

## MEMORANDUM

To Asha Saddi  
Technical Analyst  
Infrastructure Programming and Studies  
Transportation Division, Public Works  
Region of Peel

From Daryl Rideout, Amec Foster Wheeler

Tel 905-568-2929

Fax 905-568-1686

Date December 13, 2017

Project no. TP115085

**Subject Preliminary Design: Aquatic and Terrestrial Impact Assessment for the Widening of Mississauga Road from Financial Drive to Queen Street West, City of Brampton, Ontario.**

### 1.0 BACKGROUND

The Region of Peel is proposing the widening of approximately 4.5 km of Mississauga Road (Regional Road 1) extending from 300 metres (m) north of Financial Drive to 100 m south of Bovaird Drive (Regional Road 107), within the City of Brampton (Figure 1). Amec Foster Wheeler Environment & Infrastructure, a Division of Amec Foster Wheeler Americas Limited (Amec Foster Wheeler) has been retained to undertake a Schedule “C” Municipal Class Environmental Assessment (Class EA) study for the proposed road widening of a portion of Mississauga Road extending from approximately 2.0 km from Financial Drive to 150 m north of Queen Street West (Regional Road 6). The works will involve the widening and reconstruction of Mississauga Road from 4 to 6 lanes and the replacement of the existing crossing structures within the study area to accommodate the widened roadway.

This Aquatic and Terrestrial Impact Assessment memorandum has been prepared in support of the Class EA to determine potential positive and negative environmental impacts and provide mitigation measures that eliminate or minimize these impacts. The impact assessment was based on existing conditions derived from Amec Foster Wheeler’s Terrestrial Habitat and Aquatic Habitat Existing Conditions Reports dated April 2017 and evaluated using the preliminary design footprint. To determine potential impacts, the proposed grading limits and project footprint were overlaid on aerial imagery, and impacted areas were calculated. The calculated impact areas are illustrated in Figure 2.

The project area includes approximately 2.0 km of Mississauga Road and is under the jurisdiction of the Credit Valley Conservation Authority (CVC) and the Aurora District Ministry of Natural Resources and Forestry (MNR). The majority of the study area is comprised of anthropogenic land uses, but there are also sizable areas of deciduous forest and meadow marsh present. The site is located within the Credit River Watershed.

Aquatic habitat surveys identified two watercourse crossings in the study area and two cross drainage features. The two watercourses include: a bridge structure at the Credit River (Crossing C1) and a corrugated steel pipe culvert at an unnamed tributary to the Credit River (Crossing C2). Data from background sources identify the Credit River as a permanent watercourse with a coolwater thermal regime and has been assigned a 'High' sensitivity in the vicinity of the project area, due to the presence of Redside Dace, a Species at Risk (SAR) provincially and federally listed as 'Endangered'. The unnamed tributary to the Credit River is identified as having an intermittent flow and providing indirect fish habitat and periodic contributions to downstream reaches.

During field investigations, two SAR were observed within the study area, including Barn Swallow observed nesting on the Mississauga Road Bridge over the Credit River. The areas of deciduous forest may provide suitable habitat for SAR bats. Other terrestrial features of note include sizable areas of deciduous forest and a Provincially Significant Wetland.

For more details relating to aquatic and terrestrial existing conditions for this project, including potential presence for Species at Risk and MNRF correspondence records, please refer to Amec Foster Wheeler's *Preliminary Design: Widening of Mississauga Road from Financial Drive to Queen Street West, Brampton, Ontario – Terrestrial Habitat Existing Conditions and Fish and Fish Habitat Existing Conditions Reports* dated April 2017.

## **2.0 AQUATIC IMPACTS**

The proposed scope of work includes the replacement of the existing crossing structures on site to accommodate the widened roadway. The improvements, extension or replacement of the crossing structures will require 'in-water' works which will result in temporary and permanent impacts.

