



**Town Of Carleton Place Wastewater
Treatment Plant Expansion, Town
of Carleton Place**

**Municipal Class Environmental
Assessment - Environmental Study
Report**

Final

January 25, 2023

Prepared for:
Town of Carleton Place

Prepared by:
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Project Number:
163401646

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Executive Summary

The Town of Carleton Place (Town) is situated in Lanark County, west of the City of Ottawa, and is accessible via Highways 7 and 15. Based on the Census of 2021, the Town has a population of 12,517 and occupies an area of 9.94 km². The Town has experienced a 17.6% increase in population growth between 2016 and 2021, and the population is expected to grow to 25,000 by 2041. The unprecedented population growth along with increased water demands and expanding development areas underpin the need for infrastructure expansion.

The Town's wastewater is conveyed to the Wastewater Treatment Plant (WWTP) via a separated gravity sewer network including 11 pumping stations. The existing WWTP has a rated capacity of 7,900 m³/d annual average flow and a peak design flow of 22,000 m³/d. Peak flows exceeding 30,000 m³/d are occasionally observed during Spring. The assessment of the WWTP shows that, in 2041, the design average daily flow is 10,625 m³/d, hence an expansion of the plant's rated capacity of 2,725 m³/d (i.e., a 35% increase in capacity) would be required.

The preferred servicing solution from the 2022 *Water and Wastewater Master Plan* was to expand the existing WWTP to serve future growth in the Town. Following completion of the Master Plan in May 2022, Stantec was retained by the Town to undertake the Phases 3 and 4 of the Municipal Class Environmental Assessment (MCEA) process to identify a preferred design concept for the expansion of the WWTP. The project was carried out in accordance with Schedule C projects under the MCEA process. This Environmental Study Report (ESR) is the documentation of the MCEA process for the WWTP expansion.

From the long-list options, two alternative design concepts were short-listed as the most feasible and evaluated for the WWTP expansion: Conventional Activated Sludge Process vs. Membrane Bioreactor Treatment. The evaluation of alternative design concepts includes consideration of potential environmental, social, and economic impacts and recognizes the need to design the facilities in such a way that they will reduce environmental impact and blend-in with the existing WWTP and surrounding environment. Based on the detailed evaluation, the preferred design concept for the WWTP expansion is "Alternative 2 - WWTP Membrane Bioreactor Treatment Upgrade".

Membrane bioreactors (MBR) is an advanced activated sludge wastewater treatment process, which typically consists of a suspended growth biological reactor coupled with a submerged ultrafiltration membrane system. Mixed liquor from the biological reactor is fed to the membrane tanks and clean effluent is drawn through membrane filters by permeate pumps. The membrane essentially provides the functions of secondary clarification and tertiary filtration usually seen in a Conventional Activated Sludge Process, thus eliminating the need for secondary clarifiers and tertiary filters.



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The MBR treatment benefits from the following key advantages:

- Optimizes use of existing infrastructure, including conversion of the existing aeration tanks to equalization tanks and conversion of the existing secondary clarifiers to aeration tanks
- Smaller footprint required for the plant expansion, limiting disturbance to natural features and retaining space for future expansion
- Reduces flow splits and simplified hydraulic control
- Lower capital cost
- Ability to accommodate increased influent loading by operating the plant at higher Mixed Liquor Suspended Solids (MLSS).

Alternative 2 includes expanding the WWTP by converting the existing secondary clarifier tanks to aeration tanks to increase the plant's secondary treatment capacity and adding MBRs to provide clarification and improve effluent quality to tertiary treatment level. Existing WWTP infrastructure will be reused in conjunction with new tanks and buildings required for Alternative 2. Furthermore, the layout of the sanitary collection system can be maintained with this WWTP expansion option. A portion of the land east of the existing site will be required to provide adequate space for new infrastructure. However, the expanded facilities can be accommodated in the previously disturbed area of the Town's current hazardous waste depot, resulting in minimal impacts to treed areas.

A series of environmental technical studies were undertaken to identify existing conditions in the WWTP expansion project footprint as well as adjacent lands within 120 metres of the site, herein referred to collectively as the Study Area. Potential environmental effects resulting from the construction and operation of the proposed WWTP expansion were identified and analyzed based on an assessment of the existing conditions. Potential impacts include potential to impact water quality in terms of erosion and sediment control due to site's proximity to the Mississippi River (i.e., working within 30 m of a watercourse but not in-water); potential to impact wildlife/habitat and Species at Risk (SAR) due to vegetation removals; potential to impact healthy trees due to expansion; potential for noise and vibration nuisances due to construction equipment; potential to impact traffic operations, cyclists, and pedestrians due to safety measures and working adjacent to roadways and trails; and potential to impact existing utilities as there may be a need for relocations and upgrades.

Implementation of the preferred design concept should result in limited residual environmental impacts while improving plant effluent quality. In addition to employing 'best management practices', a number of environmental management measures have been identified to avoid, protect, and mitigate potential adverse environmental impacts.



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Means to monitor or verify the effectiveness of the proposed mitigation measures to reduce or eliminate adverse effects are also provided in Section 5.5 of this ESR.

Consultation with the public, agencies, stakeholders, and Indigenous Nations was undertaken as per the requirements of the MCEA process. The following are highlights of the consultation activities undertaken:

- A project contact list was compiled and maintained that included interested members of the public, agencies, stakeholders and Indigenous Nations.
- Notices were published in the local paper (*The Carleton Place Canadian Gazette*), posted on the Town's website, and mailed to those on the contact list.
- An online Public Information Centre (PIC) was held between December 5 to 19, 2022 as a recorded presentation and available for public review on the Town's website.

Comments received during the MCEA process related to the WWTP upgrades capacity, water quantity, cost of treatment options, and the relocation of the Household Hazardous Waste Depot.

The work undertaken in preparing this report represents the completion of the MCEA process for the WWTP expansion after public review and comment period. The ESR document will be made available for the mandatory 30-day public review period. Provided all stakeholder, Agency, and Indigenous concerns are addressed, the Town may proceed to design and implementation.



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- Appendix B Town of Carleton Place - Water & Wastewater Master Plan - Species at Risk Screening Report**
- Appendix C Cultural Heritage Report: Existing Conditions and Preliminary Impact Assessment - Carleton Place Water Treatment Plant and Wastewater Treatment Plant Expansions**
- Appendix D Stage 1 Archaeological Assessment: Water Treatment Plant and Wastewater Treatment Plant Expansions**
- Appendix E Sensitivity Analysis Memo**
- Appendix F Carleton Place Wastewater Treatment Plant Expansion Options Evaluation Memo**
- Appendix G Phase 3 and 4 Consultation Materials**
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Acronyms / Abbreviations

AA	Stage 1 Archaeological Assessment
ACS	Assimilative Capacity Study
AOO	Algonquins of Ontario
AQ	Air Quality
AAQC	Ambient Air Quality Criteria
AQMP	Air Quality Management Plan
CAAQS	Canadian Ambient Air Quality Standards
CAS	Conventional Activated Sludge
CEPT	Chemically Enhanced Primary Treatment
CHRECPIA	Cultural Heritage Report of Existing Conditions and Preliminary Impact Assessment
CNMP	Construction Noise Management Plan
CRZ	Critical Root Zone
CVMP	Construction Vibration Management Plan
CSA	Canadian Standards Association
DBH	Diameter at Breast Height
DFO	Fisheries and Oceans Canada
EASR	Environmental Activity and Sector Registry
ECCC	Environment and Climate Change Canada
ESA	Endangered Species Act
ESR	Environmental Study Report
FAA	Fisheries Act Authorization
GMDP	Groundwater Management and Dewatering Plan
I/I	Inflow and Infiltration
ICI	Institutional, Commercial and Industrial
IFAS	Integrated Fixed Film activated Sludge
IGF	Information Gathering Form
MABR	Membrane Aerated Biofilm Reactor



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Master Plan	Carleton Place Water & Wastewater Master Plan – Phase 2 Report
MBR	Membrane Bioreactor
MCEA	Municipal Class Environmental Assessment
MCM	Ministry of Citizenship and Multiculturalism
MEA	Municipal Engineers Association
MECP	Ministry of the Environment, Conservation and Parks
MLSS	Mixed Liquor Suspended Solids
MNFR	Ministry of Natural Resources and Forestry
MVCA	Mississippi Valley Conservation Authority
OCWA	Ontario Clean Water Agency
OHA	Ontario Heritage Act
OP	Carleton Place Official Plan
OPC	Opinion of Probable Construction Cost
O.Reg.	Ontario Regulation
PIC	Public Information Centre
PTTW	Permit to Take Water
QP	Qualified Person
RFR	Request for Review
SAR	Species at Risk
SEMMP	Soil and Excavated Materials Management Plan
TAN	Total Ammonia Nitrogen
TP	Total Phosphorus
Town	Town of Carleton Place
WTP	Water Treatment Plant
ZOI	Zone of Influence



1 Introduction

The Town of Carleton Place (Town) is situated in Lanark County, west of the City of Ottawa, and is accessible via Highways 7 and 15. Based on the Census of 2021, the Town has a population of 12,517 and occupies an area of 9.94 km². The Town has experienced a 17.6% increase in population growth between 2016 and 2021, and the population is expected to grow to 25,000 in 2041. The unprecedented population growth along with increased water demands, increased wastewater generation, and expanding development areas underpin the need for infrastructure expansion.

The Mississippi River runs through the centre of the Town and serves as the source of water for the municipal drinking water system and as the receiving stream for treated sewage effluent. The Mississippi River is also used for recreational purposes.

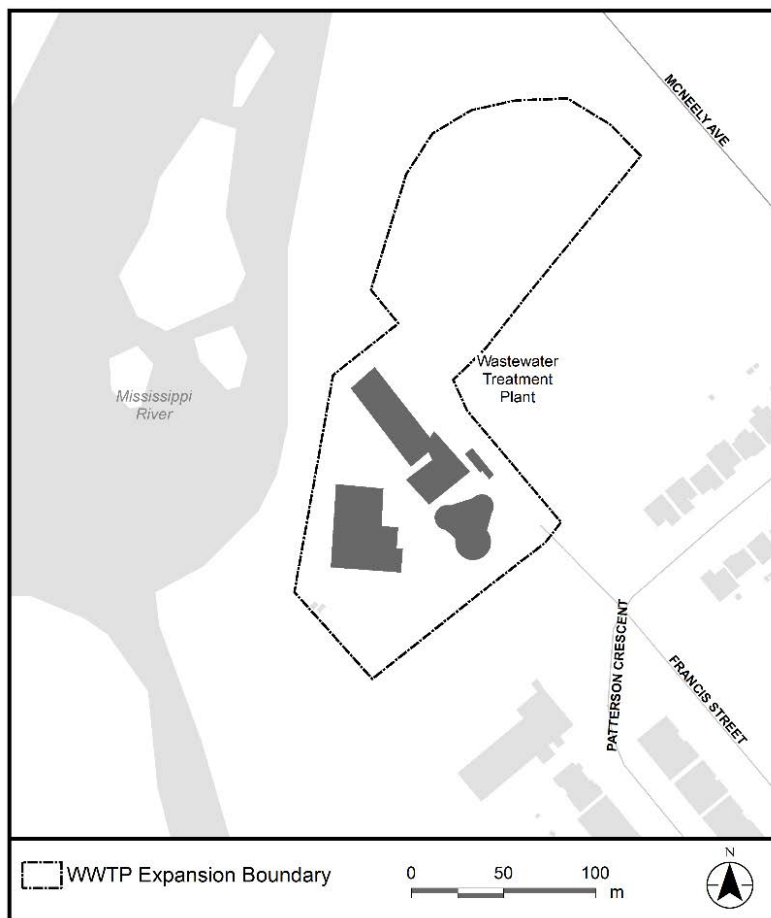


Figure 1: Wastewater Treatment Plant Expansion Footprint

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The Town's Wastewater Treatment Plant (WWTP) is located at 122 Patterson Crescent (See Figure 1). The WWTP has a current rated treatment capacity of 7,900 m³/d annual average flow and a peak design flow of 22,000 m³/d.

The Carleton Place Water & Wastewater Master Plan – Phase 2 Report (Master Plan) identified that additional treatment capacity at the WWTP is required to support existing services areas and anticipated future growth. The Master Plan was prepared in accordance with Phases 1 and 2 of the Municipal Class Environmental Assessment (MCEA) process to identify the preferred solution which involves capacity expansion of the Town's WWTP at the existing site.

The Town has undertaken Phase 3 of the MCEA process which involves the identification and evaluation of alternative design concepts for the proposed WWTP expansion and is carrying out Phase 4 with the release of this Environmental Study Report (ESR). This ESR documents the activities undertaken as part of the MCEA process and recommendations for the proposed expansion.

1.1 Municipal Class Environmental Assessment Process

1.1.1 General

The MCEA process provides a consistent method of identifying and assessing technical and environmental impacts and concerns before improvements or additions to municipal infrastructure are undertaken. Planning in this way provides reassurance that potential impacts from all municipal projects are addressed and mitigated, prior to implementation.

The MCEA guidance document defines four schedules under which projects may be planned and the associated processes required for each. The four types of projects are referred to as schedules and projects can be classed as either Schedule A, A+, B or C, depending on the anticipated level of environmental impact, and for some projects, the anticipated construction costs.

Schedule A projects are minor operational and/or maintenance activities and may go ahead without further assessment once Phase 1 of the MCEA process is complete (i.e., the problem is reviewed, and a solution is confirmed).

Schedule A+ projects are limited in scale, have minimal adverse environmental impacts, and require no documentation. However, the public is to be advised of the project prior to implementation.

Schedule B projects must proceed through the first two phases of the process. Proponents must identify and assess alternative solutions to the problem, inventory impacts, and select a preferred solution. They must also contact relevant agencies and affected members of the public. Provided that no significant impacts are found, and no



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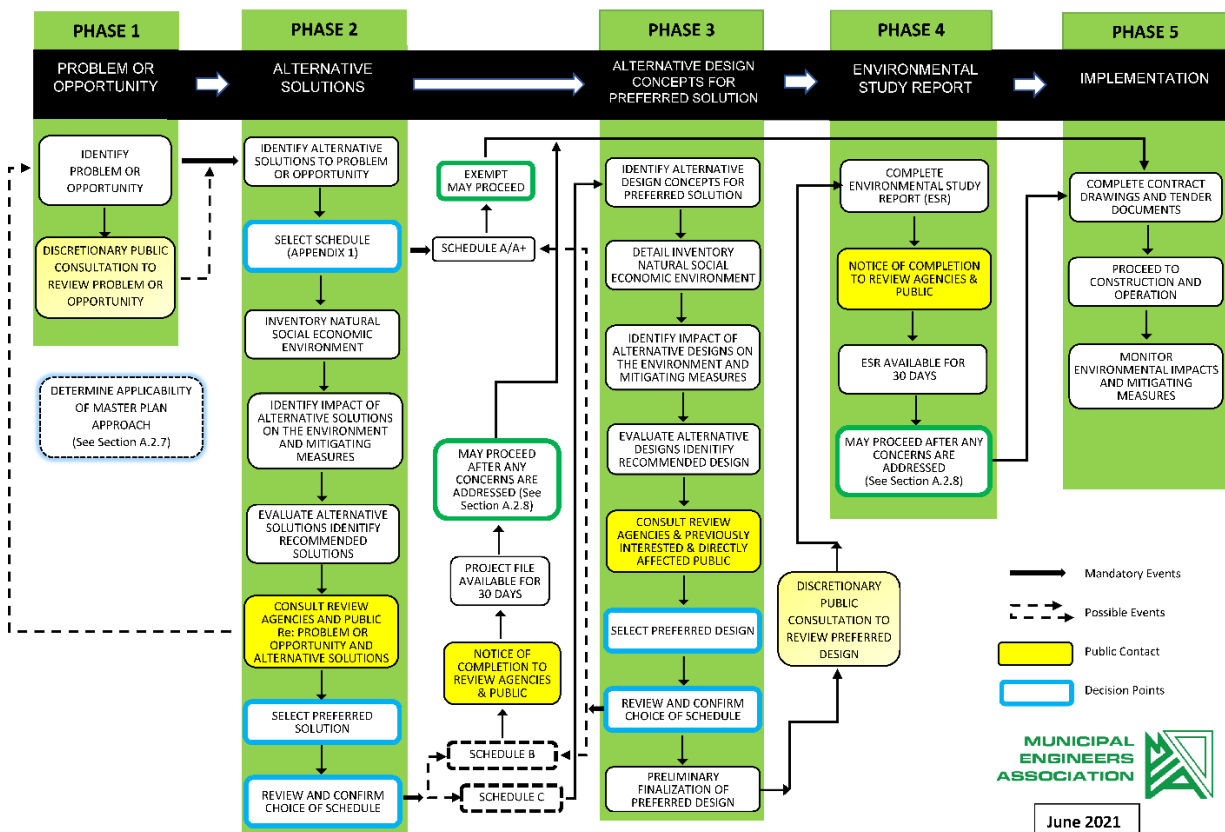
requests are received to undertake the project as an individual Environmental Assessment, the project may proceed to detail design (Phase 5).

Schedule C projects require more detailed study, public consultation, and documentation, as they may have more significant impacts. Projects categorized as Schedule C must proceed through the first four phases of assessment. Schedule C projects may result in adverse impact(s), and as such, a public consultation program is needed to ensure that stakeholders and local residents in the Study Area are provided with the opportunity to provide meaningful input.

