

**Rosehill Water Treatment
Plant Intake and Outfall
Municipal Class
Environmental Assessment
Addendum**

Project File Report (PFR)

Final

January 30, 2026

Prepared for:



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RVA 226503

January 30, 2026

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Attention: Sahil Kakkar, C.E.T., rcsi
Senior Project Manager, Water & Wastewater Services, Public Works

Dear Mr. Kakkar:

Re: Rosehill Water Treatment Plant
Intake and Outfall Municipal Class Environmental Assessment Addendum
Project File Report (PFR) – Final

Please find enclosed the Project File Report (PFR) – Final for the Rosehill Water Treatment Plant Intake and Outfall Schedule B Municipal Class Environmental Assessment Addendum.

Please do not hesitate to contact the undersigned if you have any questions.

Yours very truly,

R.V. Anderson Associates Limited

A handwritten signature in black ink, appearing to read 'Frank Feng'.

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Rosehill Water Treatment Plant Intake and Outfall Municipal Class Environmental Assessment Addendum

Project File Report (PFR)

Final

Niagara Region

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RVA 226503

January 30, 2026



ROSEHILL WATER TREATMENT PLANT INTAKE AND OUTFALL MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT ADDENDUM

PROJECT FILE REPORT – DRAFT

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1.0 INTRODUCTION

1.1 Background

The Rosehill Water Treatment Plant (WTP) is located at 300 Rosehill Road in the Town of Fort Erie, and it is owned and operated by Niagara Region (Region). The service areas for the Fort Erie (Rosehill) water system include Crescent Park, Crystal Beach, Douglastown, Ridgeway, and Stevensville. The 2021 Water and Wastewater Master Servicing Plan (MSP) Update identified that the Rosehill WTP's existing capacity is sufficient to support population growth in its service area to the year 2051.

In addition to the infrastructure improvements identified to service growth in the MSP, the Region also implements a sustainability program analysis that identifies the need for upgrades or replacements of existing infrastructure to maintain the intended level of service. The Rosehill WTP new intake and new outfall (plant drain) projects were identified by Region's Sustainability Capital Plan, as discussed in the 2021 MSP.

The existing intake has reached the end of its service life and is at risk of failure due to structural deficiencies and corrosion. Additionally, there are issues with excess accumulation of sediments and zebra mussel shells within the intake pipeline and the crib structure.

The original outfall structure was found to suffer from a significant buildup of sand and debris due to strong wind and wave action on the shoreline. The Region has implemented a temporary solution to raise the discharge point using submersible pumps and create a clear passage for the plant drain discharge. A permanent solution is required to maintain the function of the outfall while minimizing impacts to Species at Risk (SAR) and their habitats.

1.2 2022 Schedule B Municipal Class Environmental Assessment

The Region completed a Schedule B Municipal Class Environmental Assessment (Class EA) study in 2022 which identified a preferred water supply solution to address current maintenance and operational concerns associated with the condition of the existing Rosehill WTP intake. The preferred water supply solution from the 2022 Class EA included:

- A new intake structure, located in Lake Erie at an approximate lakebed depth of 5 m. The intake structure would be installed inside a large timber crib with sizable intake ports to allow flow of raw water into the intake pipe. The timber crib would be installed in an excavated pit at the lake bottom, in rock.

- A new intake pipeline with an outside diameter of 1,067 mm (and an inside diameter of 934 mm). The new intake pipeline would connect to the existing Low Lift Pumping Station (LLPS) on the shore. Both the land and marine sections of the new pipeline would be installed by conventional open cut marine trenching, extending from the LLPS, through the near shore area, and out into the lake to the new intake structure.
- New chlorination and raw water sampling piping that would extend the full length of the new intake pipeline.
- Connection of the new intake pipeline to an extension of the existing wet well at the existing LLPS. It was proposed that the connection be constructed in stages to allow the continuous operation of the LLPS.

As part of the 2022 Class EA, the following supporting studies were conducted:

- Natural Sciences Report
- Cultural Heritage Screening Report, Stage 1 & 2 Archaeological Assessment Report, and Marine Archaeological Assessment Report
- Surface Water Vulnerability, Issues Evaluation and Threats Assessment Report
- Sediment and Water Quality Investigation Report

The “Notice of Study Completion” and Project File Report (PFR) for this Class EA were filed in Summer 2022. The Region then proceeded to implement the preferred water supply solution.

1.3 Revision to Schedule B Class EA

During the preliminary design for the new Rosehill WTP intake, a constructability review was completed, which included site investigations as well as consultations with agencies and marine contractors. The review concluded that the open trenching construction method outlined in the 2022 Class EA would be challenging to feasibly implement due to site access constraints and lack of available space for construction laydown.

Therefore, a new alternative for the intake construction needs to be identified to improve constructability and project phasing. Depending on the preferred construction method for the intake, its associated infrastructure – such as the existing LLPS and the existing plant drain outfall – would need to be considered for rehabilitation/replacement/relocation to accommodate construction needs and potential future growth.

As per the Municipal Class EA document (2000, amended 2024), any significant modification to the project after the filing of the PFR shall be reviewed by the proponent with an addendum prepared. Therefore, RVA was retained by the Region in 2024 to complete a Schedule B Class EA Addendum for the Rosehill WTP intake and associated infrastructure.

2.0 MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT PROCESS

2.1 Municipal Class Environmental Assessment

The Municipal Class Environmental Assessment (MCEA) Document provided by the Municipal Engineers Association (MEA) in 2000 (as amended in 2024) outlines an approved planning process for municipal infrastructure projects, including water and wastewater projects. Proponents can use the MCEA process to meet the requirements of the Ontario Environmental Assessment Act. The MCEA process is illustrated in Figure 2.1.

The MCEA process includes mandatory requirements for gathering input from directly affected members of the public, relevant regulatory agencies, and Indigenous communities. The evaluation of alternatives to a problem or opportunity is also required in this process.

The 2022 Class EA was completed as a Schedule B Class EA. The MCEA defines the process of Schedule B projects as follows:

Schedule B projects have the potential for some adverse environmental effects. For these types of projects, the proponent must undertake Phase 1 and 2 of the Class EA process. The proponent must provide one mandatory point of contact with directly affected public, relevant government agencies and Indigenous Communities to allow for the identification and consideration of concerns that are raised regarding the project's implementation. The proponent then prepares a PFR which documents the Phase 1 and Phase 2 process of the Class EA. If there are no outstanding concerns during the 30-day public and agency review period of the PFR, then the proponent may proceed to implementation.

NOTE: This flow chart is to be read in conjunction with Part A of the MCEA

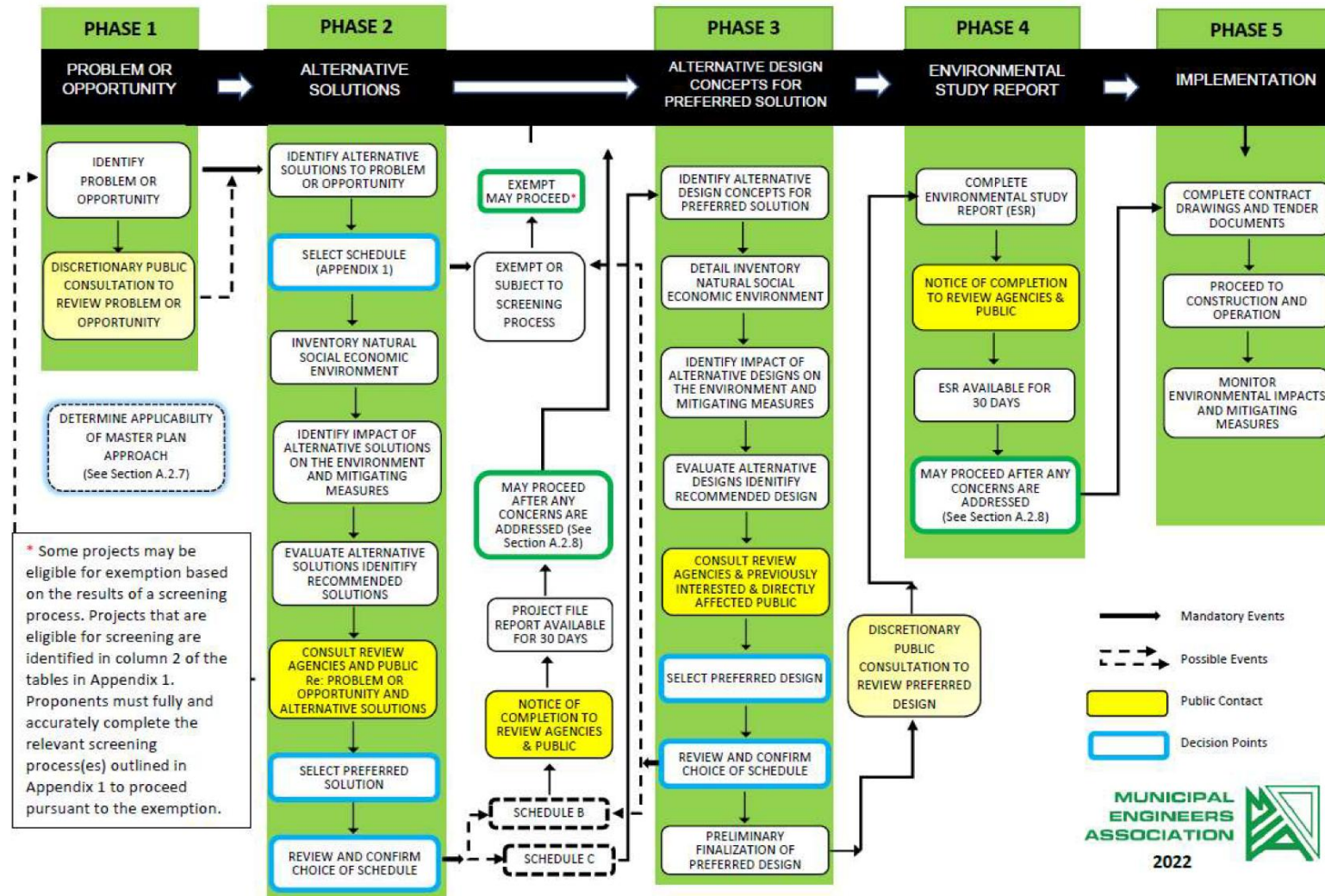


Figure 2.1: Municipal Class Environmental Assessment Process

2.2 Municipal Class Environmental Assessment Addendum

Any significant modifications to a project that occurs after the filing of a Schedule B Class EA PFR must be reviewed in an MCEA addendum process. The procedure for Schedule B MCEA addendum undertaking is indicated below. Further details of the MCEA process are provided in Section A.2 of the MCEA (2000, as amended in 2024).

