

DESIGN AND CONSTRUCTION REPORT



Detail Design and Class Environmental Assessment Study Replacement of Anne Street Bridge and Installation of Noise Walls Highway 400, Barrie, Ontario – GWP 2504-17-00

MTO Assignment No. 2017-E-0030

MP Project No.: 0KM-18-7029-00

Prepared for:



Ministry of Transportation – Central Region
159 Sir William Hearst Ave. Building D, 2nd Floor
Toronto, Ontario M3M 0B7

Prepared by:

McINTOSH PERRY

McIntosh Perry Consulting Engineers Ltd.
2010 Winston Park Drive, Suite 400
Oakville, Ontario, L6H 5R7

November 19, 2020

DESIGN AND CONSTRUCTION REPORT
DETAIL DESIGN AND CLASS ENVIRONMENTAL ASSESSMENT STUDY
REPLACEMENT OF ANNE STREET BRIDGE AND INSTALLATION OF NOISE WALLS
HIGHWAY 400, BARRIE, ONTARIO, G.W.P. 2504-17-00

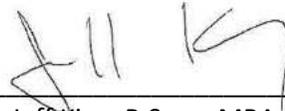
Prepared by:

McINTOSH PERRY

McIntosh Perry Consulting Engineers Ltd.



Nathan Farrell, MCIP, RPP, CAN-CISEC
Senior Environmental Planner
McIntosh Perry Consulting Engineers Ltd.



Jeff King, B.Sc., mMBA
Senior Environmental Planner
McIntosh Perry Consulting Engineers Ltd.



Steven Pilgrim, P.Eng
Senior Project Manager
McIntosh Perry Consulting Engineers Ltd.

Reviewed by:



Ministry of Transportation – Central Region



Katrina Lalor
Environmental Planner
Ministry of Transportation



Rebecca Palys, P.Eng.
Senior Project Engineer
Ministry of Transportation

Approved by:



Linda Fischer
Head, Environmental Planning
Ministry of Transportation



Jason White, P. Eng.
Manager, Engineering
Ministry of Transportation

THE PUBLIC RECORD

This Design and Construction Report (DCR) has been prepared under the Ministry of Transportation's Class Environmental Assessment for Provincial Transportation Facilities (2000) for a Group 'B' project, in compliance with the requirements of the Ontario *Environmental Assessment Act*. This DCR includes a summary of the Detail Design study and environmental assessment process undertaken for this project, existing environmental conditions, and the mitigation measures developed to address environmental concerns.

A Transportation Environmental Study Report (TESR) was approved in 2004, and a subsequent TESR Addendum was approved in 2017, for the Highway 400 improvements from Highway 89 to Highway 11. The recommendations from the TESR (URS, 2004) and TESR Addendum (AECOM, 2017a) have been built upon as part of the Detail Design for the study area specified within.

This DCR is available for a 30-day public and external agency review period from November 19, 2020 to December 19, 2020 on the project website: <http://highway400dunlopannesunnidale.com/>. Interested persons are encouraged to review the DCR and provide comments to the following Project Team members by December 19, 2020:

Mr. Steve Pilgrim, P.Eng.
Project Manager
McIntosh Perry Consulting Engineers Ltd.
1-1329 Gardiners Road,
Kingston, Ontario, K7P 0L8
Tel. (613) 542-3788

and

Ms. Rebecca Palys, P. Eng.
Senior Project Engineer
Ministry of Transportation
159 Sir William Hearst Avenue, Building D, 4th Floor
Downsview, Ontario M3M 0B7

Project E-mail: highway400dunlopannesunnidale@mcintoshperry.com

The Project Team will respond to all comments generated during the 30-day public review. Outstanding concerns are to be directed to the proponent for a response, unless the outstanding concerns are regarding potential adverse impacts to constitutionally protected Aboriginal or treaty rights, in which case Part II Order requests on these matters should be addressed in writing to the following:

Minister Jeff Yurek
Ministry of Environment Conservation and Parks
777 Bay Street, 5th Floor
Toronto, Ontario M7A 2J3
minister.mecp@ontario.ca

and

Director, Environmental Assessment Branch
Ministry of Environment Conservation and Parks
135 St. Clair Avenue West, 1st Floor
Toronto, Ontario M4V 1P5
EABDirector@ontario.ca

If you have accessibility requirements in order to participate in this project, please contact one of the Project Team members listed above. Information will be collected in accordance with *the Freedom of Information and Protection of Privacy Act*. With the exception of personal information, all comments will become part of the public record.

Notice of Completion and DCR Submission

Detail Design and Class Environmental Assessment Study Replacement of Anne Street Bridge and Installation of Noise Walls Highway 400, Barrie, Ontario – GWP 2504-17-00

THE PROJECT

The Ministry of Transportation of Ontario (MTO) has retained McIntosh Perry Consulting Engineers Ltd. to complete the Detail Design and Class Environmental Assessment (Class EA) Study for the replacement of the Highway 400 Anne Street underpass bridge in the City of Barrie, Simcoe County.

The project also includes pavement resurfacing of Highway 400 from north of Dunlop Street to north of Sunnisdale Road and from north of Bayfield Street to north of St. Vincent Street. Highway 400 median barrier replacement, drainage improvements within the resurfacing limits and the installation of noise walls in the vicinity of Anne Street, Bayfield Street and Duckworth Street. The key map shows the Anne Street Bridge location, limits of pavement resurfacing and noise wall locations.

BACKGROUND

In 2004, a Class EA Study and associated Transportation Environmental Study Report (TESR) was approved, which identified improvements to Highway 400 from 1 km south of Highway 89 to the junction at Highway 11 to accommodate future transportation needs. In 2017, an update to the 2004 Class EA was undertaken, resulting in an approved TESR Addendum. Both studies found that widening of Highway 400 to 10 lanes was required to accommodate future growth.

The MTO is currently undertaking the Detail Design and Class EA Study for the replacement of three bridges on Highway 400 at Dunlop Street, Anne Street and Sunnisdale Road, including the reconstruction of the Dunlop Street and Highway 400 interchange. The Anne Street bridge replacement is the first in a series of contracts under this study. The new Anne Street bridge will accommodate future 10-lane widening of Highway 400.

THE PROCESS

The study has followed the approved planning process under the *Class Environmental Assessment for Provincial Transportation Facilities (2000)* for a Group "B" project. A Design and Construction Report (DCR) has been prepared, which includes a summary of the detail design study and environmental assessment process undertaken for this project, existing environmental conditions, and the mitigation measures developed to address environmental concerns.

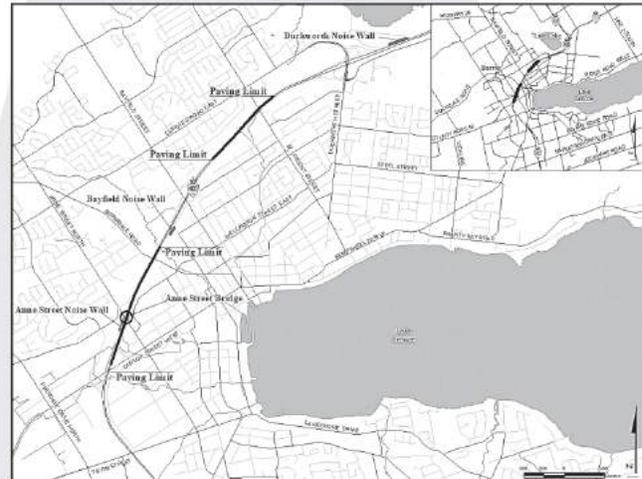
The DCR is available for a 30-day public and external agency review period from **November 18, 2020 to December 19, 2020** on the project website: <http://highway400dunlopannesunnisdale.com>

COMMENTS

Interested persons are encouraged to review the DCR and provide comments by **December 19, 2020**. The Project Team will respond to all comments generated during the 30-day public review. Outstanding concerns are to be directed to the proponent for a response, unless the outstanding concerns are regarding potential adverse impacts to constitutionally protected Aboriginal or treaty rights, in which case Part II Order requests on these matters should be addressed in writing to the following:

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Director, Environmental Assessment Branch
Ministry of Environment Conservation and Parks
135 St. Clair Avenue West, 1st Floor
Toronto, ON M4V 1P5
e-mail: EABDirector@ontario.ca

To obtain additional information or to provide comments please contact the Project Team via one of the methods below:

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1-1329 Gardiners Road,
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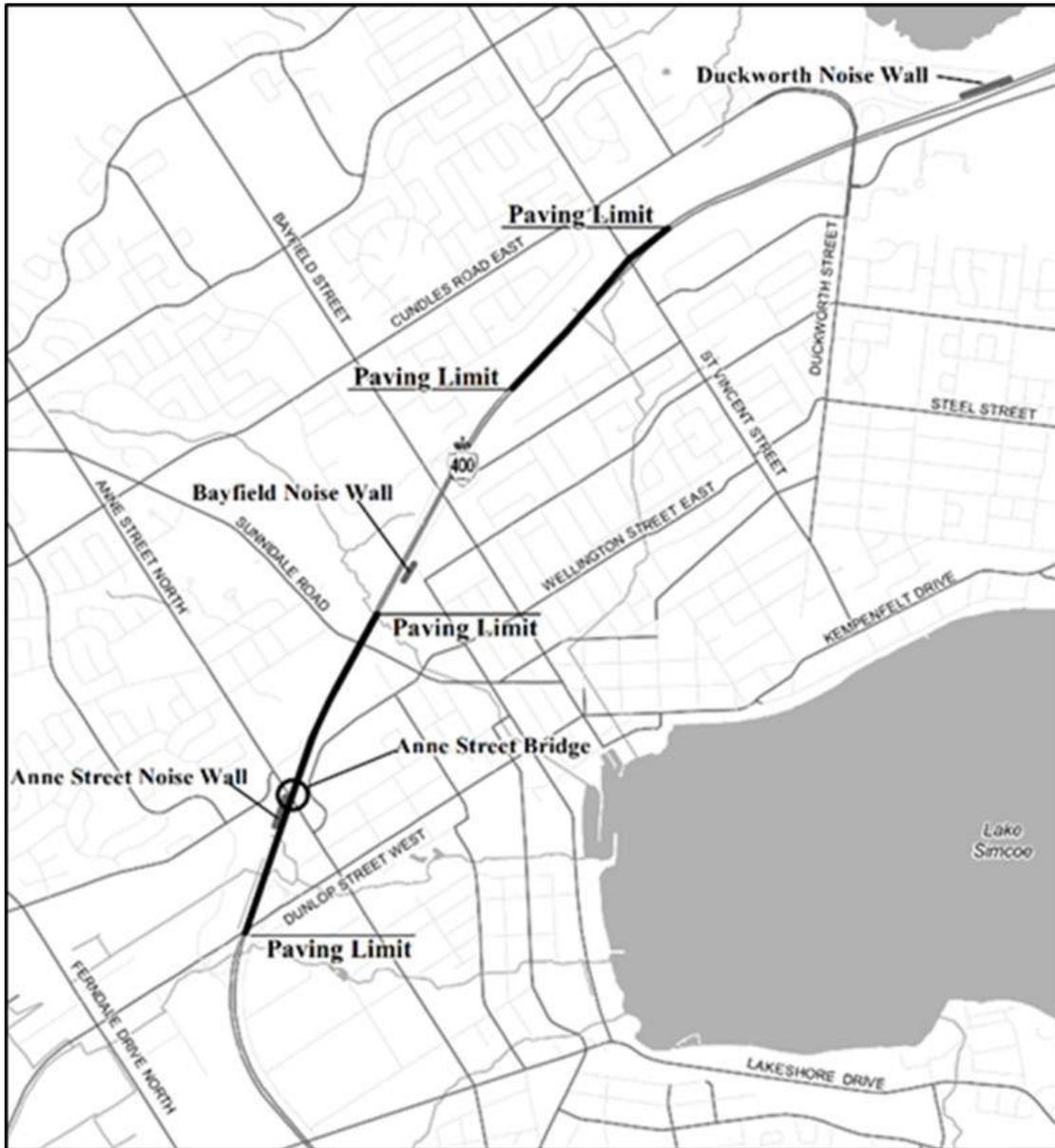
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If you have accessibility requirements in order to participate in this project, please contact one of the Project Team members listed above. Information will be collected in accordance with the *Freedom of Information and Protection of Privacy Act*. With the exception of personal information, all comments will become part of the public record.

Cette publication hautement spécialisée n'est disponible qu'en anglais en vertu du règlement 671/92, qui en exempte la traduction selon l'application de la loi sur les services en français. Pour obtenir des renseignements en français, veuillez communiquer avec le ministère des transports, bureau des services en français au: 905 704-2045.

EXECUTIVE SUMMARY

The Ministry of Transportation of Ontario (MTO) retained McIntosh Perry Consulting Engineers Ltd. to complete the Detail Design and Class Environmental Assessment (Class EA) Study for the replacement of the Highway 400 Anne Street underpass bridge in the City of Barrie, Simcoe County. The project also includes pavement resurfacing of Highway 400 from north of Dunlop Street to north of Sunnidale Road and from north of Bayfield Street to north of St. Vincent Street, Highway 400 median barrier replacement, drainage improvements within the resurfacing limits and the installation of noise walls in the vicinity of Anne Street, Bayfield Street and Duckworth Street. The key map below shows the Anne Street Bridge location, limits of pavement resurfacing and noise wall locations.



GWP 2504-17-00 – Study Area

In 2004, a Class EA Study and associated Transportation Environmental Study Report (TESR) was approved, which identified improvements to Highway 400 from 1 km south of Highway 89 to the junction at Highway 11 to accommodate future transportation needs. In 2017, an update to the 2004 Class EA was undertaken, resulting in an approved TESR Addendum. Both studies found that widening of Highway 400 to 10 lanes was required to accommodate future growth.

The MTO is currently undertaking the Detail Design and Class EA Study for the replacement of three bridges on Highway 400 at Dunlop Street, Anne Street and Sunnidale Road, including the reconstruction of the Dunlop Street and Highway 400 interchange. The Anne Street bridge replacement is the first in a series of contracts under this study. The new Anne Street bridge will accommodate future 10-lane widening of Highway 400.

This study has followed the approved planning process for a Group “B” project under the Class Environmental Assessment for Provincial Transportation Facilities (2000), approved under the Ontario *Environmental Assessment Act* for provincial transportation projects of a defined scope and magnitude. This Design and Construction Report (DCR) presents the results of the transportation engineering and environmental assessment study and has been prepared to document the consultation program, recommended design details, environmental issues and commitments and construction monitoring requirements.

