



QEW Credit River Improvement Project

Design and Construction Report #2

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Public Record

This Design and construction Report (DCR) is available for a 30-day public review period inclusively between January 4, 2021 and February 3, 2021. It is available on the Project website.

<http://www.qewcreditriver.ca>

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To obtain additional information, provide comments on this Design and Construction Report, or if you have any accessibility requirements in order to participate in this Project, please contact us via the information below.

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Executive Summary

EDCO has been retained by the Ministry of Transportation (MTO) and Infrastructure Ontario (IO) to design, construct and finance of the Queen Elizabeth Way (QEW) Credit River Improvement Project, from west of Mississauga Road to west of Hurontario Street in the City of Mississauga. The Project is located within the Region of Peel and the Project Limits include a portion of the QEW highway that is approximately 2.6 km.

This Design and Construction Report (DCR) is the second DCR (DCR 2) for the Project. DCR 2 has been prepared to document the detail design for components of the Project that will be initiated in Spring 2021. DCR 2 addresses the environmental concerns, describes the environmental and engineering mitigation and protection measures that were developed to address environmental concerns, and describes the external consultation with key stakeholders and governmental authorities. The preparation of DCR 2 fulfills the documentation requirements for a Group 'B' Project under the MTO Class Environmental Assessment for Provincial Transportation Facilities (2000) (MTO Class EA).

Consultation for the Project is following the process for a Group 'B' project and involves extensive consultation throughout. Building upon the previous consultation efforts by MTO, EDCO will continue to consult with local stakeholders and Government Authorities throughout the Project and in accordance with MTO's Class EA.

A description of the works to be initiated in early 2021 is presented in Section 3. This phase of the Project construction is focused on site preparations and utility relocations initiated by MTO, early stage traffic staging, local road works on Premium Way and South Sheridan Way, construction of the new Credit River bridge, and replacement of the Mississauga Road Overpass. Site preparation will include clearing and grubbing and installation and implementation of environmental protection measures.

Section 3.2 outlines the environmental concerns and commitments for the work being initiated in 2021. These commitments are also presented in Table 3-2 (Section 3.3), which carries forward the environmental assessment (EA) commitments from previous design and EA stages of the Project. Key environmental commitments are linked to the Permits, Licences, Approvals and Authorizations (PLAAs) for fisheries, species at risk, permit to take water; and, environmental management plans to be used as guidance and directives during design and construction for the Project.

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List of Acronyms

AA	Archaeological Assessment
AMP	Access Management Plan
ANSI	Area of Natural and Scientific Interest
BMP	Best Management Practices
CA	Contracting Authority
CAHP	Canadian Association of Heritage Professionals
CGP	Clearing and Grubbing Plan
CNWA	Canada Navigable Water Act
CRA	Commercial/ Recreational/ and or Aboriginal (Fishery)
CVC	Credit Valley Conservation
DBB	Design Bid Build
DBF	Design Build Finance
DCR	Design and Construction Report
DFO	Fisheries and Oceans Canada
EA	Environmental Assessment

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EAA	Environmental Assessment Act
EC	Environment Canada
EASR	Environmental Activity and Sector Registry
EBL	East Bound Lane
EHS	Environmental Health and Safety
ER	Elizabeth Royal
ESA	Endangered Species Act
ESCP	Erosion and Sediment Control Plan
GA	Government Authority
HONI	Hydro One Networks Inc.
IO	Infrastructure Ontario
LOA	Letter of Advice
MBCA	Migratory Birds Convention Act
MECP	Ministry of Environment, Conservation and Parks
MENDM	Ministry of Energy, Northern Development and Mines
MHSTCI	Ministry of Heritage, Sport, Tourism and Culture Industries
MNRF	Ministry of Natural Resources and Forestry
MMAH	Ministry of Municipal Affairs and Housing
MP	Member of Parliament
MPP	Member of Provincial Parliament
MTO	Ministry of Transportation
NPP	Navigation Protection Program
NSA	Noise and Vibration Sensitive Area
OMAFRA	Ontario Ministry of Agricultural and Rural Affairs
OPSD	Ontario Provincial Standard Drawing
OPSS	Ontario Provincial Standards and Specifications
P3	Public Private Partnership
PIC	Public Information Centre
PLAA	Permits, Licences, Approvals and Authorizations
PSW	Provincially Significant Wetlands
PTEC	Permission to Enter and Construct
PTTW	Permit to Take Water
QEW	Queen Elizabeth Way
SAR	Species at Risk
SARA	Species at Risk Act
SWM	Stormwater Management

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TC	Transport Canada
TESR	Transportation Environmental Study Report
TNPI	Trans-Northern Pipelines Inc.
TPA	Technically Preferred Alternative
WBL	West Bound Lane

1 Overview

1.1 Summary Description of the Undertaking

The Queen Elizabeth Way (QEW) was built as a four-lane highway from Toronto to Niagara Falls and Fort Erie and is Canada's first superhighway. The highway was dedicated the QEW in 1939 and officially opened in 1940. The QEW is a critical component of the provincial highway network and is one of Ontario's most important transportation facilities in terms of commuter and trade traffic – carrying more than 200,000 vehicles per day. The 250 metres long QEW Credit River Bridge, located in the City of Mississauga, is over 80 years old and recent investigations of the bridge determined that it is in need of major repair. To address the condition of the QEW Credit River Bridge and the future transportation requirements of this segment of the QEW, the Ministry of Transportation Ontario (MTO) has identified improvements to approximately 2.6 km of the QEW from west of Mississauga Road to west of Hurontario Street including the Credit River crossing (Figure 1).

Figure 1: Project Limits



The Project involves the finalization of detail design, construction and financing of the following works:

- Rehabilitation of the QEW Credit River Bridge (for eastbound traffic)
- Construction of a new westbound Credit River Twin Bridge to the north of the existing bridge
- Improvements to the QEW highway geometrics
- Improvements/reconfiguration of the Mississauga Road interchange
- Replacement of the QEW overpass at Mississauga Road
- Drainage and stormwater management improvements
- Noise walls for both the new and existing QEW Credit River Bridge, as well as new (relocated and replaced) noise walls from Lynchmere Avenue to east of Mississauga Road
- Illumination
- Replacement of the Kenollie and Stavebank Creek culverts
- Realignment of Premium Way
- Relocation of utilities to facilitate construction
- New active transportation facilities and associated trail connections including a multi-use path on Mississauga Road and new trail connections under the existing Credit River Bridge and over the Credit River near Stavebank Road
- Continuation of two east bound auxiliary lanes from Mississauga Road

1.2 Environmental Assessment Process and Project History

The purpose of Ontario's Environmental Assessment Act (EAA) is to help protect and conserve Ontario's environment by ensuring that projects subject to the Act follow a planning process leading to environmentally sound decision making. The Ministry of Transportation (MTO) Class EA for Provincial Transportation Facilities (2000) (MTO Class EA) outlines the environmental assessment process to be followed for specific groups of provincial transportation Projects. The MTO Class EA is a planning document approved under the EAA that provides a streamlined process that projects or activities within a defined "class" must follow. Provided this process is followed, projects and activities included under the MTO Class EA do not require formal review and approval under the EAA. This Project is following the requirements of the Group 'B' process under the MTO Class EA.

In 2013, the MTO completed a preliminary design study for a Group 'B' Project under the MTO Class EA to determine a long-term strategy to address the rehabilitation needs of the QEW Credit River Bridge and future transportation requirements for the QEW from west of Mississauga Road to west of Hurontario Street. The preliminary design and EA study resulted in the development of a technically preferred alternative (TPA) which included rehabilitation of the existing QEW Credit River Bridge structure and twinning to the north. The results were documented in a Transportation Environmental Study Report (TESR), *Queen Elizabeth Way (QEW) from West of Mississauga Road to West of Hurontario Street, Preliminary Design and Class Environmental Assessment Study* (GWP 08-20008). June, 2013.

In 2017 a detail design assignment was initiated to prepare the Project for implementation as a Design-Bid-Build (DBB) contract. Between 2017 and 2019 additional environmental investigations, impact assessment and agency/public consultation was completed in support of this detail design. In 2019, MTO and IO initiated the procurement process for the Design, Build, Finance (DBF) Public-Private Partnership (P3) delivery model for the Project.

To facilitate the construction of site access and enable works to occur outside the sensitive environmental timing window, the MTO prepared the first Design and Construction Report for the QEW Credit River Improvement Project (DCR 1) during the procurement period. DCR 1 was completed in accordance with the MTO Class EA process and filed for 30-day public review (June 2020) to cover the advanced works for the Project and to complete the Five-Year review of the TESA. No significant changes were identified during the five-year review of the TESA; therefore, a TESA addendum was not warranted.

As a result of the P3 procurement process, EllisDon Capital Inc. and Coco Paving Inc. Joint Venture ('EDCO') was selected as the private sector consortium ('Project Co') responsible for the final design, construction, and financing of the Project through a single contract. EDCO will advance the Project and is responsible for fulfilling the detail design obligations defined in the TESA including environmental mitigation measures, continued consultation and filing this and future DCRs. Upon completion of the DCR review period, and subject to acquiring the necessary permits, approvals and authorizations, EDCO will issue Environmental Clearance to allow construction of the works included in this DCR to commence.

EDCO are also responsible for construction of the Project. Responsibility for the long-term maintenance and operation of the QEW and Credit River Bridge once the Project is complete will remain with MTO.

1.3 Purpose of Report

This DCR has been prepared to document the detail design for works to be initiated by EDCO in Spring 2021, address the environmental concerns that were identified for those works, describe the environmental and engineering mitigation and protection measures that have been developed and considered to address environmental concerns, and describe the public and agency consultation completed to date. The preparation of this DCR fulfills the documentation requirements for a Group 'B' Project under the MTO Class EA process.

As noted, this DCR focuses on the works being initiated in Spring 2021 which includes:

- Site preparations such as construction of site access, vegetation removal, and installation of environmental protection measures;
- Road and utility works on QEW, Mississauga Road and Premium Way; and
- Construction of the new QEW Credit River bridge.

A detailed description of the works included in this DCR is provided in Section 3. Future DCR(s) will be prepared as needed and to capture works associated with landscaping and ecological restoration within the Project limits as well as the rehabilitation work to be completed on the existing Credit River Bridge.

2 Consultation Process

Consultation is an integral component of the MTO Class EA process as it provides a protocol to share information, generate ideas, identify stakeholder issues and is essential to the successful completion of the study. Consultation is considered to be effective when it strives to be inclusive, timely and clear, and aims to achieve the following goals as outlined in the MTO Class EA:

- Identify public concerns and values.
- Identify agency concerns.
- Collect information about the existing environment.
- Involve stakeholders, government and the public in the generation and evaluation of alternatives.
- Provide relevant information regarding decisions and potential effects.
- Provide regulatory compliance regarding the EA process.

A significant amount of consultation was undertaken during the preliminary design and initial detail design activities completed by MTO between 2010 and 2020 (Section 2.6). The primary tools and techniques used to facilitate the consultation process through preliminary design, detail design and this design-build phase included: Public Notifications, Project Website, Community Workshops and Public Information Centres (PICs).

During the current Design-Build phase, consultation will take place in accordance with the consultation principles outlined in the MTO Class EA and will provide a process for external consultation with Governmental Authorities (GAs), public stakeholders and engagement with Indigenous communities. Opportunities are provided at key stages during the Project to provide input and obtain information about the Project.

EDCO's consultation plan fosters a two-way dialogue with interested stakeholders and provides a process that is transparent, open, traceable, timely, accountable, respectful and defensible. Consultation activities are customized for each of the two phases of the Project: Design Phase and Construction Phase.

Design Phase Consultation: is intended to reach potential affected and interested stakeholders to provide them with Project information; obtain input and feedback on the design; and be responsive to concerns raised. Engagement with GAs will facilitate information exchange for the purposes of satisfying environmental legislative requirements. EDCO will engage GAs as described in the DCRs to negotiate and secure necessary PLAA to reflect EDCO design refinements if required. EDCO will consider all comments received through stakeholder review of this DCR 2 and provide

responses directly to commenters. A summary of the DCR 2 feedback received by EDCO will be included in future DCRs, and available through the project website.

Construction Phase Consultation: is intended to maintain awareness about construction activities and be responsive to concerns raised. Consultation during construction is anticipated to focus on compliance with EDCO PLAAs and provide regular updates regarding traffic staging, construction milestones and monitoring and site inspection efforts.

2.1 External Agencies and Municipalities

2.1.1 Government Authority Meetings

Meetings with Government Authorities (GAs) are to be held on a regular basis throughout the Project term. These meetings are attended by qualified representatives from EDCO and the individual Governmental Authorities. Additionally, Environmental Workshops with focused participants are carried out where necessary and appropriate on an ad-hoc basis. Governmental Authorities being consulted during the Project include, but are not limited to:

- Department of Fisheries and Oceans (DFO)
- Ministry of Heritage, Sport, Tourism and Culture Industries (MHSTCI)
- Ministry of Natural Resources and Forestry (MNRF)
- Ministry of Environment, Conservation and Parks (MECP)
- Transport Canada, Navigation Protection Program (TC, NPP)
- Environment Canada (EC)
- Ministry of Municipal Affairs and Housing (MMAH)
- Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA)
- Ministry of Indigenous Affairs (IAO)
- Ministry of Energy, Northern Development and Mines (MENDM)
- Metrolinx / GO Transit
- Credit Valley Conservation (CVC)
- City of Mississauga
- Region of Peel

2.2 Indigenous Communities

The following Indigenous communities have been engaged by the MTO throughout the study. Each community was notified at each of the key milestones:

- Six Nations of the Grand River.

- Huron-Wendat Nation.
- Mississaugas of the Credit First Nation.
- Haudenosaunee Development Institute.

The MTO continues to engage with these communities throughout the design and construction phases of this Project with support from EDCO.

2.3 Public

As part of the consultation process, EDCO will continue to consult with key public stakeholders, which includes property owners directly impacted by the proposed works, users of the QEW highway and other roadways included in the Project, businesses and community interest groups. These public stakeholders will be informed of the Project through inclusion on the Project contact list and notified of opportunities to participate in the Project at key stages including future PICs and DCRs.

2.4 Project Notification

A Project notice advising of the DCR 2 submission was published in English in the Toronto Star on December 19, 2020, and in the Mississauga News and Le Métropolitain on December 17, 2020. Letters to everyone on the Project contact list including relevant GA's, Indigenous communities, municipalities, emergency services, interest groups and stakeholders were distributed by email and mail on December 17, 2020. A copy of the Project's DCR 2 notification is included in Appendix A.

In addition, Project flyers were distributed through Canada Post to each of the mail carrier routes listed in **Table 2-1** advising of the filing of DCR 2 .