Phase 1	Identify the problem or opportunity.
Phase 2	Identify and evaluate alternatives to the problem/opportunity by considering the existing environment and establishing the preferred solution, considering public, agency, and First Nation Communities input. Document the decisions in a PFR.
Notice of Completion	Upon completion of the PFR, advertise and issue a Notice of Completion (or Notice of Addendum) to the public, to agencies, and to Indigenous Communities for a 30-day review period. During this time, consider any comments or requests from stakeholders, agencies, or concerned parties, according to the procedures outlined in the Municipal Class EA Manual (2000, as amended in 2024). In addition, during the 30-day review period, a request may be made to the Ministry of the Environment, Conservation and Parks (MECP) for a Section 16 Order requiring a higher level of study (i.e. requiring an individual/comprehensive Class EA approval before being able to proceed to the Implementation Phase), or requiring that conditions be imposed (e.g. completion of further studies). However, with the COVID Economic Recovery Act and the 2023 MCEA Amendment, the Section 16 Order may only be requested on the grounds that it will prevent, mitigate or remedy adverse impacts on constitutionally protected Indigenous and treaty rights. Requests on other grounds will not be considered.
Implementation	Provided that no Section 16 Order Requests are made to the MECP within the 30-day review period, and provided that

concerns have been addressed, the project is approved and may proceed with detailed design, construction, operation, and monitoring. The project would still be subject to all applicable environmental regulations and approvals.

3.0 PROBLEM AND OPPORTUNITY STATEMENT

Although the 2022 Class EA had a Problem and Opportunity statement, an updated Problem and Opportunity statement was prepared for this Class EA Addendum:

The Region wishes to identify, evaluate, and select the preferred location and design concept for a new Rosehill WTP intake.

The Region also wishes to identify, evaluate, and select the preferred improvement to existing infrastructure associated with the new intake, including a new low lift pumping station and a new plant drain outfall structure, which are additions to the 2022 Class EA scope.

The preferred alternative shall:

- Comply with applicable regulations to provide adequate water supply,
- Address operational and maintenance requirements,
- Be financially viable,
- Be technically feasible and adaptable to future needs, and
- Be socially and environmentally responsible.

Alternative solutions should be evaluated based on their ability to meet the above Problem and Opportunity Statement.

Alternative solutions should identify:

- A new intake structure and pipeline with alternative construction methods to address site space and access constraints, and
- The required rehabilitation, replacement, or relocation of the existing infrastructure associated with the new intake.

4.0 STUDY AREA OVERVIEW

4.1 Study Area Boundary

Figure 4.1 shows the study area for this Class EA Addendum.

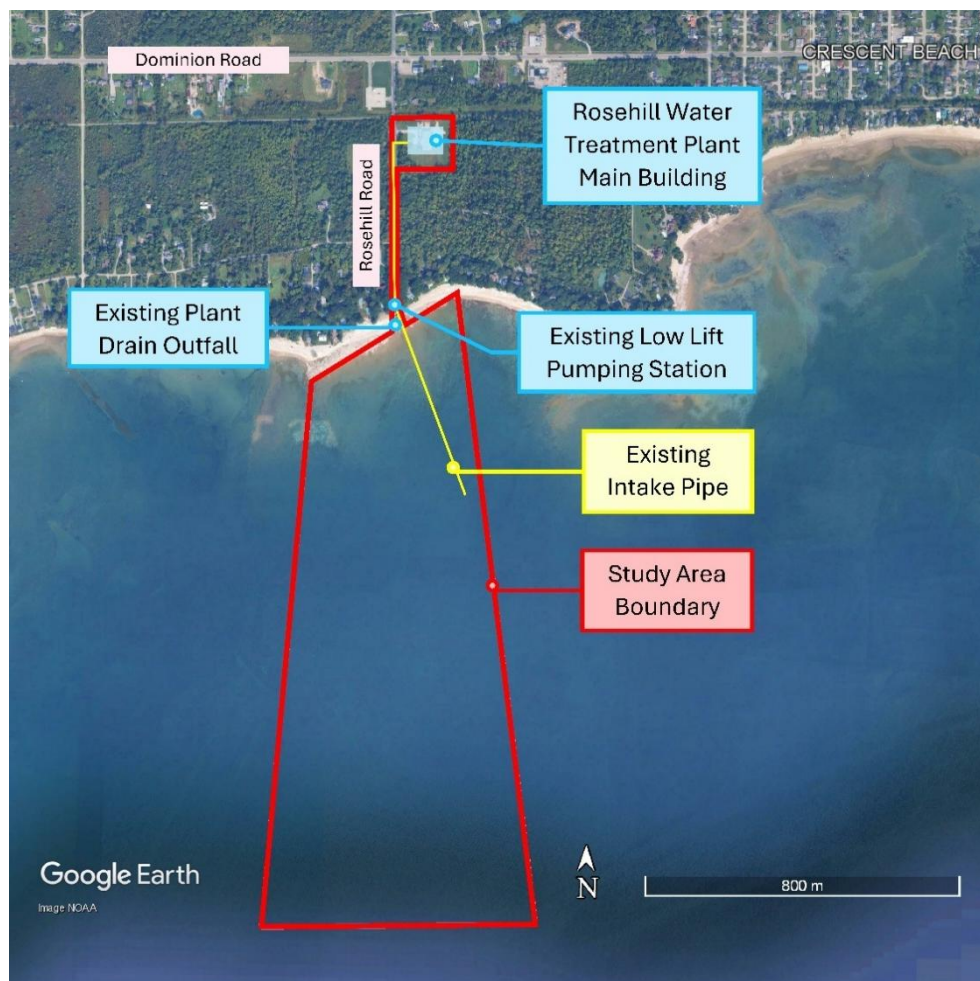


Figure 4.1: Class EA Addendum Study Area

The offshore study area includes the Region's waterlot easement for the existing intake pipe, as well as adjacent areas where the new intake structure could be located. The offshore study area extends approximately 1.5 km offshore.

The on-land portion of the study area includes the existing Rosehill WTP, the easement that the Region owns along Rosehill Road from the WTP to the shoreline, and the existing LLPS property. Figure 4.2 shows a close-up of the near shore area and the existing LLPS. See Figure 4.3 for plan views of the Rosehill WTP and the LLPS.



Figure 4.2: Class EA Addendum Study Area – Nearshore Area and Existing LLPS



Figure 4.3: Plan View of Rosehill WTP (Left) and of the LLPS (Right)

4.2 Natural Environment

The Rosehill Water Treatment Plant Intake and Outfall Natural Environment Assessment Report (NEAR) was prepared by RVA in March 2025 to support this Class EA Addendum – see **Appendix 1**. The NEAR documents the results of the desktop assessment and the subsequent field investigations for the natural heritage features relevant to the study area as shown in Figure 4.1. It also includes the recommendations to eliminate or reduce potential impacts on the identified environmental components.

A summary of the findings of the desktop and field investigations is presented below. It should be noted that the NEAR also incorporates natural heritage information from previous studies that were completed as part of the 2022 Class EA.

4.2.1 Designated Natural Areas

No provincially or locally designated reserves or Areas of Natural or Scientific Interest (ANSI) were identified in the study area.

The 2011 Town of Fort Erie Official Plan identifies the presence of Significant Natural Areas along the Lake Erie shoreline, as well as north of the shoreline and east of Rosehill Road. Additional Significant Natural Areas are located immediately north and west of the WTP, which generally correspond with wooded habitats. The Official Plan also identifies an Environmental Corridor area through the middle of the study area, extending east and west. The Lake Erie shoreline within the study area is identified as Natural Hazards including Floodplain, as well as a Critical Lake Fish Habitat polygon offshore from the terminus of Rosehill Road.

Finally, the Ontario Geohub Wildlife Values Areas indicates that the woodland within the study area is a White-tailed Deer Wintering Area, and the Lake Erie Shoreline is a Waterfowl Winter Concentration Area. The Thunder Bay Woodlot Wetland Complex shown on provincial mapping is designated as a Locally Significant Wetland.

4.2.2 Vegetation

The landscape within the study area was generally observed to be a mixture of remnant and regenerating wooded vegetation communities, as well as the more dynamic beach communities, interspersed with anthropogenic vegetation, buildings and infrastructure.

The wooded area surrounding the Rosehill WTP was confirmed as a Swamp Maple Mineral Deciduous Swamp, located south and east of the WTP. No provincially rare vegetation communities were assessed within the study area. A floral inventory was completed during

field investigations in the vicinity of the WTP and along the Rosehill Road. Notable species documented included White Wood Aster (Threatened), Black Ash (Endangered) and Shumard Oak (Special Concern).

4.2.3 Breeding Bird Survey

A single-visit breeding bird survey was completed to obtain initial breeding bird data, including information on the potential presence of SAR within the study area. Since only one survey was completed, breeding could not be confirmed but it can be assumed that for the species detected, breeding within the vicinity of the study area was probable. The species recorded during these surveys are typical of large Carolinian woodlots of far southern Ontario. Two of the species recorded during these surveys (Wood Thrush and Eastern Wood-Pewee) are considered SAR and are given the Special Concern designation.

4.2.4 Wildlife and Wildlife Habitats

Significant Wildlife Habitat (SWH) are areas or features that are rare or provide important habitat functions. The presence of Eastern Wood Pewee and Wood Thrush (both Special Concern) during the breeding season in wooded habitat within the study area indicates that the woodlands are a candidate SWH for Special Concern and Rare Wildlife Species. As the area was noted as a White-tailed Deer Wintering Area, the SWH for Deer Winter Congregation Areas was also confirmed.

Based on recorded vegetation communities outside of targeted surveys, candidate SWH is present for Shorebird Migratory Stopover Area, Bat Maternity Colonies, Landbird Migratory Stopover Areas, Bald Eagle and Osprey Nesting, Foraging and Perching Habitat, Woodland Raptor Nesting Habitat and Turtle Nesting Areas.

4.2.5 Fish and Fish Habitat

The study area falls within the northeast Lake Erie Shoreline watershed. Generally, this watershed does not reach very far inland, especially east of Point Abino, where the study area lies. The watershed generally drains southwards towards Lake Erie. Within this watershed, shorelines are typically dominated by exposed limestone bedrock substrates with sand embayments.

Details on water quality and fish habitat are presented in **Appendix 1**. Lake Erie provides habitat for a diverse fish community, and the Department of Fisheries and Oceans (DFO) identifies Lake Erie as habitat where Silver Chub - listed under the 2007 federal Species at

Risk Act as Endangered, and under the Endangered Species Act (ESA) as Threatened – is present.

4.2.6 Species at Risk (SAR)

SAR screening findings are summarized below:

- A variety of floral and faunal species of provincial interest have been recorded within or in the vicinity of the study area, as noted in Section 4.2.2.
- The nearshore habitat for Fowler's Toad within the study area was confirmed as Category 1 habitat for Fowler's Toad.
- Indications of a suitable habitat for provincially endangered bat species within the vicinity of the study area were observed. Due to these species' cryptic nature, detection is often difficult and requires bat-specific surveys. Further investigations are required to determine species presence and extent of local habitat use.
- Field investigations confirmed the presence of White Wood Aster, a Threatened species in Ontario within the vicinity of the study area. Additional surveys, as well as related permitting, may be required depending on the final design and MECP requirements to define this species' critical habitat.
- Black Ash is an Endangered species that occurs within the study area.
- Species of Special Concern were identified to be using the study area such as Wood Thrush and Eastern Wood-Pewee. These species are not afforded any species or habitat protections under the ESA due to their designation; however, their status is subject to change and can be reclassified as Endangered or Threatened due to a combination of biological characteristics and identified threats.
- The Red-headed Woodpecker was not detected within the study area during field investigations, though this species breeds regularly in the area. The species was detected at a nearby beach access point 2.5 km away. This confirms the species was available for detection in the larger area but was not actively utilizing the study area during field investigations. The wooded lands within and beyond the study area are potentially suitable breeding habitat for this species.