As per the MCEA guidelines, major expansions to existing facilities such as the WWTP fall under the classification of Schedule C projects.

1.1.2 Phases in the MCEA Process

The MCEA for municipal projects follows a five-phase planning process. Consultation is a key element of MCEA planning and is required during different phases to incorporate and consider public input. Details on the activities within each phase of the process is shown in Figure 2.



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Figure 2: Municipal Class EA Planning and Design Process (Source: Municipal Engineers Association)

1.1.3 Intent of the Report

The intent of this report is to outline the steps the Town has taken to satisfy the requirements of the MCEA process for this Schedule C project. This ESR contains the following:

- A summary of background information and the Master Plan
- The planning context in which the project is situated, including existing conditions
- Development and evaluation of design concepts and selection of the preferred alternative
- Recommendations for mitigating potential environmental impacts and permitting requirements to be carried forward into Detail Design and construction.



2 Background: Water and Wastewater Master Plan

The Master Plan (<https://carletonplace.ca/water-and-wastewater-master-plan.php#Documents>) was undertaken to develop and evaluate water and wastewater servicing strategies to address population growth in the Town. The Master Plan was developed under the MCEA process where the need and justification for individual projects and the existing conditions are better defined. The Master Plan addresses Phases 1 and 2 of the MCEA process to fulfill the requirements for the recommended Schedule A and A+ projects and forms the basis for the recommended Schedule B and C water and wastewater projects identified within the Master Plan. Any Schedule B and C projects identified would be required to complete the remaining phases as applicable. The expansion of the existing WWTP was identified as a Schedule C project, requiring the completion of Phases 3 and 4 of the MCEA planning process.

The preferred solution for wastewater servicing in the Town included the expansion of the existing WWTP in the existing footprint and on the neighbouring household hazardous waste and compost yard site to the east to service existing and future growth. The expansion alternative discussed in the Master Plan was presented as a conventional (activated sludge) treatment plant expansion, however, other treatment technologies would be explored in Phase 3 of the MCEA process.

2.1 Phase 1 - Problem or Opportunity

The first step in the MCEA process is to identify the problem or opportunity under consideration. Factors leading to the conclusion that an improvement or change is needed are documented in the following section, resulting in the identification of the Problem/Opportunity Statement, which reflects the scope and objectives of the project.

2.1.1 Population Projections

Based on the Census of 2016, the Town had a population of 10,644 inhabitants and grew to 12,517 in 2021 (17.6% increase). As the Master Plan process began when the 2021 census was not available, population estimates were used.

Growth projections over multiple planning horizons were developed: Baseline year 2021; short-term, or 5-year planning horizon, in the year 2026; medium-term, or 10-year planning horizon, in the year 2031; and long-term, or 20-year planning horizon, in the year 2041. The alternatives evaluated were specifically for the 20-year (2041) condition.

The *Design Basis Memo* Appended to the Master Plan, provides detailed information on how area growth projections were developed. Additionally, for the purpose of estimating inflow and infiltration (I/I) flows into the sanitary sewer collection system, the historical area growth rate of 13 ha/year was used. The resulting growth projections for the Town



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2 Background: Water and Wastewater Master Plan

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suggest that the population will be 17,000 in 2026 (35.8% increase), 20,500 in 2031 (63.7% increase), and 25,000 in 2041 (99.7% increase), when compared to the 2021 census population.

2.1.2 Existing Wastewater Treatment Plant

The Town's wastewater is conveyed to the WWTP via a separated gravity sewer network including eleven (11) pumping stations. The existing WWTP has a rated capacity of 7,900 m³/d annual average flow and a peak design flow of 22,000 m³/d. The plant is considered a conventional activated sludge plant with base flow treatment through complete works for flows up to 10,400 m³/d and excess wet weather flows greater than this passing through physical/chemical clarifiers for enhanced primary treatment.

The Ontario Clean Water Agency (OCWA) provided the Town with a Facility Optimization Report for the WWTP in 2020. From this analysis, the WWTP was rated as a capable plant since the performance of the plant met the Ministry of Environment, Conservation and Parks (MECP) treatment objectives and limits fairly consistently. The main treatment process consists of fine screening, grit removal, two (2) primary clarifiers, three (3) aeration tanks, three (3) secondary clarifiers, and UV disinfection. Three (3) additional clarifiers are available on standby for high flow periods. Treated effluent is discharged into the Mississippi River through an outfall sewer. Waste activated sludge is aerobically digested for stabilization and the stabilized biosolids are gravity thickened and dewatered by centrifuges. During winter months, the dewatered biosolids are hauled to an offsite storage facility and ultimately land applied.

2.1.2.1 Design Wastewater flows

Design flow projections from 2021, 2026, 2031 and 2041 were calculated as part of Phase 1 of the Master Plan. Flow projections show that for a 20-year planning horizon, the design average daily flow is 10,625 m³/d, hence an expansion of the plant's rated capacity of 2,725 m³/d (i.e., a 35% increase in capacity) would be required.

Moreover, it was projected that the WWTP would reach 90% of its rated capacity (7,110 m³/d) in 2022 with a Town population of ~14,400 and will reach its rated capacity (7,900 m³/d) in 2024-2025 with a Town population of ~16,300, i.e., within the 5-year planning horizon.

2.1.2.2 Future Wet Weather Flow Capacities

According to the Facility Optimization Report prepared by the OCWA in 2020, given the high wet weather flows experienced at the plant, continuing the current wet weather flow treatment strategy is recommended to maintain stable secondary and tertiary treatment operation and performance. Historical flows for the period of 2017 to 2019 were calculated showing that the average flow for this period was 6,541 m³/d with maximum



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2 Background: Water and Wastewater Master Plan

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daily flows recorded as high 31,856 m³/d during wet weather conditions. The data shows that the peak flow capacity of the phys/chem system (22,000 m³/d) was met or exceeded on seven (7) occasions during this timeframe. The data also reveals extended periods of time of weeks/months duration when the influent flows are consistently higher than the wet weather threshold of 10,400 m³/d (e.g., March-April 2019, likely related to Spring melt). In addition, the year 2020 Annual Report flow data for the plant is consistent with the year 2017-2019 period with annual average flow of 6,118 m³/d and a max day flow of 22,111 m³/d.

Based on the assessment of the sanitary collection system, wastewater treatment sanitary flows are projected to exceed 34,000 m³/d under the design event in 2026 and exceed 44,000 m³/d in 2041. In comparison, a peaking factor of 4.0 corresponds to a similar peak hourly flowrate of 42,500 m³/d. This value is considered in the evaluation of alternatives and the plant expansion design. In rare events, peak flows are projected to reach up to 80,000 m³/d in 2041. This rare event is not a design condition but illustrates potential impacts of extreme climate change on the system.

The plant's wet weather flow treatment capacity of 10,400m³/d represents the ability to accept flows through the normal treatment train before requiring bypass to the physical/chemical clarifier system, which can accommodate excess peak flows of up to 11,600m³/d (total plants flows of 22,000m³/d).

2.1.2.3 Treatment and Compliance Requirements

The plant operates under the Carleton Place Water Pollution Control Plant CofA No. 5001-7FZT4A (MOE, October 3, 2008). It should be noted that new proposed effluent criteria were initially presented in the *Phase 1 Report* appended to the Master Plan. However, following pre-consultation with the MECP, a new *Assimilative Capacity Study* (Appendix A) was completed which presented new updated criteria and objectives, superseding those in the Phase 1 Report. At the request of the MECP, only a single set of new criteria and objectives were proposed rather than using a different value at each flow rate, as in the current ECA (CofA).

2.1.2.4 Plant Loadings

Projections of the design loads to the plant from 2021, 2026, 2031 and 2041 were calculated as part of Phase 1 of the Master Plan. Projections are based on the future per capita design loading rates that were selected in the *Design Basis Memo* appended to the Master Plan. These values are used during design stages to size plant processes.



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2 Background: Water and Wastewater Master Plan

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2.1.3 Challenges and Constraints

The sections above describe the remaining treatment capacity of the plant and projected future wastewater flows and generation rates, which form the primary need for expansion of the facility or investigating other ways to reduce future contaminant loadings to the Mississippi River. In relation to this, there are several challenges and constraints related to the system that were considered during the evaluation of alternatives, including:

- Existing space constraints to add new tanks and/or buildings for a process expansion
- Existing floodplain limits that may further limit land available for expansion
- Existing yard piping and utility corridor conflicts
- Managing excess wet weather flows through wet weather treatment, whether continued use of phys/chem clarifiers, or other technology, to operate stable secondary and tertiary treatment processes in future. New tertiary filtration will be required to meet new monthly non-compliance TP limits. This would include additional processes such as sand filtration, cloth media filter disks or enhanced sedimentation. Finding suitable space and sufficient hydraulic head for the new process may be challenging
- Operators have had difficulty meeting target dissolved oxygen levels, which should be addressed
- New nitrification processes may be required to meet stricter TAN effluent concentration limits
- Integrating/adding new primary digester volume to the existing digester complex and adding a new dewatering process may be challenging
- The UV disinfection channel has been identified as a hydraulic bottleneck during high flow period

2.1.4 Problem Statement/Opportunity

The assessment of the WWTP under population growth shows that, for a 20-year planning horizon, the design average daily flow is 10,625 m³/d, hence an expansion of the plant's rated capacity of 2,725 m³/d (i.e., a 35% increase in capacity) would be required. Peak hourly flowrates into the plant of up to 42,500 m³/d may be experienced in 2041.



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2 Background: Water and Wastewater Master Plan

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Based on the framework provided by the Master Plan and existing capacity deficiencies, the Problem and Opportunity Statement for this project was developed as follows:

The Carleton Place WWTP has a current rated capacity of 7900 m³/d. At present, the WWTPs reserve capacity has been largely committed to population growth. Therefore, in order to accommodate both planned and future development in a manner consistent with the recommendations of the Master Plan, the Town intends to plan for the future capacity expansion of the WWTP.

2.2 Phase 2 - Alternative Solutions

As part of the MCEA process, reasonable and feasible alternative solutions to the Phase 1 problem statement were identified and described in Phase 2. The magnitude of the net positive and negative effects of each alternative solution, as well as mitigating measures, were identified and evaluated. Based on this evaluation, a preliminary alternative was selected and confirmed based on public, agency, Indigenous Nations, and stakeholder consultation (refer to Master Plan for additional details).

Based on the review of alternatives for this project, the following were developed to address the wastewater treatment needs for the Town:

- Alternative A – Do Nothing
- Alternative B – Inflow & Infiltration Reduction Measures
- Alternative C – Expand Existing WWTP
- Alternative D – Build an Additional WWTP

The full evaluation of alternative solutions undertaken is included in the *Alternatives Technical Memorandum* appended to the Master Plan.

2.2.1 Preferred Alternative Solution

Based on a comparative evaluation of impacts associated with the natural, social, economic, technical, and cultural impacts of each alternative, the expansion of the existing WWTP was identified as the recommended alternative solution.

Alternative C was identified as the preferred alternative solution because it has:

- A moderate cost and provides opportunity to utilize existing infrastructure
- A high potential to support future population growth within the 2041 horizon and beyond



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2 Background: Water and Wastewater Master Plan

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- A low potential to impact private property and provides opportunities to improve the health and safety of Town residents and employees

2.2.2 Source Water Protection

The project area for the new WWTP expansion was reviewed for source water protection. The nearest vulnerable area identified is around the intake for the Carleton Place Water Treatment Plant, however, the Preferred Solution for the WWTP expansion will occur outside of this area, which is upstream of the site. No further action is needed.

2.2.3 Water and Wastewater Master Plan Consultation (Notice of Study Completion)

To provide a complete public record of comments, the comments received upon posting the Master Plan as applicable to the WWTP have been included here.

The Notice of Study Completion for the Master Plan report was placed in the local newspaper (Carleton Place Canadian Gazette) on June 2, 2022. The Notice was also available on the project website and distributed via mail and email to agencies, key stakeholders, Indigenous Nations, and the public on the study mailing list. This notice briefly outlined the Recommended Solutions and noted that the Master Plan was posted to the project website for a 30-day public review period. A copy of this notice is provided in Appendix G of this document.

Four (4) comments relating to the WWTP Expansion were received as a result of issuing the Notice of Study Completion. The comments and responses are summarized in Table 1 below.



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2 Background: Water and Wastewater Master Plan

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Table 1: Summary of Notice of Completion (Master Plan) Comments and Responses

Topic	Question/Comment	Response
Population Growth	Question regarding the study not considering future development plans South of the Town limits (Beckwith) to support the Town's growth projections.	Comment regarding lands outside of the municipal boundary of the Town is acknowledged. A presentation to Councillors was provided to discuss growth projections and development plans.
Natural Hazards	Consider the location of the floodplain throughout the planning and design phases of the proposed expansion of the WWTP. Also, a concern regarding the proposed expansion footprint extending into the regulation limit of the 1:100-year floodplain of Mississippi River.	The Mississippi Valley Conservation Authority (MVCA) will continue to be consulted during planning and design stages regarding any potential upgrades to wastewater infrastructure in the MVCA Regulated Area / floodplain of the Mississippi River.
Climate Change and Green Infrastructure	Question regarding whether the Town is preparing for impact of a changing climate as per the Provincial Policy Statement (2020) for managing growth and development.	Preparing for growth and the anticipated impacts of climate change are key objectives of this study and will continue to be for future planning and design stages.
Aquatic Environment	Suggestion that additional aquatic environment impacts imposed by: WWTP – Alternative A (Do nothing): the risk of overloading the system resulting in runoff into local surface waters (i.e., Mississippi River) would negatively impact surface water quality as well as fish and fish habitat.	The additional impacts, including negative impacts to surface water quality and fish and fish habitat, will be included in an edited version of the Alternative Evaluation Technical Memorandum and appended to the Water and Wastewater Environmental Study Reports (Phase 4 of this project).



3 Existing Environmental Conditions

An inventory of existing environmental conditions was undertaken for this project, as described herein. Information included in this section was taken directly from the Species at Risk Screening Report (Appendix B), the Cultural Heritage Report (Appendix C), and the Stage 1 Archaeological Assessment (Appendix D).

3.1 Natural Environment

3.1.1 Aquatic Environment

The aquatic environment is encompassed within all permanent bodies of still or flowing water and their riparian area (banks), including all parts of the bodies in which aquatic species may spend parts of their lifecycles.

The Mississippi River is 200 km in length, flows northeastwards through the centre of the Town and is a tributary of the Ottawa River. The Mississippi Lake is located upstream (southwest) of the Town. The Mississippi River watershed encompasses an area of 3,750 km² and comprises various natural environment features including wetlands and Significant Ecological Areas as seen in Figure 3.

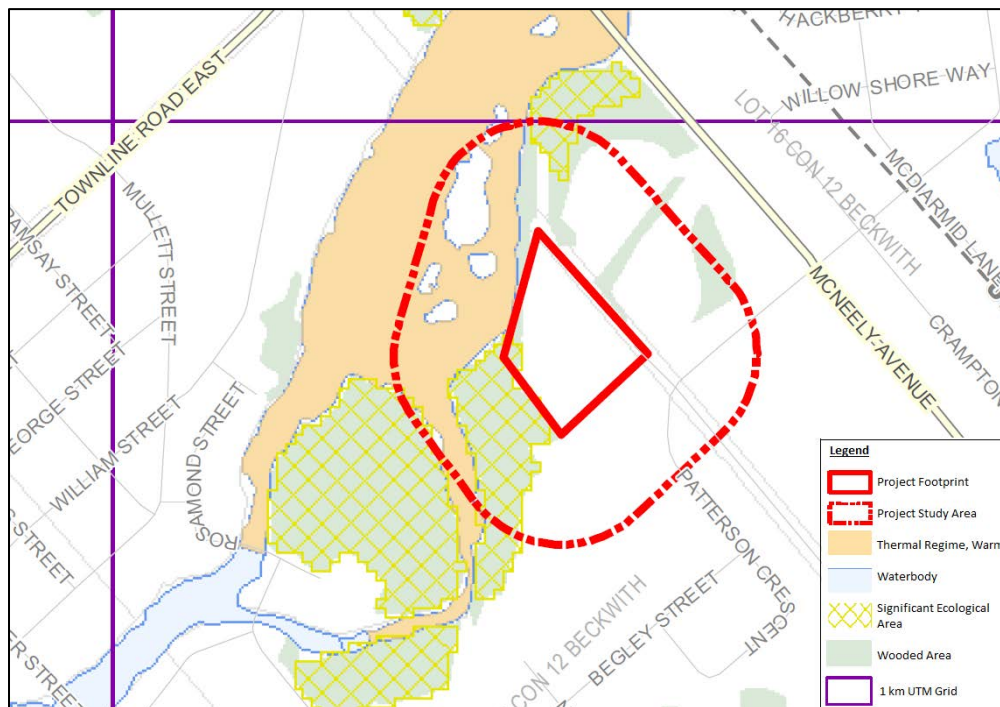


Figure 3: Natural Environment Features Located in the WWTP Study Area

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Water levels in Mississippi Lake are controlled by the Carleton Place Dam, which is owned and operated by the Mississippi Valley Conservation Authority (MVCA). The dam is not intended for hydro-electric production, but rather, it maintains recreational levels in Mississippi Lake and provides some flood control benefits for Mississippi Lake and downstream municipalities. Operation of the Carleton Place Dam is important for maintaining water levels in Mississippi Lake during low flow conditions. Additionally, the Carleton Place Dam is operated to reduce shoreline damage and maintain stable ice levels in Mississippi Lake.