Sections of both drainage features will need to be dewatered to permit works to occur 'in-the-dry'. To complete work 'in-the-dry' cofferdams and bypass pumping and/or flumes will be utilized to isolate the work areas from the surrounding watercourse. Isolating sections of the creek may leave fish stranded within work areas. As such, fish rescue will be required to move fish from the work areas to areas upstream prior to the dewatering and construction activities.

During the works, runoff from construction activities may lead to a temporary increased risk of sedimentation and deposition of deleterious materials to the watercourse due to increased area of exposed soil and stockpiled materials. This poses an increased risk of siltation and surface water turbidity which would be harmful for fish. Spills and leaks such as concrete outwash and other deleterious substances (e.g., salt, paint, solvents, oil and grease) during construction could enter the river and contaminate the water. Additionally, the limited temporary and/or permanent removal of riparian vegetation will be required. Vegetation removals can result in a temporary increase in erosion and sedimentation risk, and instability in channel banks. Vegetation removal may also cause a temporary loss of overhead cover for fish and could result in increased water temperatures, instability in channel banks. The potential for such effects is low if appropriate mitigation and environmental protection planning measures are applied consistent with Ontario Provincial Standards.

The extension of the culvert at Crossing C2 will result in a greater area of enclosed channel, leading to a net decrease in productivity of the watercourse within the ROW area. There is also potential for localized changes in hydrology and water quality due to the increase in impervious surfaces in the vicinity of the watercourses. The proposed crossing structures are detailed in Table 2-1 below, and include the approximate temporary and permanent impacts areas associated with each structure.

**Table 2-1: Aquatic Impact Areas Associated with Replacement Crossings**

<b>Crossing ID</b>	<b>Existing Crossing Structure and Dimensions (m<sup>2</sup>)</b>	<b>Future Crossing Structure and Dimensions (m<sup>2</sup>)</b>	<b>Impact Area (m<sup>2</sup>)</b>
<b>Crossing 1</b>	Span Bridge (68.58m span x 18.76m wide)	Extended Span Bridge (103m span x 29.20m wide)	1,721.04
<b>Crossing 2</b>	Corrugated Steel Pipe (CSP) Arch Culvert (1.4m x 0.9m)	CSP Arch Culvert (1.4m x 0.9m) with extension to accommodate widened roadway	TBD
<b>Crossing 3</b>	CSP Culvert	Extended CSP Culvert	Not fish habitat
<b>Crossing 4</b>	CSP Culvert	Extended CSP Culvert	Not fish habitat

### 3.0 TERRESTRIAL IMPACTS

#### 3.1 Wetlands

The Churchill-Norval Wetland Complex occurs partially within the study area, and will be impacted by the proposed works. Approximately 1862 m<sup>2</sup> is expected to be impacted along approximately 400 m of Mississauga Road east of the Credit River (Figure 2). The areas impacted are meadow marsh heavily dominated by invasive European Common Reed (*Phragmites australis* ssp. *australis*) with little to no native vegetation cover and no open water. Given these habitat features, the marshes likely do not provide habitat for wildlife like amphibians, turtles or specialized marsh-nesting birds. The widening of Mississauga Rd. may result in increased road mortality for any wildlife that are present in these areas.

There is an intermittent watercourse flowing through this wetland with a culvert passing under Mississauga Road. The project works could have temporary or permanent impacts on drainage into and through the wetland and this watercourse; however, major hydraulic changes to the wetland are not anticipated as there is currently a roadway bisecting the wetland. Additional grading and ditching will be avoided in areas adjacent to the roadway to minimize further draining of the wetland.

### 3.1 Vegetation

An assessment of the Preliminary Design indicates that the footprint of the proposed road widening will primarily impact land that is anthropogenically disturbed and manicured. A total of 6763 m<sup>2</sup> of natural and semi-natural habitats are expected to be impacted by the proposed works, which are summarized in Table 3-1 below. The location of the impact zones are shown in Attachment 2 and are summarized in Table 3-1. The areas of impact are located immediately adjacent to the existing road and are currently influenced by roadway disturbance. There will be no direct impacts beyond the adjacent roadway. The areas illustrated as impacts on a forest polygon may not necessarily indicate that all areas within the polygon contain trees and therefore tree removals may be less than shown. The golf course polygon has been included as a narrow area of impact and is only lightly manicured and resembles a cultural savannah habitat type.