4.3 Cultural Heritage

4.3.1 On-Land Archaeological Resources

A Stage 1 Archaeological Assessment (WSP Canada Inc., 2025) was completed for the on-land study area. The study area was restricted to the on-land portion of the area outlined in Figure 4.1. A property inspection was conducted on November 21, 2024.

The Stage 1 Archaeological Assessment (AA) determined that the study area has general archaeological potential for the following reasons:

- Lake Erie, a primary water source, is within 50 m of the study area. A small, unnamed tributary, a secondary water source, is within 240 m of the study area.
- The presence of favourable soil types for past human settlement.
- The study area fronts two early transportation routes.
- Early Euro-Canadian farmers having ownership of study area Lots starting in 1843.
- Portions of the study area are identified as having general archaeological potential in the Niagara Region Archaeological Management Plan, and the Town of Fort Erie's Official Plan: Schedule D: Cultural Heritage Archaeological Zones of Potential.

Based on the above findings of the archaeological assessment, the following recommendations were made:

- No further assessment is required for areas with extensive and deep land alterations or areas with steeply sloping topography. This includes the majority of the Rosehill Road and developed areas within the main treatment plant property.
- For grass areas within the main treatment plant property, assessment with test pitting at 5 m intervals is recommended.
- A strip of the study area east of Rosehill Road and north of McDonald Drive likely experienced land alteration but an assessment with test pitting at 10 m intervals is recommended to document the disturbance.

See **Appendix 2** for the complete Stage 1 Archaeological Assessment Report.

4.3.2 Marine Archaeological Resources

A Marine Archaeological Desktop Assessment (WSP Canada Inc., 2025) was completed for the offshore study area. The study area was restricted to the offshore and nearshore portion

of the area outlined in Figure 4.1. The marine archaeological desktop assessment indicated the following items within the study area that have archaeological potential:

- Evidence of Indigenous archaeological sites and land use patterns near the contemporary Lake Erie shoreline.
- Presence of 19th to early 20th century quarries with piers along the shoreline near the study area. An undated map, interpreted to show the early 20th century landscape, indicates the presence of a sunken pier and two unidentified shipwrecks within approximately 300 m of the study area.
- Presence of reported shipwrecks/stranding events within 5 km of the study area.

To investigate the items above, a site visit was conducted on November 21, 2024. This investigation yielded the following recommendations:

- Mapping the extent of near shore bedrock and delineating areas of sediment deposition north of the 45 m depth contour for sub-surface testing.
- Locating and mapping (if necessary, and without excavation) of the submerged historical infrastructure located west of the study area.
- Conducting a geophysical survey for the entire study area.

The marine archaeological desktop assessment recommended that further investigation of the deep-water area will be necessary to determine if archaeological resources exist within the study area.

See **Appendix 3** for the complete Marine Archaeological Assessment Report.

4.3.3 Built Heritage Resources and Cultural Heritage Landscapes

A Cultural Heritage Screening Memorandum and the Ministry of Citizenship and Multiculturalism's (MCM) 2022 Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes Checklist (Checklist) were completed for the study area (WSP Canada Inc., 2025). The MCM Checklist screened the study area for known or potential Built Heritage Resources (BHRs) and Cultural Heritage Landscapes (CHLs).

The Checklist was completed via desktop data collection and municipal and agency information gathering. It was determined that the study area does not contain known BHRs or CHLs. However, a historical railroad, located directly north of 300 Rosehill Road, is over 40 years of age and may have potential cultural heritage value or interest (CHVI) as a CHL. Additionally, a historical map review determined that there are two structures that are 40

years of age or older located in adjacent properties to the study area (1755 MacDonald Drive, and 200 Rosehill Road). These two structures were identified as potential BHRs in the previous Cultural Heritage Screening Report completed in 2021 (Golder, 2021).

The Cultural Heritage Screening Memorandum recommended that a Cultural Heritage Report: Existing Conditions and Preliminary Impact Assessment must be completed for the study area.

See **Appendix 4** for the complete Cultural Heritage Screening Memorandum.

5.0 EXISTING CONDITIONS

5.1 Lake Erie

5.1.1 Raw Water Quality

The 2022 Class EA reviewed selected physical, chemical, and bacteriological parameters for Lake Erie raw water data, and found that the raw water was observed to be of high quality in general. Based on historical raw water turbidity data from January 2015 to December 2019, high turbidity events (>20 NTU) typically occurred between November to February; however, no concerns with raw water turbidity were raised by the Region staff.

5.1.2 Historical Lake Levels

Lake Erie is the shallowest of all of the Great Lakes, with a surface area of 25,655 km² and an average depth of 19 m. Historical information on Lake Erie water levels with respect to the International Great Lakes Datum (IGLD) dating back to 1918 is available from the Great Lakes Environmental Research Laboratory website and shown in Table 5.1 below. The IGLD is the datum currently used for measurements of water depths for consistency throughout the Great Lakes region.

The IGLD has undergone multiple revisions with the most current iteration being IGLD 1985 (IGLD 85). According to the IGLD 85, the Lake Erie low water level (or low water datum, denoted as LWD) was determined to be 173.50 m based on the lowest recorded water level. However, a record low water level occurred after the Lake Erie LWD was established, when water levels reached 173.18 m (0.32 m lower than 173.50 m). The Lake Erie LWD was never updated to match this record low level. As such the low Lake Erie water elevation that will be referenced in this Class EA Addendum will be the historical low level of 173.18 m. Any water depths that were taken with respect to the 173.50 m LWD would therefore require an adjustment (in the form of a reduction) of 0.32 m.

Table 5.1 – Lake Erie Historical Lake Levels (1918 – 2025)

Scenario	Value	Units	Datum
High Lake Level	175.14	m	IGLD 85 ¹
Average Lake Level	174.18	m	IGLD 85
Low Lake Level (Low Water Datum) Currently used for measurements of water depths for consistency throughout the Great Lakes region	173.50	m	IGLD 85
Recorded Historical Low Lake Level	173.18	m	IGLD 85

Notes:

1. **International Great Lakes Datum, 1985**

5.1.3 Source Water Protection

The Source Water Protection assessment conclusions presented in the 2022 Class EA were as follows:

- The proposed location of the new intake is deeper and substantially further away from the shore, making the new intake less vulnerable to land-based contaminants than the existing intake. No significant drinking water threats were identified when considering the new intake's location.
- Should the location of the new intake crib structure differ from what is recommended in this report, a final delineation of the Intake Protection Zones should be undertaken to reflect the actual intake location.

These conclusions would remain unchanged through this Class EA Addendum. Final updates to the Source Protection Plan would be completed during a future detailed design phase. The most critical item to be updated is the final intake structure location and design parameters for modelling.

5.1.4 Marine Hydrographic and Geophysical Survey

CSR GeoSurveys Ltd. (CSR) was retained to conduct a hydrographic and geophysical survey for the offshore study area. The survey included the collection of lakebed bathymetry data for water depths and sidescan sonar data for surficial geology categorization. Results of the survey are summarized below:

- The water depths within the area surveyed ranged from 1.52 m to 7.32 m. In general, the lakebed elevation steadily decreases as the distance to shore increases, with a slight rise between 700 m to 900 m offshore.
- The lakebed geology within the survey area was categorized into silty sand with gravel (local boulders), sand and gravel with cobbles (local boulders), glacial till, and interpreted bedrock (at or near surface), as shown in Figure 5.1.
- The surficial lakebed features mapped from the geophysical data include ice scours, drag marks, bedrock ridges, berm, possible glacial moraine, and possible dredge spoils, as shown in Figure 5.1.

LEGEND

- Proposed Intake Pipe Alignment
from Previous Class EA
- Existing intake pipe alignment
- Proposed Intake Pipe Structure
from Previous Class EA
- Existing intake pipe structure
- Land (approximate)
- UTM graticule

SURFICIAL GEOLOGY

- Interpreted bedrock (at or near surface)
- Glacial Till
- Sand and gravel with cobbles (local boulders)
- Silty sand with gravel (local boulders)

SURFICIAL FEATURES

- Ice scour
- Linear feature, possible ice scour
- Linear feature, possible drag mark
- Linear feature, possible exposed pipe
- Bedrock ridge
- Berm
- Possible glacial moraine
- Possible dredge spoil



Figure 5.1: Offshore Study Area Surficial Geology and Lakebed Features

5.2 Rosehill WTP

The Rosehill WTP is located at 300 Rosehill Road, in Fort Erie (Figure 5.2). The plant services a residential population of approximately 33,957 and an employment population of approximately 10,264 in the Town of Fort Erie, as per the 2021 Water Master Servicing Plan Update.



Figure 5.2: Rosehill WTP Property

The Rosehill WTP is a conventional treatment plant rated at a capacity of 50 MLD. The plant's current main unit processes include:

- Intake
- Low Lift Pumping Station (LLPS)
- Flocculation and Sedimentation
- Dual Media Filtration
- High Lift Pumping Station
- Clearwell and Reservoirs
- Chemical Storage and Chemical Dosing Systems
- Waste Residual Management

5.3 Rosehill WTP Intake and LLPS

The existing source water supply at the Rosehill WTP is composed of the following:

- An existing intake crib structure, including a pre-chlorination diffuser for zebra mussel control, a timber/concrete frame (4 m wide at base and 4.6 m tall at highest point) with coarse screens, and a flared elbow inlet with a 2.14 m diameter bell mouth installed 0.6 m above the lakebed, at an approximate lakebed elevation of 170 m.
- A corrugated steel intake pipe, 1050 mm in diameter with bituminous coating and with a denoted capacity of 68 MLD capacity. The intake pipe is composed of approximately 400 m of pipe length under the lake and approximately 163 m of buried pipe length from the shoreline to the existing LLPS.
- One raw water inlet chamber (1.83 m long, 1.75 m wide, 6.10 m deep) and two suction wells at the existing LLPS, with one traveling screen and two vertical turbines in each suction well. The LLPS is located at 160 Rosehill Road, separated from the main treatment plant.
- A raw water main (900 mm diameter and 457 m long Concrete Pressure Pipe) running from the LLPS to the main WTP building.