The MVCA has identified a “Regulated Area” along the Mississippi River to protect the shoreline from construction due risk of flooding, erosion, and other hazards per Ontario Regulation (O.Reg.) 153/06.

3.1.2 Terrestrial Environment

The terrestrial environment includes plants and the combination of land-based natural features that provide habitat for plant and animal species. The Study Area includes various terrestrial natural environment features including woodlands, a Significant Ecological Area, and parkland (Figure 3). These areas create habitats for all or a part of the life cycle of wildlife (i.e., mammals, amphibians and birds), which include breeding, feeding, or stopover during migration.

3.1.3 Species at Risk

During the MCEA, a preliminary screening was completed in accordance with the MECP’s guidelines. The objective of the preliminary screening was to determine whether any species at risk or their habitat exist or are likely to exist at or near the proposed WWTP, and whether their proposed activity is likely to contravene the *Endangered Species Act, 2007*. A SAR screening was conducted for the WWTP Study Area including a desktop review of potential SAR occurrences and/or habitat accompanied by a single site visit. Natural heritage features and potentially suitable habitat for SAR were observed and/or identified as occurring in the Study Area. A copy of the SAR Screening Report is provided in Appendix B.

3.1.3.1 Background Data Collection

Based on the findings of a desktop background review, 15 SAR have been previously documented as historically occurring or have the potential to occur in the Study Area, a summary of which is provided in Table 2. Suitable habitat for five (5) SAR was identified on-site and within 120 m of the site.



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Table 2: SAR with Potential to Occur in the Study Area

Species Grouping	Species	Status Ontario ESA	Status Federal SAR, Schedule 1	Suitable Habitat Present on- Site (Y/N)	Suitable Habitat Present Within 120 m (Y/N)
Plants	Butternut	Endangered	Endangered	N	N
Reptiles	Blanding's Turtle	Threatened	Threatened	Y	Y
Birds	Common Nighthawk	Special Concern	Threatened	N	N
	Eastern whip-poor-will	Special Concern	Threatened	N	N
	Chimney Swift	Threatened	Threatened	N	N
	Least Bittern	Threatened	Threatened	N	N
	Red- headed Woodpecker	Special Concern	Threatened	N	N
	Olive- sided Flycatcher	Special Concern	Threatened	N	N
	Wood Thrush	Special Concern	Threatened	N	N
	Golden-winged Warbler	Special Concern	Threatened	N	N
	Canada Warbler	Special Concern	Threatened	N	N
Mammals	Small-footed myotis	Endangered	No Status, No Schedule	Y	Y
	Little Brown myotis	Endangered	Endangered	Y	Y
	Northern myotis	Endangered	Endangered	Y	Y
	Tri-colored bat	Endangered	Endangered	Y	Y



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3.1.3.2 Field Investigations

A site investigation was conducted on August 19th, 2021, to assess for SAR occurrences and/or potential habitat(s) as well as to confirm the natural heritage features in the Study Area that were identified through the background data collection process.

Observations of potentially suitable habitat for the SAR outlined in Table 2 is summarized herein.

Blanding's turtle - Inhabits shallow lakes, ponds, and wetlands (<2m) with soft organic substrates with abundant submergent vegetation. Blanding's turtles will nest in open sand and/or gravel substrate above the waterline in natural (e.g., eroded shorelines, beaches) and developed habitats (e.g., gravel shoulders, gravel parking lots). They can migrate several kilometers (km) between summer habitat, nesting sites, and overwintering habitat. Though no individuals were observed during the site visit, suitable habitat was observed in the Study Area.

The existing WWTP is immediately adjacent to the Mississippi River, which is known to contain Blanding's turtle, with Ontario Nature observations from 2019. The Mississippi River is deep enough to provide suitable overwintering habitat and can also serve as a migration corridor. In addition to this, the riverbank substrate was observed to have loose sandy soil which is suitable for Blanding's turtle to nest in.

Small-footed Myotis, Little Brown Myotis, Northern Myotis, and Tri-colored Bat (SAR bats) – These bat species share similar habitat preferences during their active season and are described together. These species will use trees as small as 10 cm diameter at breast height (DBH) with cavities, loose bark, and leaves to nest and day roost as well as for maternity roosting purposes, usually >10 m high on trees exhibiting early stages of decay. Additionally, these species are known to use anthropogenic structures for roosting as well. There were no observed overwintering features (e.g., caves, abandoned mines) for SAR bats observed in the Study Area. The WWTP is immediately adjacent to the Mississippi River where there is a public walking trail and mature trees along the river, several of which would provide potentially suitable SAR bat maternity roosting trees. In addition to this, the proximity of the river increases the likelihood of suitable foraging habitat for SAR bats.

3.1.4 Groundwater

There are no known private wells in the vicinity of the WWTP. A contaminated groundwater plume (the Beckwith plume) existing southeast of the Town but does not expected to impact or be impacted by the project. A Household Hazardous Waste Depot is located at 128 Patterson Crescent adjacent to the existing WWTP. The depot is a waste management facility licensed by MECP and accepts residential waste and features a compost yard (leaf / yard waste).



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Groundwater testing has not been completed at the depot or the WWTP as part of this project, however the Town has advised that there is no known contamination. Groundwater testing will be completed as part of Detail Design of the expansion. Due to the vicinity to the Mississippi River, it is likely that any deep excavation at the site would encounter groundwater infiltration.

3.1.5 Surface Water

The WWTP site sits directly adjacent to the Mississippi River. The Carleton Place Dam is located approximately 900 m upstream of the WWTP outfall. The Mississippi River runs through the centre of the Town and is used for recreation, although there are no public beaches in the vicinity of the WWTP. The treated plant effluent is discharged back into the river through an outfall pipe featuring six (6) underwater diffusers, extending approximately 20 m into the river. Part of the site is in the 100-year floodplain of the river. Mississippi River water level and flowrate is monitored at a Water Survey of Canada station at Appleton (ID 02KF006) approximately 5 km downstream of the outfall. Surface water quality in the Mississippi River is currently monitored by the MVCA in the Mississippi Lake, and further upstream on the Mississippi River at Fergusons Falls. The MVCA also collects water quality samples on the Mississippi River downstream of the Carleton Place WWTP at a monitoring site which corresponds to Ontario Provincial Water Quality Monitoring Network Appleton Station (Station ID:18343006102). This station characterizes the water quality downstream of the WWTP.

The Mississippi River is considered a Policy 1 receiver as background concentrations of parameters of concern are below Provincial Water Quality Objectives. Further details on the background water quality in the Mississippi River are available in the Assimilative Capacity Study (ACS) in Appendix A.

3.2 Social & Economic Environment

3.2.1 Social Environment

The Town's Official Plan (OP) states that the existing WWTP is considered a municipal built infrastructure which refers to the construction and maintenance of the collection and treatment of wastewater. The *Planning Act* requires that infrastructure expansions conform to the upper tier OP. The areas surrounding the existing WWTP consist primarily of Residential and Natural Environment District land uses. The lands designated as Residential District on Schedule A of the Town's OP provide the main locations for housing in the Town. Permitted uses in this district include residential uses, parks and recreational facilities, community and social service facilities, institutional uses, and existing local commercial uses.



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Areas having substantial importance to area residents are designated as Natural Environment District on Schedule A of the Town's OP. Natural Heritage Policies within the OP's aim to preserve the Town's natural heritage, maintain and enhance ecological functions, and protection of fish habitat and the habitat of rare, threatened, and endangered species. Permitted uses in this district include passive recreational uses which do not require buildings or structures, recreational trail development and maintenance, and conservation uses.

Several commercial and park and recreational use areas are found adjacent to the Study Area. The Carleton Place Curling Club and Let's Rock Sports Curling Club are located south of the existing WWTP. Also, the Arklan Community Public School and the Carleton Place Childcare are located to the southeast. Moreover, a known community toboggan hill is located east of the existing WWTP. During the Master Plan stages, the importance of this hill was identified, therefore, none of the alternatives in Phase 2 impacted this hill.

3.2.2 Noise and Vibration

The areas surrounding the existing WWTP consist of residential and some community land uses. Any activity carried out in the Town shall comply with the Town's Noise By-Law No. 29-2017, which prohibits unusual noises and noise likely to disturb the inhabitants of the municipality. The by-law currently states that no person shall cause or permit noise arising from construction between the hours of 10pm to 6am the following day, except in the case of urgent necessity or emergency.

3.2.3 Air Quality

Air Quality refers to the presence or absence of substances in the air that could cause harm to humans in large quantities. This includes substances in gaseous or solid (particulate) form. The operation of the existing WWTP may produce bio-gas, use of flare, and generate occasional odours. However, the WWTP has odour control treatment technologies to reduce its effects on the Air Quality of surrounding areas.

3.2.4 Traffic and Transportation

Traffic (i.e., vehicular, cyclist, and pedestrian) and transportation elements of the environment encompass all infrastructure and activities that help people to move from place to place. The existing WWTP is located along the Mississippi Riverwalk Trail which is 3 km in length and is used by pedestrians and cyclists. The Town has identified a portion of the trail as part of "Cycling Route 2", which takes cyclists along the Mississippi Riverwalk past the historic Townhall, Riverside Park, and the Canoe Club. From a vehicular perspective, the existing WWTP can be accessed through Francis Street and Patterson Crescent, located in the Residential District of the Study Area.



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3.2.5 Economic Environment

Along with the Town's population, employment and institutional, commercial, and industrial (ICI) areas are also projected to grow. The Town's major economic sectors include the manufacturing industry, the health industry and retail trade. The Master Plan ensures that future ICI sites supporting economic development can be appropriately serviced by municipal wastewater services.

3.2.6 Health and Safety

The WWTP stores and collects various chemicals for its treatment operations. Additionally, during extreme snowmelt and/or rainfall events, the WWTP may rarely overflow untreated sewage into the Mississippi River. These overflows are monitored and reported to the MECP and health agencies.

A Household Hazardous Waste Depot is located at 128 Patterson Crescent adjacent to the existing WWTP. The depot is a waste management facility licensed by MECP and accepts residential waste. The depot opens seasonally from May to November. Soil testing has not been completed at the depot or the WWTP as part of this project, however the Town has advised that there is no known contamination. Soil testing will be completed as part of Detail Design of the expansion to inform potential contamination.

3.2.7 Utilities

There are several utilities that exist in the Study Area, these include gas (Enbridge), electricity (Hydro One), communications (Bell), and Town water/sewer. Confirmation of location of utilities and identification of utility conflicts will occur in Detail Design.

3.3 Cultural Environment

3.3.1 Cultural Heritage

A Cultural Heritage Report of Existing Conditions and Preliminary Impact Assessment (CHRECPIA) was carried out to determine the potential for properties having cultural heritage value of interest, based on an assessment using the criteria outlined in O.Reg. 9/06 and the Ministry of Citizenship and Multiculturalism (MCM) Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes. A copy of the CHRECPIA is provided in Appendix C.

Based on the findings of the assessment, of the existing WWTP building, it does not retain cultural heritage value or interest. The complex consists of three above ground buildings that are all connected through a series of underground tunnels. The original WWTP was built in 1914 and there was a major overhaul of the entire complex that was completed in 1993. Evidence of the original 1914 building is not visible in the existing building. The new design of the facility does not retain any of the design elements of the



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historic structure of the site. Therefore, the property cannot be considered rare, unique, representative or an early example of a style, type, expression, material, or construction method. The WWTP is clad in red bricks with a primarily concrete superstructure. The site does not display a high degree of craftsmanship or artistic merit. While the functional purpose of the WWTP is unique to the Town, it does not demonstrate a high degree of technical or scientific achievement as it is a common structure that is found elsewhere in the province.

3.3.2 Archaeology

A Stage 1 Archaeological Assessment (Appendix D) was conducted in accordance with the MCM 2011 *Standards and Guidelines for Consultant Archaeologists* to determine the potential for the presence of known and/or potential archaeological resources in the Study Area.

The WWTP comprises several structures, tanks, paved roads, gravel parking lots, and manicured lawns. Much of the property has been built up in relation to the surrounding area. The southern portion of the WWTP is manicured lawn and was lower in elevation in relation to the surrounding landscape. The proposed site extends into a municipal yard that has been previously covered with gravel. A distinct change in elevation is present along the fence line leading to the WWTP, showing that the WWTP property is artificially higher than the surrounding area. There is also a noticeable difference on either side of Francis Street. The field on the north side of Francis Street is noticeably lower than the landscape on the southern side of Francis Street, indicating that the south side has been built up and graded.

A review of soil texture and topography provided an indication of past settlements. The background information of the Study Area indicates that its geology mainly consists of shallow soil over limestone, with shallow tracts of clay near the Town, and bogs in the region as well. Soils in the Study Area comprise loam, which are generally used for pasture and agriculture. The background information of the Study Area demonstrated that the Study Area retained potential for the recovery of pre- and post-contact Indigenous and Euro-Canadian archaeological resources. Two archaeological sites were identified within one (1) kilometer of the Study Area, consisting of Euro-Canadian residential sites.

Portions of the Study Area demonstrate potential for the recovery of pre- and post-contact Indigenous and Euro-Canadian archaeological resources. However, the property visit demonstrated that the WWTP area has been widely disturbed from previous construction, grading, and landscaping activities. As such, it was determined that the existing WWTP site does not retain potential for the recovery of archaeological resources. Any areas that were not previously disturbed (i.e., forest areas) were not included in the Stage 1 Archaeological Assessment.



3.4 Climate Change Considerations

The 2014 Provincial Policy Statement issued under the *Planning Act* advises of the need to consider climate change adaptation and mitigation. The MECP provides further guidance on considering climate change adaptation and mitigation in the environmental assessment process ([Considering climate change in the environmental assessment process | ontario.ca](#); *MECP Guidance on Considering Climate Change*). With climate change leading to highly variable conditions, adaptation measures may be required in the future to ensure the infrastructure's resiliency and mitigate the impact of extreme weather events. Climate change and the potential impact to infrastructure is highly uncertain. This uncertainty should be considered in engineering planning and design initiatives.

As recommended in the *MECP Guidance on Considering Climate Change*, the *Phase 1 Report* appended to the Master Plan presents the historical means, trends and projected trends in average total precipitation and average mean temperature for the Study Area, and potential impacts to the different components of this EA are identified. The *Resiliency Plan – Wastewater Treatment Plant*, prepared by J.L. Richards in 2018, relate to climate change and water infrastructure resiliency for the Town. The study concluded that some of the infrastructure required to accommodate population growth could also contribute to enhancing the facility's resiliency to climate change. Measures to enhance the treatment facility's resiliency were also presented.

For the Town, notable historical weather events include the very wet spring of 2017 and 2019 (stressing the WWTP) and the very dry summer of 2016. With climate change, high and low extreme water levels are more likely to occur. Low water levels can pose issues with the assimilative capacity of the WWTP effluent receiving stream. High water levels can create risks of flooding at the and could also pose issues with the WWTP gravity outfall (requiring pumping of effluent). Climate change resilience was considered as part of the preferred alternatives for the WWTP.

The *MECP Guidance on Considering Climate Change* also highlights the importance of considering and understanding the potential impacts that a project may have on climate change. This can be done qualitatively and includes reviewing measures that could contribute to climate change mitigation.

As recommended in the *MECP Guidance on Considering Climate Change*, potential climate adaptation and mitigation measures were considered in the evaluation of alternatives and are outlined in the *Alternatives Technical Memorandum* appended to the Master Plan, as well as in each component's implementation plan. As discussed later in this report, Stantec completed an *Assimilative Capacity Study* (Appendix A) to model the effects of increased wastewater flows and loadings from a potential expanded or new treatment plant, and to propose new future effluent criteria. Following further consultation with the MVCA, Stantec also completed a *Sensitivity Analysis*



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Memo (Appendix E) on some parameters on the results of the Assimilative Capacity Study, to simulate potential impacts of climate change.

The impacts of climate change and extreme weather events on the WWTP include:

- Increased peak inflow during wet weather event with increased precipitation or severe storms
- Increased peak inflow during spring melt due to higher temperatures and greater snow loads
- Flooding during higher river flows due to increased precipitation
- Lower river flows and reduced assimilative capacity due to decreased precipitation/prolonged droughts
- Impact of temperature increase on aeration system
- Odour generation with temperature increase
- Wet weather treatment of snowmelt with temperature increase
- Severe storms interrupting deliveries or leading to power outages

To address potential climate change impacts and increase resilience to climate change, different measures could be integrated in the WWTP expansion design. Opportunities for climate change adaptation include:

- The implementation of robust & efficient treatment processes throughout all seasons
- The addition of equalization storage, and increased chemical and sludge storage, to accommodate future peak flows
- Increased generator capacity, in the event of a power outage
- Flood-resistant facility design
- Lower effluent concentration limits, in the event of low water levels

Opportunities for climate change mitigation (greenhouse gas [GHG] emissions reduction) and energy savings include:

- The implementation of more energy efficient processes, to mitigate the impacts of increased energy consumption



4 Phase 3 - Alternative Design Concepts for Preferred Solution and Evaluation

Phase 3 of the MCEA process involves identifying alternative design concepts for implementation of the preferred alternative solution. The recommendations and scope of the expansion is determined based on an updated review of existing conditions, and design alternatives are identified and evaluated to determine the net impacts to the natural, socio-economic, cultural, and technical environments, while taking into consideration input from the public, Agencies, and Indigenous Nations.