The recommended design consists of the following:

- Replacing the existing Anne Street Underpass (Site No. 30-347) at Highway 400;
- Lengthening the Anne Street Underpass to accommodate future widening of Highway 400 to 10 lanes;
- Widening Anne Street to accommodate future active transportation installed by others;
- Rehabilitating the pavement structure of Highway 400 from north of Dunlop Street to north of Sunnidale Road, and from north of Bayfield Street to north of St. Vincent Street;
- Installing noise walls at three (3) approved locations;
- Rehabilitating/replacing/extending four (4) culverts to accommodate Highway 400 widening, and
- Replacing median storm sewer and median barrier within Highway 400 reconstruction/resurfacing limits.

Upon completion of construction, Highway 400 will be reinstated back to a 6-lane configuration

Commitments have been made to protect environmental features with appropriate mitigation measures for terrestrial and aquatic ecosystems, species at risk, traffic disruptions, and construction staging, among others. A Summary of Existing Environmental Concerns and Commitments Table is included in this document, which outlines the environmental issues and concerns identified during the Class EA process and the measures and approaches that have been developed to address these issues and concerns. All mitigation measures have been incorporated into the Contract Documents for implementation during construction.

The DCR is available for a 30-day public and external agency review period from November 19, 2020 to December 19, 2020 on the project website: <http://highway400dunlopannesunnidale.com>.

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1.0 INTRODUCTION AND BACKGROUND

In 2004, a Preliminary Design Study and associated Transportation Environmental Study Report (TESR) was undertaken to document the required improvements and widening requirements along 30 km of Highway 400 from 1 km south of Highway 89 northerly to the Highway 400 junction at Highway 11. That study recommended an ultimate 10-lane cross-section for Highway 400.

In 2014, a subsequent Preliminary Design Study was undertaken to provide an update of the required widening improvements along the same stretch of Highway 400. The study included a review of the then-present (2013), short-term (2021), and long-term (2031) transportation planning horizons and examined the transportation problems, opportunities, and issues relating to the existing Highway 400 interchanges within the study area. This study reaffirmed the need for widening of the Highway 400 corridor to 10 lanes before the year 2031. An Addendum to the 2004 TESR was prepared and made available for public review for a period of 30 days, resulting in an approved plan (AECOM, 2017a).

In 2018, The Ministry of Transportation of Ontario (MTO) retained McIntosh Perry Consulting Engineers Ltd. to complete the Detail Design and Class Environmental Assessment (Class EA) Study for the replacement of three bridges on Highway 400 at Dunlop Street, Anne Street and Sunnidale Road, including the reconstruction of the Dunlop Street and Highway 400 interchange. The Anne Street bridge replacement is the first in a series of contracts under this study. The project also includes pavement resurfacing of Highway 400 from north of Dunlop Street to north of Sunnidale Road and from north of Bayfield Street to north of St. Vincent Street, Highway 400 median barrier replacement, drainage improvements within the resurfacing limits and the installation of noise walls in the vicinity of Anne Street, Bayfield Street and Duckworth Street. **Figure 1** shows the Anne Street Bridge location, limits of pavement resurfacing and noise wall locations. The Detail Design is a continuation of the recommendations made during the approved Preliminary Design Study.

This Design and Construction Report (DCR) presents the results of the transportation engineering and environmental assessment study in accordance with the approved environmental planning process for Group 'B' undertakings under the MTO's Class Environmental Assessment (Class EA) for Provincial Transportation Facilities (2000), which has been approved under the *Ontario Environmental Assessment Act* (1990) for provincial transportation projects of a defined scope and magnitude. This DCR has been prepared to document the consultation program, recommended design details, environmental issues and commitments and construction monitoring requirements.

1.1 Study Area

The study area for GWP 2504-17-00 is located on Highway 400 from north of the Dunlop Street interchange northerly to north of the Sunnidale Road Interchange, and from north of the Bayfield Street Interchange northerly to north of St. Vincent Street (**Figure 1**). The Anne Street Underpass is located over Highway 400 approximately 680 m north of the Dunlop Street Underpass. Two (2) centreline culverts are located between Dunlop Street and Anne Street and two (2) centreline culverts are located between Anne Street and Sunnidale Road.

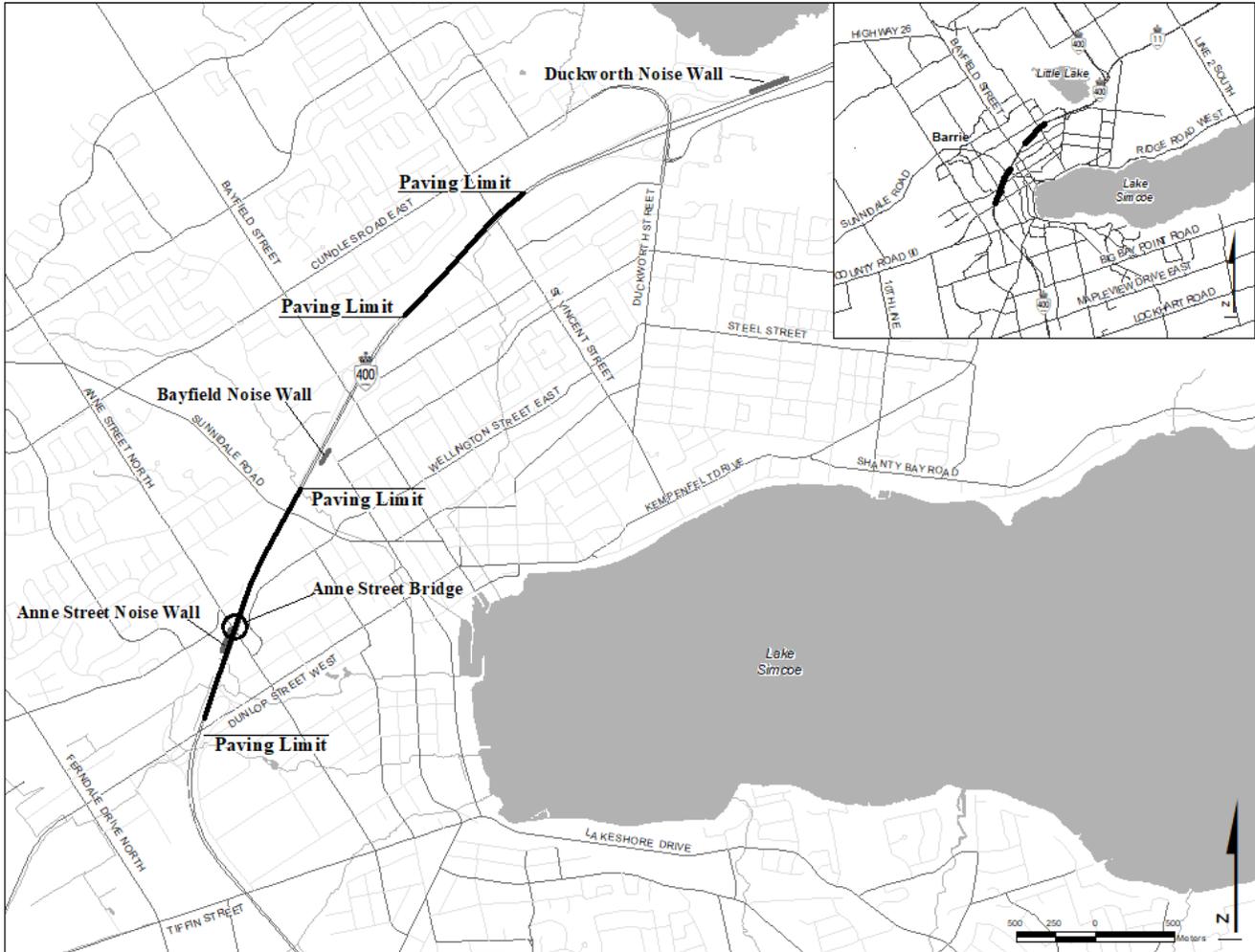


Figure 1: GWP 2504-17-00 – Study Area

1.2 Overview of the Environmental Assessment Process

The planning and design of MTO provincial transportation projects follow an approved Provincial Class EA process that has been in place and updated regularly since 1979. The MTO Class EA parent document, *Class Environmental Assessment for Provincial Transportation Facilities*, was approved under the *Environmental Assessment Act* in the fall of 1999 (revised, July 14, 2000). This process is a principal-based approach rather than prescriptive in nature. This means that the Class EA defines *what must be achieved*, rather than defining *how* it should be done.

The MTO Class EA planning process classifies projects into activity ‘groups’ with a primary focus on consultation and environmental documentation. The groups are as follows:

- Group A: projects that are new facilities;

- Group B: projects that are major improvements to existing facilities;
- Group C: projects that are minor improvements to existing facilities, and
- Group D: projects that involve operation, maintenance, administration, and miscellaneous work for provincial transportation facilities.

The Class EA outlines principles and processes that must be followed for applicable projects, including consultation, development and evaluation of alternatives, and documentation. Public participation and consultation with property owners and other interested parties is a significant element of the decision-making process. The commitments to mitigate potential environmental impacts of the project work were made available to external agencies and stakeholders through the public consultation process.

1.2.1 Impact Assessment Act

On August 28, 2019 the *Impact Assessment Act* (IAA) replaced the former *Canadian Environmental Assessment Act* (CEEA), 2012. The projects and activities that are subject to the IAA are very similar to those that were subject to environmental assessment under the CEEA, 2012. However, some changes have been made to the “Project List”, such as new thresholds or projects have been introduced or increased. Under the IAA, only those projects designated by the Physical Activities Regulations or designated by the Minister of Environment on a discretionary basis may be subject to federal environmental assessment.

It has been determined that this project does not include physical activities identified on the list and is therefore not subject to the IAA process.

2.0 CONSULTATION

Consultation is a fundamental component of the Class EA process. Consultation was ongoing throughout the planning of the project in conjunction with the transportation, engineering and environmental protection principles. It is essential for the success of Class EA studies that the consultation program be fully transparent, open and inclusive; all public / stakeholder communication must be clear, timely and accessible to all.

The Consultation Program was developed in collaboration with the MTO and meets or exceeds the mandatory requirement of the MTO Class EA for a Group 'B' project. The primary objective of the consultation program was to keep stakeholders informed throughout the study and encourage comments using effective consultation methods. Opportunities were provided throughout the study for interested agencies, stakeholder groups, and individuals to provide input and obtain information about the study.

The consultation program for this study included the following:

- Maintenance of an external agency/stakeholder contact list and property owner/interested public contact list provided by MTO from the preliminary design process;
- Preparation and publication of Ontario Government Notices (OGNs), including:
 - Notice of Study Commencement;
 - Project Update, and
 - Notice of Filing: Design and Construction Report.
- Preparation and distribution of notification letters to external agency/stakeholders and property owner/interested public contacts;
- Development and maintenance of a project website;
- Ongoing communication, negotiation, and consultation with municipalities, agencies, stakeholders, property owners and local businesses, as required;
- Consultation with Indigenous Communities;
- Online Project Update;
- Stakeholder meetings with affected agencies and stakeholders, and
- Summary of the consultation process in the environmental project documentation.

2.1 Project Contact List

An external Contact List of potentially interested stakeholder groups and individuals used during the Preliminary Design Study was provided by MTO and maintained throughout this study; updated for completeness and accuracy as required. This list includes federal and provincial government agencies and ministries, municipal staff and elected officials, local Member of Provincial Parliament, local Member of Parliament, Indigenous Communities, emergency services, utility companies, public interest groups, businesses, and property owners/tenants who may be directly or indirectly affected by the project. The full contact list used for this project can be found in Appendix A.

2.2 Notice of Study Commencement

At the onset of the project a Notice of Study Commencement was produced, which included a brief background of the Highway 400 transportation studies, as well as the subject study and Class EA process. Notifications were distributed as follows:

- Letters were mailed to the project Contact List on March 21, 2019;
- An OGN was posted in the Barrie Advance on March 21, 2019;
- A Project Website was launched, which contained the following information:
 - Overview of the study,
 - Map of the study area;
 - Schedule;
 - Ontario Government Notices (OGNs);
 - Details related to the Class EA process;
 - Background reports;
 - Frequently asked questions (FAQs), and
 - Contact details.

Notice of Study Commencement materials, including example letters and advertisements can be found in Appendix A.

2.3 Project Update

Due to COVID-19 restrictions, an in-person Public Information Centre (PIC) was not possible. In lieu of an in-person PIC, a Project Update was posted to the Project Website for public review. The purpose of this Project Update was to present the study process, recommended design, environmental mitigation, and construction staging and receive comments on the proposed improvements. Notifications of the Project Update were distributed as follows:

- An OGN was mailed to the project Contact List on July 29, 2020;
- An OGN was posted in the Barrie Advance on July 31, 2020;
- The Project Update was posted to the Project Website on July 31, 2020.

Project Update materials including Presentation Materials, example letters and OGN can be found in Appendix A.

2.4 Consultation Response

As a result of the Notice of Study Commencement, Project Update and website, over 100 responses were received. Individual responses were provided in an effort to address their comments and concerns. Many comments were similar in nature and related to individual properties. The Consultation Responses have been summarized in **Table 1** below.