5.4 Rosehill WTP Plant Drain Outfall

The plant drain/outfall system at the Rosehill WTP is composed of the following:

- A waste residual holding tank with a submersible pump. The supernatant from this holding tank is de-chlorinated then discharged by gravity to the outfall pipe.
- A concrete outfall pipe, 750 mm in diameter and approximately 530 m long. The outfall pipe, also noted as “plant drain” on as-built drawings, was installed parallel to the existing raw water main at a relatively lower elevation along Rosehill Road, and was terminated at the shoreline outfall structure.
- An outfall structure, originally installed with a rock channel at the terminal point on the shoreline with headwall gratings. This structure was modified with the addition of a water diversion chamber (0.75 m wide, 1.00 m long, 2.10 m high) placed against the original headwall, completed with supplemental pumping that discharges water from the chamber via two 200 mm pipes at the top of the chamber. This

modification was constructed as a temporary solution to raise the discharge point above the sand and debris buildup at the outfall headwall. See Figure 5.3.



Figure 5.3: Existing Plant Drain Outfall

Figure 5.4 shows the progressive installation of the existing outfall chamber which serves as a temporary solution to overcome debris buildup.

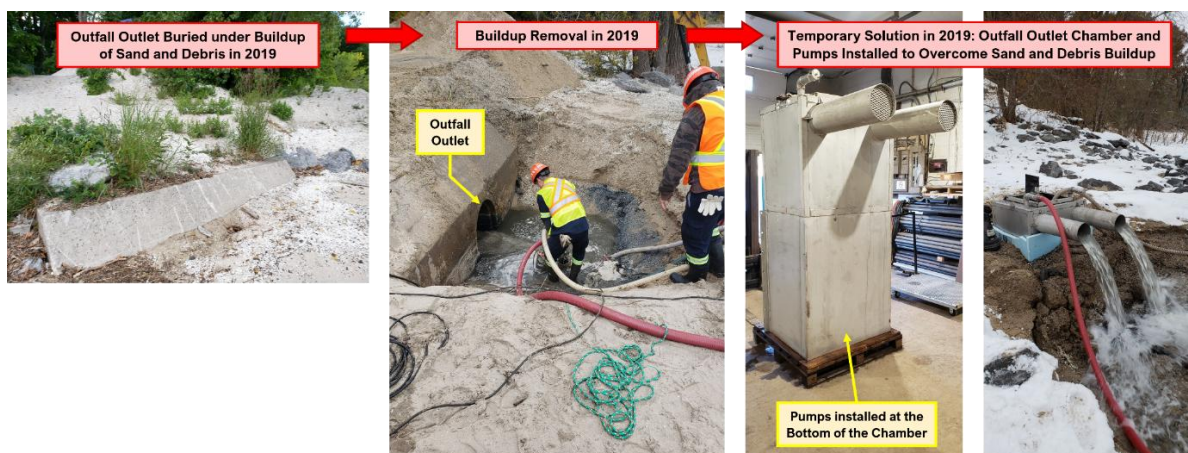


Figure 5.4: Installation of the Existing Outfall Chamber

6.0 ALTERNATIVE INTAKE SOLUTION

6.1 Preliminary Screening of 2022 Class EA Alternative Solutions

The 2022 Class EA identified the following alternative solutions:

- Do Nothing
- Limit Community Growth
- Reduce Water Demands
- Obtain Water from Another Source
- Expand/Upgrade/Modify Existing System
 - Refurbish Existing Intake
 - Replace Existing Intake

These alternatives were evaluated against a preliminary “must-meet” screening criteria, which included capacity, compliance, and technical feasibility requirements. The preliminary screening concluded that “Replace Existing Intake” is the only alternative that met all the preliminary screening criteria.

The preliminary screening alternatives, criteria, and conclusions from the 2022 Class EA remain the same for this Addendum process. The alternative “Replace Existing Intake” was carried over for further development of alternative concepts.

6.2 Key Considerations for New Intake

6.2.1 Overview of Agency Requirements for Intake Design Concepts

As per the MECP’s Design Guidelines for Drinking-Water Systems, the intake design should consider the following:

- The minimum submergence from the top of the intake structure to the minimum recorded water level should be 3 m (10 ft) wherever possible.

Niagara Region’s Water-Wastewater Project Design Manual (Revision 2, August 2019) has the following requirements for intake designs:

- Intakes shall have a minimum of 600 mm of clearance from the waterbed unless shown that a lesser clearance will not impact the function of the intake.

The Department of Fisheries and Oceans (DFO) is also involved in the review of intake structures with regards to fish protection. Some of the key general requirements are noted below:

- Approach velocities should limit fish impingement and entrainment, with required velocities typically varying from 0.035 m/s to 0.15 m/s. DFO recommends the use of an online tool for end-of-pipe screen size (CSAS, 2016) to determine the maximum approach velocity based on potential fish species near the proposed intake structure.
- A diversion device, such as bar screens, should be included in the design to prevent fish or debris from entering the intake structure.

Transport Canada (TC) is primarily concerned with long-term impacts to navigation and that the intake is properly documented and marked for navigational purposes.

- If the construction, placement, alteration, rebuilding, removal, decommissioning, repair or maintenance of a pipeline that is designated, or intended to be designated, as a minor work disturbs the bed contours of a navigable water to the point of interfering or being likely to interfere with navigation, the owner of the pipeline must ensure, on completion of the activity, that the bed contours of the navigable water do not and are not likely to interfere with navigation (Government of Canada, 2024).

Other guidance documents such as the American Water Works Association (AWWA) Water Treatment Plant Design – Fifth Edition (2012) have the following recommendations:

- The intake inlet should be a minimum of 1.2 m to 2.4 m above the bottom of the lake to prevent sediment from entering, and a minimum of 6 to 9 m below the surface for ice and wave avoidance.
 - It is noted that due to the shallowness of Lake Erie, these elevations and depths are often not practical to attain.

In summary, the intake structure should have a minimum of 3 m submergence and a minimum of 0.6 m of clearance above the lakebed. Greater clearances are acceptable. The height of an intake structure is typically 1 to 2 m to minimize its footprint while providing adequate fish protection. As a result, the location of the intake structure needs to be 5 m deep at a minimum, and greater depths are preferable to better accommodate the required criteria.

Additionally, in-water work required for this project would need to consider the Ministry of Natural Resources (MNR) and the DFO in-water work timing window guidelines. This would

require future agency consultation once construction details are known. For southern Ontario in-water work guideline restrictions may limit work between July 15 to September 15 subject to consultations and approvals.

6.2.2 Constructability for Pipe Installation

It is critical to maintain continuous operation of the WTP during the construction of the new intake with minimal disruption to the production of treated water. In addition, since the existing LLPS property is surrounded by an established residential neighbourhood, construction activities should be controlled within the property constraints and Region owned easement areas with construction impacts minimized.

A constructability review was completed during the preliminary design for the conventional open trench installation method recommended by the 2022 Class EA for the intake pipe installation. The review included potential space requirements (laydown and equipment usage for construction activities including drilling, shoring, dewatering, etc.) and site access requirements at the near shore area. This review was supported by site investigations as well as consultations with agencies and marine contractors. The constructability review concluded that it would not be feasible to implement conventional open trenching methods for pipe installation within the property limits at the nearshore area.

Trenchless construction methods would allow the installation of the new intake pipe within the tight easement area with limited impacts to adjacent property owners and the natural environment. The suitable trenchless construction method is most likely to be tunnelling, including micro-tunnelling or conventional tunnelling. The available space at the existing WTP main treatment building property could be utilized for the construction laydown and equipment setup.

6.2.3 Constructability for Tie-in with Existing LLPS

To accommodate the preferred trenchless construction method for the intake pipe installation, a deep excavation would be required south of the existing LLPS to connect the new intake pipe with the existing LLPS. To maintain plant production during construction, staged construction of LLPS wet well extensions, similar to the recommendations by the 2022 Class EA, would also be required. This is not likely to be feasible due to similar concerns regarding lack of space for site access and equipment usage.

Furthermore, the future expansion of the existing LLPS is anticipated but would not be possible at its current location and arrangement due to property constraints. A new LLPS

would be needed eventually at a different location, and additional tunnelling may be required for the tie-in of the new intake pipe with the new LLPS.

Considering the above, it is essential to address the need for a new LLPS as part of this Class EA Addendum. The location of the new LLPS can be near the entry point of the trenchless construction for the intake pipe installation, and this will minimize any additional tunnelling that would be required.

6.2.4 Overview of Agency Requirements for LLPS Design Concepts

As per the MECP's Design Guidelines for Drinking-Water Systems, the new LLPS design should consider the following:

- Structures, major piping, and appurtenances should be designed for 20-year growth. The new station should permit future expansion to the planned ultimate capacity of the Rosehill WTP facility.
- The station should be protected from transient pressure surges that may occur due to pump start/stop or during power failure. The wet well should have sufficient volume to handle intake upsurges and downsurges. Discharges from surge protection can be connected back to the wet well or can be discharged to a drainage system. A hydraulic transient analysis should be undertaken to confirm the impact of intake surges.
- Other requirements as noted in the MECP guidelines.

Niagara Region's Water-Wastewater Project Design Manual (Revision 3, July 2023) has the following requirements for the LLPS:

- The station should be equipped with vertical turbine pumps, sized according to the flow expected during the entire lifecycle of the facility.
- The station should consider the potential of flooding, provide access for emergency vehicles and cranes, and provide sufficient parking for operations and maintenance.
- Surge protection shall be provided. Water from surges can be recirculated back to the wet well or discharged to the environment.

6.3 Description of Alternative Intake Solution

An alternative intake solution was recommended based on the key considerations discussed in Section 6.2. The alternative solution includes:

- An Intake Structure, located in Lake Erie at a minimum lakebed depth of 6.5 m. The intake structure will consist of a circular bell mouth at the end of the intake pipeline with a bar screen structure overtop of the bell mouth end. The intake structure could also include a sacrificial wooden crib to enclose the entire intake structure and a navigation buoy per Transport Canada Private Buoy Regulations. Both the bar screen and the wooden crib need to be designed to regulate inlet velocity and to provide fish protection.
- An Intake Pipeline, installed with trenchless technologies, from the main WTP site to the new intake structure in Lake Erie. The intake pipeline material should be suitable for the selected trenchless technology, and the pipe should have a minimum outside diameter of approximately 1500 mm. The size and the material of the pipeline will be dependent on construction requirements and should meet hydraulic requirements. Certain methodologies may require minimum internal diameters for safe working conditions and constructability.
- Small diameter chlorine lines and sampling lines, installed within the new intake pipeline to the new intake structure. The chlorine lines would supply chlorine to the diffuser ring at the intake structure for zebra mussel control.
- A new LLPS utilizing the trenchless launch shaft as the wet well, equipped with vertical turbine pumps and associated piping, fitting, and surge protection devices.
- Connection of the new intake pipeline to the new LLPS wet well, connection of the LLPS raw water pump discharge to the main treatment building, and connection of the LLPS surge discharge to the plant drainpipe.
- The existing LLPS near shore is to be decommissioned and/or demolished.

Figure 6.1 shows the alternative intake solution and Figure 6.2 shows associated construction areas.