4.1 WWTP Expansion Needs and Constraints

The following is a summary of WWTP planning constraints and needs, some of which were discussed in the Master Plan:

- The WWTP requires an expansion by 2025 to increase its rated capacity to 10,625 m³/d and peak design flow to 42,500 m³/d to meet 20-year design average daily and peak hourly flows.
 - The influent design loads are anticipated to increase proportionally with service population and combined with the need for continuous nitrification, will require a significant increase in secondary treatment capacity.
 - The existing plant experiences high peak flows, upwards of 30,000 m³/d, particularly during the Spring, and is believed to be significantly influenced by inflow and infiltration (I/I) and potentially illegal sump pump connections. To meet future growth, a peak hourly flow of 42,500 m³/d should be designed for and will require significant capacity increases for raw sewage pumping, preliminary treatment (screening and grit removal), tertiary treatment, and disinfection.
- An updated assimilative capacity study (ACS) was completed as part of this MCEA to determine the appropriate effluent limits and objectives for the upgraded WWTP facility.
 - It is expected that tertiary treatment (or ultrafiltration) and continuously nitrifying secondary treatment will be required to meet the new non-compliance limits for Total Phosphorus (TP) and Total Ammonia Nitrogen (TAN).
- The existing WWTP site has very limited space between processes for interior expansion.



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- The land directly east of the WWTP is a hazardous waste depot and compost yard owned and operated by the Town. This depot is intended to be moved to the planned municipal yard on Bates Drive, which may open up space for WWTP expansion.
- A geotechnical investigation was not completed at the existing site but based on background document review and the proximity to the river, it is expected that any deep excavations would encounter rock and groundwater.
- A SAR review was completed at the existing site and the southern portion of the hazardous waste depot area and did not identify any SAR on the existing property but found several potentially suitable habitats for Blanding's turtles and SAR Bats. These should be considered at the design stage.
- A Stage 1 AA was completed at the existing site and the southern portion of the hazardous waste depot area (previously disturbed) and determined the site as having no archaeological potential, with no need for further investigation recommended. However, during Detail Design, if previously undisturbed areas are proposed to be impacted, additional archaeological investigations are required.

4.2 Long List of Wastewater Treatment Options

4.2.1 Wastewater Treatment Options Long List Development

A long list of wastewater treatment options potentially suited to expand the existing WWTP was developed and screened out. Each of the long-listed options was selected for its ability to provide tertiary treatment, which is a requirement for the WWTP expansion as shown in the ACS (Appendix A).

The long list of wastewater treatment options included:

- Facultative lagoon + Submerged Aerated Growth Reactor (SAGR) for ammonia removal + filters for Total Phosphorous (TP) removal.
- Sequencing Batch Reactors (SBR) + filters for TP removal.
- Conventional Activated Sludge (CAS) + filters for TP removal.
- Rotating Biological Contactors (RBC) + filters for TP removal.
- Membrane bioreactor (MBR)



4.2.2 Wastewater Treatment Options Long List Screening

A series of critical questions were identified to screen the various expansion options (Table 3) to help narrow down a short-list of feasible treatment process options for further evaluation. The questions selected for screening the options are as follows:

1. Is there sufficient space for a new process?
2. Will MECP approve the new process and issue a letter of conformance?
3. Are there other proven installations in Ontario?
4. Are there suitable sludge management options available?
5. Does the process maximize and optimize the use of existing infrastructure?
6. Will the process provide capacity to service growth and allow for expansion beyond the 20-year planning horizon?



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Table 3: Long List of Wastewater Treatment Options Screening

Process	Sufficient Space	MECP Approval	Proven Installs	Sludge Plan	Use Existing Infrastructure	Future Expansion	Pass / Fail - Comments
Lagoon + SAGR + filters	No	Yes	Yes	Yes	No	No	Fail: Insufficient space for current / future expansions; poor use of existing mechanical treatment plant infrastructure
SBR + filters	Yes	Yes	Yes	Yes	No	Yes	Fail: Requires significant operator oversight; poor use of existing mechanical treatment plant infrastructure
CAS + filters	Yes	Yes	Yes	Yes	Yes	Yes	Pass: carried forward for further evaluation
RBC + filters	Yes	Yes	Yes	Yes	No	Yes	Fail: Can have variable treatment and effluent quality; poor use of existing mechanical treatment plant infrastructure
MBR	Yes	Yes	Yes	Yes	Yes	Yes	Pass: carried forward for further evaluation



The short-list of wastewater treatment options, herein referred as Alternative Design Concepts identified based on the results of the screening assessment are:

- **Alternative 1** – WWTP Conventional Activated Sludge Treatment Upgrade
- **Alternative 2** – WWTP Membrane Bioreactor Treatment Upgrade

These alternatives will be further explored and evaluated in the following sections. The full evaluation of treatment options is included in the *WWTP Expansion Options Evaluation Memorandum* (Appendix F).

4.3 Short-listed Options for Evaluation

4.3.1 Alternative 1 – WWTP Conventional Activated Sludge Treatment Upgrade

A conventional plant expansion involves providing additional capacity to accommodate growth using the same or similar technology as existing in the treatment plant. Alternative 1 includes expanding the WWTP by adding new aeration tanks and secondary clarifiers to increase the plant's secondary treatment capacity and adding tertiary treatment with filtration. This option seeks to maintain use of the existing processes, where practical, while providing new infrastructure where necessary to increase treatment capacity to accommodate future growth. Furthermore, the layout of the sanitary collection system can be maintained with this WWTP expansion option.

A significant portion of the Town-owned land to the east of the existing site will be required to provide adequate space for new infrastructure, as shown in Figure 4, given the existing plant property is constrained by existing infrastructure and underground utilities. The land to the east of the existing plant has been previously disturbed as it is used as a hazardous waste depot and compost site. The depot is intended to be moved to the planned municipal yard on Bates Drive. Although this alternative could lead to a reduction in land, this does not impede on parkland or on the Mississippi Riverwalk Trail. However, Alternative 1 would involve encroaching on existing treed areas to provide sufficient space for new infrastructure. A summary of the advantages and disadvantages of a Conventional Activated Sludge Treatment Upgrade is provided in Table 4.



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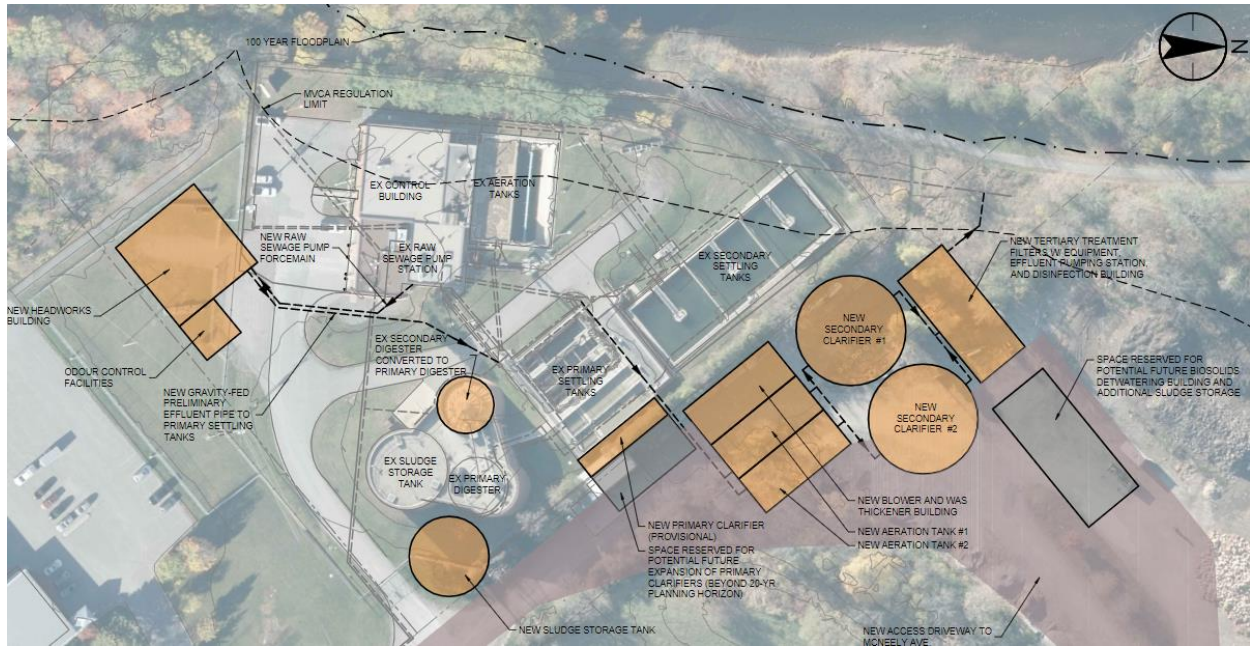


Figure 4: Alternative 1 - WWTP Conventional Activated Sludge Treatment Upgrade

Table 4: Summary of Advantages and Disadvantages of Alternative 1 - WTP Conventional Activated Sludge Treatment Upgrade

Advantages	Disadvantages
<ul style="list-style-type: none"> • Proven technology • Well understood capital and long-term O&M requirements • Ability to achieve low TP as low as 0.15 mg/L monthly non-compliance limit • Simplified MECP approvals 	<ul style="list-style-type: none"> • Larger footprint to accommodate expanded capacity • Limited energy savings opportunities over existing: Some opportunities available through equipment selection, controls, anoxic selectors, etc. • Added complexity of operating the new secondary treatment processes in conjunction with the existing plant. The existing aeration tanks are relatively shallow (~3.2m in depth) in comparison to the current industry standard (>4m in depth). • Numerous flow splits required making hydraulic control more challenging. • Likely will require effluent pumping to discharge effluent to river during 100-year flood event based on existing plant's hydraulic grade line in combination with headloss through new tertiary filters. • Requirement to treat filter backwash reduces overall capacity of plant, especially during peak flow events. • Highest initial capital expenditure and lifecycle cost.



4.3.2 Alternative 2 – WWTP Membrane Bioreactor Treatment Upgrade

MBR, as an advanced activated sludge wastewater treatment process, typically consist of a suspended growth biological reactor coupled with a submerged ultrafiltration membrane system. Mixed liquor from the biological reactor is fed to the membrane tanks and clean effluent is drawn through membrane filters by permeate pumps. The membrane essentially provides the functions of secondary clarification and tertiary filtration in a CAS process, thus eliminating the need for secondary clarifiers and tertiary filters.

Alternative 2 includes expanding the WWTP by converting the existing secondary clarifier tanks to aeration tanks to increase the plant's secondary treatment capacity and adding MBRs to provide clarification and improve effluent quality to tertiary treatment level. Existing WWTP infrastructure will be reused in conjunction with new tanks and buildings required for Alternative 2. Furthermore, the layout of the sanitary collection system can be maintained with this WWTP expansion option.

Similar to Alternative 1, a portion of the land to the east of the existing site will be required to provide adequate space for new infrastructure as shown in Figure 5. However, new infrastructure required for Alternative 2, including MBR, disinfection, and solids management buildings, has a smaller proposed footprint than Alternative 1 and is not constrained by the existing plant's hydraulic grade line. Adequate space for the Alternative 2 proposed buildings and tanks can be provided in the previously disturbed area of the Town's current hazardous waste depot, resulting in minimal impacts to treed areas. A summary of the advantages and disadvantages of an MBR plant expansion is provided in Table 5.



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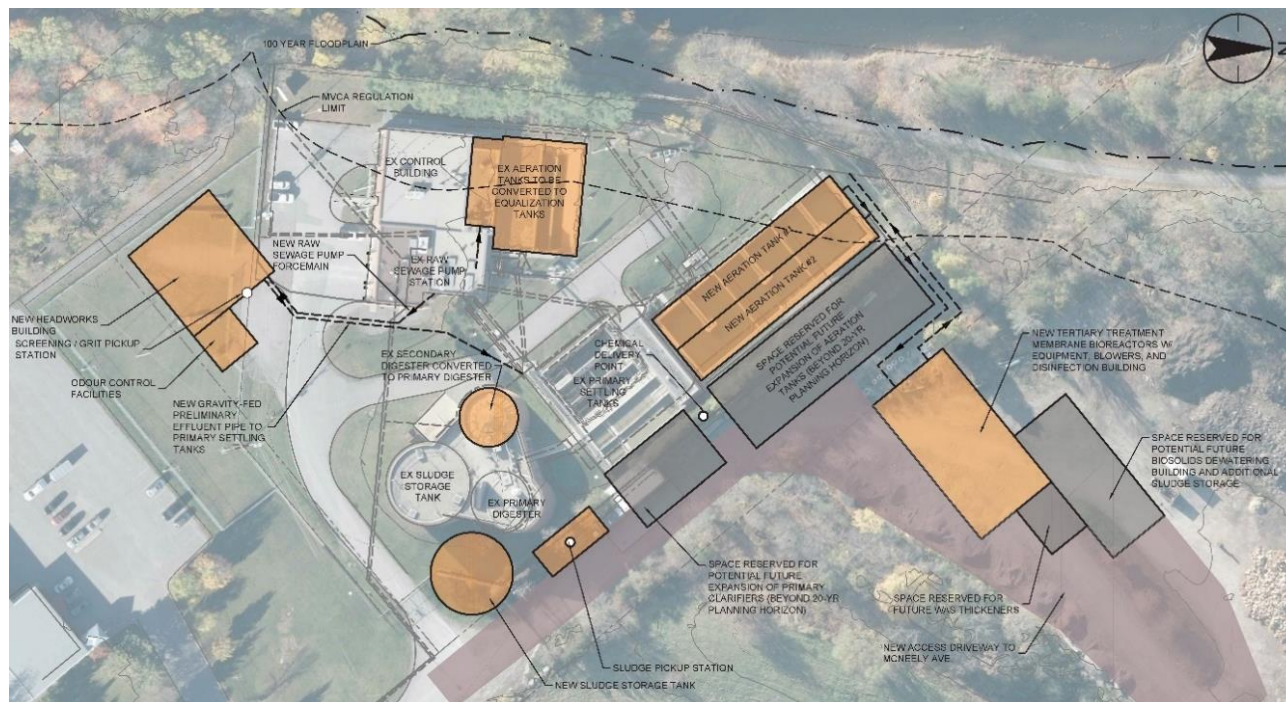


Figure 5: Alternative 2 - WWTP Membrane Bioreactor Treatment Upgrade

Table 5: Summary of Advantages and Disadvantages of Alternative 2 - WWTP Membrane Bioreactor

Advantages	Disadvantages
<ul style="list-style-type: none"> • Proven technology – used at facilities in Ontario and North America. • Smaller footprint. • Ability to achieve very low TP (<0.1 mg/L as monthly non-compliance limit). • Ability to operate plant at higher mixed liquor suspended solids concentrations (6,000 to 10,000 mg/L) and solids retention time to further increase capacity of existing treatment processes and ensure complete nitrification, even in cold weather conditions. • Reduced flow splits and simplified hydraulics control. • Simplified MECP approvals. • Lower capital cost. 	<ul style="list-style-type: none"> • Higher operating cost and energy requirements as compared to conventional plant (continues to improve as technology matures). • Upstream fine screening required for MBR. • Added complexity for design and construction for conversion of existing secondary clarifier to aeration tanks. • Requires additional operator training to become familiar with MBR treatment process.



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4.3.3 Life Cycle Cost Analysis

An opinion of probable construction cost and preliminary 20-year life cycle cost analysis were developed for both alternatives. The opinion of probable construction cost (Class 4 estimate (-30% to +50%) in \$CAD 2022) evaluated upgrades that were common to both alternatives as well as individual requirements for each. These will be confirmed and further refined during the design phase.

Common upgrades assumed for both alternatives include:

- Upgraded Raw Sewage Pumping capacity
- New Headworks Building for increased screening and de-gritting
- New yard piping for Primary Clarifier modifications (i.e., conversion of Phys-Chem clarifiers into Primary Clarifiers) and other site needs
- Conversion of the Secondary Anaerobic Digester into another Primary Digester
- Addition of a new Sludge Storage Tank
- Upgraded Chemical Storage Building
- Upgraded Electrical Supply and Standby Generator for the site; and
- Provisional Outfall Pipe modifications (pending future condition assessment)

In addition, the following upgrades were assumed only for Alternative 1 (Conventional Activated Sludge Treatment):

- Addition of a new Aeration Tank, Blower Building and fine bubble diffusers
- Addition of a new Secondary Clarifier
- New Tertiary Treatment (Filtration) Building, housing new UV Disinfection system
- New Effluent Pumping Station

The following upgrades were assumed only for Alternative 2 (Membrane Bioreactor Treatment):

- Conversion of the existing Aeration Tanks into Equalization Tanks
- Conversion of the existing Secondary Clarifiers into Aeration Tanks, including fine bubble diffusers
- New Membrane Bioreactor, housing new UV Disinfection System



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While the estimated construction cost for Alternative 2 was lower than Alternative 1 (\$40.5M vs \$43.5M), the 20-year operation and maintenance (O&M) cost was higher (\$33.1M vs \$36.3M). The resulting 20-year lifecycle costs were nearly identical (\$76.6M for Alternative 1; \$76.8M for Alternative 2).