Table 2-1: Mail Carrier Routes for Project Notifications

L5A	L5B	L5C	L5G	L5H
LC0316	LC0320	LC0001	LC0142	LC0123
LC0318	LC0322	LC0002	LC0143	LC0125
LC0320	LC0324	LC0004	LC0144	LC0129
	LC0327	LC0005	LC0145	LC0130
	LC0329		LC0146	LC0134
	LC0331			LC0136
				LC0137

2.5 Project Website

A Project website (www.qewcreditriver.ca) has been set up to provide information to interested parties and to provide a means for the public to directly contact the Project Team via email at any time during the design and construction phases.

The website hosts all pertinent Project information such as notices, and reports for public review. The website also includes a “Contact Us” feature to allow the public to submit comments and questions.

The website includes materials prepared through the preliminary design phase of the Project and those prepared by MTO during the initial detail design work. Content of the website is provided under the following general headings:

- Project Overview
- Environmental Assessment Process
 - QEW Transportation Environmental Study Report (June 2013).
 - Notice of DCR 1 Submission.
 - DCR 1 – Advance Works (June 2020)
 - Notice of Works on Non-Schedule Waters (June 2020)
 - Notice of DCR 2 Submission.
 - DCR 2 – New Credit River Bridge / Work Beginning 2021 (January 2021)
- Public Consultation
- Contact Us
- Frequently Asked Questions (FAQs).

2.6 Preliminary Design Consultation Summary

Consultation was initiated by the MTO in 2010 during preliminary design in accordance with the MTO Class EA process for a Group ‘B’ project. The results of this phase of consultation are documented in Section 3 of the Transportation Environmental Study Report (TESR) filed for public review in 2013 and available on the Project website. Public consultation during preliminary design involved the following components:

- 2010: Notice of Study Commencement and publication of Notice (OGN) in local newspapers, and launching of the Project website.
- 2010-2012: Three (3) Public Information Centres (PIC) and Three (3) Community Workshops. Notifications for the PICs were issued similarly to the

Notice of Study Commencement, while community workshops were attended by direct invitation to key community stakeholders.

In addition to consultations with public stakeholders and interest groups, the MTO also engaged with GAs, Indigenous communities and utility providers. This involved various meetings and consultations throughout the preliminary design study and is documented in Section 3 of the TESR.

The TESR was filed for a 45-day public review period between June 4 and July 19, 2013. This period allowed for comments to be received on the preliminary design.

2.7 Detail Design Consultation Summary To Date

In 2017 and 2018, MTO held public meetings to gather information as part of the initial detail design process. That information has been considered in the development of EDCO's design and was provided via:

- Stakeholder responses to the 2017 Notice of Study Commencement
- Stakeholder comments and feedback provided at 2 PICs and 2 community workshops.

Consultation during the P3 process which was initiated in early 2019 was also completed and included a PIC on November 7, 2019 specifically to present the option of replacing the existing Credit River Bridge. In response to stakeholder feedback provided at this November 2019 PIC, the option of replacing the existing Credit River Bride was discontinued.

In 2020, MTO initiated consultation building on the earlier preliminary and detail design activities and to consult on the advanced works that began in July 2020. The consultation process is documented in Section 2 of DCR 1. Similar to preliminary design, this process followed the MTO Class EA process for a Group 'B' project. The primary tools and techniques for engagement included: public notifications and presenting information on the Project website. Engagement opportunities involved local elected officials, agencies Indigenous groups and the general public.

The MTO received 38 comments related to the QEW Credit River Improvement Project and in response to DCR 1 which documented the advanced works. Comments on DCR 1 generally focused on:

- Requests for more information and to be added to or update the contact list
- Project and construction schedule
- Construction staging, traffic and access

- Property impacts
- Specific design details related to: Commemorative strategies; Active transportation as it relates to crossings and trails; QEW interchanges
- Recommendations for site restoration
- P3 Process and Design-Build details
- Utility relocations including pipeline works with Trans-Northern Pipelines Inc. (TNPI).

Additional comments were also provided to MTO regarding the TNPI pipeline work and the associated valve compound which were approved through the Canadian Energy Regulator under a separate approval process.

All comments received a response from MTO.

2.8 Detail Design Consultation Still To Occur

EDCO will continue consultation on the Project by reviewing and responding to stakeholder and GA input throughout. The Project website will be maintained and updated frequently with information regarding the Project. EDCO will issue Project notifications, newsletters and flyers for key design milestones, including public meetings, and public review periods for future DCR(s).

EDCO has reviewed all comments provided in response to the Project. EDCO has considered these comments in advancing the detail design for work documented in DCR 2 and will continue to consider these comments in developing detail design for the remaining components of the Project that will be captured in future DCR's and the subject of future PICs.

3 Detailed Description of the Recommended Design

The Project is being constructed in 3 key phases. The first phase was initiated by MTO in Summer 2020 with the completion of DCR 1. Work included in DCR 1 consisted of installation of cofferdams and access routes on the east and west sides of the Credit River, minor archaeological work within the Credit River and erection of environmental protection measures in areas within the Credit River Valley. EDCO are responsible for phase 2 and 3 works.

EDCO will initiate the second phase of work for the Project in 2021. This largest phase of the project is the focus of this DCR and includes construction of the new Credit River Bridge, the trail connections and active transportation crossing of the QEW and, improvements to regional or municipal roads within the Project limits including replacement of the Mississauga Road overpass. A summary of the construction sequencing and staging for work included in this DCR is provided in **Appendix B**. The detail design of the work to be completed is provided in **Appendix C**.

Phase 3 work will be documented in future DCR(s) and will include: rehabilitation of the existing Credit River Bridge with active transportation crossing of the River; landscaping and ecological restoration with commemorative displays; and, any refined or new design components for active transportation, roadway or highway improvements for the Project not covered in this DCR.

3.1 Major Features of Work included in DCR 2

DCR 2 has been developed to capture EDCO's design of Project components detailed in the sections below. DCR 2, covering Phase 2 work includes:

- Site preparations such as construction of site access, vegetation removal and installation of environmental protection measures;
- Road and utility works on QEW, Mississauga Road, South Sheridan Way and Premium Way; and,
- Construction of the new QEW Credit River bridge.

3.1.1 Site Preparation Work

The site preparation work builds upon Phase 1 work completed by MTO to further establish work areas within the Project limits including: clearing and grubbing of vegetation; installation of environmental protection measures; construction of access routes and laydown areas; and, road improvements such as shoulder strengthening on the QEW to support traffic staging.

The limits of clearing and grubbing have been developed based on the areas required for construction operations such as access routes and laydown areas as shown on Figure 2 to **Figure 5**. EDCO have minimized removals to the extent possible and in consideration of the sensitive environmental areas within the Project Limits and the environmental approvals for the Project.

Construction staging and access design associated with the Phase 2 works beginning in 2021 has also been completed. The environmental protection measures that will minimize impacts to the environment for Phase 2 works have been defined (**Figure 2 to Figure 5**).

3.1.2 Road and Utility Works

3.1.2.1 Queen Elizabeth Way

Road work on the QEW presented in this DCR includes roadway improvements from west of Mississauga Road to west of Hurontario Street for a distance of approximately 2.6 km. Improvements include reconstruction and resurfacing the QEW, construction of additional auxiliary lanes, replacement of the existing median and storm sewers and relocation or replacement of the existing noise walls. These improvements will contribute to safety and operational improvements along the QEW and require the mainline QEW to be shifted slightly to the north within the right-of-way (**Figure 7**).

To facilitate construction of these improvements, site preparation works involving shoulder strengthening and installation of additional asphalt on the shoulders of the QEW in both directions is required. Areas that require shoulder strengthening are shown in **Appendix B** and include:

- Westbound lanes from the west Project limit for approximately 450 m;
- Westbound lanes between Mississauga Road exit and entrance ramps;
- Westbound lanes around Dickson Road for approximately 200 m;
- Westbound lanes from east Project limit for approximately 400 m;
- Eastbound lanes from west Project limit for approximately 275 metres;

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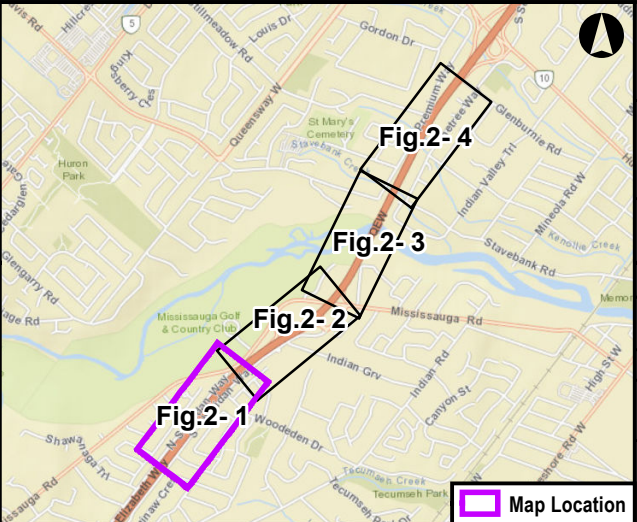
January, 2021

- Eastbound lanes between the Mississauga Road exit and entrance ramps to South Sheridan Way; and,
- Eastbound lanes around the Kenollie Creek culvert crossing.



Legend

- Heavy Duty Silt Fencing
- Light Duty Silt Fencing
- Tree Protection
- Culvert
- Permanent Stream
- Intermittent Stream
- River
- Access Road
- Lands Limit
- Launch Pad, Work Areas and Laydown Area



QEW Credit River Project

Access Roads, Laydown Areas and Environmental Protection Measures

0 10 20 40 60 80 100 120 140

Meters

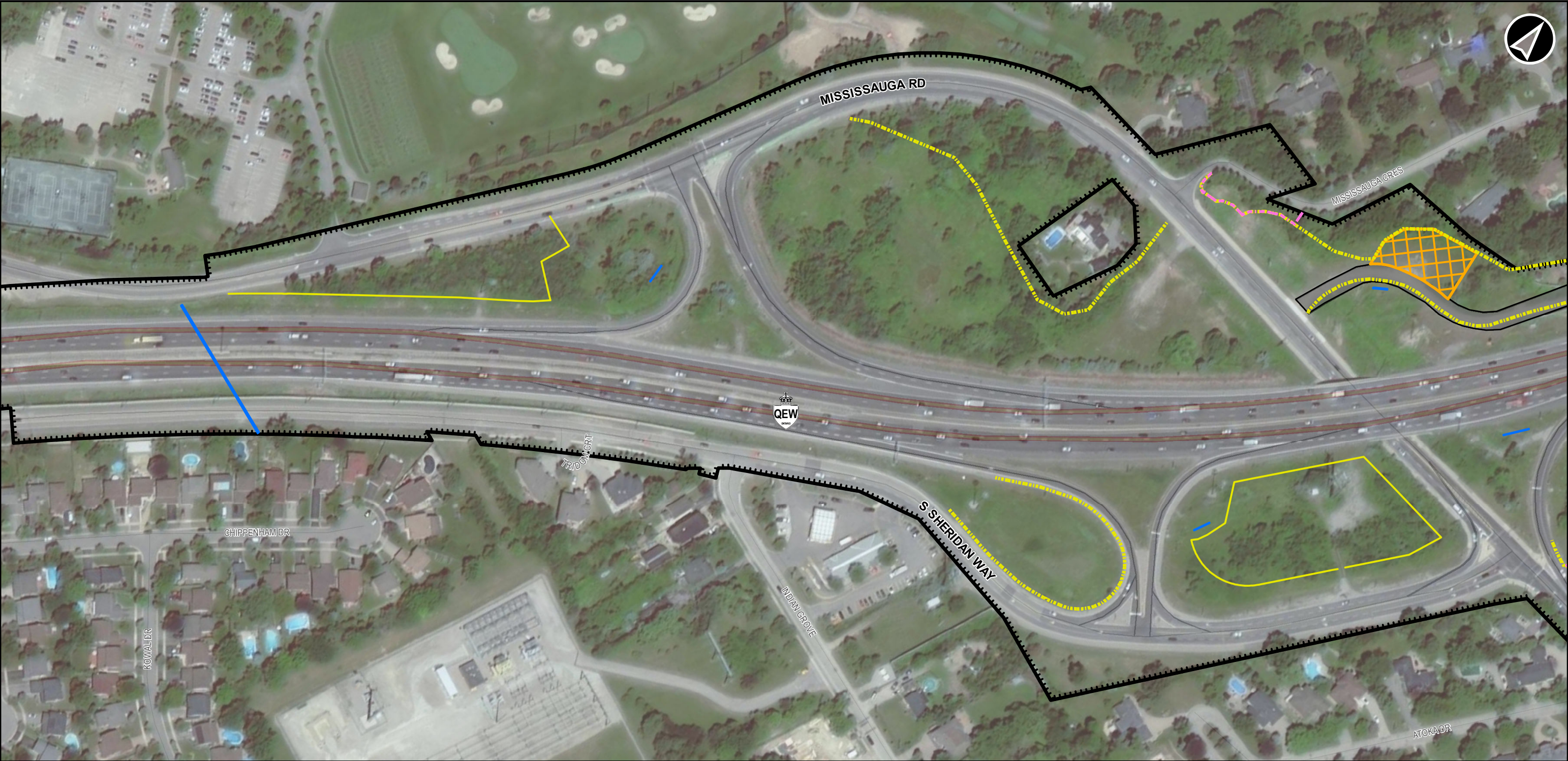
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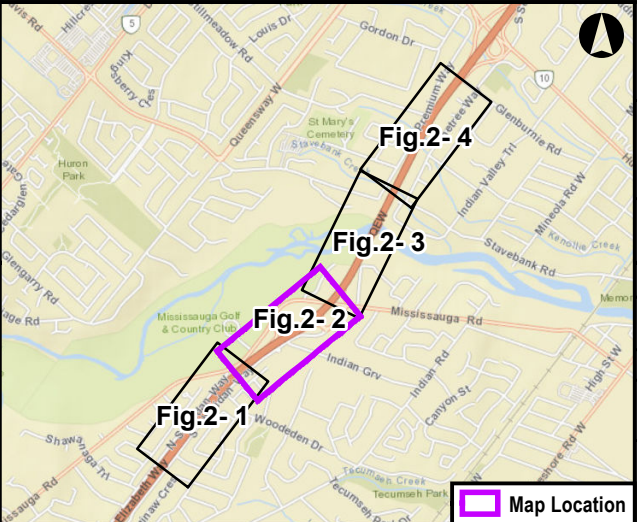
Figure 2

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Legend

- Heavy Duty Silt Fencing
- Light Duty Silt Fencing
- Tree Protection
- Culvert
- Permanent Stream
- Intermittent Stream
- River
- Access Road
- Lands Limit
- Launch Pad, Work Areas and Laydown Area



