

**DILLON**  
CONSULTING

MINISTRY OF TRANSPORTATION, ONTARIO

# Design and Construction Report (Final)

DB-2017-3017, Highway 401/Elgin Road Design-Build

October 2018 – 18-7393



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## 1.0 Introduction

On behalf of the Ministry of Transportation, Ontario (MTO), Coco Paving Inc. and Dillon Consulting Limited (Dillon) are completing the Detailed Design and Class Environmental Assessment (EA) for the Elgin Road Underpass replacement and interchange ramp reconstruction project in the Municipality of Thames Centre, Middlesex County (**Photo 1**). To complete this work, MTO has identified cost savings and efficiencies to include the Elgin Road Interchange replacement with the Design-Build Contract for the Highway 401 rehabilitation and reconstruction work being completed from 0.7 km east of Dorchester Road to 0.8 km west of Putnam Road.



**Photo 1: Elgin Road Underpass Road Elevation**

Building on the Preliminary Design and Class EA completed for the project in December 2015 (see **Section 2.2**), this Design and Construction Report (DCR) documents the Detailed Design and Class EA for the Elgin Road Underpass replacement and interchange ramp reconstruction. The replacement and reconstruction of the Elgin Road Interchange is classified as a Group “B” project following MTO’s Class EA. This DCR will be published for a 30-day public review period, prior to construction start.



**Photo 2: Highway 401 at Elgin Road Interchange Looking East**

The Detailed Design and Class EA for the Highway 401 rehabilitation and reconstruction work being completed from 0.7 km east of Dorchester Road to 0.8 km west of Putnam Road followed the MTO Class EA for Provincial Transportation Facilities (2000) as a Group “C” undertaking. The Detailed Design and EA completed for the Highway 401 rehabilitation and reconstruction work is documented under separate cover in an Environmental Screening Document (ESD, May 2018). Construction of the Highway 401 rehabilitation and reconstruction work was initiated in 2018 with an anticipated completion date of October 2019.

### 1.1 Project Study Area

The Highway 401/Elgin Road (Middlesex Road 73) Interchange is located approximately 2 km southeast of Dorchester, Ontario, in the Municipality of Thames Center, Middlesex County (**Figure 1**). The underpass currently carries two lanes, one in each direction, over highway 401. The project limits extend 400 m north and south and 350 m east and west of the Highway 401/Elgin Road Interchange. The

nearest major community, the City of London, is located approximately 11 km west of the Project Study Area.

## 1.2 Project Purpose, Needs and Justification

The existing Elgin Road Underpass is a 32.9 m single span cast-in-place reinforced concrete haunched T-beam rigid frame structure. Since its construction in 1957, it has undergone one major rehabilitation in 1987 and is nearing the end of its service life. As a result, the existing structure requires replacement. To facilitate construction of the new underpass, interchange improvements are also required to:

- Accommodate the new underpass
- Enhance traffic safety
- Improve operations and capacity
- Improve geometric design and sight distances
- Apply MTO's *Highway Access Management Guidelines* (2013) at intersecting roads and private entrances.

To minimize future costs and traffic disruption, the new underpass was designed to accommodate the future expansion of Highway 401 to eight lanes and the ultimate Highway 401 expansion to ten lanes.

## 1.3 Project Description

As documented in the 2015 TESR completed during Preliminary Design (see **Section 2.2**), the proposed work includes:

- Replacement of the Elgin Road Underpass, on the same alignment, with a two-span integral abutment underpass with 42 m spans and 2:1 embankments
- Reconstruction of Elgin Road within the Project Study Area including a grade raise to provide adequate vertical clearance for Highway 401 traffic
- Reconstruction of the existing interchange ramps, maintaining the diamond configuration
- Replacement of six culverts located underneath the existing interchange ramps
- Replacement of four catch basins and their outlets underneath Elgin Road
- Replacement of one culvert underneath a private entrance approximately 340 metres north of the Highway 401 and Elgin Road Interchange
- Ancillary improvements including full illumination of the Elgin Road Commuter Parking Lot and upgrading existing illumination on Elgin Road within the project limits to meet current MTO standards.

The proposed reconstruction and rehabilitation is not expected to have impacts beyond the existing highway right-of-way (ROW) and shall be contained to MTO owned lands.

## 2.0 Environmental Assessment Process

This project is subject to Ontario's *Environmental Assessment Act* and is being carried out in accordance with the requirements of the *MTO Class EA for Provincial Transportation Facilities (2000)* as a Group "B" Project.

Group "B" projects are categorized by the MTO Class EA as major improvements to existing transportation facilities. This DCR, upon completion, shall be submitted for a 30-day public and agency review period. Although this report is not eligible for Part II Order (i.e., "bump-up") Requests, MTO will review all comments received.