Detailed calculations and assumptions for the life cycle cost analysis are provided in the *WWTP Expansion Options Evaluation Memorandum* (Appendix F).

4.4 Evaluation Methodology

The environmental factors outlined in Table 6 represent a broad definition of the environment as described in the *Environmental Assessment Act*.

Table 6: Environmental Components

Environmental Component	Description
Natural Environment	Component having a regard for protecting significant natural and physical elements of the environment (i.e., air, land, water, and biota) including natural heritage and environmental features and functions.
Cultural Environment	Component that evaluates potential effects on historical/archaeological and heritage components.
Socio-Economic Environment	Component that evaluates potential effects on residents, neighbourhoods, businesses, community character, social cohesion, community features.
Technical Environment	Component that considers technical suitability and other engineering aspects of the alternative solutions.

A qualitative evaluation was used to consider the suitability of the different alternative design concepts with respect to a specific set of evaluation criteria identified for each environmental component. The evaluation criteria and the related key considerations and impacts to assess for the project are summarized in Table 7. Each alternative is then qualitatively assessed against each criteria using a reasoned argument approach, resulting in a determination identifying each option as preferred or least preferred.



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Table 7: Alternative Design Concepts Evaluation Criteria

Category	Criteria
Natural Environment	Aquatic Environment <ul style="list-style-type: none"> • Potential to impact fish and fish habitat • Potential to impact surface water quality and quantity
	Terrestrial Environment <ul style="list-style-type: none"> • Potential to impact wildlife/habitat (i.e., Species-at-Risk, spawning areas, significant ecological areas, etc.) • Potential to affect vegetation (i.e., wooded areas, wetlands, conservation areas, etc.) • Potential to impact individual trees or landscaped features
Cultural Environment	Archaeological Resources <ul style="list-style-type: none"> • Potential to impact undisturbed lands
	Built Heritage Resources / Cultural Landscape <ul style="list-style-type: none"> • Potential to impact known built heritage resources or cultural landscapes/features
Socio-Economic Environment	Noise/Vibration & Air Quality <ul style="list-style-type: none"> • Potential to impact noise sensitive areas (i.e., residential dwellings, daycares, etc.) • Potential to affect local air quality during construction • Potential to affect local air quality during operational phase
	Property Requirements <ul style="list-style-type: none"> • Requires acquisition of private property
	Aesthetics <ul style="list-style-type: none"> • Potential to impact visual aesthetics of study area
	Land Use <ul style="list-style-type: none"> • Potential to impact existing and future designated land use and/or community use
	Consistency with Municipal Planning Objectives and Existing/Proposed Development <ul style="list-style-type: none"> • Satisfies the goals and objectives of the Town’s Official Plan • Compliance with municipal/regional policies • Potential to support existing and future development in the area
	Health & Safety <ul style="list-style-type: none"> • Potential to impact health and safety of residents • Potential to impact health and safety of employees • Potential impacts to groundwater quality (i.e., wells, effect Source Water Protection area, etc.) • Potential to encounter contaminated subsurface conditions



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Category	Criteria
	<p>Community Access</p> <ul style="list-style-type: none"> • Disruption to existing traffic, private property and business access during construction • Disruption to existing traffic, private property and business access during operation
<p>Technical Environment</p>	<p>Functionality/Reliability of Wastewater Collection</p> <ul style="list-style-type: none"> • Provision of reliable wastewater collection for the existing and future projected population • Potential for risk of sewage backups and basement flooding • Potential impacts due to surface flooding or system overflows
	<p>Functionality/Reliability of Wastewater Treatment</p> <ul style="list-style-type: none"> • Treated effluent quality • Reliability of the treatment process • Potential for risk of sewage backups and impacts to collection system
	<p>Cost</p> <ul style="list-style-type: none"> • Relative capital, operational and maintenance costs (\$)
	<p>Utilities</p> <ul style="list-style-type: none"> • Potential to impact existing utilities
	<p>Constructability & Feasibility</p> <ul style="list-style-type: none"> • Potential to disrupt existing traffic, property access or functionality of existing facilities during construction • Location, depth of excavation, soil conditions, rock removal, groundwater control, in-water works, workable construction area, construction duration
	<p>Expandability</p> <ul style="list-style-type: none"> • Potential to be expanded or flexible to meet future population needs
	<p>Climate Change</p> <ul style="list-style-type: none"> • Ability to increase resilience to climate change (i.e., severe weather events) in the study area • Impacts to known climate change contributors (i.e., GHG emissions)

4.5 Evaluation of Alternative Design Concepts

A qualitative evaluation of the alternative design concepts considered is shown in Table 8. Based on this comparative evaluation, the two alternative designs were ranked from least preferred, represented by a black circle, to preferred, represented by a white circle, in consideration of the criteria and measures presented earlier in this document.



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The elements considered for the evaluation are discussed in the sections following the Table.

Table 8: Alternative Design Concepts Evaluation Summary for WWTP

	Alternative 1 WWTP Conventional Activated Sludge Treatment Upgrade	Alternative 2 WWTP Membrane Bioreactor Treatment Upgrade
Natural Environment	●	○
Cultural Environment	●	○
Socio-Economic Environment	●	○
Technical Considerations	●	○
Conclusion	Least Preferred	Preferred



4.5.1 Natural Environment

The alternative design concept 2 - WWTP Membrane Bioreactor Treatment Upgrade was the preferred option for the Natural Environment category due to low potential to impact water quality and quantity as having less structures reduces the quantity of potential runoff into the Mississippi River. Additionally, less structures affecting the new site lend itself to Alternative 2 having less potential to impact wildlife/habitat, including bird nesting and bat habitat (i.e., forest areas) compared to Alternative 1.

4.5.2 Cultural Environment

The Alternative Design Concept 2 - WWTP Membrane Bioreactor Treatment Upgrade was the preferred option for the Cultural Environment category because it has low potential to impact undisturbed lands as expansion would take place in existing developed site and southern portion of adjacent hazardous waste depot, which retains low to no archaeological potential. Alternative 1 proposes expansion into forested areas that remain undisturbed.



4.5.3 Socio-Economic Environment

The Alternative Design Concept 2 - WWTP Membrane Bioreactor Treatment Upgrade was the preferred option for the Socio-Economic Environment because it has a shorter construction timeframe, creating a less temporary noise and air quality impacts caused by construction vehicles than Alternative 1. Due to the increased number of structures at the Hazardous Waste Depot, Alternative 1 also had a higher potential to encounter contamination. All other factors were equal between the alternatives.

4.5.4 Technical Considerations

The Alternative Design Concept 2 - WWTP Membrane Bioreactor Treatment Upgrade was the preferred option for the Technical Considerations Category because it has low impact to operational monitoring requirements as the addition of MBR will add minimal sampling points that require compliance monitoring and reporting. Also, it represents a high improvement in efficiency of treatment with re-purposing of deeper existing secondary clarifiers as aeration tanks, ability to operate at higher mixed liquor suspended solids concentrations and automation of MBR cleaning compared to Alternative 1.

Alternative 2 has moderate-high improvement in resiliency to climate change due to accommodation of 2041 projection peak flows compared to a moderate improvement for Alternative 1. Also, although Alternative 2 has the potential to increase known climate change contributors through increased energy consumption, Alternative 1's use to concrete tanks creates a higher impact to climate change contributors.

Based on the findings of this evaluation, Alternative 2, Wastewater Treatment Plant Membrane Bioreactor Treatment Upgrade is recommended.

The full evaluation of Alternative Design Concepts undertaken as part of Phase 3 of the MCEA is included in the WWTP Expansion Options Evaluation Memorandum (Appendix F).

4.6 Preferred Design Alternative

The preferred alternative for WWTP expansion based on the detailed evaluation is: **Alternative 2 - WWTP Membrane Bioreactor Treatment Upgrade** with the following key advantages:

- Optimizing use of existing infrastructure, including conversion of the existing aeration tanks to equalization tanks to buffer peak flows and conversion of the existing secondary clarifiers to aeration tanks to improve oxygen transfer efficiency
- Smaller footprint required for the plant expansion



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- Reduced flow splits and simplified hydraulic control
- Lower initial capital cost
- Ability to accommodate increased influent loading by operating the plant at higher MLSS

Existing WWTP infrastructure will be reused in conjunction with new tanks and buildings required for Alternative 2, as described in Table 9 and shown in the process flow diagram (Figure 6 **Error! Reference source not found.**).

Table 9: Preferred Alternative Upgrades by Unit Process

Unit Process	Description of Upgrades
Raw Sewage Pumping	<ul style="list-style-type: none"> • Replacing the raw sewage pumps in the existing control building to meet the 2041 PHF (42,500 m³/d). • Installing new forcemain from raw sewage pumping to new headworks building.
Flow Equalization	<ul style="list-style-type: none"> • Existing aeration tanks can be converted to raw sewage equalization tanks to buffer peak flow events.
Preliminary Treatment (Screening and Grit Removal)	<ul style="list-style-type: none"> • Installing a new headworks building to house new screening and grit removal equipment to meet the 2041 PHF (42,500 m³/d). • Installing odour control facilities for the new headworks building. • Installing a new gravity-fed preliminary effluent pipe from the new headworks building to the existing primary clarifiers.
Primary Treatment	<ul style="list-style-type: none"> • Reuse of the existing primary clarifiers, converting the physical/chemical clarifiers to standard primary clarifiers. • Adding a sixth primary clarifier (provisional) to provide additional capacity for the expanded plant
Secondary and Tertiary Treatment, and Disinfection	<ul style="list-style-type: none"> • Converting the existing secondary clarifiers to aeration tanks to meet nitrification requirements for the upgraded plant. • Construction of new MBR tanks and disinfection building to house MBR and disinfection equipment to achieve improved effluent quality and accommodate 2041 PHF (42,500 m³/d).



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Unit Process	Description of Upgrades
Solids Management	<ul style="list-style-type: none"> • Converting the existing secondary digester to a primary digester to increase plant's anaerobic digester capacity. • Installing an additional liquid sludge storage tank to increase on-site storage capacity. • Providing sufficient space for WAS thickening and dewatering (provisional) to suit year-round solids management strategies that increase beneficial nutrient re-use and reduce cost.

It is recommended that the Town inspect the existing infrastructure that is proposed to be reused, including the outfall and effluent diffusers, to confirm their condition is adequate for future use.

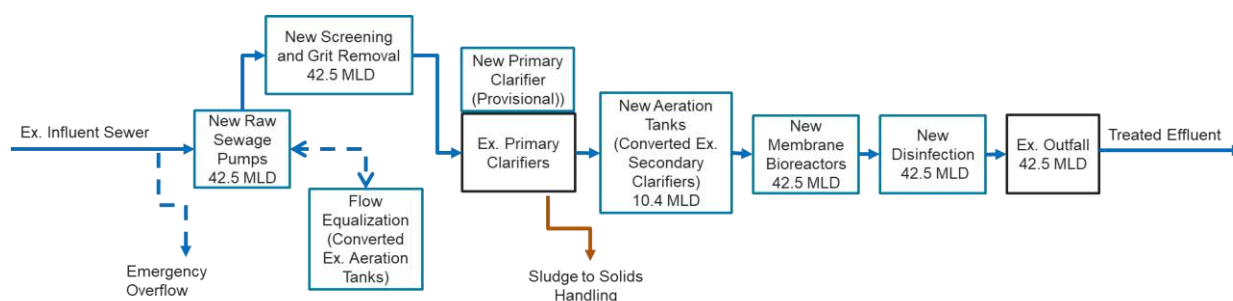


Figure 6: Preferred Option Process Flow Diagram

4.7 Implementation and Phasing

Opportunities to phase the implementation of the WWTP expansion and the preferred Design Concept Alternative were considered in order to mitigate impacts to capital budgets and to provide capacity for planned developments prior to full implementation of the expansion. While the phased approach does not offer an overall cost savings for the project, this may be outweighed by the benefits of allowing growth to proceed in the community. This is ultimately a Town decision based on municipal budgeting and forecasting.



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This phased approach is typically appropriate for expansions or new facilities requiring multiple new units of each process. For example, if three (3) new clarifiers were required by 2041, the Town may consider constructing one of them every five (5) years. However, the proposed expansion of the Carleton Place WWTP features mostly single unit additions, or construction of new buildings to accommodate the full upgraded capacity. As such, phasing of individual process units is not practical. Nevertheless, some potential optimization opportunities or future needs that could be delayed to a separate construction project from the main upgrade. Specifically, these future opportunities include a Waste Activated Sludge (WAS) Thickening and Dewatering process to suit year-round solids management strategies, maximizing beneficial nutrient re-use and minimizing costs.



5 Effects Assessment, Mitigation and Monitoring

Phase 3 of the MCEA process involves identifying the impact of the preferred design concept on the environment as well as their corresponding mitigation measures and monitoring activities. The construction and operation of the WWTP expansion has potential environmental and social impacts which are described in the following sections. Potential impacts were determined based on the natural and social inventories described in Section 3.1 and the evaluation criteria discussed in Section 2.2.

In general, the operation of the preferred design concept will have limited effect on the environment. Environmental effects due to construction activities will be limited and temporary.

5.1 Natural Environment

5.1.1 Aquatic Environment

The project construction will not require any in-water work activities. However, excavation and construction for wastewater treatment facilities at the WWTP site may have potential effects to fish and fish habitat and potential to impact water quality and quantity due to site's proximity to the Mississippi River and potential runoff during construction. Runoff and sedimentation can impact water quality and quantity as well as local fish species by changing aspects of their local environment such as the water velocity, water temperature, food supply, and nutrient concentration. During operations, there is a potential of increased effluent loadings that may result in impacts to the aquatic environment of the Mississippi River.

Impacts to the Aquatic Environment shall be mitigated through design and construction management measures including:

- Construction activities will maintain the buffers established during the design phase to reduce potential negative impacts to the Mississippi River.
- In the event that in-water and/or near water construction works are required, appropriate mitigation measures will be followed, as identified in Applicable Law and through consultation with the relevant authorities including Fisheries and Oceans Canada (DFO).
- All requirements of the *Fisheries Act* will be met.
- Construction activities will maintain the buffers established during the design phase to reduce potential negative impacts to the Mississippi River.



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- Consideration will be given to mitigating short and long-term water quality impacts to the Mississippi River. Impacts will be mitigated through, for example, the implementation of an Erosion and Sediment Control Plan and a Spill Response Plan.

Furthermore, corresponding monitoring activities include:

- On-site inspection will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions, if required. Corrective actions may include additional site maintenance and alteration of activities to reduce impacts.
- Monitoring of process effluent discharges will be undertaken according to the Ontario *Environmental Protection Act*.

5.1.2 Terrestrial Environment

5.1.2.1 Wildlife and SAR

Excavation and construction for wastewater treatment facilities at the WWTP site may have effects on wildlife including the potential for disturbance, displacement, or mortality of wildlife; potential to impact wildlife/habitat, including bird nesting, potential for impacts to SAR; potential for impacts to Blanding's turtle and/or Blanding's turtle habitat; potential for impacts to SAR bats (Small-footed Myotis, Little Brown Myotis, Northern Myotis, and Tri-colored Bat) and/or SAR bat habitat.

Impacts to wildlife and SAR shall be mitigated through design and construction management measures including:

- If wildlife is encountered, measures will be implemented to avoid death, injury, or interference with the species, and its habitat. For example, construction activities will cease, or be reduced, and wildlife will be encouraged to move off-site and away from the construction area on its own. A qualified biologist will be contacted to advise on the appropriate actions for the situation.
- Prior to construction, investigation of the project Footprint for wildlife and wildlife habitat that may have established following the completion of previous surveys will be undertaken by a qualified biologist, as appropriate.
- All works must comply with the *Migratory Birds Convention Act*, 1994, including timing windows for the nesting period (April 1 to August 31).



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- Construction will occur outside of the nesting period where feasible. However, if construction must occur during the general nesting period, then a breeding bird and nest survey will be undertaken prior to required activities. Nest searches are required and will be completed by a qualified wildlife biologist or ornithologist no more than 48 hours prior to vegetation removal.
- If a nest of a migratory bird is found outside of this nesting period (including a ground nest), it still receives protection.
- Conduct a daily pre-construction search of the work area to identify presence of species at risk.
- If threatened or endangered species are seen in or near the work area, stop work immediately.
- All requirements of the *Endangered Species Act* (ESA), 2007 will be met.
- Erect exclusion fencing (e.g., silt fence) prior to activities occurring in areas of suitable habitat (e.g. Mississippi River) to reduce the risk of turtles entering the work area.
- Install exclusion fencing prior to the sensitive nesting season if activities are anticipated to occur throughout this period to prevent turtles from entering and/or nesting:
 - Prior to 15 March if activities are occurring within or adjacent to overwintering habitat.
 - Prior to 1 June if activities are occurring within or adjacent to nesting habitat.
- If erecting exclusion fencing, the contractor shall use a type that will last the duration of the project. Check that stakes are securely driven into the ground on the inside of the working area. Place stakes 2 m apart and drive them to a depth of 30 cm, with the fabric pulled tight to reduce sagging, and the bottom of the fabric buried 10-20 cm down within an additional fabric lip extending outwards 90 degrees:
 - Backfill and compact the fabric lip
 - Inspect any fenced off areas daily to identify compromises in the fence and to remove any turtles that may be trapped in the fence
 - Install fencing so that it prevents construction sediment from entering into wetlands.