QEW Credit River Project

Access Roads, Laydown Areas and Environmental Protection Measures

0 10 20 40 60 80 100 120 140

Meters

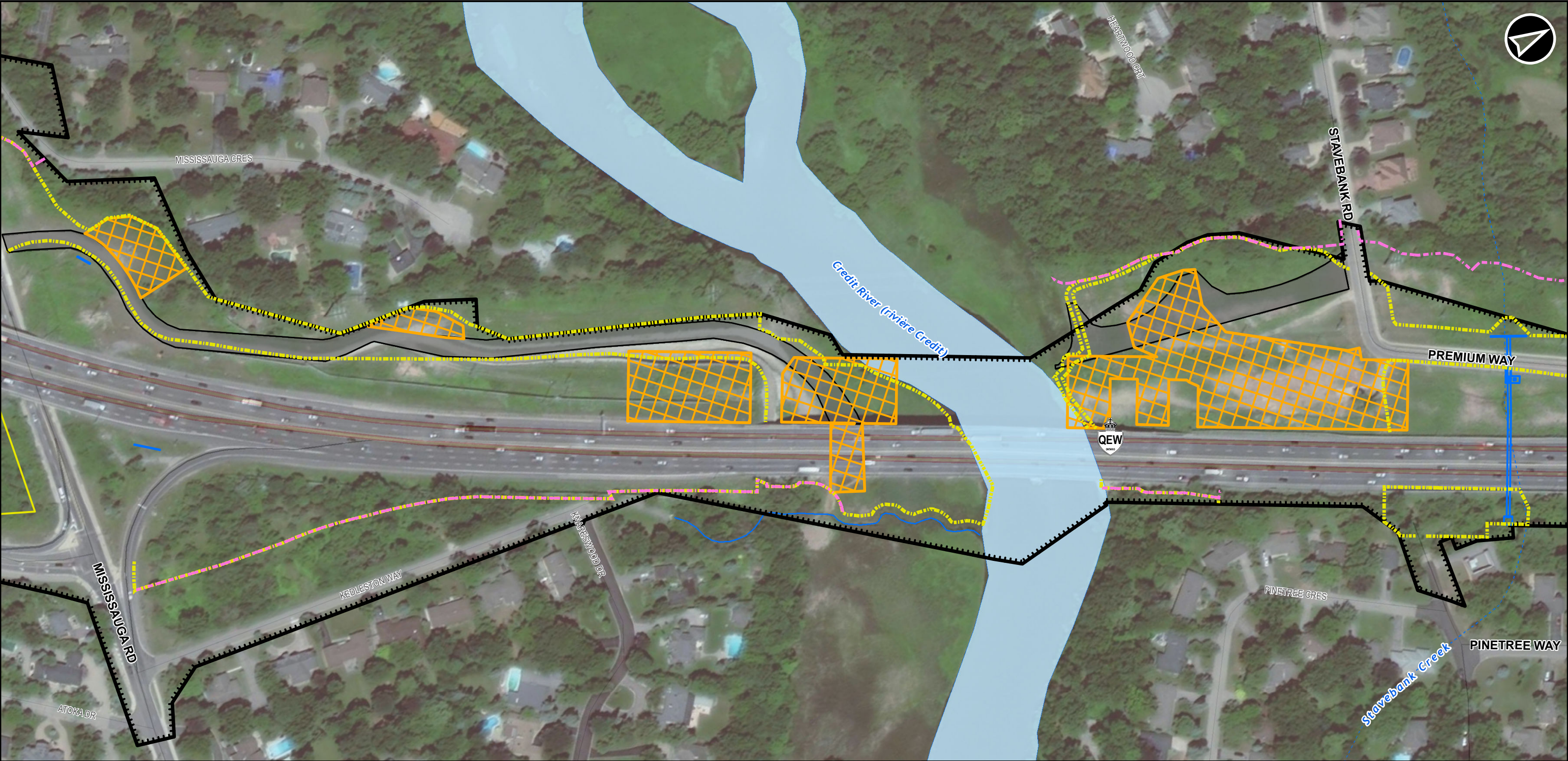
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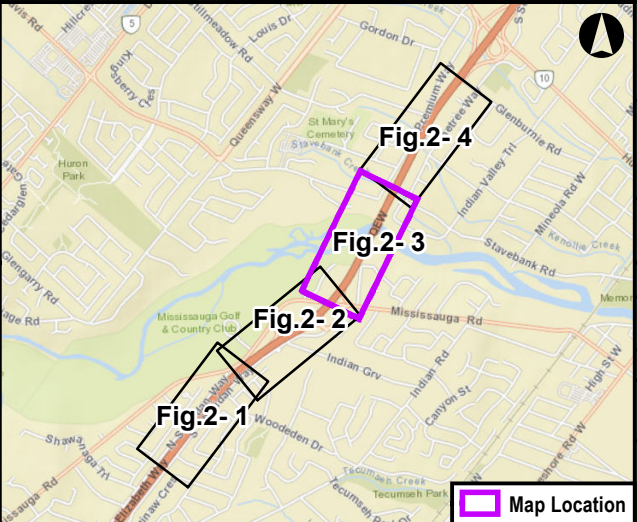
Figure 3

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Legend

- Heavy Duty Silt Fencing
- Light Duty Silt Fencing
- Tree Protection
- Culvert
- Permanent Stream
- Intermittent Stream
- River
- Access Road
- Lands Limit
- Launch Pad, Work Areas and Laydown Area



QEW Credit River Project

Access Roads, Laydown Areas and Environmental Protection Measures

0 10 20 40 60 80 100 120 140

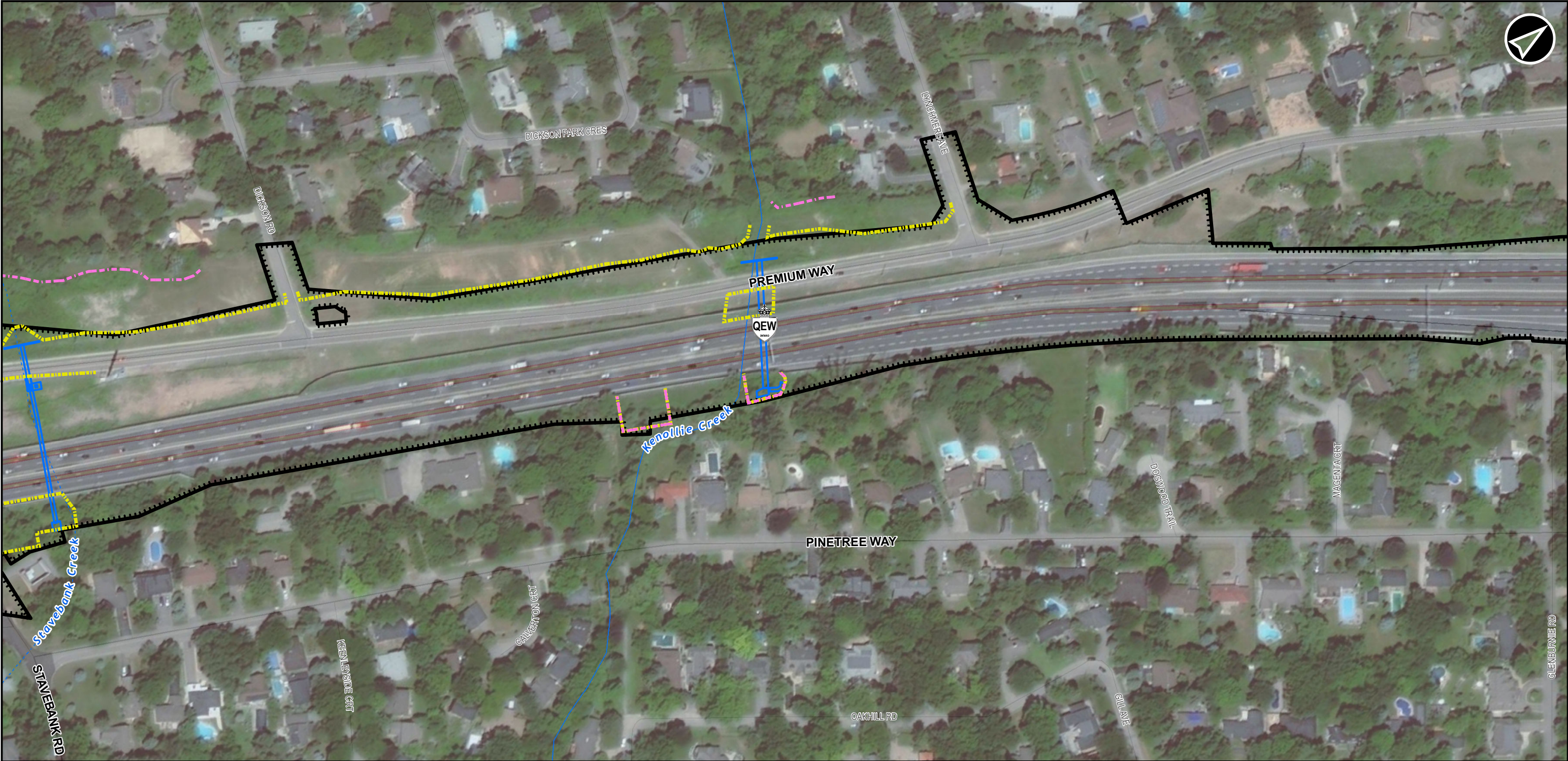
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AECOM		Figure 4

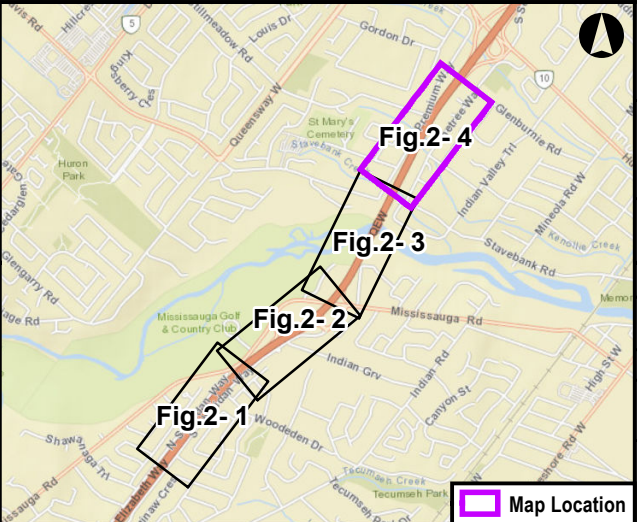
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Map Location



Legend

- Heavy Duty Silt Fencing
- Light Duty Silt Fencing
- Tree Protection
- Culvert
- Permanent Stream
- Intermittent Stream
- River
- Access Road
- Lands Limit
- Launch Pad, Work Areas and Laydown Area



QEW Credit River Project

Access Roads, Laydown Areas and Environmental Protection Measures

0 10 20 40 60 80 100 120 140

Meters

DATUM: NAD 1983 MTM 10

Dec 10, 2020	1:2,200 *when printed 11"x17"	Source: MNRF 2020 Image: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
P#: 60645186		

AECOM

Figure 5

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Map Location

Once the shoulder strengthening is complete, slight traffic shifts will take place to facilitate access to work areas. The improvements and slight traffic shifts required to construct the improvements do mean that additional work is required to replace or realign existing components of the QEW highway. Kenollie and Stavebank Creek culverts will require replacement and work within the median will also be required to install lighting and new drainage infrastructure.

In addition, two new stormwater management ponds are also required including a wet pond within the Mississauga Road interchange and a dry pond on the east bank of Credit River, north of the QEW. The ponds are shown in detail in Appendix C and may be excavated early to operate as temporary catch basins for sediment during construction. The wet pond at Mississauga Road will provide Level 1 enhanced treatment and quantity control up to and including the 100-year storm event to prevent downstream impacts to the stormwater management system. The dry pond will receive discharge from the deck drainage of the Credit River Bridges, involving retrofitting of the existing Credit River Bridge drainage system to redirect discharge to the pond. The dry pond will provide Level 3 basic treatment and discharge to Stavebank Creek with an emergency outflow via the storm outfall to discharge to the Credit River within the right-of-way.

The realignment and widening of the QEW also means that the noise barriers along the QEW (westbound) will need to be replaced from the eastern Project limit to Mississauga Road. Noise barriers will also be relocated and replaced along the QEW eastbound as a result of the work at the QEW and Mississauga Road interchange. A new noise barrier will be constructed adjacent to the new interchange ramp and the new multi-use trail crossing of the Credit River, with noise barrier walls made of transparent material to be installed on the outer edges of the new and existing Credit River bridges.

Additional work will also involve the construction of a new active transportation crossing of the QEW highway, that builds upon the planning and preliminary design by the completed by the City of Mississauga, in partnership with the Region of Peel. The new crossing will provide a north-south connection for pedestrians and cyclists via a bridge over the highway that includes access ramps.

A summary of the improvements to the QEW highway is provided in **Figure 7** and detail design drawings for this work are included in **Appendix C**.

3.1.2.2 Mississauga Road

In addition to work on the QEW mainline, the Project involves work on local roads and utilities within the Project Limits including: reconfiguration of the Mississauga Road interchange and replacement of the existing overpass; realignment of Premium Way;

and, slight adjustments to South Sheridan Way to accommodate improvements to the Mississauga Road interchange.

To accommodate the widening and shifting of the QEW, the Mississauga Road overpass and interchange will require reconfiguration and reconstruction.

Reconfiguration of the Mississauga Road interchange includes realignment of the interchange ramps, extension of speed change lanes between Mississauga Road and Hurontario Street and installation of traffic signals at the intersections. To accommodate regional plans for the roadway, work directly within Mississauga Road right-of-way includes reconstruction of the roadway to a 3-lane urban cross section and a boulevard configuration that will accommodate a 3.5 metre multi-use path on the east side (Appendix C, NC-6 & NC-7) and a sidewalk with a raised bike lane will be provided on the west side (Appendix C, TS-4). Mississauga Road will also be lowered, and the overpass will be replaced as part of the reconfiguration of the intersection and QEW improvements.

A summary of the improvements to the Mississauga Road is provided in **Figure 7** and detail design drawings for this work are included in **Appendix C**.

3.1.2.3 Premium Way and South Sheridan Way

Premium Way: will be realigned slightly to the north to accommodate the QEW mainline improvements, which adds additional westbound lanes over the new Credit River Bridge. Once realigned, Premium Way will include 1 lane in each direction and an outer boulevard that includes a 3.5m multi-use path on the north side of the road between Lynchmere Avenue and Stavebank Road. The west connection of the multi-use trail at the corner bend at Stavebank Road and Premium Way is shown in Appendix C, NC-8. The subsequent drawings from NC-9 to NC-10 show the details for the realignment work and trail path along Premium Way. This includes the intersection detail for Dickson Road on NC-9, and the Lynchmere Avenue intersection with the east end of the multi-use trail connection on NC-10.