### 2.1 Consistency with Provincial Policy Statement

The Provincial Policy Statement (PPS) is issued under Section 3 of the *Planning Act*, and came into effect on April 30, 2014. Section 3 of the *Planning Act* states decisions affecting planning matters "shall be consistent with" the PPS. The consistency of the proposed improvements (defined as "infrastructure" in the PPS) with the relevant Infrastructure and Public Service Facilities policies included in Section 1.6 of the PPS is summarized as follows:

- The planned ramp reconstruction and underpass replacement is appropriate to address the project needs and will also allow the provincial highway system to continue to operate in a safe, energy efficient manner, which facilitates the movement of people and goods
- The project makes efficient use of existing and planned infrastructure
- MTO's Class EA planning and design process has integrated transportation and land use planning considerations at all stages of the project
- As required by Section 1.6.8.1 of the PPS, MTO has planned for, and protected the corridor and ROW for transportation facilities to meet current and projected needs.

Section 1.6.8.5 of the PPS, requires that MTO, when planning for corridor and ROWs for significant transportation facilities, consider the significant resources protected by Section 2 of the PPS, Wise Use and Management of Resources. Impacts to significant resources, as identified by Section 2 of the PPS, outside the current ROW are not anticipated.

### 2.2 Preliminary Design Stage

In 2015, Dillon, on behalf of MTO, completed the Class EA, Preliminary Design and initial Detailed Design for interchange improvements for the Highway 401/Elgin Road interchange.

The Technically Preferred Alternative was chosen after completion of a comparative evaluation and consultation with the public, stakeholders, agencies and Indigenous Communities. Completed as a Group "B" project in accordance with the *MTO Class EA for Provincial Transportation Facilities (2000)*, a

Transportation Environmental Study Report (TESR) was completed (December 2015) to document the Preliminary Design for the Elgin Road Interchange (Middlesex Road 73). The TESR was approved following the 30-day public and agency review period and Environmental Clearance – Property Expropriation and ROW Designation was received on March 10, 2016.

### 2.3 Detailed Design Stage

In 2018, MTO retained Coco Paving Inc. in association with Dillon Consulting Limited to complete the Design-Build contract for the Highway 401/Elgin Road Underpass replacement and interchange improvements. This DCR builds on the previously completed Preliminary Design and initial Detailed Design (2015) and documents the final design and Class EA process for the Highway 401/Elgin Road Underpass replacement and interchange improvements.

## 3.0 Construction Staging and Traffic Management

The Elgin Road Underpass replacement will be completed over one construction season. Highway 401 will remain open for the majority of construction; however, overnight closures of Highway 401 will be required to facilitate demolition of the existing underpass and placement of new underpass girders. During construction, Elgin Road will be fully closed between Cromarty Drive and Slo Pitch Road. Full construction staging and traffic management details are provided in the following sections.

### 3.1 Highway 401

Highway 401 will remain open for the duration of construction except for short-duration night time closures. Up to five short duration night time closures are required to facilitate demolition of the existing Elgin Road Underpass and abutment walls, and for installation of new girders. During the Highway 401 closures, traffic will be managed within the MTO ROW and will be detoured using the existing interchange ramps. Temporary signage (road closing/road restriction signs) will be provided on Highway 401 during these closures.

Throughout construction, Highway 401 will be reduced to two lanes in each direction to complete construction of the median pier, median barrier wall, median storm sewer and sub-drains. Temporary advance signage will be provided along Highway 401 when lanes are restricted.

### 3.2 Highway 401 Interchange Ramps and Elgin Road

Highway 401/Elgin Road interchange ramps and Elgin Road will be closed to facilitate the replacement of the Elgin Road Underpass within four months. Reconstruction of the existing interchange ramps will also occur during the interchange closure. During construction, Elgin Road traffic will be detoured following



Cromarty Drive, Dorchester Road and Hamilton Road (**Figure 2**); access will be maintained for local residences on Elgin Road. Due to increased traffic along the detour route, temporary traffic signals shall be installed at both the south and north ramp terminals at the Highway 401/Dorchester Road Interchange for the duration of construction. Advance temporary signage will be provided along Highway 401 and Elgin Road to advise motorists of these closures.

The detour route has been approved by the Municipality of Thames Centre and Middlesex County and will have temporary signage to direct traffic along the approved route. MTO and Municipal staff will review the pavement condition of the detour routes before and after construction to determine if any repairs are required. MTO is responsible for all costs associated with necessary road repairs.

### 3.3 Commuter Parking Lot

The commuter parking lot southwest of the Elgin Road interchange will remain open to the public, except during the period when the Elgin Road interchange ramps are closed for reconstruction.