Table 1: Consultation Response Summary

Stakeholder Comment/Concern	MTO Response
<p>When will the Anne Street Underpass bridge be replaced? When will the remaining bridges as part of this Assignment (Sunnidale Road and Dunlop Street) be replaced?</p> <p>When will the Essa Road Overpass bridge be replaced?</p> <p>When will the Bayfield Street Underpass and St. Vincent Street Bridges be replaced?</p>	<p>The Anne Street Bridge will be replaced first, followed by Sunnidale Road bridge, followed by the Dunlop Street bridge and Interchange. The project is being scheduled such that Sunnidale Road and Anne Street bridges will not be closed at the same time.</p> <p>The Highway 400 Essa Road project is a separate study. For information related to the Essa Road project please visit: https://hwy400essaroad.ca/</p> <p>The Bayfield & St. Vincent Bridges are not scheduled at this time.</p>
<p>Noise mitigation:</p> <p>How was it determined where noise walls would be constructed?</p> <p>Where are the approved noise walls located?</p> <p>What are the height and length of the noise walls?</p> <p>When will the noise walls be constructed?</p> <p>Highway noise is very loud at my house, will the MTO consider installing a new noise wall along the highway near my house?</p>	<p>A noise analysis was completed during Preliminary Design (2017) in accordance with the MTO’s Environmental Guide for Noise 2006, for the Highway 400 corridor through Barrie. Under the MTO’s noise policy, if future noise levels with the project result in a greater than 5 decibel increase over the future noise level without the project, or if the projected noise level is equal to or greater than 65 decibels, the MTO will investigate noise control measures within the MTO right-of-way in the Outdoor Living Areas (OLAs), which is considered the backyards of houses. Based on the noise analysis, the results concluded that there is a need for noise mitigation measures (noise walls) in various locations throughout the corridor. For further information related to the noise study, please refer to the project website: http://highway400dunlopannesunnidale.com/wp-content/uploads/2019/06/Highway-400-Improvements-Highway-89-to-Highway-11-TESR-Addendum_November2017-compressed.pdf</p> <p>The approved noise wall locations are illustrated on Figures 30-32 of the 2017 TESR: http://highway400dunlopannesunnidale.com/?page_id=37.</p> <p>Approved noise walls will be constructed at specified areas to a specific length, as described in the noise analysis reference above. The height of panels will be 5 m tall from the ground surface.</p> <p>Noise walls being constructed as part of the Anne Street bridge replacement project include No. 2, 3 & 7. Noise wall No. 1 will be constructed as part of the Dunlop Street bridge/interchange replacement</p>

	<p>work. The remaining approved noise walls (No. 4, 5 & 6) north of Bayfield will be constructed in subsequent construction packages.</p> <p>All noise walls have been previously approved through completed Class Environmental Assessment Processes. No new noise walls are being considered at this time.</p> <p>Approved noise walls include:</p> <ol style="list-style-type: none"> 1) North side of Dunlop Street to Highway 400 northbound on-ramp. 2) West side of Highway 400, south of Anne Street. 3) East side of northbound Highway 400 at Bayfield Street off-ramp. 4) East side of Bayfield Street to Highway 400 northbound on-ramp. 5) East side of Highway 400 north of Bayfield Street on-ramp. 6) West side of Highway 400 southbound, from north of Bayfield Street off-ramp through to Bayfield Street. 7) West side of Highway 400 from southbound Duckworth off-ramp to Little Lake Drive.
<p>How will noise during construction be mitigated?</p> <p>Will there be nighttime noise?</p>	<p>Noise during construction will be minimized to the greatest extent possible. The Contractor is required to adhere to strict requirements, including:</p> <ul style="list-style-type: none"> • Equipment shall be maintained in an operating condition that prevents unnecessary noise, including but not limited to non-defective muffler systems, properly secured components, and the lubrication of moving parts. • Idling of equipment shall be restricted to the minimum necessary to perform the specified work. <p>Nighttime work is required to complete the project work. Nighttime noise will be minimized to the greatest extent possible.</p>
<p>What are the detour routes during the Anne Street closure?</p> <p>What are the detour routes during the Highway 400 closure?</p>	<p>Detour routes will be clearly posted during any road closures. Project Update materials provided three figures illustrating Detour Routes that will be posted during construction.</p> <p>Proposed construction staging to complete Anne Street bridge replacement includes:</p>

	<ul style="list-style-type: none"> • Full closure of Anne Street between Edgehill Dr. and Donald St. during all stages of construction. • A detour will be implemented north and south of the Anne Street road closure throughout construction. • Construction is expected to last two (2) years. <p>Highway 400 staging will be completed such that 6-lanes (3 per direction) will remain open at all times, excluding:</p> <ul style="list-style-type: none"> • One (1) nighttime full closure of Highway 400 at Anne Street to facilitate demolition of existing bridge. • Off-peak (nightly) lane closures on Highway 400 to accommodate bridge construction. • Highway 400 lane closures will be communicated with the public well in advance of the closures through the MTO’s Information Messaging System and signage
<p>Will the lengthening and widening of the bridge also widen the highway?</p>	<p>The Highway 400 expansion to the approved 10-lane configuration is currently not scheduled. In preparation for this widening the new Anne Street bridge will be lengthened to accommodate future expansion of Highway 400 to 10 lanes.</p> <p>The highway will be widened during construction to accommodate construction staging; however, slope paving will be provided at the abutments and the interim 6 lane cross-section will be reinstated.</p>
<p>Will the new underpass bridge include Active Transportation (pedestrian and cycling) facilities?</p>	<p>Sidewalks will be installed on both sides of the new Anne Street bridge. Provisions for bicycle lanes, to be installed by others at a later date, are being provided.</p>
<p>What is the capital cost of the project?</p>	<p>As each component of the project are completed, contract packages are put together and cost estimates are prepared for each. These estimates are not made public as a competitive bidding process is held for construction contracts. After the award of these construction contracts the bid price can be made public.</p>
<p>What is the timing for the future 10-lane expansion?</p>	<p>The timing for the future highway expansion is currently unknown to the project team.</p>
<p>Will there be new highway lighting?</p>	<p>Highway lighting is not a part of the current scope of work included in this project.</p>

<p>Will the new bridge be raised?</p>	<p>Yes, the bridges will be raised to accommodate deeper girders and provide appropriate clearance for Highway 400.</p>
<p>What will the new bridge landscaping look like?</p>	<p>Various plantings (trees, shrubs and seeding) will be installed as part of the work to stabilize soils and provide an aesthetically pleasing view. Preliminary Landscape Opportunities Plans can be found on the project website at: http://highway400dunlopannesunnidale.com/wp-content/uploads/2019/06/AppendixF-Landscape-Plan.pdf.</p>
<p>How will the contract be procured?</p>	<p>The project will be delivered by tender posted to RAQS.</p>
<p>Is there/or are you expecting opportunities for HOV lanes/Bus lanes through Barrie and surrounding areas on the 400 itself?</p>	<p>As indicated in the 2004 and 2017 Transportation Environmental Study Report (http://highway400dunlopannesunnidale.com/?page_id=37), an HOV lane will be included in the highway expansion. However, it is beyond the scope of the current study. Upon completion of the Anne Street bridge replacement, Highway 400 will remain in its current 6-lane configuration awaiting future design and construction.</p>
<p>Are there going to be any attempts to make the revamped highways more aesthetically pleasing or provide the overpasses with some forms of 'look' (for lack of a better term)?</p>	<p>The bridges being designed as part of this project may incorporate some rather unique aesthetic features for this stretch of Highway 400. For example, the Anne Street bridge will have tapered piers and coated girders (painted). These components serve both a structural engineering benefit and will be visually appealing.</p>
<p>The Ministry of Heritage, Sport, Tourism and Culture Industries requested confirmation of Archaeological Assessment project information form (PIF) numbers and Heritage Resource interest.</p>	<p>PIF numbers were provided. Cultural Heritage study information were provided.</p>
<p>The Lake Simcoe Region Conservation Authority provided information related to:</p> <ul style="list-style-type: none"> • Watercourses (Dyments Creek, Bunkers Creek, Kids Creek, Sophia Creek). • Erosion hazard of the watercourses. • Regional floodplain of the watercourses • Wetland and adjacent lands. • Apparent Valleylands. 	<p>Data and information provided was used by the Project Team during detail design.</p>

2.5 Public Agency Stakeholder Information Meeting

A Public Agency Stakeholder Information Meeting (SIM) was held to disseminate information related to the proposed project work and discuss potential impacts that the traffic management proposed during construction may cause to motorists. The meeting was held virtually on October 8, 2020, involving representatives from affected City of Barrie departments and Emergency Services. Comments during the meeting are summarized as follows:

- City of Barrie inquired if there will be any long duration ramp closures at the Dunlop Street Interchange for the Highway 400/Anne Street bridge replacement work.
 - McIntosh Perry noted that there will be select closures for grading works on one Dunlop Street Ramp (E/W-N Ramp – traffic from Dunlop Street heading north on Hwy 400). McIntosh Perry confirmed these closures will be short duration and detours will not be in place.
- County of Simcoe indicated that the Innisfil bridge replacement work will be on-going at the same time but given the separation of the two projects there shouldn't be any concerns.

2.6 Notice of Submission – Design and Construction Report

On November 17, 2020, Notice of Submission – Design Construction Report notification letters were distributed to the project mailing list, MPs/MPPs and Indigenous Communities. The letters contained information about the Detail Design for the bridge replacements and interchange and Highway 400 reconstruction assignment and notified recipients of this DCR being available for a 30-day public review period. In addition, one (1) OGN was placed in the Barrie Advance on November 19, 2020.

Notice of Submission – Design and Construction Report materials, including example letters, contact list, and advertisements, can be found in Appendix A.

3.0 DETAILED DESCRIPTION OF THE RECOMMENDED DESIGN

The purpose of this section is to provide a summary of the major features of the Detail Design and construction staging. Emphasis on the environmental protection/mitigation and environmental monitoring are integral components of the Detail Design, which are incorporated into the Contract Documents that the Contractor is required to follow. Drawings of the Recommended Design are included in **Appendix B**.

As mentioned previously, the Anne Street bridge replacement and associated works are components of a major upgrade of Highway 400, extending from Highway 89 to Highway 11, as outlined in the Preliminary Design Report and TESR (2004, addendum 2017). This Detail Design is a continuation of the recommendations made during the Preliminary Design Study.

3.1 Major Features of the Proposed Work

This section of Highway 400 was constructed in 1955 and carries three (3) lanes of traffic in each direction. The existing Anne Street Bridge is approaching the end of its service life, and bridge replacement or major rehabilitation is required. The new bridge will be built to accommodate the approved future 10-lane expansion of Highway 400, which is not a part of this project.

The existing Anne Street bridge was constructed in 1959 and is a 35.10 m (18.05 m, 18.05 m) two-span reinforced concrete rigid frame structure. The bridge is aligned in an east-west orientation and carries two through lanes of Anne Street traffic in each direction over Highway 400. The overall width of the bridge is 17.07 m, including steel open railings and cast-in-place sidewalks along both sides of the bridge, with a roadway width of 6.70 m in each direction. The existing vertical clearance under the existing bridge is minimum 4.83 m above the northbound outside lane of Highway 400. The bridge underwent a major structural rehabilitation in 1990. In 2009 and again in 2014, the bridge underwent a minor structural rehabilitation as part of a holding strategy until the ultimate replacement.

The proposed Anne Street bridge replacement is a 90.0 m (45.0 m, 45.0 m) steel box girder structure, with semi-integral abutments and a centre pier on deep foundations. A minimum vertical clearance of 5.1 m has been provided. The bridge will be constructed with a sufficient span for a future 10 lane configuration on Highway 400; however, the interim 6 lane cross-section on Highway 400 will be reinstated at the end of construction. The new Anne Street lane configuration will match existing, with two lanes of traffic in each direction. In addition, a 2.0 m sidewalk and accommodations for future bicycle lanes will be constructed on the bridge. The General Arrangement drawings are included in Appendix B.

3.2 Drainage and Stormwater Management

One of the project objectives, with respect to the drainage and stormwater management strategies, is to ensure that there is no negative impact to the receiving watercourses and the City of Barrie infrastructures as a result of proposed works. This will be completed by ensuring that the post-development water levels and peak flows will not have negative impacts to upstream and downstream beyond the MTO Right-of-Way.

The drainage strategy considered the needs for flood mitigation, pavement drainage, water quality treatment and erosion protection, using approved methods to meet the design objectives and requirements as outlined in the MTO Drainage Management Manual (1997) and Highway Drainage Design Standards (HDDS) (2008).

The proposed drainage plans considered the need for temporary drainage during the construction stages; all watercourse crossing replacements were sized to adequately convey the selected design flows. The crossings were designed to convey the Check Flow without endangering the integrity of the structure and to ensure that no roadway overtopping occurs during the Check Flood. For flood management, the risk to public safety was considered to ensure that there will be no increase in flooding or negative impact beyond the right-of-way.

The roadway stormwater runoff is captured by storm-sewer networks to ensure that flow spread does not encroach onto travelled lanes. The forgoing plan meets the stormwater management requirements for the Anne Street Contract Package with respect to flood mitigation, water quality, erosion plans and environmental consideration as detailed within the MTO HDDS and the Lake Simcoe Region Conservation Authority (LSRCA) Technical Guidelines for Stormwater Management Submissions.

3.2.1 Culvert 74 (Station 11+424)

The existing 1.2 m x 1.2 m single cell concrete box culvert carries flow from Bunker's Creek in a west to east direction, eventually outletting into Lake Simcoe. This culvert will have a temporary culvert extension constructed at the inlet (west side of the Highway). The culvert extension is considered temporary until the future replacement of Culvert 74, included as part of the Dunlop Street interchange reconfiguration, not under GWP 2504-17-00. The culvert extension is necessary to accommodate the Highway platform widening at the crossing, necessary to facilitate Highway staging requirements as part of the Anne Street bridge replacement.

3.2.2 Culvert 75 (Station 11+610)

The existing 1.2 m x 1.2 m single cell concrete box culvert carries flow from Bunker's Creek Central Branch in a west to east direction, eventually outletting into Lake Simcoe. This culvert will have a temporary 19.0 m long, 1.0 m wide by 1.0 m tall concrete box culvert extension constructed at the inlet (west side of Highway) and a temporary 11.0 m long, 1.0 m wide by 1.0 m tall concrete box culvert extension constructed at the outlet (east side of Highway). A new 1.8 m wide by 1.8 m tall by 80.45 m long concrete box culvert will be constructed approximately 5 m south of the existing culvert; constructed in stages throughout construction. Once the new concrete box culvert is complete and the watercourse is rehabilitated, flows from the tributary of Bunker's Creek Central Branch will be re-directed into the new cell and the old culvert (and extensions) will be decommissioned. The culvert extensions are considered temporary until the new culvert is constructed and flows can be changed over.

3.2.3 Culvert 76 (Station 12+193)

The existing 1.2 m x 1.2 m single cell concrete box culvert carries flow from Bunker's Creek North Branch in a west to east direction, eventually outletting into Lake Simcoe. This culvert will have a temporary 17.0 m long, 1.0 m wide by 1.0 m tall concrete box culvert extension constructed at the inlet (west side of Highway) and a temporary 14.6 m long, 1.2 m wide by 1.2 m tall concrete box culvert extension constructed at the outlet (east

side of Highway). A new 1.8 m wide by 1.5 m tall by 80.0 m long concrete box culvert will be constructed approximately 5 m north of the existing culvert; constructed in stages throughout construction. Once the new concrete box culvert is complete and the watercourse is rehabilitated, flows from Bunker's Creek North Branch will be re-directed into the new cell and the old culvert (and extensions) will be decommissioned. The culvert extensions are considered temporary until the new culvert is constructed and flows can be changed over.

3.2.4 Culvert 77 (Station 12+452)

The existing 1.2 m x 0.9 m single cell concrete box culvert carries flow from Kidd's Creek South Branch in a west to east direction, eventually outletting into Lake Simcoe. This culvert will have a permanent 18.0 m long, 1.2 m wide by 1.0 m tall concrete box culvert extension constructed at the inlet (west side of Highway) and a permanent 12.7 m long, 1.2 m wide by 1.0 m tall concrete box culvert extension constructed at the outlet (east side of Highway). Culvert 77 extension is a requirement to accommodate the highway platform necessary for the staging of Anne Street Bridge construction and will accommodate the future 10-lane widening of Highway 400.