South Sheridan Way: As part of the Mississauga Road interchange reconfiguration, changes to South Sheridan Way will be made. South Sheridan Way currently provides two lanes in the east and westbound direction. Through the reconfiguration works 2 eastbound lanes will be retained, 1 westbound lane will be eliminated and, a 3.5 m wide multi-use trail will be added on the eastbound side. On and off-ramp configurations on will be made to improve traffic flow in the area. A new eastbound ramp will be constructed at a new signalized intersection at South Sheridan Way and Mississauga Road (Appendix C, NC- 15 & NC-7) to replace the existing left turn movement for vehicles intending to travel eastward on QEW from the existing ramps on South

Sheridan Way (Appendix C, NC-14). A dedicated northbound right turn lane will also be constructed on Mississauga Road to facilitate traffic movement through this area.

A summary of the improvements to Premium Way and South Sheridan Way is provided in **Figure 7** and detail design drawings for this work are included in **Appendix C**.

3.1.2.4 Utilities

Utility relocation for the Project was initiated by MTO during Phase 1 and construction undertaken by the corresponding utility in Summer 2019. This included work on the Trans-Northern Pipeline (TNPI) infrastructure within the limits of project at the Credit River. EDCO will continue consultation and coordination with utilities in order to complete the remaining design, and undertake necessary relocation works for the various utilities including those belonging to the following: Alectra, Hydro One, Enbridge Gas, Bell, Rogers and, consideration for the TNPI infrastructure corridor.

Utility work will involve EDCO coordination with Region of Peel to satisfy municipal utility requirements for new infrastructure crossings and the protection of existing infrastructure, including watermain and sanitary sewers within the Project limits.

The protection measures identified in **Figures 2 to 5** have been developed in consideration of work remaining to relocate or protect utilities within the Project Limits.

3.1.3 New Queen Elizabeth Way Credit River Bridge

The largest component of the Project and the project and the key component of this DCR is the design and construction of the new Credit River Bridge. The 'twin' bridge is being constructed to the north of the existing Credit River Bridge at an elevation that will maintain the visibility of the existing bridge arches and spandrels from a south facing viewpoint within the river valley.

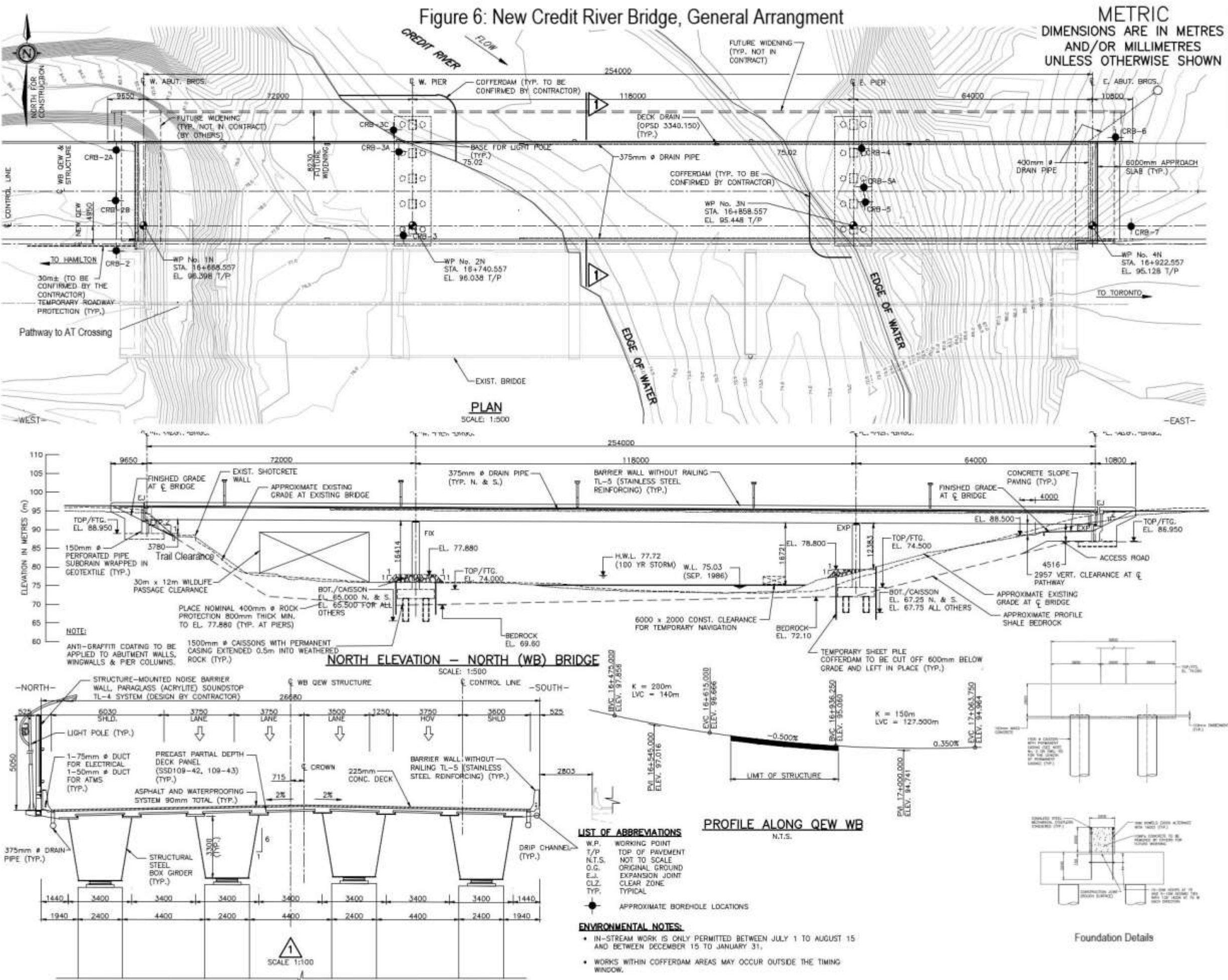
The construction of the new bridge must be completed before rehabilitation of the existing bridge can be initiated as the new bridge will be required to carry all QEW traffic over the Credit River during the rehabilitation work that will take place, starting in the middle of 2023. The general arrangement drawing for the twin bridge is presented in **Figure 6** (and **Appendix C**) and shows the location of piers and foundations for the new twin bridge and that the structure is a 3 span structure, which accommodates placement of piers outside of the main channel of the Credit River defined by the 2-year return period flood levels. The bridge foundations for the piers involve a sub-grade footing on four paired 1.5 metre diameter caissons, spaced at 6.8 metre apart. The four vertical columns of each pier will be constructed to support the superstructure of the twin bridge as shown on the general arrangement drawing (**Figure 6**). The west and east piers will

be spaced 118 metre apart for the centre span over the river, as measured from the centre point of the vertical columns for each pier. EDCO design of the new Credit River Bridge has included elements such as overbuilding components of the bridge foundation to minimize future traffic disruptions in the corridor should major rehabilitation or replacement of the new bridge be required by the MTO in the future.

The general arrangement for the new bridge has also been developed in consideration of the heritage attributes and designation of the existing bridge. The design includes slender piers which consist of 4 rectangular columns, shallow steel girders and no pier cap so as to appear 'slender' and avoid obstructing the views of the existing bridge. The new Credit River Bridge design also includes surface treatments of columns, barriers, walls and light posts and detailing of other visible bridge elements that will replicate the heritage attributes of the existing Credit River Bridge. Additional information related to heritage design consideration is provided in Section 3.2.3 of this DCR.

Under Phase 3, additional work will also be required to construct a new active transportation crossing of the Credit River, that builds upon the planning and preliminary design completed by the City of Mississauga, in partnership with the Region of Peel. The new crossing will involve retrofitting an existing maintenance access platform on the underside of the existing Credit River Bridge to provide an east-west connection for pedestrians and cyclists via a bridge over the Credit River, and under the QEW. A summary of these improvements is illustrated in **Figure 7** and detail design drawings for the crossings are included in **Appendix C**. Further details will be provided as part of Phase 3 work and documented in future DCR(s).

Figure 6: New Credit River Bridge, General Arrangement



3.1.4 Traffic Staging

Construction sequencing and associated traffic staging for the works included in this DCR are shown in **Appendix B**. On the QEW, the existing number of lanes will be maintained during peak periods with some work requiring temporary night-time and weekend lane closures. A shift in the existing lane alignments is also required for the work beginning in 2021 to facilitate access to areas where improvements to the QEW and Mississauga Road interchange reconfigurations will take place.

Replacement of the Mississauga Road overpass will require 3 stages of work:

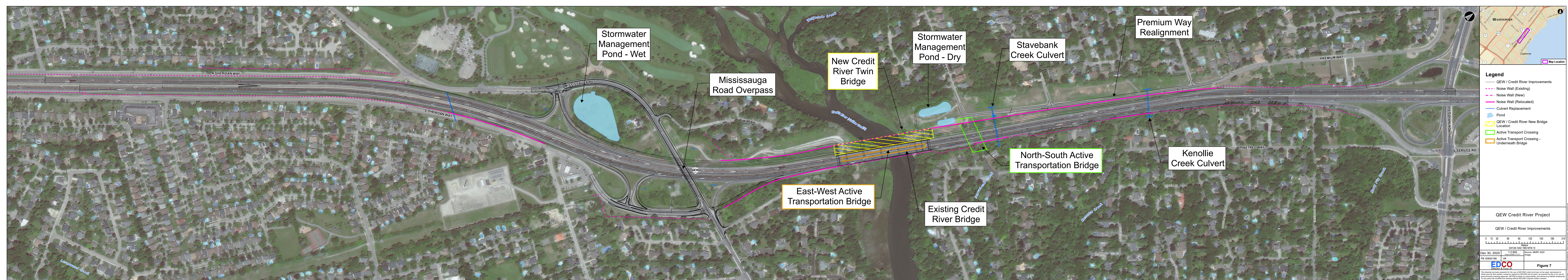
1. Construction of a new north side overpass bridge to accommodate westbound traffic on the QEW.
2. Westbound traffic relocated to the new bridge to the north and demolition/replacement of the existing bridge completed.
3. Eastbound traffic shifts to the replacement bridge and demolition/replacement of the southern portion of the existing bridge completed.

During this work, the number of lanes on QEW and Mississauga Road will be maintained during peak periods. The north to east on ramp will be extended, acting as an auxiliary lane between its current terminus and the Hurontario Street eastbound off ramp. The west to east left turn lane from South Sheridan Way to the northeast ramp will be eliminated and traffic will be diverted to the South Sheridan Way and Mississauga Road intersection, with access to QEW via the new ramp.

Traffic staging during the work will be adjusted as work is completed and new activities are initiated or new roadways (e.g. the new ramps) are completed and opened to traffic.

3.2 Environmental Issues and Commitments

This section presents information on the existing environmental conditions, potential impacts and the environmental mitigation measures and commitments that will be implemented to address impacts. These measures and commitments are summarized in **Table 3-2** and will be carried forward by EDCO and updated where necessary through design and implemented during the construction phase of the Project.



3.2.1 Air Quality

In 2018, the MTO design consultant (Novus Environmental Inc. (Novus), retained by Morrison Hershfield) conducted a construction air quality assessment for the QEW/Credit River Improvement Project. The Construction Air Quality Report prepared by Novus (2018) identified the following major construction activities associated with the Project with potential to generate dust:

- improvements to the Credit River Bridge
- reconfiguration of the Mississauga Road interchange/ramps
- replacement of the Mississauga Road Overpass
- realignment of Premium Way
- reconstruction of a portion of Mississauga Road

There are existing residences on both the north and south sides of the QEW within the study area which have the potential to be impacted by construction activities. At the Mississauga Road interchange, the nearest residences are on Mississauga Crescent (north of the QEW) and on South Sheridan Way (south of the QEW). There is also the Mississauga Golf and Country Club directly north of the interchange. Although a golf course is not typically classified as a sensitive receptor, it may be impacted by construction dust and result in complaints from construction activities. At the Credit River Bridge, there are residences on either side of the Credit River. Along Premium Way, there are existing residences mainly north of the roadway, but also a few residences south of the roadway near the Hurontario Street interchange.

Overall, construction activities from the Project are expected to be typical of any highway construction Project. **Table 3-2** identifies mitigation measures to be employed with regard to air quality and includes commitments to monitor construction and assess the effectiveness of those measures.

3.2.2 Archaeology

As detailed in previous reports including DCR 1, Credit River has been used for thousands of years by Indigenous People and subsequently European Settlers. The QEW Credit River Improvement Project area has been extensively assessed for archaeological potential, with work progressing in some locations to Stage 4 mitigation of development impacts and excavations that have uncovered repeated occupations along the east bank of the Credit River.

From 2010-2012, MTO undertook a Stage 1-3 Archaeological Assessment within the Project limits finding artifacts and other cultural material in the area around the Hogsback Site which was first identified in the 1930s by the Royal Ontario Museum (ROM). In addition to numerous finds from European Settlers, the archaeologists also found a significant amount of 'precontact' indigenous artifacts dating back to the Middle Woodland Period (400 BC – AD 600).

As a result of these finds, MTO conducted an additional Stage 3 assessment and Stage 4 excavations of the site since 2016. The site was fully hand-excavated in order to identify and record all cultural features and determine appropriate mitigation. This excavation was completed in early autumn 2017.

In 2019, additional archaeological assessments for the QEW Credit River Improvement Project was completed on lands with the potential to be impacted during construction. While the Stage 1 assessment determined that the overall study area retained archaeological potential, the Stage 2 test pit survey did not identify any archaeological material.

Marine archaeological assessment was carried out by MTO in 2019 for portions of the Credit River. The overall study area was subject to forward looking sonar survey, and the near shore in-water track (where depths were not excessive) was subject to in-water test pitting methodology, conducted in five metre intervals, approximately one metre parallel to the shoreline. No archaeological materials, features, or sites were located during the Stage 2 assessment. Further areas of the Credit River were also assessed in 2020 once in-water areas were isolated. The findings of this archaeological assessment were detailed in DCR 1 and generally included

Given the significance of the site, MTO employed archaeological site monitors from the First Nation communities who have a cultural connection to this site.

As part of the Phase 1 works described in DCR 1, MTO installed cofferdams to isolate the in-water areas in June 2020. Once the areas were isolated, MTO carried out marine archaeology within the Credit River where the river bottom was impacted / disturbed within the isolated work area for the twin bridge pier foundations (June – September, 2020). This was done to facilitate construction of the new Credit River twin bridge pier foundations, utility locations and site preparatory work.