**Table 3-1: Summary of Terrestrial Impact Areas**

<b>Vegetation Type</b>	<b>Area (m<sup>2</sup>)</b>	<b>Area (ha)</b>
Deciduous Forest	1840	0.1840
Cultural Meadow	1654	0.1654
Open Water (Credit River)	293	0.0293
Coniferous Cultural Plantation	456	0.0456
Meadow Marsh	1862	0.1862
Golf Course	658	0.658
<b>Total</b>	<b>6763</b>	<b>0.6763</b>

The impact areas are concentrated in the central section of the roadway study area and located primarily east of the Credit River. Impact to natural woody vegetation will occur in several areas, as well as impacts to planted trees in many other parts of the study area. A complete tree inventory will be completed during the detail design stage.

### 3.2 Terrestrial Wildlife

All the species observed are common, except for the Species at Risk discussed below, and the impact lands do not provide any specialized habitat. Within the study area the species identified are mostly common in the area and considered urban-tolerant. The one exception is Clay-colored Sparrow, but this species was observed in an area now under active construction and is not likely to be present any longer. The species present may still be impacted by vegetation clearing, or other construction activity despite being urban tolerant.

There are sizable areas of natural habitat on both sides of Mississauga Road east of the Credit River and wildlife may cross the road regularly to travel between these areas. Expansion of the road and associated increases in traffic volumes may increase the risk of road mortality. The existing bridge includes three spans of 22.86 m each. In the new bridge, the middle span will be increased to 46 m and the two end spans will be increased to 29 m. This will increase the ability for wildlife to cross underneath the bridge. The increase in the bridge span will in particular improve passage for small wildlife including reptiles and amphibians which may not be able to cross the roadway.

### 3.3 Species at Risk and Provincially Rare Species

Based on background information derived from secondary sources and field investigations, project works have the potential to impact several Species at Risk. Species observed during field investigations include Barn Swallow (*Hirundo rustica*) and Chimney Swift (*Chaetura pelagica*). Other potentially impacted species include Bank Swallow and four species of bats.

Additional Species at Risk and provincially rare species reported within the 10 km<sup>2</sup> grid encompassing the project study area and those which have a reported range including the project study area are reported in Amec Foster Wheeler's *Preliminary Design: Widening of Mississauga Road from Financial Drive to Queen Street West – Terrestrial Habitat Existing Conditions Report* dated April 2017. Based on the last observed date, habitat requirements and habitat available within the project study area, these additional Species at Risk have low or no probability of occurring at the site. As such, these species or their habitat are not expected to be impacted by project works.

A Barn Swallow nest was observed on the Mississauga Road Bridge over the Credit River, and Barn Swallow was observed several times throughout the study area. At the detailed design phase avian nesting investigations should be repeated to confirm the absence or continued presence of Barn Swallows and how many nests are present. In addition to the barn swallow nest on the Credit River Bridge, there is also a constructed Barn Swallow kiosk within the study area on the north side of Mississauga Road in the meadow marsh polygon. This structure is greater than 5 m outside the expected impact area and thus no impacts are expected to any swallows using the structure.

Chimney Swift was observed during the breeding bird surveys, including several individuals noted circling the brick building with a chimney (McMurphy Mill) on the south side of Mississauga Road between Embleton Road and the Credit River. This is a likely roosting or nesting chimney for Chimney Swift. There are no potential nesting or roosting sites within the impact area.

Bank Swallow was not observed during field investigations. At the detailed design phase avian nesting investigations should be conducted within 2 days prior to the commencement of work to confirm the absence of nests in natural banks or artificial structures within the impact area near the Credit River.