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- Have a qualified person conduct a pre-construction sweep and monitor the work area for active turtle nests during the turtle nesting season (May-July).
- Implement a worker awareness program for construction staff that includes species at risk identification and habitat characteristics.
- Take photographs, if possible, but do not interact with the animal.
- If turtles have established nests in construction areas, stop work immediately and notify the MECP, depending on the species encountered, of the occurrence and ask for further direction. The nests are to be protected from disturbance until the nestlings have hatched and dispersed, approximately in late September, and permit from the MECP, depending on the species encountered, will most likely be required.
- Disturbance to bat roosting habitat/tree removal of trees ≥ 10 cm DBH will be avoided during the bat roosting period of April 1 to November 1. Compensation to be determined to IGF and AAF.
- Mitigation measures to reduce adverse impacts of Project activities on SAR bats will comply with the ESA, 2007.

Furthermore, corresponding monitoring activities include:

- On-site inspection will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions, if required. Corrective actions may include additional site maintenance and alteration of activities to reduce impacts.
- Regular monitoring will be undertaken during construction to confirm that activities do not encroach into nesting areas or disturb active nesting sites.
- On-site inspection will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions, if required. Corrective actions may include additional site maintenance and alteration of activities to reduce impacts. Additional monitoring measures will be developed with the MECP, if required.
- Monitoring activities to reduce adverse impacts of Project activities on Blanding's Turtle will comply with the ESA, 2007
- Monitoring activities to reduce adverse impacts of Project activities on SAR bats will comply with the ESA, 2007.

No impacts to wildlife or SAR are expected during the WWTP's operation.



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5.1.2.2 Vegetation

Cutting, digging, or trimming ground covers, shrubs and trees during the project's construction may have the potential to impact trees and vegetation. Impacts to trees and vegetation shall be mitigated through design and construction management measures including:

- Vegetation removal will be reduced to the extent possible and limited to the construction footprint.
- Where adjacent trees and naturalized areas are to be retained, the following management practices should be followed when construction activities occur near trees:
 - Erect a fence at the minimum critical root zone (CRZ) of trees (i.e., 25m radius from stem)
 - Do not place any material or equipment in the CRZ of the tree
 - Do not raise or lower the existing grade in the CRZ
 - Tunnel or bore when digging in the CRZ of any tree
 - Do not damage the root system, trunk, or branches of any tree
 - Ensure that exhaust fumes from all equipment are not directed towards any tree's canopy.
- Vegetation removals will also consider and mitigate potential impacts to sensitive species (e.g., migratory birds and SAR) and features (e.g., significant wildlife habitat).

Furthermore, corresponding monitoring activities include:

- On-site inspection will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions, if required. Corrective actions may include additional site maintenance and alteration of activities to reduce impacts. Additional monitoring measures will be developed with the MECP, if required.
- Monitoring activities to reduce adverse impacts of Project activities on trees and vegetation will comply with the *ESA, 2007*.
- New trees will be planted post-construction to replace trees removed at a 1:1 ratio.

No impacts to vegetation and trees are expected during the WWTP's operation.



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5.1.2.3 Soils and Groundwater

Excavation and construction for wastewater treatment facilities at the WWTP site may have the potential to encounter contaminated materials and/or result in the spreading of contaminated materials. Also, there is the potential to encounter contaminated groundwater or exposing groundwater to contamination.

Impacts to soils and groundwater resources shall be mitigated through design and construction management measures including:

- Identification of potential contaminants and determination of extent of contamination is recommended for the household hazardous waste and compost depot adjacent to the existing WWTP.
- A soil and groundwater quality investigation is recommended during detail design for the household hazardous waste and compost site adjacent to the existing WWTP.
- Develop a Soil and Excavated Materials Management Plan (SEMMP) for the handling, management, and disposal of all excavated material (i.e., soil, rock and waste) that is generated or encountered during construction. The plan will be overseen by a Qualified Person pursuant to O.Reg. 153/04 under the EPA and will comply with O.Reg. 406/19 (On-Site and Excess Soil Management), the MECP, formerly the Ministry of the Environment and Climate Change (MOECC)'s *Management of Excess Soils: A Guide for Best Management Practices*, and all Applicable Law. The plan will describe how to address the management of the excavated materials, imported materials, and contaminated materials, including handling, transportation, testing, documentation and reuse and disposal of excavated materials generated as part of the construction and in accordance with applicable regulatory requirements and the project contract documents/agreement as applicable.
- Non-soil materials encountered during the earthworks will also require waste classification as documented by testing where applicable to determine management and disposal requirements as per O.Reg. 347 (as amended) and All Applicable Law.
- The SEMMP will be reviewed and approved by the Town prior to construction.
- Develop a **Groundwater Management and Dewatering Plan** (GMDP) to guide the handling, management, and disposal of groundwater encountered during construction in compliance with O.Reg. 406/19 (On-Site and Excess Soil Management), 64/16 and 387/04, as amended under the *Ontario Water Resources Act*.



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- The GMDP will describe the handling, transfer, testing, monitoring, disposal of groundwater generated as part of the construction and in accordance with applicable regulatory requirements and the project contract documents/agreement as applicable. The GMDP will outline general groundwater monitoring considerations during construction and provide guidance for groundwater monitoring following construction where considered applicable.
- The GMDP will describe the anticipated groundwater quantity and dewatering Zone of Influence (ZOI) that will be encountered during construction, and if approvals are needed for the water taking, such as a Permit to Take Water (PTTW) from the MECP, or an Environmental Activity and Sector Registry (EASR).
- The GMDP will describe the storage, transfer, and disposal and or treatment of the groundwater collected during construction, and approvals for the water disposal, and or treatment if applicable based on the quantity and quality.
- The GMDP will be reviewed and approved by the Town prior to construction.
- Potential impacts to groundwater-dependent natural features and/or private groundwater supply wells (if present) can be mitigated with measures such as avoidance of dewatering requirements, minimizing dewatering, and/or utilizing groundwater cut-off techniques to physically exclude groundwater from flowing into excavations advanced for construction.

Monitoring and reporting will be conducted in accordance with applicable O.Reg. requirements.

Overall, the impact of the WWTP's construction on the terrestrial environment is anticipated to be limited as most development is in previously disturbed areas.

No impacts to soils and groundwater are expected during the WWTP's operation.

5.2 Social & Economic Environment

No impacts to private property or existing or designated land use are expected, as most construction activities will be undertaken in the existing WWTP and municipal-owned lands in the hazardous waste depot and compost site. This includes no impacts to access the Mississippi Riverwalk Trail. Furthermore, the project satisfies the goals of the Town's Master Plan to support future projected population growth in the 20-year planning horizon (2041). Similarly, the WWTP expansion is consistent with municipal/regional policies related to servicing existing and future population in an environmentally responsible manner and account for the health and safety of residents.



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5.2.1 Noise and Vibration

The project has the potential to result in noise and vibration effects during construction activities (e.g., heavy equipment operation, construction equipment, etc.). The excavation and construction of the WWTP will require grade preparation activities including vegetation removal, earth moving, excavation, and backfilling which uses heavy construction equipment. Heavy equipment use related to construction activities may have noise and vibration impacts on nearby residential or commercial areas. Further, increases in noise and vibration will be temporary in nature and are considered to be a short-term nuisance to nearby properties.

Potential noise and vibration effects shall be mitigated through design and construction management measures including:

- Noise emissions of the construction equipment should be reviewed during detailed design to confirm that they are within the NPC-115 and NPC-118 limits. If they are expected to exceed the limits, quieter equipment should be considered for the project. Alternatively, noise control options, such as silencers/mufflers should be investigated and implemented for specific equipment.
- Construction related noise emissions shall adhere to the Town's Noise By-Law No. 29-2017.
- The potential vibration effects from construction equipment can be controlled by increasing the setback distance. Therefore, construction operational changes (e.g., maintaining setback distance and switching to lesser impactful equipment, etc.) are recommended. Select construction/ maintenance methods and equipment with the least vibration impacts.
- In the presence of persistent complaints and subject to the results of an investigation, identify reasonable alternative vibration control measures, where possible.

Corresponding monitoring activities include establishing a **Complaints Protocol** to respond to issues that develop during construction.

No impacts to noise and vibration are expected during the WWTP's operation.

5.2.2 Air Quality

The project has the potential, at times, to result in temporary air quality impacts during construction as a result of increased fugitive dust emissions, construction equipment tailpipe emissions, vehicle emissions and associated dust. Further, during operations, there is a potential to impact air quality due to increase in bio-gas production and use of flare, as well as occasional odours.



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Potential effects to air quality shall be mitigated through design and construction management measures including:

- All construction equipment to be maintained and in good working order in accordance with operational manual.
- Existing WWTP already has odour control treatment technologies. Odour treatment technologies will be incorporated for the new Headworks Building to meet odour requirements.

Furthermore, corresponding monitoring activities include:

- Establish a **Complaints Protocol** to respond to issues that develop during construction.
- Implement an **Odour Control Plan** to ensure compliance of odour regulations, guidelines, and standards.

5.2.3 Aesthetics and Light Pollution

There is a potential to impact visual aesthetics of the Carleton Place Curling Club due to the construction and operation of the new Headworks and Dewatering Building and Odour Control Facilities. Moreover, construction activities may have the potential for light trespass, glare, and light pollution effects in nearby commercial and residential areas.

Potential effects to aesthetics and light pollution shall be mitigated through design and construction management measures including:

- As applicable, design of the WWTP will be undertaken in a way that compliments the existing built form and characteristics of the surrounding community.
- The Constructor will perform the construction in such a way that any adverse effects of construction lighting are controlled or mitigated in such a way as to avoid unnecessary and obtrusive light with respect to adjoining residents, communities and/or businesses.

Corresponding monitoring activities include establishing a **Complaints Protocol** to respond to issues that develop during construction.

5.2.4 Traffic and Transportation

The project may have the potential to impact existing traffic, cyclists/pedestrians, private property, and business access during construction. Potential effects to traffic and transportation shall be mitigated through design and construction management measures including:



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- Developing a **Traffic Management Plan** prior to construction to maintain reasonable access through work zones, to the extent possible.
- Avoid directing construction traffic via residential streets.
- Improved sludge storage and dewatering may decrease traffic by reducing frequency of visits by solids disposal trucks.
- Access to nearby land uses will be maintained for vehicular, pedestrian and cyclist traffic, to the extent feasible. Potentially affected residents, tenants and business owners will be notified of initial construction schedules, as well as modifications to these schedules as they occur.
- Construction schedules will be shared with the public in advance of any construction works to reduce traffic during peak hours.
- Potential effects to pedestrian and cyclist activities during construction will be mitigated through the installation of appropriate wayfinding, regulatory, and warning signs.
- Existing sidewalks and crossings will be maintained to the extent possible. Temporary pedestrian facilities will comply with accessibility and applicable municipal standards.

Furthermore, corresponding monitoring activities include:

- Pedestrian, cyclist, and vehicular traffic impacts are to be monitored in accordance with a Traffic Management Plan and adjusted as necessary during the construction period.
- Trail access to be monitored in accordance with the Traffic Management Plan and adjusted as necessary during the construction period.

No impacts to traffic and transportation are expected during the WWTP's operation.

5.2.5 Health and Safety

There is low potential to impact the health and safety of Town residents due to construction nuisance such as noise and vibration, and reduced air quality. Mitigation and monitoring measures will be implemented to address such impacts. Moreover, the project improves the health and safety of operating staff through the design of new buildings and processes with improved safety features.

During construction, there is a potential to encounter contaminated materials or expose groundwater associated contamination for portion of expansion extending onto the existing hazardous waste depot site, although the Town has advised that there is no



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known contamination at the site. A **Designated Substance and Hazardous Materials Survey** will be required during Detail Design.

Additional mitigation measures and monitoring activities related to soil and groundwater as it pertains to contamination are described in Section 5.1.2.3.

5.2.6 Utilities

Excavation and construction for wastewater treatment facilities at the WWTP site may have the potential to impact existing utilities. Potential effects to utilities shall be mitigated through design and construction management measures including:

- Obtain permits and consents from and with all utility companies with respect to the design, construction, installation, servicing, operation, repair, preservation, relocation, and or commissioning of Utility Infrastructure.

Furthermore, corresponding monitoring activities include:

- Maintain regular communication with applicable utility companies.
- In the event of potential effects to critical utilities, instrumentation and monitoring shall be carried out to protect the critical utilities and structures and reduce risks of damage due to construction activities.

Also, an upgraded hydro connection may be required due to the increased energy requirements to operate a larger facility. To mitigate potential impacts to utilities, plans for addressing utility conflicts are required.

No impacts to utilities are expected during the WWTP's operation.

5.3 Cultural Environment

It is anticipated that the project will not have impacts to built heritage or cultural landscapes/features since the existing WWTP site was determined not to have cultural heritage value or interest. There is low potential to impact undisturbed lands as expansion would take place in existing developed site and southern portion of adjacent hazardous waste depot, which retain no archaeological potential. However, in the event that unassessed or documented archaeological materials are encountered during construction, the following mitigation measures shall be implemented:

- It is an offence under Sections 48 and 69 of the *Ontario Heritage Act* for any party other than a licensed archaeologist to make any alteration to a known archaeological site or to remove any artifact or other physical evidence of past human use or activity from the site, until such time as a licensed archaeologist has completed fieldwork on the site, submitted a report to the Minister stating that the site has no further cultural heritage value or interest, and the report has been



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filed in the Ontario Public Register of Archaeological Reports referred to in Section 65.1 of the *Ontario Heritage Act*.

- Should previously undocumented archaeological resources be discovered, they may be a new archaeological site and therefore subject to Section 48(1) of the *Ontario Heritage Act*. 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, in compliance with Section 48(1) of the *Ontario Heritage Act*.
- *The Funeral, Burial and Cremation Services Act, 2002, S.O. 2002, c.33* (Government of Ontario 2002) requires that any person discovering human remains must notify the police or coroner and the Registrar of Cemeteries at the Ministry of Government and Consumer Services.

Furthermore, corresponding monitoring activities include:

- Performance of the work will occur in land previously subject to an Archaeological Assessment.
- Any site personnel responsible for carrying out or overseeing land-disturbing activities will be informed of their responsibilities in the event that an archaeological resource is encountered.

No impacts to archaeological resources are expected during the WWTP's operation.

5.4 Technical Factors and Climate Change

5.4.1 Climate Change

The WWTP expansion provides opportunities to improve resiliency to climate change due to accommodation of 2041 projection peak flows and conversion of existing aeration tanks into flow equalization tanks for use as emergency storage. Also, there is potential to increase known climate change contributors through increased energy consumption of MBR processes, although there are opportunities to implement more energy efficient processes.

Monitoring activities include on-site monitoring of climate change contributors will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions, if required. Corrective actions may include additional site maintenance and alteration of activities to reduce impacts.



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5.4.2 Functionality/Reliability of Wastewater Treatment

The project is expected to improve treated effluent quality as well as reliability and efficiency of treatment with the re-purposing and deepening of existing secondary clarifiers as aeration tanks, ability to operate at higher mixed liquor suspended solids concentrations, and automation of MBR cleaning. Also, positive impacts on the sewer system by reducing surcharge and flooding frequency are expected during the project's operational phase.

There is a potential risk for sewage backups and impacts to collection system due to temporary shutdown of the existing raw sewage pump station and influent sewers for connection to the upgraded headworks building. This impact shall be mitigated through design and construction management measures including:

- A Flow Management Plan will be developed by the Constructor prior to construction and will outline plans for temporary flow shutdowns and diversions or bypass pumping required for construction.
- The Flow Management Plan will generally include contingency measures for failure of a flow diversion or bypass pumping system.
- The Constructor will maintain open and effective lines of communication with the operators.

Furthermore, corresponding monitoring activities include:

- Temporary bypass pumping will generally include water level monitoring to ensure potential backups are detected.
- Continuous monitoring of water levels at the plant inlet is performed by the plant operator. These are related to upstream sewer levels and provide indicators sewage backup potential.
- On-site inspection and observation can be used to monitor for potential backups in the inlet sewer upstream of the plant.



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5.5 Summary of Potential Effects, Mitigation Measures and Monitoring Requirements

Table 10 summarizes the effects, mitigation measures and proposed monitoring for the various components of the environment described in the previous sections of this ESR. The Town is responsible for confirming that the recommendations are met but may direct a third party to undertake future activities (i.e., contractor, technical consultant). The intent of this table is to provide a summary of those commitments and responsibility of third parties where the Town determines applicability. These are recommendations that will be confirmed as Project planning advances.



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Table 10: Summary of Potential Effects, Mitigation Measures and Monitoring

Environment	Environmental Component	Project Activity	Potential Effects	Mitigation Measure(s)	Monitoring Activities
Natural Environment	Aquatic Environment	Excavation and construction for wastewater treatment facilities at the WWTP site	Potential to impact fish and fish habitat	<ul style="list-style-type: none"> • Construction activities shall maintain the buffers established during the design phase to reduce potential negative impacts to the Mississippi River. • As near water construction works are required, a Fish and Fish Habitat Impact Assessment shall provide appropriate mitigation measures, in accordance with legislation and through consultation with the relevant authorities including Fisheries and Oceans Canada (DFO). 	On-site inspection will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions, if required. Corrective actions may include additional site maintenance and alteration of activities to reduce impacts.
			Potential to impact water quality and quantity due to site's proximity to the Mississippi River and potential runoff during construction	<ul style="list-style-type: none"> • Construction activities shall maintain the buffers established during the design phase to reduce potential negative impacts to the Mississippi River. • Consideration will be given to mitigating short and long-term water quality impacts to the Mississippi River. Impacts will be mitigated through, for 	On-site inspection will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions, if required. Corrective actions may include additional site maintenance and alteration of activities to reduce impacts.