Intake Structure: Detailed View

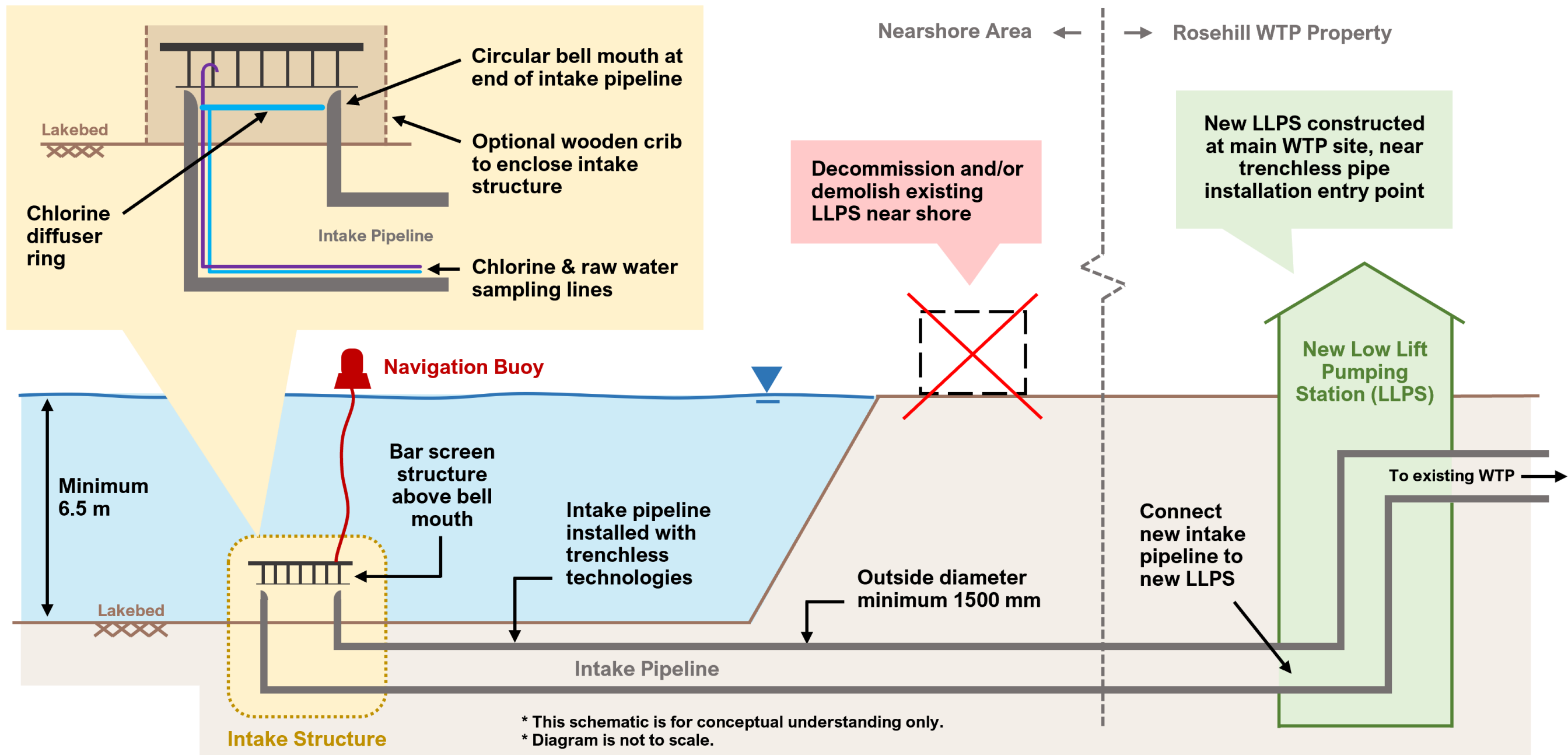


Figure 6.1: Summary of Alternative Intake Solution

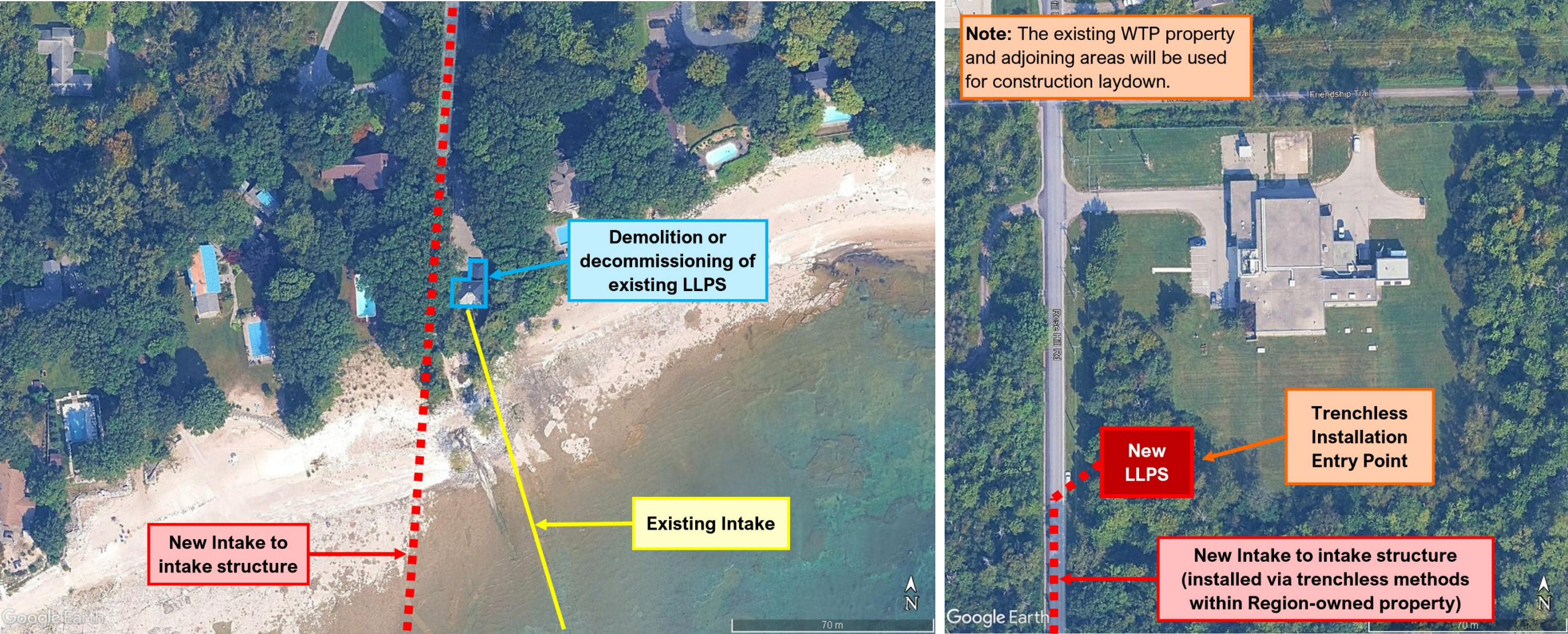


Figure 6.2: Alternative Intake Solution at LLPS/Nearshore Area (Left) and Rosehill WTP Site (Right)

6.4 Comparison and Evaluation of New Intake Solution

6.4.1 Comparison to 2022 EA Preferred Solution

The main differences and the advantages of the alternative intake solution compared to the 2022 EA Preferred Solution are summarized in Table 6.1.

Table 6.1 – Comparison of Alternative Solution to 2022 EA Preferred Solution

Intake Design	2022 EA Preferred Solution	Alternative Solution	Main Advantages of Alternative Solution
Intake Location	Located at an approximate lakebed depth of 5 m.	Located at an approximate lakebed depth of 6.5 m.	Deeper intake structure would be able to meet agency requirements for submergence and provide allowance for a taller opening, which reduces the approach velocity and enhances fish protection.
Intake Pipeline Size	Approximately 1,000 mm	Approximately 1,500 mm or larger	Larger pipe size would be able to meet future water demands.
Intake Pipeline Installation	Conventional open cut trenching	Trenchless technology: Tunneling or Micro-Tunneling	Trenchless technology would mitigate impacts to the natural environment and the neighbouring properties. It can also restrict the construction activity within the existing easement area. Open cut trenching is generally more disruptive as it would require the usage of marine blasting, temporary offshore access causeways, and marine dredging/backfilling.
Connection to WTP	Connection of new intake pipeline to the WTP via existing LLPS.	Connection of the new intake pipeline to the WTP via a new LLPS.	Alternative solution addresses the lack of space at the near shore area and optimizes the available intake tunnel from the WTP to shoreline. The existing LLPS area cannot accommodate expansion.

6.4.2 Evaluation Criteria

The 2022 EA Preferred Solution and the alternative solution were evaluated with respect to their impacts on the social, economic, technical, cultural, and environmental categories. The evaluation criteria under each category are shown in Table 6.2.

A graphical scoring method, as shown in Table 6.3, was used in the evaluation. Preference for an alternative solution is indicated by the amount of shading within the circle symbol. The highest impact, which would be the most negative solution, is shown as an empty/white

circle symbol. The lowest impact, which would be the most positive solution, is shown as the circle symbol coloured fully green.

Table 6.2 – Evaluation Criteria and Considerations

Criteria	Considerations
Social	• Effects on neighbouring properties • Sensory impacts during and after construction
Economical	• Comparative cost (capital cost, operation & maintenance cost)
Technical	• Constructability and construction impact to maintaining operations of the existing system • Compatibility and potential impacts to existing infrastructure • Implementation phasing and ease of implementation • Optimization of existing or available infrastructure • Operations and maintenance requirements • Ability to meet existing and future water demands • Resiliency and adaptability to future needs • Regulatory and approval requirements
Cultural	• Effects on archaeological resources • Effects on built heritage resources and cultural heritage landscapes
Environmental	• Effects on wildlife and vegetation • Effects on habitats and air quality • Effects on Source Water Protection • Effects on Climate Change

Table 6.3 – Graphic Scoring Legend

				
Highest Impact	High Impact	Moderate Impact	Low Impact	Lowest Impact
(Most Negative)	(Negative)	(Neutral)	(Positive)	(Most Positive)

6.4.3 Evaluation of Alternative Intake Solution

The detailed evaluations of the 2022 Class EA Preferred Solution and the alternative intake solution are shown in Table 6.4.

Based on the evaluation ratings, the alternative intake solution was determined to have the less social, technical, and environmental impacts. As such, the alternative intake solution is preferred.