3.3 Electrical/Illumination

There is no existing illumination along this section of Highway 400. Provisions for future lighting will be provided for:

- High mast lighting along the Highway 400 mainline, and
- Underpass lighting at the Anne Street Underpass.

The existing illumination along Anne Street that is impacted by construction will be replaced.

3.4 Commercial Entrances

There are two commercial entrances being impacted by the roadway grading along Anne Street. The commercial entrances will be maintained during construction with minor interruptions expected when grading in the immediate proximity of the entrance is required.

3.5 Intersections

The following intersections will be modified to accommodate the planned profile change of Anne Street over Highway 400:

- Anne Street/Donald Street
- Anne Street/Edgehill Drive

Traffic lights, pedestrian crossings and turning signals will be upgraded to accommodate new grading as a result of the bridge replacement project.

3.6 Active Transportation Infrastructure

Sidewalks will be installed on both sides of the new Anne Street bridge. Provision for bicycle lanes, to be installed by others at a later date, is being provided.

3.7 Utilities and Pipe Lines

The following utilities are located within or adjacent to the Highway 400 ROW.

- Bell Canada – 2 Bell copper cables direct embedded in Anne Street Bridge & along Anne Street – relocation is required;
- Bell Canada – Fibre and copper cables located parallel to Highway 400 on the east side – a localized lowering will be completed during construction to avoid conflict with the new retaining wall along Anne Street;
- Enbridge – gas main crossing Highway 400 north of Anne Street - relocation is required;
- Watermain – City of Barrie is undertaking decommissioning of a watermain under Highway 400, just south of Anne Street;
- Alectra – overhead wire crosses Highway 400, north of Anne Street – relocation is required; and
- Rogers – aerial cable on Alectra poles - relocation is required.

4.0 ENVIRONMENTAL CONDITIONS, ISSUES AND COMMITMENTS

The following sections present an overview of the existing conditions, environmental concerns and potential impacts to the natural, socio-economic and cultural environments associated with the project. Details related to each section are contained in factor-specific reports on file with the MTO (See Section 6.0).

To mitigate the potential impacts on the natural, socio-economic, and cultural environments, the Contractor is responsible for implementing the requirements of referenced Special Provisions (SP), Non-Standard Special Provisions (NSSP), and Ontario Provincial Standard Specifications (OPSS) prescribed in the Contract Documents. In general, the Contractor is responsible for the protection of people, property and the natural environment from adverse impacts and damage that may result from this work, in accordance with Operational Constraint – Environmental Protection Requirements – General.

4.1 Natural Environment

During preliminary design, the MTO's service provider conducted an Existing Environmental Conditions study (FRi Ecological Services, 2015) and Natural Heritage Impact Assessment study (FRi Ecological Services, 2017) for the larger study corridor of Highway 400 from Highway 89 to Highway 11.

McIntosh Perry conducted several field investigations during the 2018 and 2020 field seasons, collecting data related to existing natural environmental conditions throughout the study area. The investigations included identification of the following, where applicable:

- Aquatic habitat and fish communities;
- Existing vegetation communities;
- Existing wetland areas;
- Observations of species at risk (SAR) and their habitat (including suitable habitat);
- Resident or migrant bird and wildlife species;
- Wildlife corridors;
- Significant habitat areas or vegetation communities; and
- Current land uses surrounding the study area.

4.1.1 Aquatic Habitat and Fish Communities

The watercourses associated with the project scope flow into Kempenfelt Bay of Lake Simcoe within the Lake Simcoe watershed. The preliminary technical reports prepared by FRi indicated that Bunker's Creek is a cold-water tributary of Lake Simcoe, which contains warm water fish species. For this project, this includes Culverts C-74, C-75, and C-76 (**Figure 2**) and portions of the existing Highway 400 ditch line. The LSRCA subwatershed plan indicates that the Bunker's Creek is considered to have a warm water thermal regime downstream of the Highway 400/Dunlop Street interchange and a cold-water thermal regime upstream of the interchange. The MNRF has stated that Bunker's Creek is a warm water system, however, due to the LSRCA subwatershed plan indicating it to be cold-water upstream of the interchange and, it historically being a cold-water system containing Brook trout, as well watercress being identified in the field within the ROW, Bunker's Creek should

be considered a cold water system. McIntosh Perry contacted the MNR to verify the cold-water recommendation, which was later confirmed (Appendix A). A dam is present at the mouth of the watercourse at Lake Simcoe. Warm water fish species have been caught and recorded at this dam. There are three (3) other known barriers to fish movement within Bunker's Creek between Highway 400 and Lake Simcoe.

The LIO database and LSRC subwatershed plan indicates that Kidd's Creek is a cold-water tributary of Lake Simcoe, which contains cold and warm water fish species. For this project, this includes Culvert C-77 (**Figure 2**). The preliminary technical reports indicate that the watercourse has a warm water thermal regime. Cold-water fish species have been caught and recorded downstream of Highway 400. Midhurst District of MNR confirmed that the watercourse is considered a cold-water system. There are four (4) barriers to fish movement known to occur downstream of Culvert C-77. Kidd's Creek also has an enclosure at the mouth of the watercourse, which prevents fish migration from Lake Simcoe.

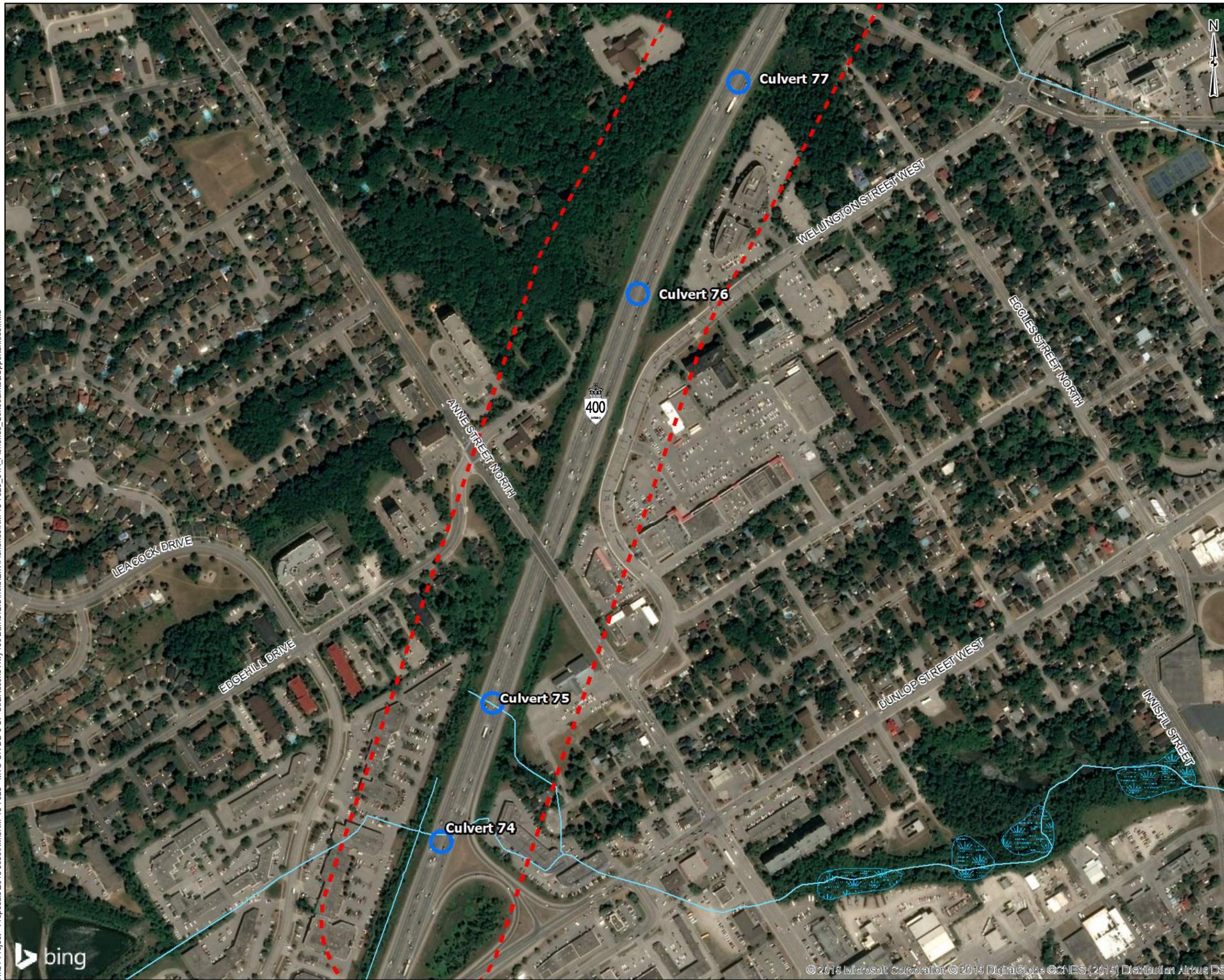
During the 2018/2020 field investigations all four centreline culverts and portions of the ditch lines conveying flows from Bunker's Creek and Kidd's Creek were considered to provide indirect fish habitat. Downstream barriers to fish migration (i.e. buried portions of the watercourses) limit the ability for fish to reach the study area; as a result, no fish were captured during field investigations.

The proposed work involved with realignment of the ditch lines and at Culverts C-74, C-75, C-76 and C-77 do not represent routine MTO works and do not fall within the allowable conditions of the Fisheries Best Management Practices (BMPs). As the watercourses are considered indirect fish habitat and have potential for cold-water and warm-water species, a detailed fisheries assessment was completed. This information is ultimately required to ensure a defensible determination as to the likelihood of the project causing the death of fish or harmful alteration, disruption or destruction (HADD) of fish habitat. The impact assessment was completed as per Step 4 of the fisheries protocol. The impact assessment was conducted using the framework of DFO's pathways of effects (PoEs).

Standard mitigation measures will be implemented during construction including, construction timing windows (July 16 to September 30), erosion and sediment control measures, designed specifically for this project, and rehabilitation of disturbed areas within and adjacent to the culverts and ditch lines.

In addition, based on hydraulic modelling of existing and proposed flows through Culverts 75 and 76, the installation of low flow channels throughout the entirety of the culverts is proposed as a means to enable fish passage through the culvert under normal conditions. This is being implemented based on plans for the City of Barrie to restore passage for fish within these watercourses in the future.

It has been determined that the proposed works for the ditch lines and at culverts C-74, C-75, C-76 and C-77 are not likely to result in a HADD.



LEGEND

-  Culvert (Coldwater Thermal Regime)
-  Watercourse
-  Unevaluated Wetland
-  Study Area

REFERENCE
 GIS data provided by the Ontario Ministry of Natural Resources and Forestry, 2019.

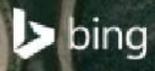


CLIENT: MINISTRY OF TRANSPORTATION
 CENTRAL REGION

PROJECT:
 GWP 2504-17-00 - HIGHWAY 400, ANNE STREET

TITLE:
 CULVERTS C-74, C-75, C-76 & C-77

McINTOSH PERRY 115 Walgreen Road, RR3, Carp, ON K0A1L0 Tel: 613-836-2184 Fax: 613-836-3742 www.mcintoshperry.com	PROJECT NO: KM-18-7029		FIGURE: 2
	Date	Dec., 20, 2019	
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4.1.2 Vegetation and Vegetation Communities

Vegetation communities based on Ecological Land Classification vegetation types were identified through field review and satellite image interpretation within and adjacent to the study area, and were found to be consistent with the Natural Heritage Impact Assessment Report (Fri, 2017), completed during the Preliminary Design Study. Vegetation communities identified throughout the study area include coniferous forest (FOC), deciduous forest (FOD), mixed forest (FOM), cultural meadow (CUM), and swamp (SW).

The study area does not contain significant or rare vegetation or vegetation communities. The surrounding area is dominated by transportation infrastructure, residential and commercial property. The study area contains regenerative and maintained graminoid conditions with sparse deciduous and coniferous shrub and tree species. No Butternuts (*Juglans cinerea*) or other at risk or rare vegetation species or communities were identified within the study area.

The project will result in the removal of approximately 13,800 m² of trees/vegetation and 125 individual trees to accommodate construction activities (see Appendix B 'Removals'). The study area is heavily influenced by human activities and contains a range of native and non-native herbaceous vegetation species. No impacts on SAR plant species are anticipated, as none were identified. A Landscape Planting plan has been developed for the stabilization of disturbed areas during construction (see Appendix B 'Landscape Plans').

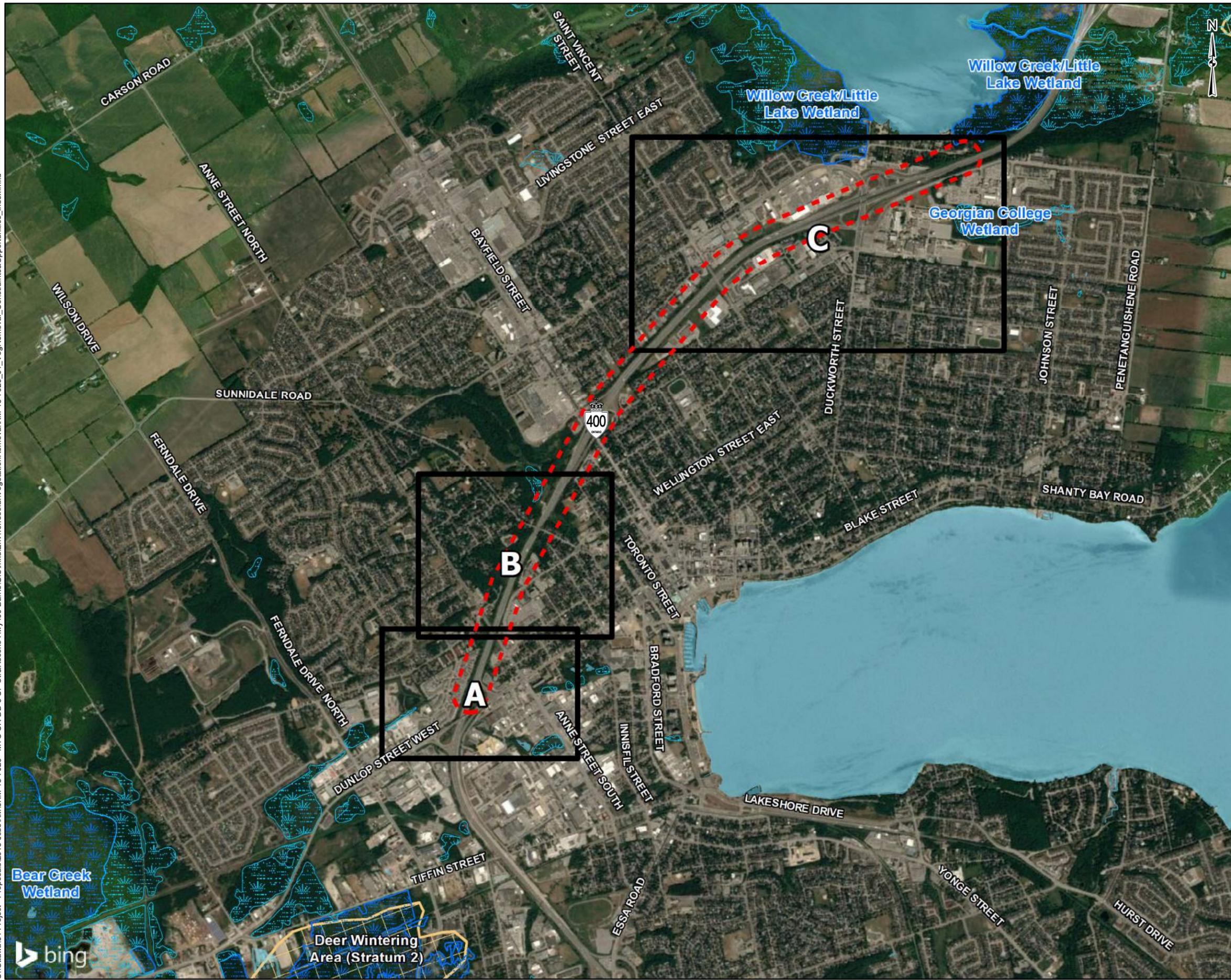
4.1.2.1 Invasive and Noxious Plant Species

Invasive species of plants are listed in *Table 2* (prohibited invasive species) and *Table 4* (restricted invasive species) of the *Invasive Species Act* (2015). Noxious plant species are listed in the Noxious Weeds Table under the *Weed Control Act* (1990). In general, invasive and noxious vegetation should always be controlled to avoid spreading.