3.2.2.1 Stage 4 Mitigation through Avoidance and Protection of the Hogsback Site (AjGv-3)

As detailed in **Table 3-2**, EDCO will complete Stage 4 mitigation of development impacts through avoidance and protection (protective fencing and construction

monitoring) along the northern extent of the Hogsback site (AjGv-3), east of Stavebank Road, during construction activities occurring in the immediate vicinity. This area will be identified and clearly marked in the field by employing the following measures:

- A temporary barrier will be erected between the work area and instructions provided to EDCO personnel that the area to be avoided (NAD, 2018);
- Site orientation and environmental awareness training will include clear direction and “no go” instructions to all on-site construction crews, engineers, architects or others involved in day-to-day decisions during the construction; and,
- The location of the area to be avoided is on all contract drawings, when applicable. EDCO will also include explicit instructions and/or labelling on drawings to avoid that area. Construction activities are not proposed in proximity to this area; however, during grading and other soil disturbing activities that may encroach upon this area, EDCO’s licensed archaeologist shall inspect and monitor the area to be avoided in order to verify the effectiveness of the avoidance strategy. If alteration of the archaeological site is observed at any time during construction, the Ministry of Heritage, Sport, Tourism and Culture Industries (MHSTCI) shall be notified immediately. After completion of the grading and other soil disturbing activities, EDCO’s licensed archaeologist will inspect and report to the MHSTCI on the effectiveness of the strategy in ensuring that the area to be avoided remains intact.

3.2.3 Cultural Heritage

Within the Project limits, the following cultural heritage resources have been identified through previous review and cultural heritage analysis: existing QEW Credit River Bridge (MTO Site No. 24-203); the Queen Elizabeth Way (QEW); Mineola Neighbourhood; and, Rice Residence at 1564 Mississauga Road.

Through the detail design phase of this project, which was initiated by the MTO, a Heritage Impact Assessment (HIA) was completed. This HIA provides the basis of heritage considerations for the twin bridge and will continue to form the basis of heritage considerations for the bridge designs and construction for the project. EDCO will amend the HIA and consult with the MHSTCI if necessary. Similarly, the Strategic Conservation Plan (SCP) initiated by the MTO provides guidance on repairs/rehabilitation work for the existing bridge.

3.2.3.1 Rice Residence

The Rice Residence is located at 1564 Mississauga Road, and is individually listed (Inventory #253) for architectural reasons and its location within the Mississauga Road Scenic Route Cultural Landscape (F-TC-4) on the City's Heritage Register. Indirect impacts due to the improvements to Mississauga Road will affect the driveway associated with the residential property. The identified impacts are minor in nature to the property entrance and therefore no mitigation is recommended. Potential impacts associated with work documented in this DCR are limited to clearing and grubbing on lands adjacent to the property.

3.2.3.2 New Credit River Bridge

As described in Section 3, the piers for the new Credit River bridge have been designed in a slender fashion and as four rectangular columns so as to visually blend in with the vertical components of the existing bridge and be sympathetic to those features of the existing bridge. In addition, the new bridge has shallow steel girders, no pier caps and will undergo surface treatments of various components so as to replicate the cultural heritage attributes of the existing bridge. The shallow girders and pier design are expected to allow for maximum views from the river, of the heritage attributes of the north side of the existing bridge.

The new bridge design is intended to retain as much of the view of the Credit River valley from the bridge deck as possible, by including barrier walls that meet code requirements, coupled with noise walls made of transparent materials. The "ER" lights will be installed on the north side of the new twin bridge, with the remaining "ER" lights re-instated on the south side of the existing bridge, retaining these key features for motorists travelling across the bridge.

3.2.3.3 QEW Highway Mainline

The QEW highway mainline is commemorated by the Canadian Society for Civil Engineering as a National Historic Civil Engineering Site. The significance of the QEW is described as:

- Canada's first freeway
- Officially opened in 1939
- A tribute to the engineers who designed and supervised the construction of the freeway

Further details regarding the rehabilitation of the existing Credit River Bridge and proposed mitigation measures, commitments and the commemorative strategy for the entire Project will be presented at a future PIC and documented in a separate DCR.

3.2.4 Fisheries

Watercourses identified within the Project limits consist of the Credit River, an Unnamed Tributary of the Credit River, Stavebank Creek, Kenollie Creek, and Mary Fix Creek. All watercourses within the Project limits are part of the Credit River watershed and generally considered to support a warmwater fishery.

The subsections below describe existing conditions of each watercourse along with the work planned at each location. Mitigation measures associated with this work are described in **Table 3-2**. EDCO is completing design of the landscaping and ecological restoration required at each watercourse and will detail this work in a future DCR.

3.2.4.1 Credit River

The **Credit River** is a warmwater tributary of Lake Ontario with a coldwater migratory corridor which directly supports fish species that are part of a commercial, recreational, and/or Aboriginal fishery (CRA Fishery), as defined by the Fisheries Act (1985). This includes recreational coldwater salmonid species, Brown Trout (*Salmo trutta*), Rainbow Trout (*Oncorhynchus mykiss*), and Chinook Salmon (*Oncorhynchus tshawytscha*), as well as warmwater sportfish including Northern Pike (*Esox lucius*), Smallmouth Bass (*Micropterus dolomieu*) and Largemouth Bass (*Micropterus salmoides*). The river also acts as an important migratory corridor for coldwater salmonid species, including Chinook Salmon, Coho Salmon, and Brown Trout in the fall, and Rainbow Trout in the spring, that move through the area to upstream spawning habitats. Atlantic Salmon (*Salmo salar*), introduced as part of MNRF restoration efforts have also been documented within the area as they smolt out to Lake Ontario and also migrate upstream to spawning areas in the Fall. The MNRF has noted the possible presence of American Eel (*Anguilla rostrata*), a species designated as “endangered” under the Provincial Endangered Species Act (ESA) and has noted that habitat for the species is present in the Credit River. Based on correspondence with the MNRF (January 2019), the proposed works are not considered to result MNRF having concerns in relation to the American Eel.

The MTO installed the advanced works documented in DCR 1 including in-water isolation measures (i.e., cofferdam) within the permissible in-water timing window of July 1 to August 31, 2020 and to complete marine archaeology in the isolated area. MTO was granted an extension for those works by the DFO to allow construction of the

bridge foundations to occur in isolation of the river. EDCO works will include re-enforcement of these measures and maintaining the isolated work area to facilitate construction of the new bridge foundations in the dry.

3.2.4.2 Unnamed Tributary of Credit River

The **Unnamed Tributary of Credit River** is located within the Credit River valley and enters the main branch of the Credit River approximately 40 metres downstream of the existing bridge on the southwest bank. This tributary originates from a concrete box culvert storm sewer outfall and contributes roadside drainage to the Credit River. The tributary flows parallel to the bridge and is not crossed by the QEW.

3.2.4.3 Stavebank Creek

Stavebank Creek is a tributary of the Credit River that originates from a storm sewer outfall approximately 700 metres north of the Premium Way. The creek flows from north to south under Premium way and the QEW, through separate concrete box culverts, approximately 245 metres east of the Credit River Bridge. The Premium Way culvert outlet is perched 0.65 metres above the invert of the creek, posing a barrier to fish movement. Downstream of the QEW the Stavebank Creek flows through a residential area before it outlets to the Credit River approximately 660 metres downstream of the Credit River Bridge.

3.2.4.4 Kenollie Creek

Kenollie Creek originates approximately 435 metres north of Premium Way and is a tributary to the Credit River. The creek flows from north to south under both Premium Way and the QEW through a single concrete open bottom culvert, approximately 660 metres east of the Credit River Bridge. Downstream of the QEW the creek bends 90 degrees and flows parallel to the QEW (along residential backyards) for approximately 85 metres before flowing south. Kenollie Creek outlets to the Credit River approximately 2 km downstream of the QEW.

3.2.4.5 Mary Fix Creek

Mary Fix Creek is a channelized watercourse, located beyond the limits of the Project near Hurontario Road and not within proximity to the proposed works.

3.2.4.6 Fisheries Act Approvals

EDCO will adhere to the measures to avoid and mitigate potential for prohibited effects to fish and fish habitat specified in environmental approvals for the Project issued by DFO and which includes Letter Of Advice (LOA) 18-HCAA-01146 (June 8, 2020). The measures identified in the LOA are detailed as Items 1.01 to 1.08 in **Table 3-2** and include adherence to the annual permissible in-water construction timing windows for the Project, as follows:

- Credit River: July 1 – August 15; and December 15 – January 31
- Stavebank Creek: no timing window required
- All other watercourses: July 1 – March 31

3.2.5 Groundwater

Soil and groundwater investigations were completed in 2017 and 2019 by the MTO. A Permit to Take Water (PTTW) or Environmental Activity and Sector Registry (EASR) is required for water takings.

Water taking activities are to be undertaken during construction per the Ontario's Water Taking Regulation (O. Reg. 387/04 made under the Ontario Water Resources Act, as amended by O. Reg. 64/16, March 29, 2016), and the new EASR regulation (O. Reg. 63/16 – Registration under Part II.2 of the Act – Water Taking and the Water Taking User Guide for Environmental Activity and Sector Registry MECP, August 2017), respectively.

3.2.5.1 Water Taking Permits

The Ministry prepared and filed a draft Category 3 application for a Permit to Take Water (PTTW) to allow for water taking during construction.

EDCO will complete and finalize the draft permit in accordance with the Memorandum of Understanding (MOU) between the MTO and the Ministry of Environment Conservation and Parks (MECP).

A dewatering plan will be prepared for future phases of work to be completed by EDCO and in support of the PTTW and/or EASR registration requirements, which will include the Project requirements for surveys and monitoring of groundwater as detailed in **Table 3-2**.

3.2.6 Noise and Vibration

Impacts to existing noise levels as a result of the Project have been assessed previously as part of the previous design phases of work. Many residents in close proximity to the Credit River Valley will see an improvement in sound levels due to the construction of a clear noise wall on the existing and future bridge. Noise levels will also be improved as a result of an overall reduction in the number of expansion joints on the existing bridge.

Noise walls impacted by the design of the QEW and municipal roads, which are to be removed, relocated or replaced are shown in **Appendix C**. As described in **Section 3**, due to the realignment and widening of the QEW, the noise barrier along the QEW westbound between the east construction limit and Mississauga Road will need to be replaced. Along the new Credit River Bridge and the existing bridge, a transparent noise barrier will be utilized to maintain the natural aesthetic of the river crossing. Noise barriers will also need to be relocated and replaced along the QEW eastbound in advance of the proposed works at the westbound off-ramp, tying into the existing noise barrier further west of the interchange. Additionally, a noise barrier will be constructed adjacent to the new ramp at Mississauga Road.

Based on the noise analysis and recommendations for new or relocated/replaced noise wall, impacts to noise are limited to construction impacts. The MTO completed a Construction Noise Assessment (2018) to assess possible construction impacts according to applicable guidelines and provides measurements and recommendations to minimize potential noise impacts.

Construction noise impacts are considered to be temporary in nature, and largely unavoidable. In addition, the timing of construction activities is such that they vary by activity and location within the site as the construction progresses and thus noise levels from construction activities will also vary. Although for some periods and types of work, construction noise may be noticeable, with adequate controls, impacts can be minimized. As a result, it is not anticipated that receptors will be exposed to constant construction noise for the duration of the construction contract.

The potential environmental noise impacts resulting from construction of the proposed undertaking were assessed and measures to minimize disturbance to nearby homes will be implemented as described in **Table 3-2**.

The measures have been developed with consideration for the local noise By-laws and measures applied to construction activities in order to: address potential impacts to noise and vibration sensitive areas (NSAs) within 600 metres of the Project limits; identify proposed mitigation measures for noise; document monitoring requirements

during construction; and, identify additional mitigation measures that may need to be implemented to address complaints.

EDCO will maintain a Project website to provide regular updates; provide notification to those residents or individuals requesting to be notified of weekend/night works and, regularly update City Councillors and staff of night/weekend work.

3.2.7 Surface Water

Surface water and drainage design and construction analysis required to support design of two stormwater management ponds and stormwater drainage for the QEW have been initiated. In consultation with Peel Region and the City of Mississauga for regional and municipal drainage requirements within the Project limits, EDCO will continue to advance the design provided in **Appendix C**. Landscaping and vegetative treatments within the pond will also be generated and will be documented in a future DCR.

As detailed in **Table 3-2**, during in-water works for the Project, EDCO will adhere to the mitigation measures to protect waterbodies, animal species and vegetation due to increased siltation, changes in stream channel structure and water clarity, increase in stream temperatures and input of pollutants from roadside drainage.

EDCO will complete surface water monitoring and implement mitigation measures, including adaptive management strategies during construction as required.

3.2.8 Terrestrial Ecosystem

The existing conditions within the Project limits were documented in DCR 1. It is noted that within the Project limits there are: portions of the Credit River Marshes Wetland Complex Provincially Significant Wetland (PSW); a species at risk (SAR) afforded protection under the provincial *Endangered Species Act* (ESA), including a Butternut (*Juglans cinerea*); sensitive habitat for SAR bats within wooded areas; and, invasive species.

As part of the advanced works completed by MTO, vegetation at some locations within the Project limits has been removed. In advancing EDCO's design, the potential impacts associated with additional vegetation clearing have been reviewed. The limits of additional vegetation clearing are demonstrated on **Figure 8** to **Figure 11** and will be defined in the field using fencing materials in accordance with OPSS 801. The vegetation clearing as part of EDCO's site preparation work will be carried out in accordance with the measures described in **Table 3-2** and best management practices will be employed as EDCO seeks to avoid, minimize and mitigate potential impacts to sensitive vegetation and vegetation communities.

The works within the Project limits will be completed in compliance with the Letter of Advice (LOA) issued by MNRF for vegetation removal and the specified mitigation measures for the protection of Butternut and SAR bat habitat.

Snapping turtle are considered to occur within the Credit River valley. During work within the Credit River valley EDCO, as specified in the access management plan, clearing and grubbing plan and erosion and sediment control plan will provide measures on-site to avoid potential impacts to turtles. The MTO as part of the advanced works, installed turtle exclusion fencing within the Credit River valley to facilitate EDCO's construction.

Invasive species management for Common Reed (*Phragmites*) known to be present in four (4) patches, totalling approximately 100 m², Emerald Ash Borer, and Asian Long-horned beetle are detailed in **Table 3-2**.

For the protection of migratory birds under the Migratory Birds Convention Act (MBCA), vegetation removals will be undertaken between September 1 and March 31 of any given year. In areas of bat habitat, vegetation removal will be undertaken between October 1 and March 31 of any given year.

Table 3-1 provides a summary of the impact to each Ecological Land Classification (ELC) community within the Project limits.

A landscaping and ecological restoration plan will be prepared during later phases of design for the Project and to guide restoration activities within the Project limits. The landscaping and ecological restoration strategy designed by EDCO will be made available for stakeholder review and comment through future PICs and included in a future DCR.