Table 6.4 – Evaluation of Alternative Solution for Intake

Criteria	2022 EA Preferred Solution	Rating	Alternative Intake Solution	Rating
Social	- Higher construction impacts (noise, dust, vibration, heavy truck traffic) to nearby residents due to marine blasting, near shore area construction and open cut trenching installation. - Construction activities near shore would require space from neighbouring properties.		- Lower construction impacts to nearby residents. Entry point for trenchless pipe installation can be located within the main WTP site. - Construction can be restricted within Region's property/easement.	
Economical	- Higher marine construction cost due to open cut trenching for full length of new intake pipe. - Additional future costs when existing LLPS requires expansion. Would potentially require the "Alternative Intake Solution" to be implemented in part or full regardless. - Additional cost to secure lands near shore from neighbouring properties for construction laydown and equipment usage. - Similar operation and maintenance cost.		- Higher on-land tunneling cost. - Reduced marine construction cost as marine work is only required for intake structure. - Long term cost savings to incorporate the planning, design, and construction of the new LLPS with the new intake. - Similar operation and maintenance cost.	
Technical	- Lack of space and narrow access to shore. Limited construction window for in-water works. - Interruptions required to plant production when connecting to existing LLPS. - Potential for damages to existing intake pipe during the connection. - New intake makes use of the existing raw watermain pipe from the LLPS to the main WTP site. - Cannot accommodate future LLPS expansions (lack of space at existing LLPS property). - Similar permit and approval efforts; however, construction would be considered more disruptive.		- Improved constructability as trenchless installation utilizes available space at the main WTP site for construction laydown and storage. Year-round construction is also possible. - Less risk of interruptions to plant production. - New intake pipeline runs directly from the lake to the main WTP site. - Ability to meet future growth in demands. - Ease of implementation for future LLPS expansions. - Similar permit and approval efforts but construction would be considered less disruptive.	
Cultural	- Impacts to potential marine archeological resources due to open cut trenching. - Similar impacts to built heritage resources.		- Trenchless technology would have less impacts on marine archeological resources since the amount of lakebed disruption is reduced. - Similar impacts to built heritage resources.	
Environmental	- Higher impacts to aquatic habitats/species due to open cut trenching, dredging, and blasting. - Moderate impact to wildlife and terrestrial wildlife habitats, with mitigation required during design/construction. - Higher impact to the nearshore aquatic habitat for the identified SAR, Fowler's Toad, due to construction activities near shore.		- Lower impacts (in terms of extent and duration) to aquatic habitats and species as lakebed disruption would only be required at the intake structure location. - Moderate impact to wildlife and terrestrial wildlife habitats, with mitigation required during design/construction. - Minimized impact to the nearshore aquatic habitat for the identified SAR, Fowler's Toad, due to the use of trenchless technology. - Moderate impact to terrestrial vegetation due to potential clearing of woody vegetation for the trenchless installation launch point and the new LLPS, with mitigation required during design/construction.	
Overall Conclusion	Alternative Less Preferred		Alternative More Preferred	

7.0 PLANT DRAIN OUTFALL ALTERNATIVES

7.1 Identification of Plant Drain Outfall Alternatives

The 2022 Class EA did not include the replacement or upgrading of the existing outfall. The following alternatives for the Rosehill WTP outfall were therefore identified for this Class EA Addendum as follows:

- Alternative 1: Do Nothing. The existing temporary outfall chamber would remain as-is. However, the existing chamber may require frequent structural repair and repositioning due to build-up of debris.
- Alternative 2: Upgrade the Existing Outfall Chamber. This alternative would involve upgrading the existing temporary solution to a permanent solution at the same general area of the existing outfall, including:
 - Structural modifications to the existing outfall water diversion chamber to improve hydraulics, reinforce its resilience against sand and debris build up, and extend its service life.
 - Process modifications of the existing submersible pumps and piping to provide sufficient capacity.
 - Electrical and instrumental and control modifications to improve ease of operation and maintenance.
- Alternative 3: New Outfall. This alternative involves constructing a new submerged outfall that would extend out to Lake Erie, installed via open trenching.

Alternatives 1, 2 and 3 may require rehabilitation or modifications to the plant drain line from the new LLPS to the shoreline to maintain this line in a good state of repair. These alternatives may also require tie-ins for any clean water discharges from the new LLPS.

After the existing LLPS and the existing intake are decommissioned, there is an opportunity to convert the existing raw water well at the LLPS as well as the existing intake pipe to a plant drain outfall. However, considering the poor condition of the existing intake and the excessive accumulation of debris within the intake, additional investigations would be required to review the feasibility of this opportunity after the existing intake is decommissioned.

7.2 Evaluation Criteria

The same criteria as shown in Section 6.4.2 were used for the plant drain outfall alternative evaluation.

7.3 Plant Drain Outfall Alternatives Evaluation

The detailed evaluations of plant drain outfall alternatives are shown in Table 7.1.

Based on the ratings for each of the criteria, Alternative 2 was determined to have the lowest technical and economical impacts. As such, Alternative 2 is the Preferred Solution.

Table 7.1 – Evaluation of Plant Drain Outfall Alternatives

Criteria	Alternative 1: Do Nothing	Rating	Alternative 2: Upgrade the Existing Outfall Chamber	Rating	Alternative 3: New Outfall	Rating
Social	Construction impacts to nearby residents. The required excavation to repair or reposition the existing chamber can be limited to the chamber's general area.		Minor construction impacts to nearby residents. The required upgrades can be limited to the same general area of the existing outfall chamber.		Highest construction impacts to nearby residents due to the use of heavy machinery for new outfall construction and the proximity of the work area to neighbouring properties.	
Economical	- No upfront capital cost. - Long-term costs due to repair or repositioning of the existing outfall chamber.		- Moderate capital cost for upgrades. - Lower maintenance cost once upgraded due to improvements in discharge capacity and process automation.		- Highest capital cost due to required trench and backfill near shore. - Lower maintenance cost once upgraded due to improvements in discharge capacity and process automation.	
Technical	- Higher operation and maintenance efforts as the existing chamber is only a temporary solution. - Not able to meet future growth in required capacity.		- Improved constructability to restrict construction activities within region-owned easement. - Minor interruptions to plant production. - Optimization of the existing outfall chamber. - Able to meet future growth in required capacity. - Less permit and approval efforts.		- Poor constructability due to lack of space near shore and narrow access to shore. - Longer duration of Interruptions to plant production. - Able to meet future growth in required capacity. - Significant permit and approval efforts.	
Cultural	Possible impacts to archaeological resources, cultural heritage landscapes, and built heritage resources, with mitigation required during construction.		Possible impacts to archaeological resources, cultural heritage landscapes, and built heritage resources, with mitigation required during construction.		Impacts to marine archaeological resources due to open cut trenching.	
Environmental	Moderate impacts to the nearshore aquatic habitat for the identified SAR, Fowler's Toad, with mitigation required during design/construction.		Moderate impacts to the nearshore aquatic habitat for the identified SAR, Fowler's Toad, with mitigation required during design/construction.		Significant impacts to the nearshore aquatic habitat for the identified SAR, Fowler's Toad, due to the extent of open cut trenching near shore, with mitigation required during design/construction.	
Overall Conclusion	Alternative Less Preferred	✗	Alternative More Preferred	✓	Alternative Less Preferred	✗

8.0 SUMMARY OF PREFERRED ALTERNATIVE

The preferred alternative for the new intake includes:

- An Intake Structure, located in Lake Erie at an approximate lakebed depth of 6.5 m. The intake structure will consist of a circular bell mouth at the end of the intake pipeline with a bar screen structure overtop of the bell mouth end. The intake structure could also include a sacrificial wooden crib to enclose the entire intake structure, and a navigation buoy per Transport Canada Private Buoy Regulations. Both the bar screen and the wooden crib need to be designed to regulate inlet velocity and to provide fish protection.
- An Intake Pipeline, installed with trenchless technologies, from the main WTP site to the new intake structure in Lake Erie. The intake pipeline material should be suitable for the selected trenchless technology, and the pipe should have a minimum outside diameter of approximately 1500 mm. The size and the material of the pipeline will be dependent on construction requirements and should meet hydraulic requirements.
- Small diameter chlorine lines and sampling lines, installed within the new intake pipeline to the new intake structure. The chlorine lines would supply chlorine to the diffuser ring at the intake structure for zebra mussel control.
- A new LLPS, constructed at the main WTP site near the trenchless pipe installation entry point. The detailed design stage for the new LLPS should consider the required functions and components of the new LLPS, as well as other features required by the MECP.
- Connection of the new intake pipeline to the LLPS at the main WTP site.
- The existing LLPS near shore is to be decommissioned and/or demolished.

The preferred alternative for the plant drain outfall includes:

- Structural modifications to the existing outfall's water diversion chamber to improve hydraulics, reinforce its resilience against sand and debris build up, and extend its service life.
- Process modifications of the existing submersible pumps and piping to provide sufficient capacity.
- Electrical and instrumental and control modifications to improve ease of operation and maintenance.

- Additionally, rehabilitation or modifications to the existing plant drain line from the WTP to the existing outfall may be required to maintain this line in a good state of repair. This plant drain line will continue to be used even with the construction of the new LLPS at the main WTP site. Any clean water discharges from the new LLPS may be tied into the existing plant drain line.

9.0 PROPOSED MITIGATION MEASURES OF POTENTIAL IMPACTS

Implementation of the preferred alternative solution for the new intake and the plant drain outfall is expected to have impacts on the existing natural and socio-cultural environment. The following mitigation measures are proposed to reduce the anticipated potential impacts.

9.1 Social Impacts & Mitigation

Residents and businesses in the area may experience short-term construction impacts such as noise, dust and vibration. Long-term impacts related to the operation and maintenance of the new intake and new plant drain outfall would be similar to existing impacts.

As described in Table 6.1, the preferred alternative solution for the new intake will use trenchless technology which significantly reduces disturbances compared to open cut trenching because it does not require as much excavation and restoration. For the plant drain outfall, the required construction activities can be limited to the same general area of the existing outfall chamber via trenching.

During construction, the following identified mitigation measures should be specified:

- Before construction begins, notices will be provided to nearby residents and businesses.
- Noise and vibration generated by intake pipe installation typically comes from a single source (the jacking shaft) and could be mitigated with the use of sound walls or by selecting appropriate equipment. Construction of the project would be carried out in accordance with municipal noise requirements.
- Construction activities will abide by the local Dust Control By-law. It is recommended that best management practices be followed during the demolition, excavation, and construction of new facilities to reduce any air quality impacts that may occur. Dust could be mitigated using water trucks, covered dump trucks, tracking mats, and if needed, street sweepers.

- To minimize vibration, an alternative microtunneling shaft construction method could be considered to eliminate the need for sheet piling.
- Construction equipment would be appropriately maintained to ensure that any exhaust emissions meet industry standards.
- Lane closure will be limited to one (1) lane where possible, and when a full closure is needed, alternate routes will be provided.
- Damages to the road should be avoided where possible. A pre- and post-construction survey should be conducted and damages to be repaired where needed.

9.2 Cultural Impacts & Mitigation

Based on the results of the on-land Stage 1 archaeological assessment and the desktop marine archaeological assessment, the study area has general archaeological potential. Archaeological field investigations, including on land (stage 2 test pitting) and marine (in combination with marine geophysical surveys), should be completed during the detailed design stage of the new intake and the new LLPS, as recommended by the desktop studies. This is to confirm if archaeological resources exist within the study area. The Region will continue to consult with First Nation communities after the completion of the Class EA Addendum and during the design phase.

During construction, the following identified mitigation measures should be specified:

- Trenchless technology would have less impacts on marine archeological resources since the amount of lakebed disruption is reduced.
- In the case of archaeological resources being unexpectedly encountered during construction, in spite of the completion of archaeological assessment, the proponent or person discovering the archaeological resources must cease alteration of the site immediately and engage a licensed consultant archaeologist to carry out archaeological fieldwork. The site project team should also ensure that all observed saturated or waterlogged cultural materials are kept submerged and/or wet until they can be archaeologically assessed.