Plant species designated as *invasive* and/or *noxious* that were observed within the study area include: phragmites (*Phragmites australis australis*), bull thistle (*Cirsium vulgare*), Canada thistle (*Cirsium vulgare*), coltsfoot (*Tussilago farfara*), common ragweed (*Ambrosia artemisiifolia*), European buckthorn (*Rhamnus carthartica*), poison ivy (*Toxicodendron radicans*) and sow-thistle (*Sonchus* spp.).

Areas of an abundance of phragmites have been mapped and included in the Opportunities and Constraints Maps; **Figure 3A**, **Figure 3B** and **Figure 3C**. The phragmites were observed in association with several areas where construction disturbance is planned. The Contractor will be responsible for the control of the spread of phragmites during construction.

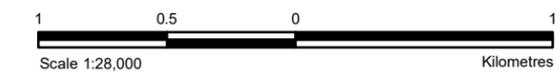
It should be noted that the exact location of other invasive and/or noxious plants within the study area have not been mapped due to the small size of area or limited number of individuals of each species within the study area (i.e., no stands of the species but rather sporadic occurrence of individuals).



LEGEND

-  Study Area
-  Index
-  Waterbody
-  Unevaluated Wetland
-  Provincially Significant Wetland
-  Deer Wintering Area

REFERENCE
 GIS data provided by the Ontario Ministry of Natural Resources and Forestry, 2020.

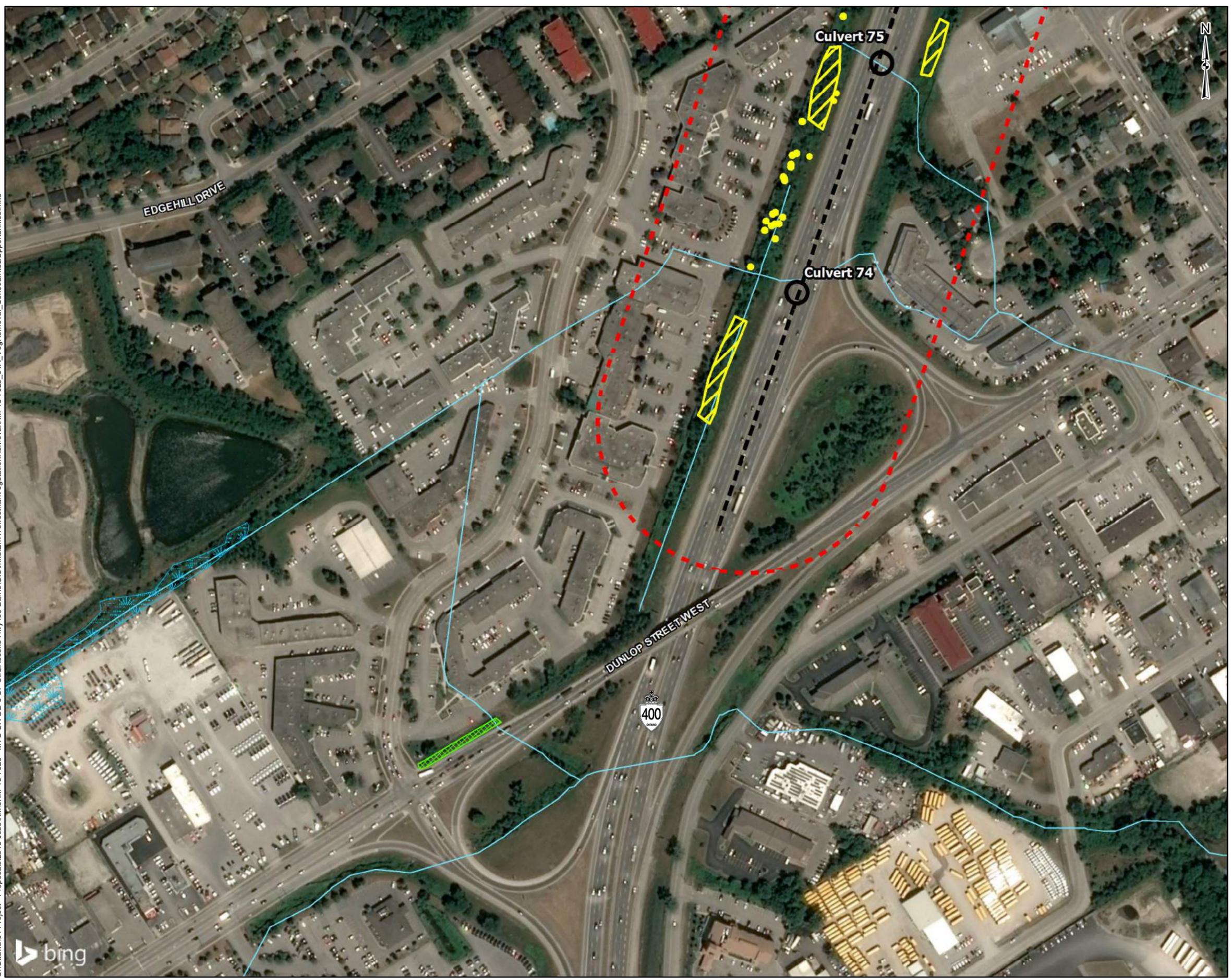


CLIENT: MINISTRY OF TRANSPORTATION CENTRAL REGION		
PROJECT: TERRESTRIAL ECOSYSTEMS EXISTING CONDITIONS AND IMPACT ASSESSMENT		
TITLE: VEGETATION REMOVAL AREAS		
McINTOSH PERRY 115 Walgreen Road, RR3, Carp, ON K0A1L0 Tel: 613-836-2184 Fax: 613-836-3742 www.mcintoshperry.com	PROJECT NO: KM-18-7029	FIGURE:
	Date: Sep., 04, 2020	3
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LEGEND

-  Site Location
-  Paving Limits
-  Study Area
-  Vegetation Removal Area
-  Phragmites
-  Unevaluated Wetland
-  Watercourse

REFERENCE
 GIS data provided by the Ontario Ministry of Natural Resources and Forestry, 2020.



CLIENT:	MINISTRY OF TRANSPORTATION CENTRAL REGION	
PROJECT:	TERRESTRIAL ECOSYSTEMS EXISTING CONDITIONS AND IMPACT ASSESSMENT	
TITLE:	VEGETATION REMOVAL AREA	
McINTOSH PERRY <small>115 Walgreen Road, RR3, Carp, ON K0A1L0 Tel: 613-836-2184 Fax: 613-836-3742 www.mcintoshperry.com</small>	PROJECT NO: KM-18-7029	FIGURE:
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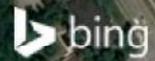
LEGEND

- Site Location
- Snag Tree Location
- Paving Limits
- Noise Wall
- Study Area
- Vegetation Removal Area
- Phragmites
- Unevaluated Wetland
- Watercourse

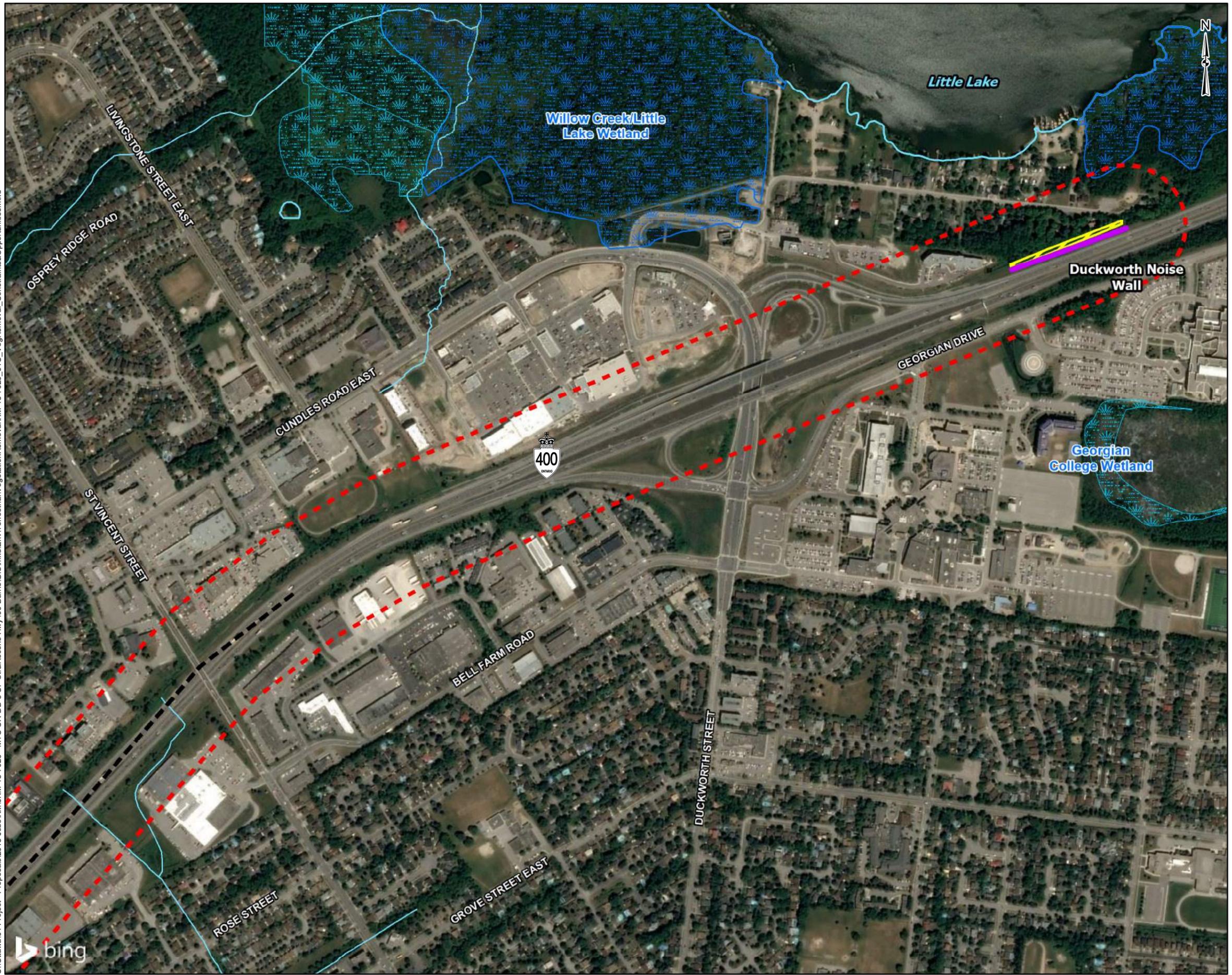
REFERENCE
 GIS data provided by the Ontario Ministry of Natural Resources and Forestry, 2020.



CLIENT:	MINISTRY OF TRANSPORTATION CENTRAL REGION	
PROJECT:	TERRESTRIAL ECOSYSTEMS EXISTING CONDITIONS AND IMPACT ASSESSMENT	
TITLE:	VEGETATION REMOVAL AREAS	
McINTOSH PERRY <small>115 Walgreen Road, RR3, Carp, ON K0A1L0 Tel: 613-836-2184 Fax: 613-836-3742 www.mcintoshperry.com</small>	PROJECT NO: KM-18-7029	FIGURE:
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LEGEND

- Paving Limits
- Noise Wall
- Study Area
- Vegetation Removal Area
- Unevaluated Wetland
- Provincially Significant Wetland
- Waterbody
- Watercourse

REFERENCE
 GIS data provided by the Ontario Ministry of Natural Resources and Forestry, 2020.



CLIENT:	MINISTRY OF TRANSPORTATION CENTRAL REGION	
PROJECT:	TERRESTRIAL ECOSYSTEMS EXISTING CONDITIONS AND IMPACT ASSESSMENT	
TITLE:	VEGETATION REMOVAL AREAS	
McINTOSH PERRY <small>115 Walgreen Road, RR3, Carp, ON K0A1L0 Tel: 613-836-2184 Fax: 613-836-3742 www.mcintoshperry.com</small>	PROJECT NO: KM-18-7029	FIGURE:
	Date	Sep., 04, 2020
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4.1.3 Erosion and Sediment Control

Existing environmental conditions within the study area mainly consist of vegetated areas with several soil types over variable topography. Construction activities required to complete the project work will disturb areas that are currently stable under normal conditions. In order to mitigate concerns related to erosion and sedimentation an Erosion and Sediment Control Plan was prepared, to be implemented during construction. Erosion and sediment control (ESC) is a multi-layered approach that includes several temporary and permanent components across the site, including (but not limited to):

- Light and heavy-duty sediment fence;
- Light-duty fibre roll;
- Rock and straw bale flow check dams;
- Rip rap spillway protection;
- Rip rap ditchline protection, and
- Rip rap/waterbody material culvert inlet and outlet protection.

Temporary ESC measures will be maintained by the Contractor and kept in place until 100% of all work has been completed and stabilized. Temporary control measures shall be removed at the completion of the work, but not until permanent erosion control measures, if required, as specified in the contract, have been established.