Four species of bat are classified as Endangered in Ontario (Tri-colored Bat, Little Brown Myotis, Northern Myotis, and Eastern Small-footed Myotis). All four species have the potential to occur within the deciduous forest habitats within the study area. Bat habitat can be impacted where deciduous forest disturbance is anticipated (see Attachment 2). These disturbance areas result in a total of approximately 1840 m<sup>2</sup>, of potential impact. To confirm bat use of the areas, acoustic surveys and habitat assessment surveys were recommended by the MNR. Due to the potentially lengthy period of time until detail design occurs, the MNR recommended conducting the studies during detail design.

## **4.0 MITIGATION**

### **4.1 Aquatic Mitigation Measures**

Specific mitigation measures to minimize and/or avoid significant short-term and long-term adverse environmental effects resulting from the proposed construction activities on fish and fish habitat include:

#### **4.1.1 Erosion and Sediment Control**

- Prior to commencement of works, design and implement standard Erosion and Sediment Control (ESC) measures, consistent with Ontario Provincial Standards and Specifications (OPSS) and maintain ESC measures through all phases of the Project until vegetation is re-established and all disturbed ground is permanently stabilized. The ESC measures should be installed to meet the following requirements:
  - All materials and equipment used for the purpose of site preparation and Project construction will be operated and stored in a manner that prevents any deleterious substance (e.g., petroleum products, silt, etc.) from entering a watercourse.
  - Vehicle maintenance and refueling shall be conducted a minimum of 30 m from the bank of the watercourses.
  - Construction material and excess materials shall be stored / stockpiled greater than 30 m away from the watercourses.
  - Stabilize stockpiles and embankments when not in use/as soon as possible following use, in order to prevent sedimentation to the watercourse.
  - A protocol to minimize spills/leaks and their impact to the environment should be provided in an Emergency Spill Response Plan. Routine inspections of the Project construction site should be conducted to ensure continued use and function of best management practices, mitigation measures and spill control and prevention measures. As appropriate, spills will be reported to the Ministry of Environment and Climate Change (MOECC) Spills Action Centre.
  - An environmental monitor is expected to be on site during project works to identify potential risks to the natural environment and ensure ESC measures remain functional at all times.
  - Staging of the Project will limit vegetation disturbance and minimize the amount of time disturbed soil is exposed.
  - Land drainage systems, whether naturally occurring or man-made are not to be used as receptors for any substance or material other than clean water complying with local municipal bylaws or storm water as intended.

- All disturbed areas of the work site should be stabilized and revegetated promptly, and/or treated with appropriate erosion protection materials. In riparian and aquatic habitats, all temporarily disturbed areas will be reinstated to original condition, or better, upon completion of works.
- Should the watercourse bed and/or bank be temporarily impacted as a result of construction activities, these areas should be rehabilitated to pre-construction condition.

Significant impacts to aquatic habitat in the vicinity of Mississauga Road are not anticipated as a result of project works. There is potential for localized changes in hydrology and water quality due to the increase in impervious surfaces; however, mitigation measures and best management practices are expected to prevent these changes from impacting aquatic habitat.

#### **4.1.2 Timing Restrictions**

- The Credit River supports warmwater, coolwater, and coldwater species within the Crossing C1 study area. The construction timing windows outlined in the Credit River Fisheries Management Plan (CVC 2002a) indicate that in-water works are not permitted from April 1 to June 14 (spring spawning period), or from September 16 to May 31 (fall spawning period). Contrary to DFO and provincial MNRF timing constraints which are applied to general regions, typical timing constraints applied by Aurora District MNRF for both cold and warmwater combined species is July 1 to September 30.
- All works within a 30 m buffer of the Credit River will also observe the in-water construction window as suggested by the Credit River Fisheries Management Plan (CVC 2002a).
- If in-water works are required beyond these timing constraints, a formal request to DFO and MNRF for exemption to work during the constraint period may be appropriate. Potential timing variances can also be discussed with MNRF.