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Environment	Environmental Component	Project Activity	Potential Effects	Mitigation Measure(s)	Monitoring Activities
				example, the implementation of an Erosion and Sediment Control Plan and a Spill Response Plan . <ul style="list-style-type: none"> • Slopes shall be stabilized and seeded as soon as practicable • Avoid highly erodible soils • Silt fencing to be installed 	
		Operations	Increased effluent loadings into the Mississippi River	All requirements of the Fisheries Act will be met.	Monitoring of process effluent discharges will be undertaken according to the Ontario <i>Environmental Protection Act</i> .
	Wildlife	Excavation and construction for wastewater treatment facilities at the WWTP site	Potential for disturbance, displacement, or mortality of wildlife	<ul style="list-style-type: none"> • If wildlife is encountered, measures will be implemented to avoid death, injury, or interference with the species, and its habitat. For example, construction activities will cease, or be reduced, and wildlife will be encouraged to move off-site and away from the construction area on its own. A qualified biologist will be contacted to advise 	On-site inspection will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions, if required. Corrective actions may include additional site maintenance and alteration of activities to reduce impacts.



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Environment	Environmental Component	Project Activity	Potential Effects	Mitigation Measure(s)	Monitoring Activities
				on the appropriate actions for the situation. <ul style="list-style-type: none"> • Prior to construction, investigation of the project Footprint for wildlife and wildlife habitat that may have established following the completion of previous surveys will be undertaken by a qualified biologist, as appropriate. 	
			Potential to impact wildlife/habitat, including bird nesting	<ul style="list-style-type: none"> • All works shall comply with the <i>Migratory Birds Convention Act, 1994</i> (MBCA), including timing windows for the nesting period (April 1 to August 31). • Construction shall occur outside of the nesting period where feasible. However, if construction must occur during the general nesting period, then a breeding bird and nest survey will be undertaken prior to required activities. Nest searches are required and will be completed by a qualified wildlife biologist or 	Regular monitoring will be undertaken during construction to confirm that activities do not encroach into nesting areas or disturb active nesting sites.



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Environment	Environmental Component	Project Activity	Potential Effects	Mitigation Measure(s)	Monitoring Activities
				ornithologist no more than 48 hours prior to vegetation removal. <ul style="list-style-type: none"> • If a nest of a migratory bird is found outside of this nesting period (including a ground nest), it shall receive protection. 	
	SAR - General	Excavation and construction for wastewater treatment facilities at the WWTP site	Potential for impacts to SAR	<ul style="list-style-type: none"> • Constructor shall conduct a daily pre-construction search of the work area to identify presence of species at risk. • If threatened or endangered species are seen in or near the work area, work will stop immediately. 	<ul style="list-style-type: none"> • On-site inspection will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions, if required. Corrective actions may include additional site maintenance and alteration of activities to reduce impacts. Additional monitoring measures will be developed with the MECP, if required. • Monitoring activities to reduce adverse impacts of Project activities on



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Environment	Environmental Component	Project Activity	Potential Effects	Mitigation Measure(s)	Monitoring Activities
					Blanding's Turtle shall comply with the ESA, 2007
	SAR-Blanding's turtle	Excavation and construction for wastewater treatment facilities at the WWTP site	Potential for impacts to Blanding's turtle and/or Blanding's turtle habitat	<ul style="list-style-type: none"> • All requirements of the <i>Endangered Species Act</i> (ESA), 2007 will be met. • The contractor shall erect exclusion fencing (e.g., silt fence) prior to activities occurring in areas of suitable habitat (e.g., Mississippi River) to reduce the risk of turtles entering the work area. • The contractor shall install exclusion fencing prior to the sensitive nesting season if activities are anticipated to occur throughout this period to prevent turtles from entering and/or nesting: <ul style="list-style-type: none"> ○ Prior to 15 March if activities are occurring within or adjacent to overwintering habitat. ○ Prior to 1 June if activities are occurring within or adjacent to nesting habitat. 	<ul style="list-style-type: none"> • On-site inspection will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions, if required. Corrective actions may include additional site maintenance and alteration of activities to reduce impacts. Additional monitoring measures will be developed with the MECP, if required. • Monitoring activities to reduce adverse impacts of Project activities on Blanding's Turtle shall comply with the ESA, 2007.



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Environment	Environmental Component	Project Activity	Potential Effects	Mitigation Measure(s)	Monitoring Activities
				<ul style="list-style-type: none"> • If erecting exclusion fencing, the contractor shall use a type that will last the duration of the project. Check that stakes are securely driven into the ground on the inside of the working area. Place stakes 2 m apart and drive them to a depth of 30 cm, with the fabric pulled tight to reduce sagging, and the bottom of the fabric buried 10-20 cm down within an additional fabric lip extending outwards 90 degrees: <ul style="list-style-type: none"> ○ Backfill and compact the fabric lip ○ Inspect any fenced off areas daily to identify compromises in the fence and to remove any turtles that may be trapped in the fence ○ Install fencing so that it prevents construction sediment from entering into wetlands. 	



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Environment	Environmental Component	Project Activity	Potential Effects	Mitigation Measure(s)	Monitoring Activities
				<ul style="list-style-type: none"> • The contractor shall have a qualified person conduct a pre-construction sweep and monitor the work area for active turtle nests during the turtle nesting season (May-July). • The contractor shall implement a worker awareness program for construction staff that includes species at risk identification and habitat characteristics. • The contractor shall take photographs, if possible, but do not interact with the animal. • If turtles have established nests in construction areas, work shall stop immediately and notify the MECP, depending on the species encountered, of the occurrence and ask for further direction. The nests are to be protected from disturbance until the nestlings have hatched and dispersed, approximately in late September, and permit 	



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Environment	Environmental Component	Project Activity	Potential Effects	Mitigation Measure(s)	Monitoring Activities
	SAR - Bats	Excavation and construction for wastewater treatment facilities at the WWTP site	Potential for impacts to SAR bats (Small-footed Myotis, Little Brown Myotis, Northern Myotis, and Tri-colored Bat) and/or SAR bat habitat	<p>from the MECP, depending on the species encountered, will most likely be required.</p> <ul style="list-style-type: none"> • Disturbance to bat roosting habitat/tree removal of trees ≥10 cm DBH shall be avoided during the bat roosting period of April 1 to November 1. Compensation to be determined to IGF and AAF. • Mitigation measures to reduce adverse impacts of Project activities on SAR bats shall comply with the ESA, 2007. 	<ul style="list-style-type: none"> • On-site inspection will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions, if required. Corrective actions may include additional site maintenance and alteration of activities to reduce impacts. Additional monitoring measures will be developed with the MECP, if required. • Monitoring activities to reduce adverse impacts of Project activities on SAR bats will comply with the ESA, 2007.



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Environment	Environmental Component	Project Activity	Potential Effects	Mitigation Measure(s)	Monitoring Activities
	Terrestrial Environment	Cutting, digging, or trimming ground covers, shrubs and trees	Potential to impact trees and vegetation	<ul style="list-style-type: none"> • The contractor shall reduce to the extent possible any vegetation removal and limited to the construction footprint. • Where adjacent trees and naturalized areas are to be retained, the following management practices shall apply when construction activities occur near trees: <ul style="list-style-type: none"> ○ Erect a fence at the minimum critical root zone (CRZ) of trees (i.e., 25m radius from stem) ○ Do not place any material or equipment in the CRZ of the tree ○ Do not raise or lower the existing grade in the CRZ ○ Tunnel or bore when digging in the CRZ of any tree ○ Do not damage the root system, trunk, or branches of any tree ○ Ensure that exhaust fumes from all 	<ul style="list-style-type: none"> • On-site inspection will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions, if required. Corrective actions may include additional site maintenance and alteration of activities to reduce impacts. Additional monitoring measures will be developed with the MECP, if required. • Monitoring activities to reduce adverse impacts of Project activities on trees and vegetation will comply with the ESA, 2007. • New trees will be planted post-construction to replace trees



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Environment	Environmental Component	Project Activity	Potential Effects	Mitigation Measure(s)	Monitoring Activities
				<p>equipment are not directed towards any tree's canopy.</p> <ul style="list-style-type: none"> Vegetation removals shall also consider and mitigate potential impacts to sensitive species (e.g., migratory birds and SAR) and features (e.g., significant wildlife habitat). 	removed at a 1:1 ratio.
Soils and Groundwater	Soils Management	Excavation and construction for wastewater treatment facilities at the WWTP site.	Potential to encounter contaminated materials and/or result in the spreading of contaminated materials	<ul style="list-style-type: none"> Identification of potential contaminants and determination of extent of contamination (through soil testing) shall be conducted for the household hazardous waste and compost depot adjacent to the existing WWTP. The contractor shall develop a Soil and Excavated Materials Management Plan (SEMMP) for the handling, management and disposal of all excavated material (i.e., soil, rock and waste) that is generated or encountered during construction. The plan will be overseen by a Qualified 	Monitoring and reporting will be conducted in accordance with applicable O.Reg. requirements.



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				<p>Person pursuant to O.Reg. 153/04 under the EPA and will comply with O.Reg. 406/19 (On-Site and Excess Soil Management), the MECP, formerly the Ministry of the Environment and Climate Change (MOECC)'s Management of Excess Soils: A Guide for Best Management Practices, and all Applicable Law. The plan will describe how to address the management of the excavated materials, imported materials, and contaminated materials, including handling, transportation, testing, documentation and reuse and disposal of excavated materials generated as part of the construction and in accordance with applicable regulatory requirements and the project contract documents/agreement as applicable.</p> <ul style="list-style-type: none"> • Non-soil materials encountered during the 	



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				earthworks shall also require waste classification as documented by testing where applicable to determine management and disposal requirements as per O.Reg. 347 (as amended) and All Applicable Law. <ul style="list-style-type: none"> The SEMMP shall be reviewed and approved by the Town prior to construction. 	
	Groundwater resources	Excavation and construction for wastewater treatment facilities at the WWTP site.	Potential to encounter contaminated groundwater or exposing groundwater to contamination	<ul style="list-style-type: none"> The contractor shall develop a Groundwater Management and Dewatering Plan (GMDP) to guide the handling, management, and disposal of groundwater encountered during construction in compliance with O.Reg. 406/19 (On-Site and Excess Soil Management), 64/16 and 387/04, as amended under the Ontario Water Resources Act. The GMDP shall describe the handling, transfer, testing, monitoring, 	Monitoring and reporting will be conducted in accordance with applicable O.Reg. requirements.



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Environment	Environmental Component	Project Activity	Potential Effects	Mitigation Measure(s)	Monitoring Activities
				<p>disposal of groundwater generated as part of the construction and in accordance with applicable regulatory requirements and the project contract documents/agreement as applicable. The GMDP will outline general groundwater monitoring considerations during construction and provide guidance for groundwater monitoring following construction where applicable.</p> <ul style="list-style-type: none"> • The GMDP shall describe the anticipated groundwater quantity and dewatering ZOI that will be encountered during construction, and if approvals are needed for the water taking, such as a PTTW from the MECP, or an EASR. • The GMDP will describe the storage, transfer, and disposal and or treatment of the groundwater collected during 	



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Environment	Environmental Component	Project Activity	Potential Effects	Mitigation Measure(s)	Monitoring Activities
				construction, and approvals for the water disposal, and or treatment if applicable based on the quantity and quality. <ul style="list-style-type: none"> • The GMDP will be reviewed and approved by the Town prior to construction. • Potential impacts to groundwater-dependent natural features shall be mitigated with measures such as avoidance of dewatering requirements, minimizing dewatering, and/or utilizing groundwater cut-off techniques to physically exclude groundwater from flowing into excavations advanced for construction. 	
Socio-Economic Environment	Noise	Use of construction equipment	Potential for temporary noise impacts caused by construction vehicles and machinery.	<ul style="list-style-type: none"> • Noise emissions of the construction equipment shall be reviewed during detailed design to confirm that they are within the NPC-115 and NPC-118 limits. If they are expected to exceed the limits, quieter equipment shall be 	The contractor shall establish a Communications Protocol and a Complaints Protocol to respond to issues that develop during construction.



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Environment	Environmental Component	Project Activity	Potential Effects	Mitigation Measure(s)	Monitoring Activities
				considered for the project. Alternatively, noise control options, such as silencers/mufflers shall be investigated and implemented for specific equipment. <ul style="list-style-type: none"> • Construction related noise emissions shall adhere to the Town's Noise By-Law No. 29-2017. 	
	Vibration	Excavation and construction for wastewater treatment facilities at the WWTP site.	Potential to vibration impacts that may result in public annoyance and complaints. Vibration may cause damage to buildings and other structures	<ul style="list-style-type: none"> • The potential vibration effects from construction equipment shall be controlled by increasing the setback distance. Therefore, construction operational changes (e.g., maintaining setback distance and switching to lesser impactful equipment, etc.) are recommended. The contractor shall select construction/ maintenance methods and equipment with the least vibration impacts. • In the presence of persistent complaints and subject to the results of a field investigation, the 	The contractor shall establish a Complaints Protocol to respond to issues that develop during construction.



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Environment	Environmental Component	Project Activity	Potential Effects	Mitigation Measure(s)	Monitoring Activities
				contractor shall identify reasonable alternative vibration control measures, where available.	
	Air Quality	Excavation and construction for wastewater treatment facilities at the WWTP site.	Potential for temporary impacts to local air quality due to construction-related air pollution	<ul style="list-style-type: none"> All construction equipment shall be maintained and in good working order in accordance with operational manual to limit tailpipe emissions Employ dust control measures 	The contractor shall establish a Complaints Protocol to respond to issues that develop during construction.
		WWTP operations	Potential for impacts to local air quality during operation phase due to increase in bio-gas production and use of flare, as well as occasional odours.	Existing WWTP already has odour control treatment technologies. Odour treatment technologies will be incorporated for the new Headworks Building to meet odour requirements.	An Odour Control Plan shall be implemented to ensure compliance of odour regulations, guidelines, and standards.
	Aesthetics	Construction of new wastewater treatment facilities at the WWTP site.	Potential to impact visual aesthetics of the Carleton Place Curling Club due to the construction of the new Headworks and Dewatering Building and Odour Control Facilities	As applicable, design of the WWTP will be undertaken in a way that compliments the existing built form and characteristics of the surrounding community.	No monitoring required.



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Environment	Environmental Component	Project Activity	Potential Effects	Mitigation Measure(s)	Monitoring Activities
	Light Pollution	<ul style="list-style-type: none"> • Excavation and construction for WWTP facilities. • Use of construction equipment 	Potential for light trespass, glare, and light pollution effects	The Constructor will perform the construction in such a way that any adverse effects of construction lighting are controlled or mitigated in such a way as to avoid unnecessary and obtrusive light with respect to adjoining residents, communities and/or businesses.	The contractor shall establish a Complaints Protocol to respond to issues that develop during construction.
	Traffic and Transportation	<ul style="list-style-type: none"> • Excavation and construction for wastewater treatment facilities at the WWTP site. • Use of construction equipment 	Potential to impact existing traffic, cyclists/pedestrians, private property, and business access during construction	<ul style="list-style-type: none"> • A Traffic Management Plan shall be developed prior to construction to maintain reasonable access through work zones, to the extent possible. • Stage construction to cause the least disruption • Access to nearby land uses will be maintained for vehicular, pedestrian and cyclist traffic, to the extent feasible. • Potentially affected residents, tenants and business owners will be notified of initial construction schedules, as well as modifications to 	<ul style="list-style-type: none"> • Pedestrian, cyclist, and vehicular traffic impacts shall be monitored in accordance with a Traffic Management Plan and adjusted as necessary during the construction period. • Trail access shall be monitored in accordance with the Traffic Management Plan and adjusted as necessary during the construction period.



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Environment	Environmental Component	Project Activity	Potential Effects	Mitigation Measure(s)	Monitoring Activities
				these schedules as they occur. <ul style="list-style-type: none"> • Construction schedules will be shared with the public in advance of any construction works to reduce traffic during peak hours. • Installation of AODA compliant access for affected pedestrians and cyclists through wayfinding, warning signs and municipal requirements 	
	Health and Safety	Construction involving existing infrastructure	Interaction with Designated Substances and Hazardous Material	Undertake a Designated Substance and Hazardous Material Survey prior to construction and follow applicable protection and disposal measures	Monitor in compliance with O.Reg. requirements
	Utilities	Excavation and construction for wastewater treatment facilities at the WWTP site	Potential impact to existing utilities	The Contractor shall obtain permits and consents from and with all Utility Companies with respect to the design, construction, installation, servicing, operation, repair, preservation, relocation, and or commissioning of Utility Infrastructure.	<ul style="list-style-type: none"> • The contractor shall maintain regular communication with applicable utility companies. • In the event of potential effects to critical utilities, instrumentation and monitoring shall be carried out to



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Environment	Environmental Component	Project Activity	Potential Effects	Mitigation Measure(s)	Monitoring Activities
					protect the critical utilities and structures and reduce risks of damage due to construction activities.
Cultural Environment	Archaeological Resources	Excavation and construction for wastewater treatment facilities at the WWTP site	Potential for the disturbance of unassessed or documented archaeological resources	<ul style="list-style-type: none"> It is an offence under Sections 48 and 69 of the <i>Ontario Heritage Act</i> for any party other than a licensed archaeologist to make any alteration to a known archaeological site or to remove any artifact or other physical evidence of past human use or activity from the site, until such time as a licensed archaeologist has completed fieldwork on the site, submitted a report to the Minister stating that the site has no further cultural heritage value or interest, and the report has been filed in the Ontario Public Register of Archaeological Reports referred to in Section 65.1 of the <i>Ontario Heritage Act</i>. 	<ul style="list-style-type: none"> Performance of the work will occur on land previously subject to an Archaeological Assessment. Any site personnel responsible for carrying out or overseeing land-disturbing activities will be informed of their responsibilities if an archaeological resource is encountered.