4.1.4 Landscape Plantings

Developed in conjunction with the highway design and staging plans, a Landscape Planting Plan aims to address the need for stabilization of disturbed areas due to construction through revegetation. CSW Landscape Architects Ltd. prepared a series of landscape plantings that are designed to integrate infrastructure needs with landscape works to minimise the environmental and visual impact of construction (Appendix B, 'Landscape Plans').

4.1.5 Wetland Communities

One (1) Provincially Significant Wetland (PSW) is located within 120 m of the north limits of the Highway 400 – Anne Street Underpass study area: Willow Creek/Little Lake Wetland (**Figure 3**). Given the limited scope of work associated with this section of the study area (i.e., the construction of the Duckworth Street Noise Wall), and that construction activities in this area are limited to the existing Highway 400 ROW, there are no anticipated impacts to this PSW as part of this project.

Several unevaluated wetlands occur within the study area (**Figure 3A, Figure 3B and Figure 3C**); however, given the scope of the proposed project works, it is not anticipated that wetland features will be negatively impacted by the project works. As wetlands are home to many species, including SAR, mitigation measures will be implemented to control the release of water and/or sediment during construction to prevent negative impacts to the identified wetlands.

4.1.6 Wildlife and Natural Corridors

Migratory birds are known to nest within vegetation present within the study area. Timing windows allow vegetation removal activities to avoid periods when birds are actively nesting. The period when a bird is actively nesting is considered its most critical life stage as many species are highly dependent on habitat around their nest site to supply food for nestlings and to conceal their nest, eggs, and young. Timing windows allow vegetation removal activities to avoid periods when birds are actively nesting. April 15 – September 5 (i.e., the period when most birds are anticipated to be actively nesting) in any calendar year. The study area contains a variety of habitat types, and it is important to note that this timing window will not be applied only to the removal of trees but all vegetation removal as ground nesting species may also be present within the work area associated with this project (i.e., adjacent to wetlands and watercourses, etc.).

During the 2020 field survey, big brown bats were observed traveling along the edge of forested habitat associated with the Sunnidale Road woodland (southwest quadrant of the Sunnidale Road bridge). Most bat species rarely venture more than 40 m from the edge of treed habitats (i.e. woodland edges or fencerows) and these features are likely important as travel corridors for local bat populations. Localized changes to habitat structure are anticipated, which will impact the function of candidate bat maternity colony sites (i.e. snag tree within woodland southwest of Sunnidale Road) and springs and seeps. It is not anticipated that candidate area-sensitive bird breeding habitat will be impacted by the widening (i.e. no interior forest exists within the woodland parcel).

Mid-sized mammals are also known to use the various fencerows and woodland edges as a travel corridor; however, these are anticipated to be very local in nature. Though none of the culverts within the study area have been observed to be used by traveling wildlife, raccoons and coyotes are known to use culverts to pass under Highway 400 just outside the study area (i.e., culverts within the larger Highway 400 study area).

4.1.7 Species At Risk

Background data collection identified the potential presence of several terrestrial (birds, mammals, insects & amphibians, snakes & lizards, turtles and plants) and aquatic SAR within the study area. During the 2018/2020 field investigations, no SAR were observed within the study area. Though SAR have been identified with the potential to be encountered within the study area limits, the proposed project works are not anticipated to impact these species.

4.1.8 Physiography, Bedrock and Soils

Topography in the study area starts fairly flat in the south at Culvert C-74 and runs on a gradual uphill towards Bayfield Street, with approximately 40 m in elevation gain over this length. The study area crosses a significant valleyland, north of Sunnidale Road, that includes the main channel of Kidd's Creek. Drainage patterns generally follow the topography of the study area, crossing the highway in several locations through centreline culverts, towards Lake Simcoe.

Published geological mapping by the Ontario Geological Survey (OGS) in the area reveals that the surficial geology on study area consists of coarse-textured glaciolacustrine deposits of sand, gravel, minor silt and clay,

as well as till consisting of stone-poor sandy silt to silty sand on Paleozoic terrain. The surficial geology is underlain by bedrock consisting of limestone, dolostone, shale, arkose and sandstone of the Ottawa and Simcoe Group (OGS, 2019).

During foundations investigations for design of the Anne Street Bridge, five boreholes were analyzed near the Anne Street underpass bridge. Below the asphalt, and fill, varying deposits of silty sand with traces of clay and gravel, or silty sand with gravel, or gravelly sand with some silt was encountered in the boreholes. These layers were underlain with silty clay or clayey silt in some of the boreholes. The depths of the boreholes ranged from 9.8 m to 43.0 m below ground surface. In addition, five boreholes were analyzed near culvert C-75. Below the asphalt or topsoil and road base fill (silty sand with traces of gravel and clay), there were varying layers of sand and silt with traces of gravel and clay, clayey silt with sand, and a deposit of sand with silt and clay. The depths of the boreholes ranged from 15.4 m to 15.8 m below ground surface. Bedrock was not encountered in any of the boreholes that were completed within the project limits. Additionally, a review of the MECP Well Records indicated that bedrock was not encountered in any wells within 500 m of the study area.

4.1.9 Groundwater

The study area is located within the Lakes Simcoe and Couchiching/Black River (LSCBR) source protection area. In the core area of the City of Barrie, municipal wells 3A, 4, 5, 7, 17, 18, and 19 (wells west of the Lakeshore Wells), have been combined into one wellhead protection area (WHPA). As illustrated in the Source Protection Information Atlas (MECP 2019b), the study area includes portions of WHPA B, C and D, with vulnerability scores of 6, 4 and 2, respectively. A portion of the Site near St. Vincent St. is located within a highly vulnerable aquifer, with a score of 6. A portion of the Site near Anne St. and St. Vincent St. are within a municipal surface water Intake Protection Zone (IPZ) 3, with a vulnerability score of 5.6. Construction activities are not anticipated to impact municipal drinking water systems; no approvals from LSCBR Source Protection Authority are required.

Ninety (90) Well Records were identified within 500 m of the study area. The Well Records were for the following well types: fifty three (53) test holes, ten (10) domestic water supply wells, three (3) abandoned test holes, two (2) dewatering wells, one (1) unfinished test hole, two (2) municipal water supply wells, four (4) abandoned unknown wells, ten (10) unknown wells, three (3) industrial water supply wells, and two (2) observation wells (MECP, 2019a). The overall average static water level within 500 m of the study area is 12.3 m below the ground surface, and the recorded static water level ranges from 2.4 m to 33.5 m below the ground surface. None of the identified wells are within the maximum calculated radius of influence of 42.5 m. However, it should be noted that the location of the MECP well records are approximate, and therefore water supply wells may be located within the radius of influence. Additionally, based on the MECP well records, some of the wells may be within the ROW.

It is anticipated that the Anne Street underpass abutments and pier installation, culvert extension and replacements, and the storm sewer installations will be accomplished through open excavations. Groundwater seepage and stormwater inflow into the excavations is expected. Construction dewatering will be required to ensure that the work areas remain dry to allow access for workers and/or equipment. The expected typical volume of groundwater and stormwater being pumped per day will be in excess of 400,000 L/day. As a result, a Category 3 Permit to Take Water (PTTW) will be obtained. Groundwater that seeps into the excavations, as

well as any collected stormwater within the excavations, will be discharged downgradient of the work area as per OPSS 517. It is not anticipated that the water supply wells will be affected during construction dewatering as all the water supply wells are relatively deep, and the water-taking will be in stages of short-term durations.

During the 2018 Natural Sciences field investigations, indications of groundwater seepage were observed within the Tributary of Bunker's Creek associated with Culvert 75 and Culvert 76, as well as at the Tributary of Kidd's Creek associated with Culvert 77. These indications included the presence of watercress within the watercourse.

4.1.10 Surface Water

Surface water in the study area consists of highway stormwater management, Anne Street Bridge stormwater management, roadside ditches and watercourses associated with centerline culverts C-74, C-75, C-76 and C-77. Hydrologic and hydraulic analyses were performed for the study area based on design criteria and guidelines detailed in a variety of MTO and other relevant standards documents. The designs of the new highway drainage features were completed to meet the minimum requirements of the MTO Drainage Management Manual and Highway Drainage Design Standards. The drainage strategy considered the needs for flood mitigation, pavement drainage, water quality treatment and erosion protection, using acceptable methods to meet the design objectives and requirements.

4.2 Socio-Economic Environment

A thorough review of the socio-economic environment within the study area was conducted during Detail Design. The existing conditions outlined in the preliminary design report and TESR were examined and are generally consistent with current conditions. Potential socio-economic impacts of the proposed work to the study area are restricted to the Highway 400 and Anne Street ROW, adjacent land uses, as well as local road detour routes and staging areas.

The following sections describe the potential impacts to the socio-economic environment associated with the project works. A summary of mitigation measures is provided in **Table 3**.

4.2.1 Land Use

The study area is located within the geographic boundaries of the City of Barrie, County of Simcoe. As shown in **Figure 4**, the City of Barrie Official Plan identifies several land use types within the study area including: general commercial, residential, educational institutional, environmental protection area and Highway 400 industrial.

A number of property acquisitions were required to facilitate the Highway 400 Anne Street underpass bridge replacement and future widening of Highway 400. With the exception of the MTO acquired property, land uses within the study area will not be impacted due to the project work.

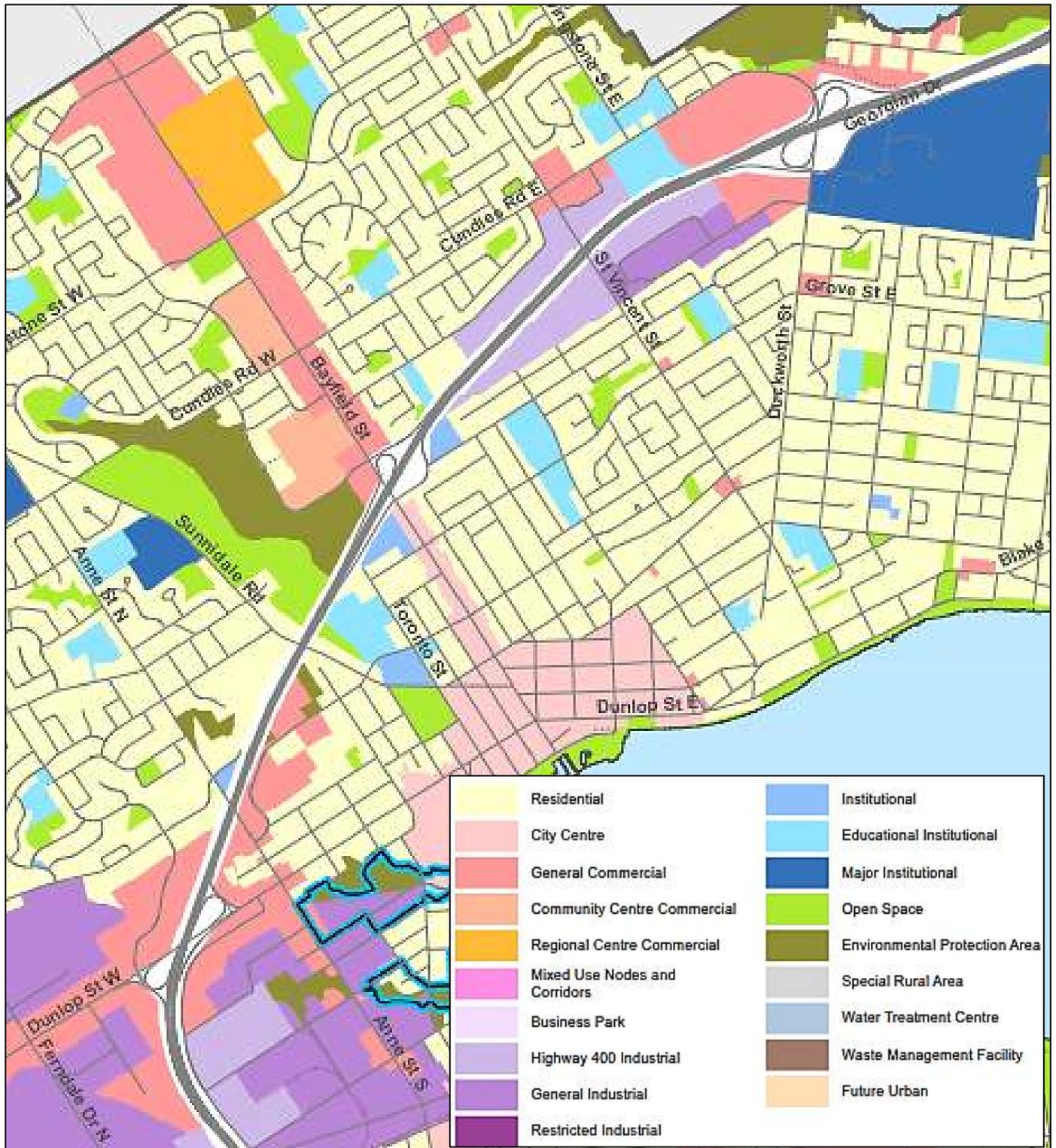


Figure 4: City of Barrie Official Plan – Appendix A – Land Use Map (January 2018)

4.2.2 Designated areas

One (1) PSW is located within 120 m of the north limits of the Highway 400 – Anne Street Underpass study area: Willow Creek/Little Lake Wetland. Given the limited scope of work associated with this section of the study area (i.e., the construction of the Duckworth Street Noise Wall), and that construction activities in this area are limited to the existing Highway 400 ROW, there are no anticipated impacts to this PSW as part of this project.

Anne Street has been identified on the City of Barrie Transportation Master Plan (2019) as part of the City Cycling network. Provisions for bicycle lanes have been provided on the new Anne Street bridge, to be installed later by others.

4.2.3 Municipal Services and Traffic Operations

Highway 400 is classified as a Rural Freeway Divided and has a posted speed limit of 100 km/h. Highway 400 begins at Maple Leaf Drive in Toronto, south of Highway 401 and extends northerly to Highway 69, north of Parry Sound. Within the project limits the highway has an urban/suburban surrounding with the main traffic generators expected to be the City of Barrie commuters and users travelling to and from the Greater Toronto Area (GTA). MTO has classified this segment of Highway 400 as having a ‘Commuter Tourist Recreation’ traffic pattern. Highway 400 at this location consists of six lanes (three in each direction) and auxiliary lanes associated with Highway 400 interchanges. The ultimate cross section for Highway 400, as approved in the TESR (URS, 2004) and TESR Addendum (AECOM, 2017a) will include a 10-lane cross section consisting of 4 General Purpose Lanes and 1 High Occupancy Vehicle (HOV) lane in each direction.