## 4.0 Consultation

The following summarizes public and agency consultation completed throughout Detailed Design. A copy of all consultation materials is provided in **Appendix A**.

### 4.1 Project Contact List

A Project Contact List was developed during project initiation. The contact list was developed based on the Preliminary Design contact list and includes directly impacted stakeholders, federal agencies, provincial ministries, municipalities, Indigenous Communities, utilities, local agencies, school boards, emergency services, and landowners who have properties adjacent to the Project Study Area. The contact list was maintained as a living document throughout Detailed Design.

### 4.2 Project Website

On March 28, 2018, a project website ([www.elgininterchange.com](http://www.elgininterchange.com)) was launched for the Elgin Road interchange improvements project (**Photo 3**). To minimize public confusion about construction in 2018, the website also provides high level information on the Highway 401 rehabilitation and reconstruction project. The website allows the project team to provide updates, maps of the Study Area, and for stakeholders to submit comments at their convenience.



**Photo 3: Project Website Home Page**  
([www.elgininterchange.com](http://www.elgininterchange.com))

## 4.3

## Notice of Commencement

As part of the project efficiencies, Notice of Commencement packages were prepared to initiate the Elgin Road Interchange Improvements Group "B" Class EA and the Highway 401 rehabilitation and reconstruction Group "C" Class EA projects at the same time. To meet the consultation requirements for a Group "B" project, a package containing a Notice of Commencement Newsletter for the Elgin Road Improvements project and a project comment form was sent to everyone on the Contact List on March 28, 2018.

The project initiation package requested comments by April 11, 2018. In total, eight comments were received as summarized in **Table 1**.

**Table 1: Notice of Commencement Comments Received**

Contact	Summary of Comment	Response
Upper Thames River Conservation Authority (UTRCA)	<ul style="list-style-type: none"> <li>Reminded the project team that they are adjacent landowners and requested to be kept informed as the project proceeds</li> </ul>	<ul style="list-style-type: none"> <li>No response required</li> </ul>
Nature London	<ul style="list-style-type: none"> <li>Phoned Dillon Consulting Limited (Dillon) on April 11, 2018, requesting more time to provide comments. On April 13, 2018, Nature London phoned again indicating they had no formal comments on the project</li> </ul>	<ul style="list-style-type: none"> <li>No response required</li> </ul>
Dorchester Fairgrounds	<ul style="list-style-type: none"> <li>Indicated they received the Notice of Commencement for the project and requested to be kept informed as the project proceeds</li> </ul>	<ul style="list-style-type: none"> <li>No response required</li> </ul>
Member of the Public	<ul style="list-style-type: none"> <li>Concerned about highway drainage issues on private property, identified significant erosion at the end of their laneway due to a previous change in the elevation of Elgin Road</li> </ul>	<ul style="list-style-type: none"> <li>No grade raise is anticipated at their entrance. Drainage issues will be alleviated by the project's drainage design and the entrance reconstruction, which includes installation of a new culvert under their driveway</li> </ul>
Member of the Public	<ul style="list-style-type: none"> <li>Interested in more information regarding the construction laydown area and potential Elgin Road Underpass closures</li> </ul>	<ul style="list-style-type: none"> <li>The laydown area is anticipated to be contained within the existing interchange loops</li> <li>The Highway 401/Elgin Road Interchange is planned to be closed for a maximum of four months during 2019</li> </ul>

Contact	Summary of Comment	Response
Member of the Public	<ul style="list-style-type: none"> <li>Concerned about: construction timing and detour routes, impacts to local traffic, and local road impacts from detoured traffic</li> </ul>	<ul style="list-style-type: none"> <li>The replacement of the Elgin Road Underpass and interchange ramps is scheduled to start in spring 2019 and be completed in October 2019</li> <li>Detour routes will be confirmed with the Municipality of Thames Centre and Middlesex County as the project proceeds</li> <li>Any improvements to detour routes would be made by Middlesex County, prior to construction, with costs covered by MTO</li> </ul>
Member of the Public	<ul style="list-style-type: none"> <li>Concerned about detour routes during the Highway 401/Elgin Road interchange closure and Highway 401 closures and the impact to local roads</li> </ul>	<ul style="list-style-type: none"> <li>Highway 401 traffic during closures will be detoured using the existing Elgin Road Interchange ramps and would not require detouring onto local roads</li> <li>Detour routes will be confirmed with the Municipality of Thames Centre and Middlesex County as the project proceeds</li> <li>Any improvements to detour routes would be made by Middlesex County, prior to construction, with costs covered by MTO</li> </ul>
Member of the Public	<ul style="list-style-type: none"> <li>Concerned about increasing traffic along Cromarty Drive during construction and the safety while leaving and entering their entrance</li> <li>Indicated that construction activities are to be completed adjacent to their property in 2018 by Hydro One</li> </ul>	<ul style="list-style-type: none"> <li>The replacement of the Elgin Road Underpass and interchange ramps is scheduled to start in spring 2019 and be completed in October 2019</li> <li>Detour routes will be confirmed with the Municipality of Thames Centre and Middlesex County as the project proceeds</li> <li>Any improvements to detour routes would be made by Middlesex County, prior to construction, with costs covered by MTO</li> </ul>

#### 4.4 Municipality of Thames Centre

On April 23, 2018, the project team presented a project update to the Municipality of Thames Centre Council. No significant concerns were raised by Council and the presentation was received for information.