#### **4.2 Terrestrial Mitigation Measures**

The following general mitigation measures can be utilized to protect and minimize impacts to the terrestrial habitats and wildlife species during construction:

- All construction debris and litter will be removed regularly.
- Minimize the disturbance or removal of trees, shrubs and vegetation
- In particular, minimize the disturbance or removal of riparian vegetation.
- Promptly stabilize and vegetate all disturbed areas of the work site, and/or treat the area with appropriate erosion protection materials.

- Where possible, tree protection measures should be used to preserve trees close to construction works.
- To minimize nesting birds from delaying construction during the breeding bird period, exclusion netting (or other deterrents) should be installed under the Credit River bridge to prevent birds from utilizing the bridge before demolition is scheduled.
- Any ditching that is not already present adjacent to Mississauga Road should be minimized to prevent additional drainage from the wetland.
- The replacement culvert proposed in this location should maintain or enhance existing passage for herpetiles which are likely to be inhabiting and/or utilizing the wetland in the vicinity of the crossing.
- Barn Swallow is provincially-designated as Threatened. As such, it is protected under the provincial Species at Risk legislation, which prohibits destroying critical or essential habitat for Threatened and Endangered Species at Risk. In order to avoid adverse affects to Barn Swallow and their habitat, mitigation measures should be applied, including adhering to breeding bird season restrictions. Creation of an artificial nest structure nearby will be required to compensate for the loss of Barn Swallow nesting habitat on the bridge over the Credit River. Replacement nests are required to be installed prior to the beginning of the breeding bird season (April 1 to August 31)

#### **4.2.1 Timing Restrictions**

- The Migratory Birds Convention Act (MBCA 1994) makes it unlawful to pursue, hunt, take, capture, kill or sell birds listed therein ("migratory birds"). Compliance with the MBCA regulations and guidelines for vegetation clearing or demolition, as recommended by Environment Canada, will be considered during the project's construction phase. In order to minimize the potential for incidental take of any nesting migratory birds, clearing of vegetation and any proposed work activities in migratory bird habitat must be undertaken outside of the active breeding season (mid-May to August 1 for Southern Ontario). In the event that clearing (or other work) is required during the nesting season, a nest survey must be conducted by a qualified avian biologist within 2 days prior to commencement of the works to identify and locate active nests of species covered by the MBCA.
- If bat species at risk are detected within the study area during detailed design, further mitigation measures such as bat boxes may be necessary. Any vegetation clearing should take place outside the active period for bats (April 1 to September 30), or at least the maternity period (June 1 to July 31).



## 5.0 CONCLUSIONS

There are two drainage features within the study area which provide fish habitat. Works should occur 'in-the-dry' and in-water works scheduled between July 1 to September 30 to protect both warm and coolwater species.

The study area is characterized by a mix of highly disturbed and manicured area as well as forests and marsh.

Two bird Species at Risk were observed within the study area (Barn Swallow and Chimney Swift). Both these species are listed provincially as Threatened and are protected under the *Endangered Species Act*. Cliff swallow nests are also reported from under the Credit River Bridge, exclusion measures will also be required to prevent the birds from returning during the breeding bird period.

Five other Species Risk have a high potential to occur within the study area (Bank Swallow and four species of bat). Based on the Preliminary Design footprint, impacts are expected on Barn Swallow and potentially on endangered bats. Ongoing consultation with MNRF will be required during the Detail Design phase to determine required mitigation measures and to confirm the presence/absence of any additional Species at Risk. Additionally, wildlife Species at Risk can move into an area at any given time and future inspections may be necessary.