Anne Street is a City of Barrie, municipal roadway and is classified as Urban Collector Undivided (UCU50), with a posted speed limit of 50km/h. Anne Street North, north of Dunlop Street, is an approximately 6.7 km roadway that runs north-south from Dunlop Street in the south to Carson Road in the north, where it comes to an end, picking back up at Snow Valley Road (Simcoe County Road 43) where it takes a jog to the north-west terminating at Highway 26. Anne Street South, south of Dunlop Street, is an approximately 1.8 km roadway that runs north-south from Dunlop Street in the north to Essa Road in the south. The Anne Street structure carries four through lanes, two lanes per direction, over Highway 400, with a roadway width of approximately 13.4 m. There are sidewalks on both sides of Anne Street.

4.2.4 Construction Staging

In order to complete the planned work for this project, construction staging is required and has been broken down into four (4) stages expected to last two (2) construction seasons. Highway 400 staging will be completed such that 6-lanes (3 per direction) will remain open at all times, excluding:

- off-peak (nightly) lane closures of Highway 400, and
- one (1) night-time full closure of Highway 400 at Anne Street to facilitate demolition of the existing bridge.

Additional traffic disruptions throughout construction, including temporary Highway 400 lane and ramp closures, long duration shoulder closures, and detours to the adjacent road networks. Lane widths will be reduced to 3.5m during select stages along Highway 400 during construction to facilitate the staging sequencing required for the bridge replacement work. Highway 400 lane closures will be communicated with the public well in advance of the closures through the MTO's Information Messaging System and signage. Detour routes for the Highway 400 closure are illustrated in **Figure 5**.

Anne Street will be closed between Edgehill Drive and Donald Street for the duration of construction. During this time detour routes, as illustrated in **Figure 6**, will be communicated to the public with signage.

Impacts associated with traffic disruptions include emergency service response times and an anticipated increase to municipal road traffic volumes within the vicinity of the project area (i.e., the City of Barrie) and detour route. The detour routes have been discussed with the affected emergency service providers and the City of Barrie. The contractor will be required to notify the emergency services and City of Barrie a minimum of two weeks in advance of any full road closures. Additionally, Portable Variable Message Signs (PVMS) will be used to provide up-to-date information to drivers regarding construction works on Highway 400, and temporary advanced notification signs will be used to provide drivers with advance notification of lane closures.

Following the completion of construction an interim configuration on Highway 400 will be put in place maintaining a 6-lane configuration (3 per direction). This configuration will be in place until the future 10-lane expansion of Highway 400 construction commences.

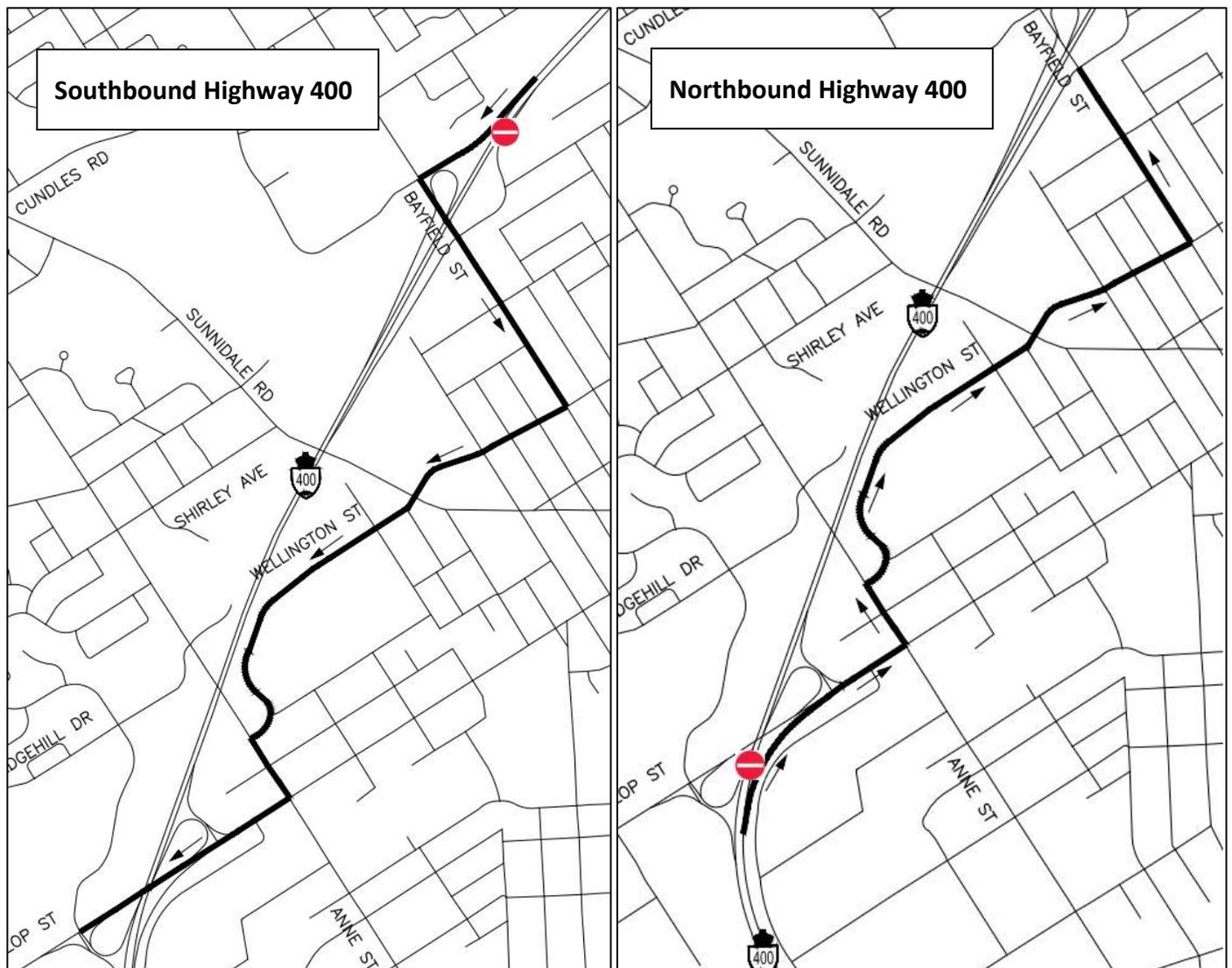


Figure 5: Highway 400 Traffic Detour Routes



Figure 6: Anne Street Road Closure Detour Route

4.2.1 Construction Noise

Unlike operational traffic noise, the MTO does not establish a quantitative threshold noise level to establish construction noise impacts. However, construction noise produced by the Contractor’s operations shall be mitigated as shown in **Table 2**.

Table 2: Construction Noise Constraints	
Constraint	Constraint Details
Equipment Maintenance	Equipment shall be maintained in an operating condition that prevents unnecessary noise, including but not limited to non-defective muffler systems, properly secured components, and the lubrication of moving parts.
Equipment Operation	Idling of equipment shall be restricted to the minimum necessary to perform the specified work.

4.2.2 Noise Mitigation Measures

A noise impact assessment was completed during preliminary design for the Highway 400 corridor, which identified areas that meet the MTO criteria for noise mitigation. Approved noise walls being constructed as part of the current Anne Street bridge replacement project are illustrated on **Figure 7**.

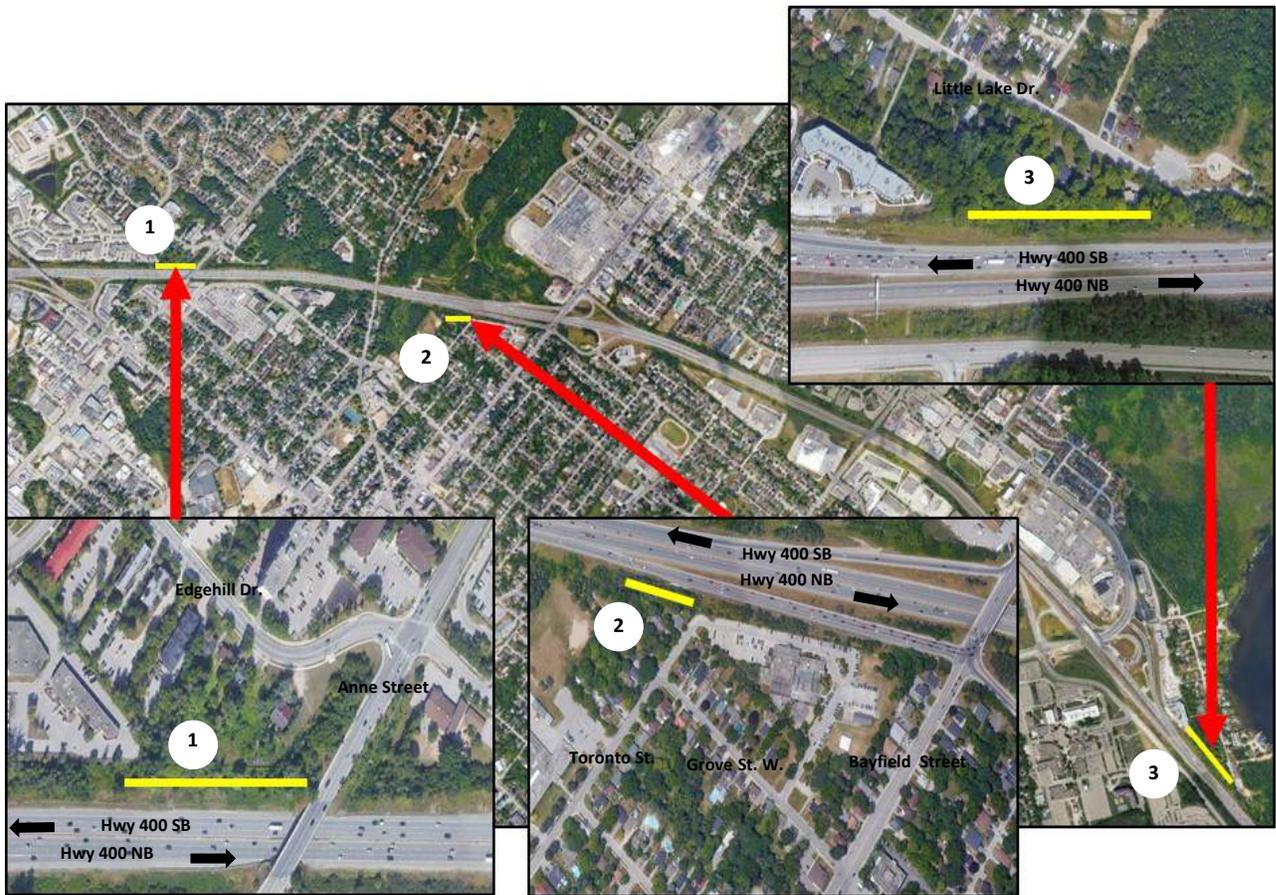


Figure 7: Noise Wall Locations

4.2.3 Air Quality

The MTO has a methodology for assessing local air quality impact, which is set out in the Environmental Guide for Assessing and Mitigating the Air Quality Impacts and Greenhouse Gas Emissions of Provincial Transportation Projects (AQ Guide) (MTO, 2012). During the preliminary design study the Highway 400 corridor from Highway 89 to Highway 11 was analyzed under the AQ Guide. The study determined that proposed work within the study area would have negligible impacts to air quality and no design changes were recommended.

The project work generally has the potential to create dust due to construction activities. Dust suppressants will be required to be used by the contractor during construction to ensure dust is kept to a minimum.

4.2.4 Waste & Contamination

McIntosh Perry conducted desktop review and field surveys to determine the possible presence of the eleven (11) designated substances identified by Ontario Regulation 490/09 under the *Occupational Health and Safety Act*, including:

- Acrylonitrile
- Arsenic
- Asbestos
- Benzene
- Coke Oven Emissions
- Ethylene Oxide
- Isocyanates
- Lead
- Mercury
- Silica
- Vinyl Chloride

Where available, documentation such as construction drawings and Ontario Structure Manual – Inspection Forms, were reviewed to determine the potential for designated substances to be associated with the bridges slated for replacement. Following documentation review, the bridges were inspected and where accessible sampling was performed for analytical assessment.

The following designated substances were detected through analysis:

- Arsenic – guiderail wood posts
- Lead – guiderail and steel coatings

The following designated substance is likely to be present, but no testing was conducted to confirm this.

- Silica – assumed to be present throughout the project area in the form of but not limited to, concrete, granular materials and asphalt.

The following hazardous substance was detected through analysis:

- Chromium – guiderail wood posts

The remaining designated substances are either not likely to be present or have been polymerized into a form which would no longer be considered as a designated substance.

4.2.5 Snow Drift Assessment

McIntosh Perry retained RWDI to review the snow drift assessment prepared during preliminary design for this area, under RWDI's June 3, 2016 Highway Snowdrifting Consultation: Highway 400 Improvements from 1 km South of Highways 89 to the Junction at Highway 11, Project #1301130. After reviewing the existing Anne Street crossing, the proposed changes and the results from previous study in this area, the Snow Transport Potential (STP) is expected to be low. This is mainly due to the urban development immediately around the study area. From a global snow drifting perspective, the total volume of snow reaching the highway in these areas is expected to be limited. However, the potential remains for localized finger drifts to occur on the ramps or on the underpass section of the highway adjacent to the embankments. Local landscape plantings have been provided aimed at reducing the potential for significant drifting on the roadways.

4.3 Cultural Environment

4.3.1 Archaeology

During the preliminary design study, a Stage 1 and 2 Archaeological Assessment Report was prepared to document archaeological potential within the greater study area from Highway 89 to Highway 11 (AECOM, 2017b). McIntosh Perry retained Past Recovery Archaeological Services to conduct further Stage 1 and Stage 2 Archaeological Assessments in the project study area. The Stage 1 and 2 Assessments were conducted within the study area not covered by the AECOM (2017b) Report. The Stage 1 and 2 Assessments found no additional potential archaeological resources within the study area.

4.3.2 Built Heritage and Cultural Heritage Landscape

McIntosh Perry retained Unterman McPhail Associates (UMA) Heritage Resource Management Consultants to assess the cultural heritage landscapes and built heritage resources for the study area.

UMA determined that no cultural heritage landscape or built heritage resources recognized at the municipal, federal or international levels are identified as being located within or adjacent to the study area. Highway 400 is considered to be a cultural heritage landscape of historical/associative interest or value to the provincial history; however, its original highway design has been significantly altered. There are no anticipated impacts to the cultural heritage resources as a result of the proposed MTO work in the study area.

4.4 Summary of Environmental Concerns and Commitments

The environmental protection/mitigation measures identified in the DCR have been incorporated into the contract package to address potential environmental effects resulting from this project. Areas of environmental sensitivity or concern, the sources of those concerns, and the mitigation measures associated with the undertaking are described in **Table 3**.