Table 3-1: ELC Community Impacts

ELC Code	Community	Detail Design Impacts (hectares)
CUM1	Cultural Meadows	3.25
WODM4	Dry - Fresh Deciduous Woodland Ecosite	2.08
MAMM1	Graminoid Mineral Meadow Marsh Ecosite	0.21
TAGM2	Coniferous Plantation	0.49
THDM2	Dry - Fresh Deciduous Shrub Thicket Ecosite	1.43
SVD	Deciduous Savanna	1.16
MASM1	Graminoid Mineral Shallow Marsh Ecosite	0.02
WODM5	Fresh - Moist Deciduous Woodland Ecosite	0.06
FODM2	Dry-Fresh Poplar-White Birch Deciduous Forest	0.02
FODM5	Dry-Fresh Sugar Maple Deciduous Forest	0.01
MAMM2	Forb Mineral Meadow Marsh Ecosite	0.24
SVM	Mixed Savanna	0.33

ELC Code	Community	Detail Design Impacts (hectares)
THDM4	Dry - Fresh Deciduous Regeneration Thicket Ecosite	0.42
FODM4	Dry–Fresh Poplar–White Birch Deciduous Forest	0.01
CGL1	Golf Course	0.18
SVDM3	Dry - Fresh Deciduous Savanna Ecosite	3.07
Total	All vegetation communities listed above	12.99

3.2.9 Waste and Contamination

The studies completed by the MTO during preliminary and detail design phases of the Project identified areas of samples exceeding Ontario Regulation 153/04 for soil and groundwater quality standards. EDCO's approach to waste and contamination management and earth movement, including management of contaminated soil and groundwater will be in accordance with applicable regulation and standards and will fulfill the commitments to additional work and mitigation measures detailed in **Table 3-2**.

3.2.10 Additional Approvals

In addition to the permits, licences, approvals and authorizations acquired for the Project that have been noted above, the following are approvals that EDCO shall obtain prior to construction of the detail design works to be constructed in early 2020.

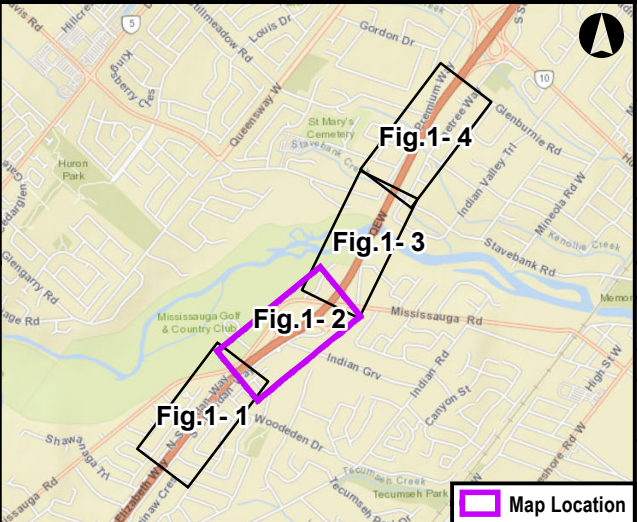
3.2.10.1 Canadian Navigable Waters Act

In 2019 the act governing navigation changed, and pre-existing exemptions and memorandums of understanding (MOU) between the MTO and Transport Canada were changed. Under the new Act, the proposed works for the new Credit River Bridge are considered to be major works on non-schedule waters and therefore approval under the Canadian Navigable Waters Act (CNWA) is required. The MTO initiated the application for approval by providing Transport Canada with an overview of the Project, a summary of the consultation with Indigenous communities completed to date and a description of anticipated construction methodology .



Legend

- Phragmites location provided by MH, 2017
- Cavity Tree Location
- Butternut Tree Location
- Tree Protection Fencing
- - - QEW MTO ROW
- Property Boundary
- ⬡ Potential Bat SAR Habitat
- ⬡ QEW Clearing and Grubbing
- ⬡ Laydown Area
- ⬡ No-Go Area (PSW or SAR Habitat)
- ⬡ Restricted Access - Clearing and grubbing of this wetland unit to be carried out September 1 to September 15 of any given year, following the installation of exclusion fence
- ⬡ Terrestrial Environment Study Area



QEW Credit River Project
Clearing and Grubbing Plan

Vegetation Clearing Limits

0 10 20 40 60 80 100 120 140
Meters

DATUM: NAD 1983 MTM 10

Dec 09, 2020	1:2,200 *when printed 11"x17"	Source: MNRF 2020 Image: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
P#: 60645186		

AECOM

Figure 9

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Map Location: \\na.aecom.com\NA\AECOM\Projects\QEW Credit River\Design\01_Report\Clearing and Grubbing Plan\MXD_60645186_CROP_Fig9_Clearing and Grubbing.mxd
Date Saved: 12/9/2020 5:29:34 PM User Name: danks

In support of the advance works documented in DCR 1, on June 4, 2020, the MTO filed a Notice of Works on Non-Scheduled Waters on the Navigable Waters Registry pursuant to the CNWA for the expected minimal impacts to navigation on the Credit River. The notification allowed for public comment with respect to the advancement of site preparations, installation of temporary cofferdams, marine archaeology within the limits of the cofferdams and associated utility works within the Credit River valley.

EDCO is responsible for finalizing the CNWA approvals process to secure the necessary approvals under the CNWA for the detail design for the new Credit River twin bridge structure. This has been initiated through a meeting with Transport Canada on December 16, 2020 to present EDCO's design of the QEW Credit River Twin Bridge, construction methodology and staging, and recommended mitigation measures to minimize or avoid impacts to navigation during construction. General construction methodology and staging will include the following:

- Construction of the foundations and piers will be completed within the isolated work areas on the banks of the Credit River.
- All work will be conducted from designated work areas and laydown areas, with access to the work areas along defined access routes
- The bridge deck span components will be constructed using cranes to build toward the middle of the bridge from the abutments and new piers.

To minimize potential impacts to navigation, EDCO will adhere to the terms and conditions of the Canadian Navigable Waters Act (CNWA) approval of the work, which may include the following:

- Installation of signage advising of temporary access restrictions through the Project limits
- Installation of yellow flashing lights to identify in-water hazards during periods of low visibility
- Opportunities for a portage around the work site during full waterway closures, where practical and safe to do so.

Approvals under the CNWA for rehabilitation work on the existing Credit River bridge will be negotiated between EDCO and Transport Canada under a separate approval process as the detail design progresses.

3.2.10.2 Licence to Collect Fish Permit

To facilitate fish removals and relocations from isolated work areas prior to dewatering activities, EDCO will seek an annual licence to collect fish for scientific or educational

purposes. EDCO fisheries specialists will perform the fish relocations and document the activities in accordance with the terms of the licence issued by the MNRF.

3.2.10.3 Wildlife Handling Permit

In the event that wildlife is encountered during construction, and there is a need to relocate them to an area outside of the active construction work area, a wildlife handling permit is required. EDCO will seek an annual licence to handle and relocate wildlife. EDCO wildlife and SAR specialists will perform wildlife relocations and document the activities in accordance with the terms of the licence issued by the MNRF.

3.3 Summary of Environmental Effects, Proposed Mitigation, Commitments to Further Work

The following table outlines the environmental effects, proposed mitigation measures and commitments to further work, carried forward from previous environmental assessments for this Project. The list is provided in **Table 3-2** and is comprehensive, capturing all environmental commitments for the Project and will be carried forward to future design development and documented in future DCR(s) for this Project, where applicable.

Table 3-2: Environmental Concerns, Mitigation and Commitments

ID	Issues / Concerns / Potential Effects	Concerned Agency	Mitigation / Protection / Monitoring / Commitments
1.01	Potential Impact to fish and fish habitat (General)	MTO MNRF MECP DFO	<ul style="list-style-type: none"> EDCO will adhere to the permissible in-water construction timing windows for watercourses and apply the following during construction to protect fish and fish habitat during construction activities: <ul style="list-style-type: none"> –When possible, schedule work to avoid wet and rainy periods that may increase erosion and sedimentation and inspect in accordance with requirements of the Erosion and Sedimentation Control plans. –Contain all in-water works using site isolation as per Ontario Provincial Standard Specification (OPSS) 182 – General Specification for Environmental Protection for Construction in Waterbodies and on Watercourse Banks, designed and installed according to relevant Contract Specifications to delineate temporary in-water work zones to allow work in the dry and maintain clean flow downstream/around the work zone at all times. –Retain a qualified environmental professional to perform fish salvage within isolated, enclosed or dewatered areas at the work site and safely relocate them according to a License to Collect Fish for Scientific Purposes (as per OPSS 182). Fish may need to be relocated again, should flooding occur on the site. –Minimize duration of in-water work and conduct instream work during periods of low flow when possible to further reduce the risk to fish and their habitat and to allow work in water to be contained. –When temporary flow control must be undertaken for the work it shall be per OPSS 517 – Construction Specification for Dewatering. –All exposed soils or disturbed areas that drain into a waterbody will be treated with seed and cover according to OPSS 804 – Construction Specification for Seed and Cover, as soon as possible after exposure or upon completion of the work in or around the waterbody or on the waterbody bank. –Monitor construction activities in and around watercourses and ensure all related mitigation measures are properly installed, maintained, and are functioning effectively.
1.02	Potential Impacts to fish and fish habitat within the Credit River	MTO MNRF MECP DFO	<ul style="list-style-type: none"> Due to the presence of resident warmwater fish species and migratory coldwater fish species, any required in-water works will only be permitted between July 1st to August 15th (July 1st to August 31st in 2020) and December 15th to January 31st. Once containment measures are installed at Credit River, work may occur within the watercourse and along the banks outside of the permitted in-water timing window.
1.03	Potential Impacts to fish and fish habitat within Kenollie Creek, Stavebank Creek, Unnamed tributary of the Credit River, and Mary Fix Creek	MTO MNRF MECP DFO	<ul style="list-style-type: none"> Due to the presence of a warmwater fish community, any required in-water works will only be permitted between July 1st and March 31st, except for works in Stavebank Creek, which does not require an in-water works timing window. During the culvert replacement and extension activities at Stavebank Creek and Kenollie Creek the following measures will be taken to protect fish and fish habitat during construction activities: <ul style="list-style-type: none"> –Replacement culverts to be installed with proper embedment and hydraulic capacity to ensure that fish passage to upstream habitats is maintained under high and low flow conditions. –Appropriate fisheries substrates as per OPSS 1005 – Material Specification for Aggregates – Streambed Material and low flow channel will be included for culverts determined to directly support fish habitat (Kenollie Creek).
1.04	Dewatering activities during construction	MTO MECP	<ul style="list-style-type: none"> The control of water from dewatering operations will be conducted in accordance with OPSS 517 which includes: <ul style="list-style-type: none"> –When using a pump, the intake will be controlled to prevent entry of fish and other aquatic wildlife (screen any water intakes or outlet pipes to prevent entrainment or impingement of fish). –Dewatering operations will be directed to a sediment control device or natural attenuation area prior to discharge to watercourses, if a natural attenuation area is used, a minimum 30 metre setback will be maintained from the receiving watercourse. –When water is discharged to a watercourse, the water discharged will be done in a manner that does not cause erosion or other damage to adjacent lands.

ID	Issues / Concerns / Potential Effects	Concerned Agency	Mitigation / Protection / Monitoring / Commitments
1.05	Erosion and Sediment Control	MTO MECP CVC	<ul style="list-style-type: none"> ▪ The following erosion and sediment control measures will be implemented: <ul style="list-style-type: none"> – Use of effective erosion control measures including topsoil and seed, silt fence barriers, and erosion control blankets as per OPSS 804. – Design and implement erosion and sediment controls to contain/isolate the construction zone, manage site drainage/runoff and prevent erosion of exposed soils and migration of sediment into waterbodies at all stages of the Project using details outlined in OPSS 805 – Construction Specification for Temporary Erosion and Sediment Control Measures. Erosion and sediment control measures will be maintained until all disturbed ground has been permanently stabilized, suspended sediment has resettled to the bed of the waterbody or settling basin and runoff water is clear. – Minimize vegetation removal where possible and proper clearing and grubbing techniques will be utilized. All retained vegetation will be delineated and protected. Removal of vegetation shall be in accordance with OPSS 182 and clearing shall be completed in accordance with the specifications outlined in OPSS 201 – Construction Specification for Clearing, Close Cut Clearing, Grubbing and Removal of Surface and Piled Boulders. – Site isolation/containment measures (i.e. cofferdams) will be implemented to isolate areas where in-water work is required. Site isolation will be implemented as per OPSS 182 and designed according to relevant Contract Specifications. – Rock protection to be used in construction within the river shall be clean (washed) and free of fine materials and debris prior to placement. Placement of rock protection shall be in a controlled manner to minimize sedimentation. – Measures will be implemented for containing and stabilizing waste material (e.g., dredging spoils, construction waste and materials, commercial logging waste, uprooted or cut aquatic plants, accumulated debris) above the High Water Mark (HWM) of nearby waterbodies to prevent re-entry. – All stockpiled materials, including but not limited to excavated overburden and topsoil, excess materials, construction debris and containers will be stored and stabilized in a manner that prevents them from entering any waterbody. – Regular inspection and maintenance of erosion and sediment control measures and structures during the course of construction. – Repair erosion and sediment control measures and structures if damage occurs. – Remove non-biodegradable erosion and sediment control materials once site is stabilized.
1.06	Operation of Machinery	MTO MECP	<ul style="list-style-type: none"> ▪ EDCO will ensure that machinery arrives on site in a clean condition and is maintained free of fluid leaks for the duration of construction. EDCO shall also ensure that: <ul style="list-style-type: none"> – Whenever possible, heavy machinery access will be limited to areas within the existing ROW and along the banks of the Credit River, Stavebank Creek, Kenollie Creek and Mary Fix Creek above the normal high-water mark. The watercourses will not be crossed (i.e. forded) or treated as machinery staging at any time. – Whenever possible, machinery will be operated on land above the high-water mark in a manner that minimizes disturbance to the banks and bed of the waterbody. – Washing and servicing machinery shall not occur within 30 metre of any watercourse or wetland features to the extent possible and to prevent any deleterious substances from entering the water. – Where equipment can easily be moved, refueling shall not occur within 30 metre of wetland or watercourse feature. – Should re-fuelling occur within 30 metre of a watercourse or wetland (i.e., during construction of the new bridge over the Credit River), the Spills Contingency Plan shall be followed and, a 2 person refueling process will be followed; specified re-fuelling areas shall be delineated; extra spill response kits shall be available; and, secondary containment system (such as a spill tray /absorbent pad/ containment bladder, etc.) will be employed. – Spill kits are available onsite and drip pans are to be placed under all non-mobile machinery. – The Clean Equipment Protocol for Industry (Halloran, Anderson, Hayley and Tassie, Danielle, 2013). Applicable OPSS for Equipment Use includes OPSS 182 will be followed.