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Environment	Environmental Component	Project Activity	Potential Effects	Mitigation Measure(s)	Monitoring Activities
				<ul style="list-style-type: none"> • Should previously undocumented archaeological resources be discovered, they may be a new archaeological site and therefore subject to Section 48(1) of the <i>Ontario Heritage Act</i>. The proponent or person discovering the archaeological resources shall cease alteration of the site immediately and engage a licensed consultant archaeologist to carry out archaeological fieldwork, in compliance with Section 48(1) of the <i>Ontario Heritage Act</i>. • The <i>Funeral, Burial and Cremation Services Act</i>, 2002, S.O. 2002, c.33 (Government of Ontario 2002) requires that any person discovering human remains shall notify the police or coroner and the Registrar of Cemeteries at the Ministry of Government and Consumer Services. 	



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Environment	Environmental Component	Project Activity	Potential Effects	Mitigation Measure(s)	Monitoring Activities
Technical Factors	Climate Change	WWTP operations	Potential to increase known climate change contributors through increased energy consumption or MBR processes	Energy efficient processes for the MBR will be implemented.	On-site monitoring of climate change contributors will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions, if required. Corrective actions may include additional site maintenance and alteration of activities to reduce impacts.
	Functionality / Reliability of Wastewater Treatment	WWTP construction and operation	Potential for risk of sewage backups and impacts to collection system.	<ul style="list-style-type: none"> • A Flow Management Plan will be developed by the Constructor prior to construction and will outline plans for temporary flow shutdowns and diversions or bypass pumping required for construction. • The Flow Management Plan will generally include contingency measures for failure of a flow diversion or bypass pumping system. • The Constructor will maintain open and effective lines of 	<ul style="list-style-type: none"> • Temporary bypass pumping will generally include water level monitoring to ensure potential backups are detected. • Continuous monitoring of water levels at the plant inlet is performed by the plant operator. These are related to upstream sewer levels and provide indicators sewage backup potential.



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Environment	Environmental Component	Project Activity	Potential Effects	Mitigation Measure(s)	Monitoring Activities
				communication with the operators.	<ul style="list-style-type: none"> On-site inspection and observation can be used to monitor for potential backups in the inlet sewer upstream of the plant.



6 Consultation

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

6.1 Public Consultation

6.1.1 Study Website

Study background information, notifications, updates, and links to online PIC presentation recordings were provided on the project webpage, as they became available. The consultation materials published on the study webpage are provided in **Appendix G**. Through the project webpage, users were invited to contact study team members through their email account. The website for the WWTP expansion is: <https://carletonplace.ca/wwtp-expansion-eas.php>.

6.1.2 Study Contact List

A comprehensive study contact list consisting of government agencies, Town staff, utilities, emergency service providers, Indigenous Nations, Indigenous Organizations, local organizations, special interest groups and members of the public who expressed interest in the study was developed at the onset of the study. This list was updated as the study progressed. The latest version of this contact list is provided in **Appendix G1**.

6.1.3 Notice of Commencement and Online Public Information Centre (PIC)

The purpose of the Notice of Study Commencement and Online PIC was to inform the public that Phases 3 and 4 of the MCEA process was being initiated for the WWTP expansion to complete the planning and preliminary design of this Project. The notice briefly outlined the objective of the study, the Study Area location map, and contact information for project team representatives. Additionally, the Town announced the start of an Online PIC available for public review and comment from December 5 to 19, 2022. The PIC informs the public about the purpose, format, how to access the PIC materials, and provide the study team's contact information.

The Notice of Study Commencement and Online PIC was communicated via the local newspaper, the Carleton Place Canadian Gazette on December 1 and 8, 2022 and was also posted on the Town's website. Additionally, a copy of the notice was mailed and emailed to the contact mailing list. A copy of this notice is provided in Appendix G3.



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6.1.3.1 PIC

A PIC was held to share information and solicit feedback from the public, agencies, Indigenous Nations and other stakeholders on the study background, evaluation criteria, alternative and recommended design concepts for the WWTP expansion Project, and next steps in the MCEA process. The PIC was held on an online platform on the study website using the Articulate Storyline platform. This platform included a pre-recorded presentation which shared the study materials on a set of slides, along with a transcript, which was available both audibly and visually next to each slide. This format allowed participants to read/listen to the presented information, as well as pause the presentation, or skip ahead to the section that interests them most.

The PIC was available for viewing from December 5, 2022 and made available to Councillors two days prior. All participants were encouraged to provide their feedback over the course of 2 weeks directly to the Project Team. Six (6) comments were received as a result and are summarized in Table 11 below.

Table 11: Summary of Notice of Study Commencement and PIC Comments and Responses

Topic	Question/Comment	Response
Upgrades Capacity	Question regarding whether the development of the UG-50 lands in included in the upgrade designs for the WTP and WWTP and whether capacity that has allotted for the UG-50 lands has been considered in proposed upgrades.	Confirmation that the UG-50 development lands were included in the 20-year (2041) total population projections used for the upgrade treatment plants' design capacities. Provided detailed break down of how the UG-50 development lands' 20-year (2041) population was estimated.
Online Public Information Centre	Question regarding whether the request for participation sent by the municipality would be understood by the general public.	The material intended for the general public will be uploaded to the website later in the week. Additional questions about the project can be sent to the Director of Public Works.
	Comment on how the online presentation material was clear and appeared to be comprehensive. However, the judgement of the effectiveness and comparative advantages of the proposed technologies is challenging for the general public.	Comment regarding the online presentation material acknowledged and explained that the information in the ESR will provide greater explanation.



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Topic	Question/Comment	Response
	Question regarding the process to provide comments on the Online Public Information Centre	Comments can be sent by email to either Kevin Alemany or Guy Bourgon
Water Quantity	Question regarding the consideration of water and sewage usage metering as well as water conservation strategies within the EA process.	The Town promotes water conservation from May through September on our website and through social media and restricts lawn watering. Water metering has been considered in the past, but it has been shown that doing so will increase the cost of water and sewer services to residents.
Cost of Treatment Options	Comment regarding the inclusion of a breakdown of how much the various treatment options would cost, and what those costs would mean for residents in the short and long term.	Cost estimates have been presented to the public in the Water and Wastewater Master Plan Report and during a public accessible meeting with Council in August 2022. Construction cost details will be available in the ESR early in the New Year.
Hazardous Waste Depot	Question regarding what will be done with the household hazardous waste depot and leaf yards during construction and operation of the WWTP.	The household hazardous waste depot and compost yard will be migrated to the new municipal yard on Bates Drive as part of the construction project.

6.1.4 Notice of Publication of Environmental Study Report

The Notice of Study Completion was placed in the local newspaper (Carleton Place Canadian Gazette) on January 26th, 2023. The Notice was also available on the project website and distributed via mail and email to agencies, key stakeholders, Indigenous Nations and the public on the study mailing list. This notice briefly outlined the Preferred Design Concept and noted that the ESR will be posted to the project website for a 30-day public comment period between January 26th and February 28th, 2023. A copy of this notice is provided in **Appendix G5** of this document.

6.2 Agency Consultation

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



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All applicable agencies that were provided with the Notice are listed in the Contact List which can be found in Appendix G1.

6.2.1 Consultation Meetings

Regarding the expansion of the WWTP, meetings during Phase 3 of the MCEA process were held with the MVCA and with the MECP. The following provides a summary of the discussion.

6.2.1.1 Meetings with the MVCA

Following the Notice of Study Commencement, the MVCA shared comments and questions on the consideration of climate change in the Town's MCEA process. A pre-consultation meeting was held with the MVCA on July 5th, 2021, as part of the Master Plan process. The study team gave a brief presentation providing an overview of the Master Plan project, followed by a discussion of the MVCA's questions and comments regarding the uncertainty in historical streamflow data and potential drought conditions, and their impacts on the calculation of treatment objectives. The MVCA suggested that the Mississippi River low flow indicators be re-calculated using an extended flow data set including more recent dry years as an input to a new assimilative capacity study (as requested by the MECP, see next section on pre-consultation meeting with the MECP). The MVCA also shared data on the Carleton Place Dam (rating curve), which was used for the preparation of the assimilative capacity study (ACS) that was finalized in Phase 3 of this project (Appendix A). The meeting with the MVCA also helped identify climate change considerations, which helped inform potential resilience measures in the evaluation, selection and development of the preferred alternatives design concepts.

MVCA comments on the first submission of the ACS report were received on April 24, 2022. The report was revised accordingly and supplemental comments from the MECP were received on July 8, 2022. The report was further revised to address these supplemental comments. All comments by the MECP and responses by the project team are appended to the report. These included many technical comments and questions related to the inputs and assumptions made in the modelling of plant effluent parameters, such as historical Mississippi River water quality and flow data.

Further to the assimilative capacity study, and to satisfy some comments from the MVCA, Stantec also completed a sensitivity analysis on the receiving stream (Mississippi River), to analyze the potential impacts of the plant effluent under extremely low river flows and higher background contaminant concentrations.

It should be noted that part of the WWTP site is within the MVCA regulation limit, and therefore may require permit for construction and demolition works, depending on the expansion layout proposed during detailed design. The MVCA will be consulted with throughout the design phase to confirm permitting requirements.



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6.2.1.2 Meetings with MECP

The study team organized a pre-consultation meeting with the MECP on December 16th, 2021, to review regulatory requirements which might impact the study. The study team gave a presentation providing an overview of the Master Plan project, during which the MECP's questions and comments were discussed. Following this meeting, the study team prepared a new Mississippi River assimilative capacity study (ACS) and a water availability study, which were finalized in Phase 3 of this project. The new ACS was reviewed by the MECP (and MVCA), including new proposed discharge criteria and objectives, and comments were addressed.

MECP comments on the first submission of the ACS report were received on May 2, 2022. The report was revised accordingly and supplemental comments from the MECP were received on June 23, 2022. The report was further revised to address these supplemental comments. All comments by the MECP and responses by the project team are appended to the report. These included notes, suggestions and questions related to the modelling of WWTP effluent parameters, and some notes related to the proposed effluent objectives (such as pH, total ammonia nitrogen and E. Coli). The reviewer noted that the proposed final effluent objectives were reasonable and that the parameters of concern will be fully assimilated within a reasonable mixing zone.

MECP was also provided with an advanced copy of the ESR in December 2022.

6.3 Indigenous Consultation

The following Indigenous communities and organizations are considered to be interested parties of the project and were provided with a Notice of Request to Consult at the time of study commencement:

- Algonquins of Ontario
- Algonquins of Pikwàkanagàn
- Sharbot Obaadjiwan First Nation
- Alderville First Nation
- Mississaugas of the Scugog Island First Nation
- Hiawatha First Nation
- Mississaugas of Curve Lake First Nation
- Métis Nation of Ontario
 - Ottawa Métis Council
 - High Land Waters Métis Council
- Haudenosaunee Development Institute East



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Given that the Town of Carleton Place is in the Algonquins of Ontario (AOO) Settlement Area, and that AOO and the Provincial and Federal governments are currently working together to resolve a claim to this area, AOO was regarded as a key participant within the consultation process.

An Indigenous Consultation Log can be found in **Appendix G1** following the Contact List. Throughout Phases 1 – 4, Notices and Letters of Request to Consult were sent by email and mail. Follow-up was provided through telephone calls to community Lands & Resource Coordinators on two occasions to confirm that the Notices had been received and the community wished to continue receiving updates on the study. In instances where the Lands & Resource Coordinators were unavailable, voicemails were left.

Apart from acknowledging the notification and wishing to continue receiving updates on the Study via email and not Canada Post mail from Métis Nation, no responses from Indigenous Nations or Organizations were received. The contact list was updated throughout the study anytime email bounce backs and an alternate contact was noted.



7 Conclusions

The MCEA process enables the planning of municipal infrastructure to be undertaken in accordance with an approved procedure designed to protect the environment. The MCEA process provides a decision-making framework that enables the requirements of the *Environmental Assessment Act* to be met in an effective manner. Experience has demonstrated that considerable social, economic, and environmental benefits are achieved by applying the MCEA concept to municipal infrastructure projects.

The following summarizes the results of the Carleton Place WWTP Expansion Project MCEA.

7.1 Recommendations

Alternative 2 - WWTP Membrane Bioreactor Treatment Upgrade was selected as the preferred design concept. This alternative is recommended as it optimizes the use of existing infrastructure, including conversion of the existing aeration tanks to equalization tanks to buffer peak flows and conversion of the existing secondary clarifiers to aeration tanks to improve oxygen transfer efficiency. Additionally, this alternative requires a smaller footprint and lower initial capital cost for the expansion and does not result in any significant impacts to the natural and socio-economic environments. The majority of new infrastructure can be constructed adjacent to the existing plant on municipal property. Tie-ins of new infrastructure to existing plant may require short shutdowns or temporary treatment processes. Lastly, the preferred design concept reduces flow splits and simplified hydraulic control and has the ability to accommodate increased influent loading by operating the plant at higher MLSS.

7.2 Implementation and Phasing

Since the proposed expansion of the Carleton Place WWTP features mostly single unit additions, or construction of new buildings to accommodate the full upgraded capacity, phasing of the main expansion project to meet the 20-year demand is not necessarily practical. Nevertheless, the project identified some potential optimization opportunities or future needs that could be delayed to a separate construction project from the main upgrade. Specifically, these future opportunities include a Waste Activated Sludge (WAS) Thickening and Dewatering process to suit year-round solids management strategies, maximizing beneficial nutrient re-use and minimizing costs.



7.3 Cost Opinion

The cost estimate for the full expansion of the WWTP is \$40.5M, including engineering and excluding H.S.T. The cost estimate of the 20-year life cycle cost including O&M is \$76.8M. Additional details on Cost Opinion can be found in the **WWTP Expansion Options Evaluation Memorandum** (Appendix F).

7.4 Permit and Approval

The permits and approvals required for the preferred design concept are outlined in Table 12. The permit requirements are based on studies undertaken during this MCEA and feedback received during consultation with review agencies. As the design develops and additional environmental investigations are completed, this list may change at the discretion of the applicable regulatory agency.

Table 12: Potential Permit and Approval Requirements

Agency	Description of Permit/Approval
Fisheries and Oceans Canada	<ul style="list-style-type: none"> • Due to the increased effluent loadings, it may result in impacts to the aquatic environment of the Mississippi River. A <i>Fish and Fish Habitat Existing Conditions and Impact Assessment Report</i> is required during Detail Design to inform a <i>Fisheries Act</i> self-screening and a Request for Review (RFR). • A Fisheries Act Authorization (FAA) may apply if loss to fish and aquatic habitat cannot be avoided or mitigated during design and construction.
Ontario Ministry of Environment, Conservation and Parks	<ul style="list-style-type: none"> • An updated Environmental Compliance Approval for the WWTP will be required as the plant capacity is being increased. • New standby power generators are expected to be less than 700kW and therefore will be EASR eligible activities. • A temporary PTTW or EASR may be required during construction activities if dewatering activities are required. • Permit or other authorization may be required to conduct an activity that could permanently impact an endangered or threatened plant or animal or its habitat through an Information Gathering Form (IGF). A Terrestrial Existing Conditions and Impact Assessment Report would be required to inform the IGF.



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Agency	Description of Permit/Approval
Ministry of Citizenship and Multiculturalism	<ul style="list-style-type: none"> If undocumented archaeological resources are encountered during construction, all archaeological and Cultural Heritage assessments, including fieldwork and reporting, are required to comply with the Ministry's 2011 Standards and Guidelines for Consultant Archaeologists.
Mississippi Valley Conservation Authority (MVCA)	<ul style="list-style-type: none"> Planned construction or alterations of land (e.g., excavate or fill) near or in the Regulated Area will require a permit from MVCA. Permits are issued in accordance with the provincial Conservation Authorities Act and Ontario Regulation 153/06: Mississippi Valley Conservation Authority: Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses. The MVCA will be consulted with throughout the design phase to confirm permitting requirements
Town of Carleton Place	<ul style="list-style-type: none"> A Building Permit may be required to receive approval for new building construction from the Town's Building Department. Should any trees require removal, their removal will comply with applicable municipal by-laws. 1:1 Compensation of healthy trees will be required.
Electrical Safety Authority	<ul style="list-style-type: none"> All electrical installations, repairs, replacements or alterations in Ontario need to be done in compliance with the Ontario Electrical Safety Code, and all necessary Notifications ("permits") must be taken out. This creates a permanent record of the work and triggers a review process by the Electrical Safety Authority.
Local Utilities	<ul style="list-style-type: none"> Utility clearance from local utilities, as required.