Yours truly,

**Amec Foster Wheeler Environment & Infrastructure  
a Division of Amec Foster Wheeler Americas Limited**

Prepared by:



**Reuven Martin, B.Sc.**  
Amec Foster Wheeler  
Terrestrial Biologist

Reviewed by:



**Daryl Rideout, B.Sc.**  
Amec Foster Wheeler  
Environmental Biologist

Prepared by:



**Brittany Ferguson, B.Sc**  
Amec Foster Wheeler  
Environmental Biologist

Attachments: Figure 1 – Project Location and Site Map  
Figure 2 – Impact Assessment Map

## 6.0 REFERENCES

- AMEC. 2013. Preliminary Design: Proposed Westbound Ramp to Highway 403 from Mohawk Road City of Hamilton (Ancaster), Ontario Lincoln, Ontario – Terrestrial Ecosystem and Fish and Fish Habitat Existing Conditions Report.
- Lee, H.T., W.D. Bakowsky, J. Riley, J. Bowles. M. Puddister, P. Uhlig, and S. McMurray. 1998. Ecological Land Classification for Southern Ontario: First Approximation and its Application. Ontario Ministry of Natural Resources, Southcentral Science Section, Science Development and Transfer Branch. SCSS Field Guide FG-02. 225 pp.

**Attachment 1**

**Project Location and Site Map**

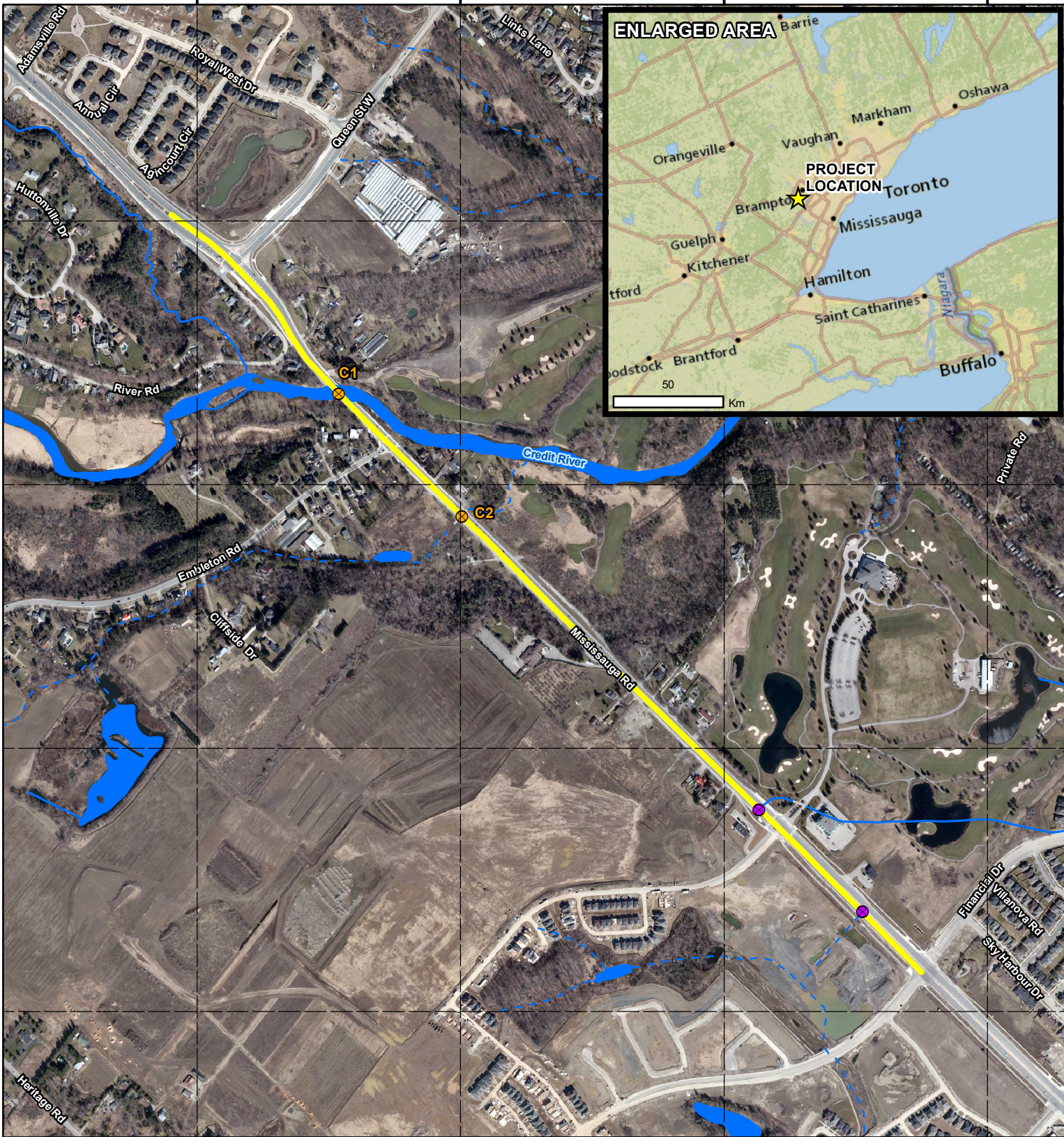


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**LEGEND**

- Watercourse Crossing
- Cross Drainage
- Project Location
- Permanent Watercourse
- Intermittent Watercourse
- Culvert / Bridge

**NOTES:**  
 - Background imagery from City of Brampton, Spring 2016  
 - Topographic features extracted from LIO, MNRF.



**MISSISSAUGA ROAD WIDENING PROJECT**

**Project Location**

Datum & Projection:  
NAD 1983 UTM Zone 17N



PROJECT N<sup>o</sup>: TP115085

FIGURE: 1

SCALE: 1:10,000

DATE: December 2017



4833500  
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**Attachment 2**  