Considerations for Built Heritage Resources and Cultural Heritage Landscapes during the implementation of this project will include:

- Identified resources are to be included in project mapping.

- For BHR's, completion of a CHER during detailed design to determine whether the identified properties have cultural heritage value or interest.
- Determination of the potential for vibration impacts during construction on the Built Heritage Resources. A Baseline Vibration Assessment will be completed as part of the geotechnical investigation during detailed design. If vibration impacts are confirmed to be a concern, a Vibration Monitoring Plan will be developed and implemented during construction.
- Contractor to be informed of the potential cultural heritage landscapes and avoid encroachment onto the resources when delivering materials and equipment.
 - Pre and post construction condition assessment or recording of the site/building should be taken prior to construction. Post-construction rehabilitation to return resources to pre-construction conditions, to be completed if required.
 - Construction activities and staging should be suitably planned and undertaken to avoid negative impacts to identified built heritage resources and cultural heritage landscapes. Avoidance measures may include, but are not limited to erecting temporary fencing, establishing buffer zones, issuing instructions to construction crews to avoid identified cultural heritage resources, etc.

9.3 Environmental Impacts & Mitigation

Based on the Natural Environment Assessment Report in **Appendix 1**, the following environmental impacts and mitigation measures have been identified:

- Vegetation
 - If development in woodlands is unavoidable, consideration should be given for salvage and replanting of woodland species within the study area as part of site restoration activities.
 - SAR plants (White Wood Aster and Black Ash) were identified during site investigations and appropriate mitigations, to be confirmed through future correspondence and/or permitting with the MECP including the preparation of an Information Gathering Form, will be required to be implemented. Failure to do so could result in a contravention of the ESA.
- Excavation, Grading, Filling, and Industrial Equipment

- Excavation impacts will be mitigated by the erosion and sediment controls (ESCs) implemented during construction. All ESC measures should be inspected regularly by a qualified professional and maintained to ensure they are functioning as intended throughout the construction period and until such time that disturbed areas have stabilized.
 - All excess materials generated by excavation will be stockpiled, handled, and disposed of in a manner that prevents entry into adjacent natural features.
 - A Spill Response and Action Plan shall be prepared by the contractor in advance of work that describes actions to be taken in the event of a spill, and a spill kit containing appropriate absorbent materials will be maintained on site to be used in the event deleterious materials are released into adjacent roadside drains.
- Wildlife and Wildlife Habitat
 - SAR wildlife (Fowler's Toad) and potential habitat (Red-headed Woodpecker, SAR bats) were identified during site investigations and appropriate mitigations, as confirmed through future correspondence and/or permitting with the MECP, will be required to be implemented. Failure to do so could result in a contravention of the ESA.
 - To prevent incidental impacts to nesting birds, (including at-risk and rare species) as well as bat maternity colonies, clearing of unmaintained and/or woody vegetation will be restricted to outside of the migratory bird nesting and bat maternity seasons, generally April 1 through September 30. If vegetation clearing must occur within this window, a qualified ecological professional should be retained to confirm no birds or bats are incidentally harmed. Removal of large sections of woodland is strongly discouraged at this time as these habitats are difficult to effectively assess for wildlife use.
- Trees
 - The Tree Protection Zone (TPZ) should be protected with hoarding or similar in agreement with local tree protection by-laws. Should none be in force, minimum standards to be considered are barriers of 1.2m (4 feet) orange plastic snow fence framed with 2 x 4s.

- Anti-compaction matting should be considered for areas where staging/tracking areas are in conflict with TPZ's to preserve as many trees as possible. Location of anti-compaction matting and proximal tree preservation/removals should be determined in consultation with an ISA certified arborist at detailed design.
- Fish Habitat
 - Measures to protect fish and fish habitat would be required for in-water works in accordance with DFO requirements such as:
 - Standardized General Avoidance and Mitigation Measures
 - Codes of Practice
 - To prevent any deleterious substances from entering the waterbody, operate, store, and maintain all equipment, vehicles, and associated materials at a minimum, 30 m away from any waterbody.
 - Manage and treat dewatering/unwatering effluent (as required) to prevent erosion and/or release of sediment laden or contaminated water to the waterbody. Additional dewatering considerations:
 - Use of appropriately designed and sited temporary settling basin, filter bag, overland through 30 m of vegetation, etc., such that sediment is filtered out prior to the water entering a surface water feature.
 - Use of energy dissipation measures to prevent erosion.
 - Travel paths, stockpile areas and staging areas, within the vicinity of the waterbody, should be pre-planned and followed.

Mitigation measures should be updated and refined during the detailed design phase of the project. Mitigation measures may also be driven by contractor means and methods during construction. For the complete list of environmental impacts and mitigation measures, refer to **Appendix 1**.

9.4 Water Quality Impacts & Mitigation

In-water construction activities will lead to re-suspension of sediments. A common sediment control method is the use of turbidity curtain, or silt curtains, around the perimeter of the marine work area. These curtains could be designed to resist moderate current, wind and

wave activity. However, if the marine work area experiences weather conditions that make it difficult to maintain turbidity curtains, the contractor may rely on real-time turbidity monitoring. This means that the excavation would be slowed or paused if the turbidity level reaches a pre-determined threshold.

9.5 Source Water Protection

As part of the 2022 Class EA, BluMetric Environmental Inc. completed a surface water vulnerability, issues evaluation and threats assessment report. This report yielded the following findings:

- Based on an analysis of historical raw water quality data available for the existing water intake at the Rosehill WTP, it was found that aluminum, hardness, iron and turbidity are potential water quality issues. However, none of these parameters are directly related to human health considerations.
- No significant drinking water threats were identified as per the threats assessment.
- Should the location of the new intake crib structure differ from what is recommended in this report, a final delineation of the Intake Protection Zones (areas surrounding the intakes that are vulnerable to contamination) should be undertaken to reflect the actual intake location (CIMA+, 2022).

The location of the intake structure in this Class EA Addendum has been changed from the location presented in the 2022 Class EA. Given this change, new Intake Protection Zone mapping, a new vulnerability score, and a new threats assessment would have to be prepared for the new intake. These updates would occur during the detailed design phase of the project when the intake structure location and parameters have become fixed.

9.6 Excess Soil Management

If applicable, considerations for excess soil management include the following:

- During detailed design, an Excess Soil Management Plan would be developed and incorporated in the Contract Specifications, if required. This plan will address issues such as identification, assessment, excavation conveyance, treatment, staging and disposal of contaminated soils as required.
- Construction activities involving the management of excess soils would be completed in accordance with O.Reg. 406/19 and the most current MECP

guidelines documented under “Management of Excess Soil – A Guide for Best Management Practices”.

- Excess construction soil would be properly stored, reused and/or disposed of per the Environmental Protection Act. Waste generated on-site would also be disposed of in accordance with the MECP’s requirements.
- Excess material generated from tunneling would be handled via a spoil handling system.
- Disposal of dredge soil could be completed at the lakebed, which would require an application via the MNR.

9.7 Navigation

All in-water work would comply with Transport Canada’s Navigation Protection Program which administers the Canadian Navigable Waters Act.

The following are general requirements outlined by Transport Canada (TC) within the *Minor Works Order* that would be followed for the construction of a new intake:

- Before beginning construction, information must be deposited on TC’s registry describing the proposed activity and intake location. A notice must be published on TC’s site entitled “Publish a notification of work”.
- During the construction of the intake, the owner must ensure:
 - That vessels can navigate safely through or around the work site or, if navigation is interrupted by any activity related to the construction of the work, that a suitable means, such as a portage, exists to allow vessels to resume navigation upstream and downstream of the work site.
 - That the perimeter of the work site is visible from sunset to sunrise and during periods of restricted visibility by the placement of:
 - Yellow flashing lights,
 - Cautionary buoys with retro-reflective material, or
 - Cautionary buoys with yellow flashing lights.
 - That any cables or pipes that are in, on, over, through or across the navigable water are not left unattended unless:
 - The cable or pipe is lying on the bed of the navigable water, or

- The cable meets the requirements of Overhead Systems, CAN/CSA C22.3 No. 1, as amended from time to time.
- Buoys referred in the *Minor Works Order* must meet the following criteria:
 - The part of the buoy that shows above the surface of the water is at least 15.25 cm wide and at least 30.5 cm high.
 - The buoy, including the buoy's anchor, is constructed and maintained in a manner and with materials that ensure that it remains in position after the buoy has been anchored.
 - The buoy complies with the requirements set out in the section entitled "Floating Aids to Navigation (Buoys)" of TP 968, entitled *Canadian Aids to Navigation System* and published by the Canadian Coast Guard, as amended from time to time. (Government of Canada, 2025)

10.0 PERMITS AND APPROVALS

Anticipated permits and approvals from regulatory agencies for the new intake have been listed in **Table 10.1**. Permits or approvals would be obtained during detailed design, prior to construction and implementation.

Table 10.1 – Anticipated Permits and Approvals for the New Intake at the Rosehill WTP

Agency / Authority	Permit / Approval Required
Niagara Peninsula Conservation Authority (NPCA)	• Application for Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Permit • Update to Source Water Protection Program
Ministry of the Environment, Conservation and Parks (MECP)	• Amendments to: ○ Municipal Drinking Water License (MDWL) ○ Permit to Take Water (PTTW) ○ Drinking Water Works Permit (DWWP) ▪ Dependent on Source Water Protection Program updates undertaken by the NPCA, a conditional DWWP may be required to allow construction to proceed • Construction dewatering permit

Agency / Authority	Permit / Approval Required
	○ Either a PTTW or Environmental Activity and Sector Registry (EASR) • Permit and approval activities related to excess soil may be required. • SAR pre-screening exercise (at a minimum) • Completion of an Information Gathering Form (IGF)
Ministry of Natural Resources (MNR)	• Crown Land Work Permit ○ Requires sub-permitting from the Conservation Authority, MECP SAR, TC, and the DFO ○ Required for in-water works • Consideration of in-water works timing guidelines (disruptive work potentially restricted to July 15 to September 15) ○ For work outside of this timing window, an additional review would be completed by the MNR based on the contractor's means and methods • License of Occupancy ○ Requires an Application for Crown Land • Land Use Permit
Department of Fisheries and Oceans (DFO)	The DFO primarily enforces the Federal Fisheries Act for activities or undertakings that may harm fish or fish habitat. The following submissions are recommended: • DFO Request for Review(s) ○ Confirmation of intake structure operational parameters related to aspects such as approach velocities and screening. ○ Any in-water investigation work (such as geotechnical drilling) ○ Intake construction plans
Transport Canada (TC)	• Approval under the Canadian Navigable Waters Act for in-water works
Town of Fort Erie	• Building Permit • Site Plan Approval

11.0 CONSULTATION RECORD

The public consultation and communications that were carried out during this project provided opportunities for the public, government agencies, and First Nations to review information and provide comments and feedback to the project team. Consultation was undertaken in accordance with Schedule B Class EA Addendum requirements. Consultation for this Addendum began on August 15, 2024 when the Notice of Commencement was published. Consultation will end 30 days after the Project File Report is published for public review.