ID	Issues / Concerns / Potential Effects	Concerned Agency	Mitigation / Protection / Monitoring / Commitments
1.07	Contaminant and Emergency Spill Response	MTO MECP	<ul style="list-style-type: none"> For the proposed activities within the QEW/Credit River study area including bridge construction and rehabilitation works and culvert replacements and extensions, EDCO shall develop a response plan that is to be implemented immediately in the event of a sediment release or spill of a deleterious substance as well as keep emergency spill kits on site (and in heavy machinery) in case of emergency. EDCO shall also ensure that: <ul style="list-style-type: none"> Materials such as paint, primers, rust solvents, degreasers, grout, poured concrete or other chemicals do not enter the watercourse. Building material used in a watercourse has been handled and treated in a manner to prevent the release or leaching of substances into the water that may be deleterious to fish. Mitigation/Protection/Monitoring shall ensure the following All spills shall be reported to the Ministry of Environment, Conservation and Parks (MECP) Spills Action Centre (1-800-268-6060) as well as to DFO and MNRF Aurora District if there is potential for significant impacts to fisheries and/or wildlife resources.
1.08	Fish Habitat Enhancement and Restoration Measures	MTO DFO	<ul style="list-style-type: none"> For bridge construction works at the Credit River the following measures will be incorporated in to design of the restoration works which will be documented for stakeholder review and comment in a future DCR: <ul style="list-style-type: none"> Clean, appropriately sized river stone will be used for rock protection in order to enhance the quality of fish habitat along the channel banks. Rock protection around piers will be 400 mm round boulders to create interstitial spaces meeting the requirements for American Eel. Following construction activities appropriate riparian planting will be completed where possible to restore and enhance the bank areas disturbed during construction. Stabilize bridge embankments to minimize washout of granular material entering watercourses. For culvert replacement and extension activities at Stavebank Creek and Kenollie Creek the following measures will be incorporated in to design of the restoration works which will be documented for stakeholder review and comment in a future DCR Ensure replaced culverts are installed in a manner to enhance fish passage to upstream areas including appropriate sizing and embedment. Where possible, incorporate riparian plantings along existing watercourses where banks are disturbed to enhance stream shading and overhanging cover. Installation of baffles and plunge pool to mitigate velocities at the culvert outlets. Stabilize QEW embankments to minimize washout of granular material entering watercourses.
2.01	Disturbance of Soils During Construction Activities	MTO MNRF	<ul style="list-style-type: none"> In addition to implementing measures as per Ontario Provincial Standard Specification (OPSS) 805: Construction Specification for Temporary Erosion and Sediment Control Measures: <ul style="list-style-type: none"> Minimize vegetation removal, where possible, and limit removal to within the construction footprint. Maintain vegetation of embankments for as long as possible prior to disturbance. Seed and cover exposed soils as soon as possible. Routinely inspect sediment and erosion control structures, including after storms, and repair as required.
2.02	Wetlands and Vegetation	MTO MNRF CVC	<ul style="list-style-type: none"> To avoid and/or minimize impacts to vegetation, the following mitigation measures include: <ul style="list-style-type: none"> Vegetation removal shall be minimized to the extent possible and shall be limited to the construction disturbance footprint. To protect the features and functions of retained vegetation areas, the limits of construction work areas shall be clearly delineated. To protect deciduous forest communities that will be retained, tree protection shall be installed along the limits of construction areas as per OPSS-801: Construction Specification for the Protection of Trees. Trees and shrubs to be retained shall be pruned if damaged by construction activities and replaced if killed by construction activities. Trees and shrubs removed as part of the proposed Project shall be replaced with native species where possible. Areas of herbaceous vegetation disturbed during construction shall be seeded with an appropriate seed mix per the Landscape Plan and OPSS 804 – Construction Specification for Seed and Cover. Seed and cover exposed soils as soon as possible. Areas shall be restored with vegetation/landscaping per the Landscaping and Ecological Restoration Plan.

ID	Issues / Concerns / Potential Effects	Concerned Agency	Mitigation / Protection / Monitoring / Commitments
			<ul style="list-style-type: none">– Stockpiling of materials shall be limited to clearly identified locations within the Project footprint.– Sediment and erosion control measures (e.g., silt fencing, straw bales, etc.) shall be installed at the limits of construction to minimize direct impacts to wetland areas. No access, work, or storage shall be permitted within wetland areas outside of the limits of disturbance. Refuelling shall not occur within 30 metre of wetland areas.– Forest communities (FODM4, FODM5, FODM2) that exist within and adjacent to the work area shall be clearly delineated in the field and no access beyond the limits of work shall be permitted as they are potential habitat for SAR bats (Figures 2 to 5).– Wetland Unit 2h (within the Credit River Valley, (Figures 2 to 5) shall not be disturbed after mid-September through April to protect any turtles that may be hibernating in this feature. Alternatively, if installation of the crane pad / staging area is required during the winter, exclusion fencing could be erected around this feature prior to the end of August to prevent turtles to hibernate.– Minimize the extent of the construction footprint in Wetland Unit 2h given that this area is identified as candidate Significant Wildlife Habitat.
2.03	Invasive Species Control During Construction	MTO MNRF MECP CVC	<ul style="list-style-type: none">▪ To prevent nesting of birds during construction, EDCO shall establish preventative measures within the Project limits.▪ To avoid the destruction of migratory birds, their eggs and their nests, vegetation removal shall be conducted outside of the breeding bird window of April 1 to August 31.▪ If clearing and grubbing during the breeding bird window (April 1 – August 31) cannot be avoided within areas of simple habitat, an avian specialist must conduct nest surveys to confirm the absence of nesting birds within the area to be cleared and/or grubbed. If any nests are found, they must be protected during the nesting season with a species-appropriate buffer (determined by the avian specialist). Nest sweeps are valid one week from the date of survey.▪ Adjust the preventative measures as needed during construction and maintain the integrity/function of the preventative measures until no longer needed or until Project completion.▪ If adjustments to the preventative measures are required to facilitate construction staging operations, the adjustments shall be effective in preventing nesting of migratory birds.▪ Document and report all preventative measures, to be available to the Contracting Authority upon request.▪ If nests with eggs and/or young are found, the EDCO avian biologist shall confirm if they belong to a migratory bird species. If active nests (nests with eggs or young birds) are found:<ul style="list-style-type: none">▪ Immediately notify the Contracting Authority who shall contact the Environmental Office and the avian biologist for direction.▪ Monitor the area daily for nesting activity and notify the Contracting Authority immediately if a nest (re)appears.▪ Remove nests only during specific situation as identified below:▪ Remove inactive nests only outside the migratory bird nesting season (August 31 to April 4); in certain circumstances a Canadian Wildlife Services (CWS) permit may be obtained for the removal of nest and eggs of migratory birds.
2.04	Impacts to Migratory Birds	MTO MNRF	<ul style="list-style-type: none">▪ Awareness training shall be provided to all EDCO parties that addresses the potential for SAR to occur on site. Training will provide information that should allow the staff to recognize the SAR and respond appropriately.▪ Any observations of Endangered or Threatened species must be reported to the MNRF using the Rare Species Reporting form available at http://nhic.mnr.gov.on.ca/species/species_report.cfm
2.05	Species at Risk – Bats	MTO MNRF MECP	<ul style="list-style-type: none">▪ EDCO will implement the following mitigation measures with respect to bats and bat habitat:<ul style="list-style-type: none">– Vegetation removals will not occur between April 1 and September 30 to protect critical life processes related to rearing young bats.– Those communities that provide bat habitat shall be identified as Sensitive Bat Habitat. These areas shall be protected as per OPSS-801: Construction Specification for the Protection of Trees and shall be clearly delineated in the field. These areas shall be considered no-go zones, where storage, staging and access are not permitted at any time.– Standard practices to minimize construction noise and vibration shall be implemented. Construction activities shall be in compliance with the municipal bylaws when possible.– Any lighting associated with the construction phase shall be the minimum necessary to ensure security and safety and should be directed away from natural areas when possible.

ID	Issues / Concerns / Potential Effects	Concerned Agency	Mitigation / Protection / Monitoring / Commitments
2.06	Species at Risk – Snapping Turtle	MTO MNRF MECP	<ul style="list-style-type: none"> To avoid impacts to this species, EDCO will employ the following measures: <ul style="list-style-type: none"> – Awareness training shall be provided to EDCO parties that addresses the potential for Snapping Turtles to occur on site. Training should provide information that will allow EDCO parties to recognize the species and respond appropriately. – Snapping Turtles encountered outside of the work area should be left to move on their own. – Maintenance of erosion and control measures prescribed for the Project should work to prevent individuals from entering the work area. – Snapping Turtles encountered within the work area shall be moved to a location outside of the work area that is within close proximity and provides similar habitat to where the individual was found. – If a nesting activity is observed or a nest is found, the MNRF should be contacted immediately and a 5 metre buffer around the site shall be flagged and protected until further direction is received from MNRF.
2.07	Species at Risk – Butternut	MTO MNRF MECP	<ul style="list-style-type: none"> The limits of disturbance to accommodate clearing and grubbing, and rehabilitation of the existing bridge have been minimized to the extent possible and the location of the tree marked within the no-go area. Tree protection fencing will be installed to avoid encroachment into the buffer limit for this tree to allow rehabilitation works on the south side of the existing bridge.
2.08	Species at Risk – Bank Swallow	MTO MNRF MECP	<ul style="list-style-type: none"> If work within stockpiles or slopes is required during the breeding bird season, a slope reduction plan should be used to deter nesting by Bank Swallows, which may include the following: <ul style="list-style-type: none"> – Sloping off stockpiles (using a bulldozer excavator etc.). – Contouring slope faces. – Piling materials on the face (exclusion). – Slope reduction measures should continue throughout the breeding bird season (April 1 – August 31) of any year.
3.01	Impacts to Existing Land Use within the Project Limits	N/A	<ul style="list-style-type: none"> No impacts are expected; therefore, no specific mitigation measures are required.
4.01	Construction Noise and Vibration (General)	MTO MECP City of Mississauga	<ul style="list-style-type: none"> EDCO will: <ul style="list-style-type: none"> – Create and maintain a website with regular updates (weekly, daily/nightly, as necessary) to inform the public of night/weekend work, and provide updates on traffic staging/traffic impacts and closures – Provide all the information related to the anticipated night/weekend construction activities to the area Councillors. This will be provided prior to the start of the construction contract. – Provide regular updates to City Councillors and staff regarding night/weekend work, and updates on traffic staging/traffic impacts and closures
4.02	Construction Noise within the MTO Right-of-Way	MTO MECP	<ul style="list-style-type: none"> MTO has a standing agreement with the City of Mississauga that night and weekend work within the MTO right-of-way (ROW) are exempt from the Noise By-Law. Despite the agreement with the City, where possible, construction activities will be limited to the time periods allowed by the Noise By-Law
4.03	Construction Noise outside of the MTO Right-of-Way	MTO MECP City of Mississauga	<ul style="list-style-type: none"> For works outside the MTO ROW that will be completed outside the hours of the City of Mississauga’s Noise By-law, a noise by-law exemption permit shall be acquired by EDCO, if required. EDCO will Follow and implement requirements as may be set out under the noise by-law exemption.
4.04	Construction Noise and Vibration	MTO MECP City of Mississauga	<ul style="list-style-type: none"> EDCO will implement the following measures to mitigate impacts associated with construction noise and vibration: <ul style="list-style-type: none"> – All equipment should be properly maintained to limit noise emissions. As such, all construction equipment must be operated with effective muffling devices that are in good working order. – Any initial noise complaint shall trigger verification that the general noise control measures agreed to, are in effect. Any noise complaints should be forwarded to the Contracting Authority. – In the presence of persistent noise complaints, all construction equipment should be verified to comply with MECP NPC-115 guidelines. – If noise level emissions for the construction equipment in use exceed the sound level criteria for construction equipment contained in the MECP NPC-115 guidelines, EDCO shall comply with the sound level criteria where quieter alternative equipment is reasonably available.

ID	Issues / Concerns / Potential Effects	Concerned Agency	Mitigation / Protection / Monitoring / Commitments
5.01	Air Quality due to dust emissions from works in paved surfaces	MTO MECP City of Mississauga	<ul style="list-style-type: none"> EDCO will be responsible for: <ul style="list-style-type: none"> – Street sweeping as required, based on visual inspection. Roads should be kept clear of dust as much as possible. – Swift removal of spilled materials – Use enclosed cargo holds on trucks and vehicles or cover open-bodied trucks. – Minimize or limit the number of trucks accessing the site. – Clean the wheels and empty cargo holds of vehicles prior to leaving the site.
5.02	Air Quality due to fugitive dust from works in unpaved areas	MTO MECP City of Mississauga	<ul style="list-style-type: none"> EDCO will implement the following measures to mitigate impacts associated with construction air quality and dust in unpaved areas: <ul style="list-style-type: none"> – Minimize vehicle traffic on-site. – Set low speed limits for on-site traffic. – Apply water or a dust suppressant on unpaved surfaces, including roads and lots. – Limit total area of exposed sites at any given time throughout the construction period (i.e. staging of construction activities).
5.03	Air Quality related to aggregate materials, including unloading, loading and transfer; and, earth storage.	MTO MECP City of Mississauga	<ul style="list-style-type: none"> EDCO will implement the following measures to mitigate impacts associated with construction air quality from aggregate material and earth storage: <ul style="list-style-type: none"> – Minimize uncovered storage of materials on-site. – Apply water or a dust suppressant to storage piles. – Construct wind breaks surrounding storage piles. – Strategic placement of storage piles to increase separation distance to nearby sensitive receptors such as schools, residences and parks. – Consider predominant winds and avoid locating storage piles upwind of nearby sensitive receptors. – Mitigation and control measures for unloading, loading, and transferring aggregate materials: <ul style="list-style-type: none"> – Minimizing the amount of material being transferred on-site at any one time. – Lower drop distances when unloading material onto piles or surfaces. – Loading trucks and vehicles so that the dump load will not spill over the sides of the target vehicle. Loads should be dropped as close to the vehicle opening as possible. – Apply a water spray or dust suppressant to the materials being transferred.
5.04	Air Quality related to odours and exhaust	MTO MECP City of Mississauga	<ul style="list-style-type: none"> EDCO will implement the following measures to mitigate impacts associated with construction air quality and odours from exhaust: <ul style="list-style-type: none"> – Minimize the number of vehicles and engines operating at any one time. – Increase separation distances between sensitive receptors, such as schools, residences, and parks and all exhaust points. – When possible, ensure that engine exhausts are oriented upwards. – Limit idle times of vehicles and engines. Shut off engines when not in use. – When possible, limit operations to times when winds are blowing away from sensitive receptors and minimize use when winds would direct exhaust emissions towards sensitive receptors.
5.05	Air Quality related to dust from excavation operations	MTO MECP City of Mississauga	<ul style="list-style-type: none"> EDCO will implement the following measures to mitigate impacts associated with construction air quality from dust due to excavations: <ul style="list-style-type: none"> – Minimizing the number of machines in operation concurrently. – Use water or dust suppressants on the work surface. – Decrease the travel distance between the work area and storage piles or trucks. – Lower drop distances of the excavated earth and materials.
6.01	Encounter of Undiscovered Archaeological Materials or Human Remains	MTO MHSTCI	<ul style="list-style-type: none"> In the event that human remains are encountered during construction, EDCO shall contact the Ontario Provincial Police, the Ministry of Transportation Archaeologist at 416-23-5489, the Ministry of Heritage, Sport, Tourism and Culture at 416-314-7146; and the Registrar of the Ministry of Government Services Cemeteries Regulations Unit at 416-326-8404.