**Impact Assessment**





596600 4833600 596800 4833400 597000 4833200 597200 4833000



**LEGEND**

- Study Area (120m Buffer)
- Impact Area Limit
- Right-of-Way
- - - Road Centerline
- Road Design
- Permanent Watercourse
- Intermittent Watercourse

**Impact Assessment**  
(summary area of ELC community in the entire study area)

- CUM: Cultural Meadow (1,654m<sup>2</sup>)
- CUP3: Coniferous Plantation (456m<sup>2</sup>)
- FOD7: Fresh - Moist Lowland Deciduous Forest Ecosite (1,840m<sup>2</sup>)
- MAM: Meadow Marsh (1,862m<sup>2</sup>)
- WATER (293m<sup>2</sup>)



**NOTES:**

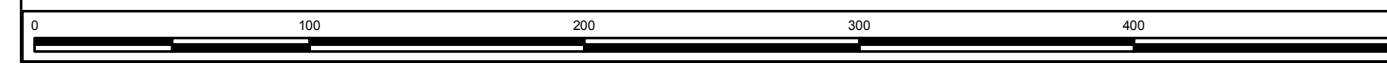
- Background imagery from City of Brampton, Spring 2016
- Topographic features extracted from LIO, MNRF.

Datum & Projection:  
NAD 1983 UTM Zone 17N

**MISSISSAUGA ROAD WIDENING PROJECT**

**Impact Assessment**

PROJECT N <sup>o</sup> : TP115085	FIGURE: 2a
SCALE: 1:2,750	DATE: December 2017



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- LEGEND**
- Study Area (120m Buffer)
  - Impact Area Limit
  - Right-of-Way
  - Road Centerline
  - Road Design
  - Permanent Watercourse
  - Intermittent Watercourse

- Impact Assessment**  
(summary area of ELC community in the entire study area)
- CGL-1: Golf Course (658m<sup>2</sup>)
  - FOD7: Fresh - Moist Lowland Deciduous Forest Ecosite (1,840m<sup>2</sup>)
  - MAM: Meadow Marsh (1,862m<sup>2</sup>)



**NOTES:**  
 - Background imagery from City of Brampton, Spring 2016  
 - Topographic features extracted from LIO, MNRF.

Datum & Projection:  
 NAD 1983 UTM Zone 17N

**MISSISSAUGA ROAD WIDENING PROJECT**

**Impact Assessment**

PROJECT N <sup>o</sup> : TP115085	FIGURE: 2b
SCALE: 1:2,750	DATE: December 2017