All consultation documentation (i.e. contact/mailling lists, notices, newspaper ads, PIC material) are provided in **Appendix 5**.

11.1 Notices and Communications

11.1.1 Notice of Commencement

The Notice of Commencement was published on August 15, 2024 in Niagara This Week (online), and on August 29, 2024 in the Fort Erie Observer. The notice was also emailed or mailed to stakeholders, agencies, and First Nation communities, and published on the Region's project website.

The notice advised that the Region was undertaking a study for the Rosehill WTP new intake and outfall design and construction. The notice advised that the project was a Class EA Addendum, and that a PIC would be held as part of the Class EA Addendum process. The notice also indicated that comments on the project should be submitted to the Region or to RVA.

11.1.2 Notice of Public Information Centre

The notice of Public Information Centre (PIC) was published on July 26, 2025 in Niagara This Week (online) and in the Fort Erie Observer. The notice was also emailed or mailed to stakeholders, agencies, and First Nation communities on July 15, 2025.

The notice advised that the PIC would be published as a virtual presentation on the Region's project website on August 13, 2025. The notice indicated that questions and comments can be provided through an online comment form posted on the project website, or via an email to the project team.

11.1.3 Public Information Centre

The virtual PIC presentation video and slideshow were published on the Region's project website on August 13, 2025. Questions or comments via the online comment form were requested to be received by September 10, 2025.

The PIC material presented an introduction and overview of the 2022 Class EA, a description of the Class EA Addendum process, the Problem and Opportunity statement, an overview of the study area, the proposed alternative solution, and the evaluation of the alternative solution.

A total of two (2) comments were received from the public and from agencies for the PIC.

11.1.4 Notice of Completion

The Notice of Completion will be published on Niagara Region's project website, in Niagara This Week, and in the Fort Erie Observer upon completion of the study.

A copy of the Rosehill WTP Intake and Outfall Project File Report will be posted on Niagara Region's project website for a 30-day review period.

11.2 First Nations and Indigenous Engagement

As part of the consultation process, the following First Nations and Indigenous Communities were contacted by the Region:

- Six Nations of the Grand River Territory
- Mississaugas of the Credit First Nation
- Haudenosaunee Development Institute
- Haudenosaunee Confederacy Chiefs Council

At the time of reporting, the project team has not received comments from contacted First Nations and Indigenous Communities.

11.3 Agencies Consultation

As part of the consultation process, various agencies, regulatory authorities, utilities and community groups were contacted for input during the Class EA Addendum. A few of the key stakeholders that were contacted included:

- Government ministries (e.g. MECP, DFO, MNR, MCM)

- Conservation authorities (e.g. Niagara Peninsula Conservation Authority)
- Utility providers (e.g. Bell, Enbridge)
- Other regulatory agencies

For a complete list of all agencies and authorities contacted, please refer to Appendix 5.

Table 11.1 summarizes the feedback received from agencies and authorities during the Class EA Addendum. Note the following abbreviations:

- CIRNAC – Crown-Indigenous Relations and Northern Affairs Canada
- MTO – Ministry of Transportation
- MTCG – Ministry of Tourism, Culture and Gaming
- MECP – Ministry of the Environment, Conservation and Parks
- MCM – Ministry of Citizenship and Multiculturalism
- NPCA – Niagara Peninsula Conservation Authority

Table 11.1 – Summary of Consultation with Agencies & Authorities

Name	Project Stage	Comment / Input	Resolution / Response
CIRNAC	Notice of Commencement	August 20, 2024: Remove from mailing list. Contact the Regional Office for Indigenous Services Canada (Ontario Region) for appropriate contact.	Removed from mailing list and Regional Office contacted.
MTO	Notice of Commencement	August 20, 2024: Add to mailing list. Chris is Supervisor of Maintenance Contracts for the MTO.	Added to mailing list.
MTCG	Notice of Commencement	August 20, 2024: Remove from mailing list.	Removed from mailing list.
MECP	Notice of Commencement	August 20, 2024: Remove from mailing list. No longer working at Niagara District Office.	Removed from mailing list. An alternate contact at the Niagara District Office was added.
Niagara Region Planner	Notice of Commencement	September 4, 2024: Unclear if EA Addendum study area (both inland and in water) has changed from 2022 EA. September 16, 2024: From the Regional Planning Comment Letter: 1. No objection to the proposed EA Addendum as long as inland and marine archaeological assessments are completed for unevaluated portions of the new study area footprint. 2. Future work should avoid negative impacts to the Region's Natural Environment System (NES).	Noted. This PFR includes these recommendations.
MECP	Notice of Commencement	September 26, 2024: From MECP's Letter of Acknowledgement and attachments: 1. Must address all "Areas of Interest" (attachment) in EA documentation. 2. Required to consult with Mississaugas of the Credit and Six Nations of the Grand River. 3. Send report draft to Joan before release of final addendum report (allow for min 30 days for it to be reviewed). 4. Send copy of Notice of Addendum Completion to West Central Region EA email account after draft report and Notice of Completion is finalized.	Noted. The specified First Nations were contacted as part of this Class EA Addendum. Copies of this PFR will be forwarded to the MECP as requested.
MCM	Notice of Commencement	October 21, 2024: From MCM's preliminary comments: 1. For study areas not previously screened, use Ministry's resources to determine if archaeological assessment is needed. If needed, AA must be undertaken. 2. MCM said it was unclear if Cultural Heritage Report was completed for the original EA. Cultural Heritage Report must be undertaken if there is potential for cultural heritage landscapes within project area. 3. If applicable, provide MCM with technical cultural heritage studies before issuing Notice of Completion. If no known cultural heritage resources exist, include completed checklists and supporting documentation in EA report. 4. Send all notices, reports, documentation via email to Karla Barboza and Liam Smythe (liam.smythe@ontario.ca).	Noted. This PFR includes these recommendations. The MCM has been provided with the technical cultural heritage studies.

Name	Project Stage	Comment / Input	Resolution / Response
NPCA	PIC	September 9, 2025: 1. Can you please confirm that the location of the intake structure is consistent with what was proposed in the original EA (i.e., it has not changed)? If it has changed, new IPZ mapping, new vulnerability score, and a new threats assessment would have to be prepared. 2. Could you also please confirm that the threats assessment done for the original EA used the 2021 technical rules? Could you please send me a copy of this? Tom Proks, our source protection coordinated also requested that I remind you that we need the technical work completed so that we can update the assessment report and source protection plan, and allow enough time for MECP review before the new intake, pipe and pumping station are operational.	The following email response was provided to the NPCA on October 7, 2025: Thank you for your comments on the PIC materials. Please see below for our responses: 1. The identified intake location in the prior EA had a different location than the location used in the source water protection updates; however, the same general area. The location of the intake structure in the EA addendum has been changed from the prior EA. The intake structure is now being proposed to be located at an approximate lakebed depth of 6.5 m. Based on a review of the previous technical assessment (BluMetric Environmental Inc., dated Nov 10, 2021, attached), the intake structure location used for the technical assessment in the original EA is at an approximate depth of 6.25 m based on the Bathymetry survey results in 2023, which is considered close to the area with lakebed depth of 6.5m. However, we understand and agree that new IPZ mapping, new vulnerability score, and a new threats assessment would have to be prepared. These updates would occur during the detailed design phase when the intake structure location/parameters have become fixed. On October 31, 2022 a meeting was held with the MECP and NPCA regarding this item. 2. Please see attached copy (BluMetric Environmental Inc., dated Nov 10, 2021. The 2021 technical rules were published on December 03, 2021. 3. Thank you for the reminder. During a project meeting with NPCA on May 15, 2024, NPCA stated that intake protection zone modelling can be updated once the final intake location is confirmed (e.g., in detailed design). Source Water Protection conclusions from the previous EA may be reused for this EA Amendment. The Region's plan is still to update the assessment report and the source protection plan during detailed design phase once the intake parameters are fixed.

11.4 Public and Interested Stakeholder Consultation

Information, comments, and feedback were exchanged with the public and interested stakeholders through the PIC. The comments received from the public and interested stakeholders and responses to these comments are summarized in Table 11.2.

Table 11.2 – Summary of Consultation with the Public and Interested Stakeholders

Name	Comment / Question	Resolution / Response
Public	Summary of comment: The alternatives presented in the PIC are preferred over the previous Class EA solution. For the complete comment, see Appendix 5. Additional requests: “Can the Rosehill Road be repaved or repaired after the work is complete. The road was finally fixed after many many years. Can the bushes and tress by the water plant driveway and trail be removed or trimmed. It can be hard to see when big trucks leave the plant. Also hard to see people biking or walking on the trail when driving. Even better can there be a better turning system for trucks like a second entrance or turn around. A reminder that Macdonald Drive is for residents only and no construction vehicles. Can the Region fence off access at the shore of Rosehill Road. People use Rosehill road to access the shore but that is private property. No Region property expropriation. They did it for the original water plant and we all regret it now. I had called awhile back to Jamie at the Region. Can they plan the new intake so the plant could be relocated in future. Could they build a plant up at Garrison road and just pump the water there. This part of the shore area should be woodland or individual homes.”	Note: This comment was submitted via the online form on Region’s project website. The contact information for this comment was not provided; therefore, the response could not be provided to the public member but is shown below. Thank you for your comments on the PIC materials. The Region will carefully consider the suggestions to minimize construction impacts to other users of the Rosehill Road. Region will also review the suggested changes to public access on Region’s right of way. At this time, there is no plan to relocate the water treatment plant building.

12.0 NEXT STEPS AND SCHEDULE

Detailed design and construction scheduling have not yet been established and will be confirmed following future capital planning, funding approvals, and completion of regulatory requirements.

13.0 REFERENCES

- CIMA+. (2022). *FINAL Project File Report - Class Environmental Assessment for Rosehill Water Treatment Plant New Intake*. Mississauga.
- CSAS. (2016). *Fish Protection Tools*. Retrieved from <https://www.fishprotectiontools.ca/>
- Golder. (2021). *Cultural Heritage Screening Report*.
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- MECP. (2016, April 5). *Ontario.ca*. Retrieved from Management of Excess Soil - A Guide for Best Management Practices: <https://www.ontario.ca/page/management-excess-soil-guide-best-management-practices>
- WSP Canada Inc. (2025). *Cultural Heritage Screening Memorandum*.
- WSP Canada Inc. (2025). *Marine Archaeological Desktop Assessment*. Mississauga.
- WSP Canada Inc. (2025). *Stage 1 Archaeological Assessment*. Mississauga.

Appendix 1 – Natural Environment Assessment Report



Appendix 2 – Stage 1 Archaeological Assessment Report



Appendix 3 – Marine Archaeological Assessment Report



Appendix 4 – Cultural Heritage Screening Memorandum



Appendix 5 – Consultation Documentation