Table 3: Summary of Environmental Concerns and Commitments

ID #	Issues/Concerns/Potential Affects	Concerned Agencies	ID #	Mitigation/Protection/Monitoring
1.0 Fish and Fish Habitat				
1.1	Construction activities may result in the suspension of sediments within the Tributaries of Bunker's Creek, associated with Culvert C-75 and C-76, Bunker's Creek, associated with Culvert C-74 and the Tributary of Kidd's Creek associated with Culvert C-77, which may have direct negative effects on downstream fish populations by causing respiratory stress, reduced feeding efficiency, and impairment of physiologic processes such as growth and reproduction.	Ministry of Natural Resources and Forestry (MNRF) Fisheries and Oceans Canada (DFO)	1.1.1	In order to protect fisheries and aquatic habitat resources within the study areas, this Contract includes Ontario Provincial Standard Specification (OPSS) 182 - General Specification for Environmental Protection for Construction in Waterbodies.
			1.1.2	In order to avoid disruption to sensitive fish life stages, in-water work will only be permitted from July 16 to September 30 of any year, Table A of Special Provision No. 101F23 – Amendment to OPSS 182.
			1.1.3	Erosion and sediment control measures, as described on the Contract Drawings, shall remain in place and maintained until all disturbed areas are stabilized and/or vegetation has been re-established, per Contract Drawings and Non-Standard Special Provision (NSSP) No. ENVR0005 – Temporary Erosion and Sediment Control Measures and OC – Erosion and Sediment Control.
1.2	Removal of riparian vegetation has the potential to increase erosion, affect water temperatures, and impact nutrient inputs into the Tributaries of Bunker's Creek, Bunker's Creek and the Tributary of Kidd's Creek.	MNRF DFO Ministry of the Environment, Conservation, and Parks (MECP)	1.2.1	Removal or disturbance of riparian vegetation shall be minimized during construction operations in order to prevent unnecessary loss of stream shading, overhead cover or bank stability, per OPSS 182 - Environmental Protection for Construction in Waterbodies and on Waterbody Banks.
			1.2.2	Construction staging areas will be set back from the watercourse and held on the existing roadway platform wherever possible, as described in the Contract Drawings. The Contractor shall plan access points to minimize the amount of riparian vegetation lost or disturbed. All Access routes to be reviewed and accepted by Contract Administrator prior to vegetation removal and construction of access route, per Operational Constraint (OC) – Construction Ingress, Egress and/or Access Locations.
			1.2.3	Erosion and sediment control measures, as described on the Contract Drawings, shall remain in place and maintained until all disturbed areas are stabilized and/or vegetation has been re-established, per Contract Drawings and NSSP No. ENVR0005 – Temporary Erosion and Sediment Control Measures and OC – Erosion and Sediment Control.
			1.2.4	Landscape plantings shall be installed per Contract Drawings. Old Field Mix (the only permanent seed mix as outlined in Table 1 of OPSS 804 containing only native species is designed for seeding of areas where there will be fallow areas left alone with little or no maintenance, no mowing and the area will be required to be self-sustaining) shall be used to re-seed all disturbed areas associated with the work zone, including access routes.
1.3	Dewatering operations are required to complete the proposed work throughout the study area, which may lead to entrainment of sediment leading to fish habitat watercourses.	MNRF MECP DFO	1.3.1	Water from dewatering and unwatering operations shall be directed to a sediment control measure and/or a vegetated discharge area 30 m away from waterbodies or as far away as practicable from the top of the bank of any waterbody, prior to discharge to the natural environment per OPSS 805 – Temporary Erosion and Sediment Control Measures and OPSS 517 – Dewatering.
			1.3.2	Where the dewatering system involves taking of water from a waterbody, the design shall maintain the flow of water and the natural functions of the waterbody upstream and downstream of the work area, per OPSS 517.
2.0 Erosion and Sediment Control				
2.1	Disturbance of existing vegetation and general grading work in the project area has the potential for erosion and	MNRF MECP	2.1.1	Temporary erosion and sediment control measures shall be installed and removed according to the timing constraints set out in Table A of SSP No. 805F01 – Amendment to OPSS 805, NSSP – Temporary Erosion and Sediment Control Measures and NSSP No. ENVR0005 – Temporary Erosion and Sediment Control Measures and OC – Erosion and Sediment Control.

ID #	Issues/Concerns/Potential Affects	Concerned Agencies	ID #	Mitigation/Protection/Monitoring
	sedimentation concerns due to soil types, slopes and sensitive receptors (watercourses and wetlands).	DFO	2.1.2	In order to prevent the entrainment of sediment in watercourses adjacent to the ROW study area, the Contractor shall install appropriate erosion and sediment control measures appropriate to site conditions and stages of Construction as illustrated in the Contract Drawings.
			2.1.3	All dewatering and flow diversion will be conducted in a manner that prevents the release of sediments into the watercourses/wetlands, per OPSS 517 - Dewatering of Pipeline, Utility and Associated Structure Excavation.
3.0 Terrestrial Ecosystems				
3.1	Construction activities, including excavation, grading, bridge replacement, interchange reconstruction, etc. have the potential to disturb wildlife and bird habitat such as nesting and foraging habitat.	MNRF EC	3.1.1	Vegetation clearing during the breeding bird-window (April 15 to September 5) shall not occur in order to prevent disturbance of migratory birds, per OC – Migratory Bird Protection. Should vegetation clearing be required during the timing restriction, a qualified bird specialist must complete an assessment of the site to identify active bird nests, if any.
			3.1.2	The removal of trees and other vegetation shall only occur where specified in the Contract Drawings. Any removals outside of the delineated areas shall be reviewed and approved by the MTO Contract Administrator and MTO Environmental Planner.
			3.1.3	All disturbed areas will be stabilized as soon as possible using erosion and sediment control measures per Contract Drawings and NSSP No. ENVR0005 – Temporary Erosion and Sediment Control Measures and OC – Erosion and Sediment Control.
			3.1.4	Access routes and staging areas will be delineated on-site to prevent workers from unintentionally straying from the work platform, per OC – Construction Ingress, Egress and/or Access Locations.
			3.1.5	Vegetated areas disturbed during construction shall be stabilized and re-vegetated as soon as possible. Tree and shrub plantings identified in the Contract Drawings' Plantings Plan shall be implemented per SSP LAND0001 – Requirements for Planting.
4.0 Species at Risk				
4.1	Species at Risk (SAR) may be encountered during construction, which may have negative impacts on the individual(s).	MECP	4.1.1	Fact sheets and identification training must be provided to all onsite personnel for the identification of SAR which may be encountered within or directly adjacent to the work area.
			4.1.2	The Contractor shall perform daily site inspections for SAR for the duration of the project work. If SAR have entered the site, the Contractor shall: <ul style="list-style-type: none"> - Temporarily stop work - SAR should be allowed a reasonable amount of time to leave the work area. - Report SAR Observations to the MECP - The Contractor will contact MTO's Contract Administrator and report SAR observations within 24-hours to the MECP to seek advice on how to proceed.
5.0 Groundwater				
5.1	Construction activities, such as refuelling, can increase the potential for accidental spillage and subsequent contamination of groundwater sources.	MNRF MECP	5.1.1	Construction activities, such as refuelling, can increase the potential for accidental spillage and subsequent contamination of groundwater sources. The Contractor is required to have a spill kit available on site in the event of a spill. All spills that may have an adverse effect should be reported to the MECP Spills Action Centre (1-800-268-6060) in accordance with provincial and federal legislation.
			5.1.2	The Contractor shall have a Spill Prevention and Response Contingency Plan, per OC – Spill Prevention and Response Contingency Plan.

ID #	Issues/Concerns/Potential Affects	Concerned Agencies	ID #	Mitigation/Protection/Monitoring
5.2	Groundwater seepage and stormwater inflow into excavations is expected. Construction dewatering will be required to ensure that the work areas remain dry. It is expected that the typical volume of groundwater and stormwater being pumped per day will be in excess of 400,000 L/day.	MECP	5.2.1	An Application for Approval of a draft Category 3 Permit to Take Water has been submitted to the MECP by the MTO: Reference Number 3424-BUCHZ8, per SSP No. 199F31 - Environmental Exemptions and Permits.
			5.2.2	Groundwater that seeps into the excavations, as well as any collected stormwater within the excavations, will be discharged downgradient of the work area as per OPSS 517. It is recommended that the groundwater and stormwater be directed to a sediment control device installed on a well vegetated area prior to release to the natural environment (i.e. the surrounding area).
6.0 Surface Water				
6.1	There is potential for contamination spills entering the surface water and spreading the contamination.	MECP DFO MNRF	6.1.1	The Contractor shall have a Spill Prevention and Response Contingency Plan, per OC – Spill Prevention and Response Contingency Plan. As part of this Plan, the Contractor shall make use of a Spill Containment System. This system shall ensure no deleterious substances, as outlined in the <i>Fisheries Act</i> , enter waterbodies
			6.1.2	Mobile equipment refuelling shall take place no closer than 30 m from any waterbody in order to prevent water contamination due to accidental fuel spills. For non-mobile equipment, refuelling should be carried out in a controlled manner so as to prevent fuel spillage, and drip pans should be located under the equipment at all times, per OC – Equipment Refueling, Maintenance and Washing.
			6.1.3	Equipment operating near any waterbody shall be in good working condition, properly maintained and free of excess oil/grease to reduce the risk of contaminant leakage. In the event that a spill occurs, proper containment, clean up, and reporting, in accordance with provincial requirements, shall be completed.
			6.1.4	The Contractor is required have a spill kit available on site in the event of a spill. All spills that may have an adverse effect should be reported to the MECP Spills Action Centre (1-800-268-6060) in accordance with provincial and federal legislation.
6.2	Construction activities can lead to the accumulation of litter and debris within watercourses.	MTO	6.2.1	The Contractor shall take all necessary precautions to prevent the accumulation of litter and construction debris within watercourses, per OPSS 182.
7.0 Contamination and Waste Management				
7.1	Exposed soils and/or stockpiles of excess material located onsite may potentially leave the site and impact environmentally sensitive areas.	MECP	7.1.1	Management of excess material outside the right-of-way, stockpiling and wood management will depend upon local circumstances and be managed per Tender Documents and OPSS 180 - Management of Excess Materials.
7.2	Designated substances may be present in on-site existing construction materials, which may pose a threat to the health and safety of the construction workers.	MECP	7.2.1	In accordance with the <i>Occupational Health and Safety Act</i> , R.S.O. 1990, c. 0.1, Special Provision No. 101F21, <i>Occupational Health, and Safety Act</i> Compliance, has been added to the Contract Package to advise the Contractor of the presence of the following Designated Substance(s): <ul style="list-style-type: none"> • Silica is assumed present throughout the working area including, but not limited to, all concrete and masonry products, materials, and finishes; • Arsenic – guiderail wood posts • Lead – guiderail and steel coatings

ID #	Issues/Concerns/Potential Affects	Concerned Agencies	ID #	Mitigation/Protection/Monitoring
8.0 Noise During Construction				
8.1	Improper maintenance of construction equipment can cause excessive noise that may disturb neighbouring residents.	Nearby Residents and Businesses City of Barrie	8.1.1	The Contractor is required to maintain equipment in an operating condition that prevents unnecessary noise, including but not limited to non-defective muffler systems, properly secured components, and the lubrication of moving parts, per SSP 199F33 – Construction Noise Constraints.
			8.1.2	Idling of equipment shall be restricted to the minimum necessary to perform the specified work, per SSP 199F33 – Construction Noise Constraints.
9.0 Air Quality				
9.1	It is anticipated that dust and emissions from machinery will be generated during construction.	MECP MTO	9.1.1	Odour and fume impacts will be minimized by ensuring that all equipment is properly maintained and that all pollution control devices on the equipment are operational and properly maintained.
			9.1.2	Dust shall be controlled as per OPSS. PROV 100 – MTO General Conditions of the Contract (GC 7.07).
10.0 Traffic Operations				
10.1	Project work will temporarily disturb normal traffic operations on Highway 400, Anne Street and other affected local roads. Safety of construction workers, motorists and pedestrians is of primary concern.	MTO Motorists Local Municipalities Nearby Commercial Businesses Emergency Services	10.1.1	Temporary disruption to traffic shall conform to the stipulated access, lane closures, ramp closures, and various restrictions set out on the SSP 199F01 - Temporary Roadway Closures.
			10.1.2	Per Notice to Contractor – Notification of Local Authorities of Detours, the Contractor shall notify identified emergency services and the City of Barrie in writing at least 14 days in advance of the implementation of each detour required for the Highway 400 and Anne Street Closures including which detour routes will be used and when and for how long each detour will be in use.
			10.1.3	The Contractor shall notify in writing and provide the detour route and signage plan to the Contract Administrator and City of Barrie at least two (2) weeks in advance of the detour route and signage work on Municipal roads, per Notice to Contractor – Notification of Road Closures and Staging Changes.
11.0 Cultural Environment				
11.1	During construction, there is a chance of encountering buried archaeological material.	Ministry of Heritage, Sport, Tourism and Cultural Industries (MHSTCI) Ministry of Indigenous Affairs (MIA)	11.1.1	If this occurs, the Contractor shall immediately stop all construction activities in the area and contact the office of the Heritage Operations Unit MTSTCI (416-314-7159). If unmarked human remains are uncovered, the provisions of the <i>Ontario Cemeteries Act</i> apply. The Contractor shall immediately stop all construction activities in the area and contact the office of the Heritage Operations Unit, MTSTCI the Registrar of Cemeteries (416-326-8394), the local Ontario Provincial Police (OPP) and the local Coroner.

5.0 FOLLOW UP AND COMPLIANCE MONITORING

On-site contract administration/inspection staff (retained by MTO) will be responsible for inspecting the construction area and for ensuring that the construction contractor complies with all environmental, operational constraints, has all required environmental permits/approvals and has all required environmental protection measures properly sited, installed and maintained as per the Construction Contract.

The Contract Administrator and their inspectors will be responsible for monitoring the Contractor's operations on a day-to-day basis as per the MTO *Construction Administration and Inspection Task Manual*. The Contract Administrator's inspectors will be responsible for maintaining an environmental diary, which will include a daily recording of activities related to the environment, such as the condition and effectiveness of erosion and sedimentation control measures and weather conditions.

The Contract Administrator's Environmental Specialist (Environmental Monitor) shall conduct regular site inspections for the duration of construction, to ensure environmental compliance with contract documents.

6.0 REFERENCES

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- McIntosh Perry. 2020. Fish and Fish Habitat Existing Conditions and Impact Assessment Report. Replacement of Highway 400 Anne Street Underpass Structure (Site 30-347), Rehabilitation/Reconstruction of Highway 400 from south of Anne Street to north of St. Vincent and Installation of Noise Walls, Barrie, Ontario. October 2020. 90p.

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