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			<ul style="list-style-type: none">▪ In the event that potential archaeological resources are discovered during construction, they may be a new archaeological site and therefore subject to Section 48 (1) of the Ontario Heritage Act. The proponent or person discovering the archaeological resources must cease alteration of the site immediately and engage a licensed consultant archaeologist to carry out archaeological fieldwork, in compliance with Section 48 (1) of the Ontario Heritage Act. EDCO shall also contact the Ministry of Transportation Archaeologist at 416-235-5489 and the Ministry of Heritage, Sport, Tourism and Culture at 416-314-7132.▪ Fencing will be installed to prevent any entry and disturbance of lands north of the Project limits (west of Stavebank Road) as shown in Figures 2 to 5. Fencing installation will be monitored by a licensed archaeologist.
7.01	Built Heritage – Rehabilitation of Existing QEW Credit River Bridge	MTO MHSTCI	<ul style="list-style-type: none">▪ Adhere to the Strategic Conservation Plan (SCP) prepared for the existing bridge by MTO that sets out conservation guidelines for undertaking repairs/rehabilitation of the bridge. EDCO’s rehabilitation design of the Existing Credit River Bridge shall take the following into consideration:<ul style="list-style-type: none">– For concrete repairs, an appropriate concrete mix should be developed based on core sampling analyses, as specified design specifications for the bridge.– The key heritage attributes to be protected will be incorporated in the rehabilitation design and taking into consideration that some elements will be reconstructed (i.e. deck and cross beams).– Soil shall not be piled up against the heritage bridge and materials, equipment and vehicles will be stored elsewhere on the site.– Where practical, fencing or other means of shielding shall be used to establish protection measures when work is being completed near the existing structure.– Protect the embankments to the extent possible and undertake minimal intervention if erosion control.– EDCOs specialist with proven experience in the repair of historic concrete to monitor construction activities shall be involved with the Strategic Conservation Plan for the Project.▪ General Rehabilitation design considerations:<ul style="list-style-type: none">– The original structural design of the bridge will be retained, such that the main structural function of Spandrels, arches and piers will be retained; and the replacement floor beams will be concrete and continue to be supported by the arch columns (spandrel columns).– The visual qualities of the new concrete in terms of colour and texture should be compatible with the historic concrete where possible.– The visual detailing of the connection between the floor beams and the arch columns (spandrel columns) will be retained, where possible.– Existing “ER” light standards will be retrofitted as part of the bridge rehabilitation with new LED lights installed. The ER light poles will be installed in line with the centre of each pier of the existing QEW eastbound bridge to match existing conditions. The poles will be installed on the outside of the noise wall.– Match forms, material and detailing of the 1960s parapet walls to the extent possible based on a review of the documentary records including drawings from the 1960 widening and with current safety standards. New barrier walls were sympathetically designed considering existing plans from the 1960 bridge widening and 1980 upgrades to meet existing bridge code requirements.– Design to a height that retains as much of the view that is technically feasible based on current safety standards from the bridge deck of the Credit River valley.▪ To mitigate visual impacts, the new noise barrier walls are to be designed with consideration of the following:<ul style="list-style-type: none">– The use of a transparent material for the noise barrier walls is supported since it will permit views of the Credit River from the bridge deck to be retained.– Given that the noise barriers are transparent, they will not obscure views of the “ER” light standards. Note the lower section of the light standards will be behind the noise barrier when looking from the highway side.– The noise barrier wall system will be attached to new or replacement components of the existing QEW Credit River Bridge and avoid use of the historic concrete structure for support.▪ In addition, to protect the structure from future graffiti the following will be implemented:<ul style="list-style-type: none">– Graffiti is to be removed from the existing bridge.– Anti-graffiti coating will be applied to the abutments and wingwalls and to the lower 3 metres of the arches and piers. Coatings to be tested on concrete that will be removed to test the impact.– Graffiti removals and anti-graffiti coating will be subject to review by a heritage professional.

ID	Issues / Concerns / Potential Effects	Concerned Agency	Mitigation / Protection / Monitoring / Commitments
7.02	Built Heritage (General)	MTO MHSTCI	<ul style="list-style-type: none">▪ EDCO's qualified Cultural Heritage specialist with experience in historic structures, notably historic concrete construction and linear corridor Projects will be involved during the design phase.<ul style="list-style-type: none">– “ER” light standards will be salvaged, and the lights will be replaced with LED lighting. The “ER’ lights will be placed on the north side of the new bridge and the south side of the existing bridge.– The ER light poles will be installed in line with each pier of the existing QEW eastbound bridge to match existing conditions. Placement of the light poles on the north side of the new bridge will be parallel to those on the south side of the existing bridge.– Design the new noise barrier walls to be considerate of the following to minimize visual impacts:<ul style="list-style-type: none">• The use of a transparent material for the noise barrier walls to permit views of the Credit River from the bridge deck to be retained.• Given that the noise barriers are transparent, they will not obscure views of the “ER” light standards. Note the lower section of the light standards are to be placed behind the noise barrier when looking from the highway side.• Care should be taken to ensure the alignment of the posts of the noise barrier wall do not obscure the base of the light standards. Noise barrier post should be position so that light standards are centred on a panel between two posts.– Ensure that all commemoration commitments are addressed.– Embankments are to be protected to the extent possible and undertake minimal intervention if erosion control is recommended.▪ Adhere to the Heritage Impact Assessment (HIA) prepared for the existing bridge by MTO.
8.01	Groundwater and Soil Contamination	MTO MECP	<ul style="list-style-type: none">▪ The following measures will be implemented to monitor for the presence of impacted soils/groundwater and to ensure proper management if encountered include:<ul style="list-style-type: none">– Requirements to manage soil in accordance with applicable regulations and guidelines, including “Management of Excess Soil – A Guide for Best Management Practices”, Ontario Ministry of the Environment, 2014.– Requirements for Qualified Persons (as defined by Ontario Regulation 153/04) to be onsite during work within areas identified as being potentially subject to soil impacts.– Sampling and analysis of soil and groundwater prior to ultimate reuse and/or disposal.– Requirements to manage all wastes, including any contaminated soil and/or groundwater in accordance with applicable regulations and Ontario Provincial Standard Specification 180.– Disposal of any contaminated earth at an MECP-approved waste facility.– Discharging all dewatering in compliance with requirements stipulated in the PTTW and all supporting documentation. The detailed requirements will be determined through the PTTW process.
8.02	Management of Effluent from Concrete Surface Work	MECP	<ul style="list-style-type: none">▪ The following pertains to management of wastewater, sludge, sand, rubble, and effluent resulting from concrete surface work, including concrete cleaning by dry abrasive and/or wet methods, concrete cutting/grinding, and electrochemical chloride extraction procedures. Also, this includes the establishment of a Portable Sewage Works where necessary to comply with requirements Management of Effluent from Concrete Surface Work specified here for certain liquid and sludge excess materials treatment and handling.▪ Conditions on Management of Wastewater:<ul style="list-style-type: none">– All wastewater resulting from concrete surface work shall not be allowed to soak into or otherwise come in contact with the soil, surface or groundwater, or otherwise enter untreated into the natural environment. The effluent must be isolated, fully captured, contained, and fully collected for treatment by a Sewer Vac Truck. All wastewater shall be managed by one of the following methods:<ul style="list-style-type: none">• Direct treatment of the wastewater via a Portable Sewage Works for ultimate discharge to a sanitary sewer or sewage treatment plant;• Managing the wastewater entirely as a subject waste.– Representative composite samples from the entire collection of effluent shall be taken and analyzed by an independent accredited laboratory. Wastewater entering the Portable Sewage Works shall be sampled at the beginning of the treatment process and analyzed for pH and Total Suspended Solids.

ID	Issues / Concerns / Potential Effects	Concerned Agency	Mitigation / Protection / Monitoring / Commitments
			<ul style="list-style-type: none"> – Have a contingency plan in place for dealing with any unexpected emergencies or release of wastewater on site. Monitor the work to allow for prompt identification of problems. Have spill cleanup materials present on site of the type and quantity appropriate to deal with any unexpected release of wastewater. ▪ Conditions on Management of Effluent: <ul style="list-style-type: none"> – Treated effluent exiting from the Portable Sewage Works shall be discharged directly to a sanitary sewer or sewage treatment plant. Notify the Contracting Authority of the manner (i.e. sanitary sewer or sewage treatment plant), and exact location of intended effluent discharge. – If effluent is discharged, EDCO shall: <ul style="list-style-type: none"> • Comply with the conditions of the MECP Certificate of Approval or Environmental Compliance Approval for a Portable Sewage Works; • Comply with any conditions imposed by the owner of the property to which effluent from the sewage works is directed and control the effluent to avoid causing scours or washout. – Effluent shall be managed by discharge to a sanitary sewer or sewage treatment plant and shall comply with any conditions imposed by the owner and operator of the sanitary sewer or sewage treatment plant to which effluent is directed. – Ensure that the following conditions are also met for all effluent discharge: <ul style="list-style-type: none"> • Representative composite samples of final effluent shall be taken upon exiting the treatment works and prior to dilution with, or modification by, extraneous flows unrelated to the Portable Sewage Works, and analyzed by an independent accredited analytical laboratory for pH and Total Suspended Solids. • Effluent flow information shall be collected and recorded to include: • Flow rate at the time sampling is undertaken; and • Total volume of effluent discharged per 24-hour period of hydro-demolition/cleaning or per operation if less than 24 hours. • A record shall be kept documenting all routine maintenance procedures, actions taken to correct treatment processing upsets and any other relevant information relating to achievement of effluent compliance, which shall be made available to the Contracting Authority upon request. ▪ Discharge to a Sanitary Sewer or Sewage Treatment Plant: <ul style="list-style-type: none"> – If effluent is to be discharged to a sanitary sewer or sewage treatment plant, then written permission from the local municipality or owner shall be obtained by EDCO prior to the commencement of concrete cleaning/hydro-demolition work, to be made available to the Contracting Authority upon request. – If effluent is hauled off to an off-site sanitary sewer or sewage treatment plant, then a copy of the carrier's MECP Certificate of Approval or Environmental Compliance Approval for a Waste Management System shall be available to the Contracting Authority upon request. The Certificate/Approval shall be valid for the entire period that the equipment is utilized and/or the waste class of the material is managed.
8.02	Designated Substances encountered during rehabilitation works on QEW Credit River Bridge	MTO MOL	<ul style="list-style-type: none"> ▪ Any work with the potential to disturb asbestos-containing materials (ACM) shall be carried out in accordance with O. Reg. 278/05, as amended: Designated Substances – Asbestos on Construction Projects and in Buildings and Repair Operations. Asbestos-containing waste must be handled in accordance with R.R.O. 1990, Regulation 347 General – Waste Management (O. Reg. 347). ▪ All work related to the removal of arsenic-containing material shall be undertaken in accordance with O. Reg. 490/09 made under the Occupation Health and Safety Act. All arsenic containing materials shall be disposed of in accordance with OPSS 180 and O. Reg. 347. ▪ All activities that may disturb paints suspected of containing lead shall comply with the applicable OSHA legislation. All lead containing waste shall be disposed of in accordance with OPSS 180 and O. Reg. 347. ▪ All construction activities shall be conducted in accordance with the Guideline: Silica on Construction Projects, published by the Occupational Health and Safety Branch of the Ministry of Labour, dated April 2011.
8.03	Designated Substances encountered during works on Mississauga Road Overpass	MTO MOL	<ul style="list-style-type: none"> ▪ All work related to removal of arsenic-containing material shall be undertaken in accordance with Ontario Regulation 490/09 made under the Occupational Health and Safety Act. Arsenic containing materials shall be disposed in accordance with OPSS 180 and O. Reg. 347. ▪ All activities that may disturb paints suspected of containing lead shall comply with the applicable OSHA legislation. All lead containing waste shall be disposed of in accordance with OPSS 180 and O. Reg. 347.

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			<ul style="list-style-type: none">▪ All construction activities shall be conducted in accordance with the Guideline: Silica on Construction Projects, published by the Occupational Health and Safety Branch of the Ministry of Labour, dated April 2011.▪ Used bulbs, luminaires or ballast shall be checked by EDCO for the presence of mercury vapour prior to disposal. Disposal of used bulbs, luminaires or ballast shall be carried out in accordance with best practices and applicable legislation.▪ Before disposing of bulbs, luminaires or ballast EDCO shall check for PCB. The PCB waste management shall follow O. Reg. 347 and is subject to special requirements for transportation and disposal.
9.01	Traffic Management During Construction	MTO City of Mississauga Peel Region Emergency Services	<ul style="list-style-type: none">▪ During construction Advanced Notification/Warning/Detour Route TC-64 signs will be installed to provide notification to the travelling public of lane reductions, closures or detour routes.▪ In addition to public notification via roadside signage, the City of Mississauga, Region of Peel and emergency services will be provided notice in writing prior to a major change to the existing traffic flow conditions.
10.01	Impacts to Navigation (Credit River)	MTO Transport Canada	<ul style="list-style-type: none">▪ Adhere to the terms and conditions of the Canadian Navigable Waters Act (CNWA) approval of the work, which may include the following:<ul style="list-style-type: none">– Installation of signage advising of temporary access restrictions through the Project limits– Installation of yellow flashing lights to identify in-water hazards during periods of low visibility– Opportunities for a portage around the work site during full waterway closures, where practical and safe to do so.

4 Monitoring

4.1 Prior to Construction

In completing the detail design and EA process and acquiring remaining permit and approvals, the design drawings and specifications will be refined and finalized. Design modifications or refinements may be required during the design process, which could result in environmental benefits or impacts not anticipated or identified in this document. Such changes will be discussed with appropriate stakeholders prior to construction, if necessary.

4.2 During Construction

Monitoring programs to be implemented by EDCO during construction are intended to:

- Assess compliance with design details, environmental commitments and conditions of the PLAAs for the Project.
- Monitor the effectiveness of mitigation measures and identify the need for additional measures, corrective actions, or adaptive management where necessary.

The EDCO team includes dedicated resources who will be responsible for environmental and construction inspections during construction. These personnel and all personnel who are working or accessing the construction site will be required complete the necessary training. This will include but not be limited to Environmental Health and Safety (EHS) and Environmental Awareness. EDCO's environmental awareness training will provide a pre-site orientation of the sensitive environmental conditions on-site, protocols for encounters with wildlife including SAR and best management practices to be implemented during construction as specified under the various environmental management plans for the work.

Appendix A

Public Consultation

Appendix B

Construction Sequencing and Staging Overview

Appendix C

Design Drawings