On September 17, 2018, Coco Paving Inc. submitted a Noise By-law exemption request for 2019 construction activities to the Municipality of Thames Centre Council. Council approved the Noise By-law exemption and a resolution was passed at the September 17, 2018, Council Meeting for all 2019 construction activities (See **Section 5.2**).

#### 4.5 Ministry of Natural Resources and Forestry

As part of the background data collection, an Information Request was sent to the Ministry of Natural Resources and Forestry (MNRF) on January 11, 2018. Due to project timeline constraints, the request was sent prior to the official project commencement in an effort to effectively document existing conditions for the project.

A response was received from MNRF on March 28, 2018, documenting several Species at Risk (SAR), Significant Wildlife Habitats (SWH) and Environmentally Sensitive Areas (ESAs) within the project Study Area. These natural environment features including potential impacts and mitigation measures are summarized and discussed in **Section 5.1** of this DCR.

No additional correspondence was required with MNRF.

#### 4.6 Consultation with Indigenous Communities

MTO's Indigenous Liaison provided a contact list of Indigenous communities. The following Indigenous communities were provided with notification materials by MTO and encouraged to provide comments:

- Walpole Island First Nation
- Mississaugas of the New Credit
- Six Nations of the Grand River
- Oneida Nation of the Thames
- Chippewas of the Thames First Nation
- Munsee-Delaware Nation
- Moravian of the Thames
- Chippewas of Kettle & Stony Point First Nation
- Chippewas of Aamjiwnaang
- Caldwell First Nation.

Comments were not received from any of the listed Indigenous communities.

## 5.0 Impact Assessment and Mitigation

The proposed improvements (see **Section 1.3**) are anticipated to be constructed in 2019, subject to final approvals. Work associated with the Elgin Road Underpass replacements, interchange ramp reconstruction and Elgin Road reconstruction will be completed within the existing road ROW. No temporary or permanent property is required to complete construction. Traffic detours, as outlined in **Section 3** of this DCR, are required for the closure of Elgin Road for the duration of construction. Improvements to the detour route including intersection improvements and temporary traffic signals at the Dorchester Road interchange ramp will be completed prior to construction starting on Elgin Road.

Based on the scope of work for this project, impacts to adjacent land uses, including the Dorchester Swamp Provincially Significant Wetland (PSW), are anticipated to minimal. With appropriate mitigation measures implemented during construction, all potential impacts can be avoided, mitigated or minimized to the greatest extent possible.

## 5.1 Natural Features

Dillon biologists completed site visits on April 5, 2018, and August 31, 2018, to identify potential natural heritage features (aquatic, terrestrial, SAR) impacted by the project. During field investigations, no incidental wildlife observations were recorded, no migratory bird nests were identified and no SAR were observed. To complete the impact assessment, field information was further supplemented with data collected during preliminary design, as documented in the Highway 401, Three Bridge Replacements and Interchange Improvements in Middlesex County (GWP 3053-11-00) Terrestrial Ecosystem Assessment Report (September 2015) completed by Dillon. Given the information collected during Preliminary Design and the recent field investigations, along with the marginal habitat within the MTO highway ROW, limited impacts are anticipated to the surrounding natural environment.

### 5.1.1 Aquatic Ecosystem

The August 31, 2018, site visit confirmed watercourse presence/absence, which included documenting general site conditions.

The six culvert crossings in the Study Area are generally characterized as providing flow conveyance and water balance within the interchange. There are no defined channels or watercourses associated with any of the culvert crossings. The wetland(s) may provide seasonal contributing fish habitat to downstream cold water watercourses.

Aquatic vegetation predominately consisted of dense European Common Reed and Cattails and substrate generally consisted of muck and detritus with organic debris. There was no flow observed at any of the crossings; however, some culverts had standing water inside. There were no defined channels or watercourses present and no direct fish habitat was observed. There does not appear to be any direct surface water connectivity between the culverts and any municipal drains. The planned works are greater than 30 m from any municipal drain.

Findings from the August 31, 2018, site visit are documented in the October 10, 2018, Fisheries Considerations Memo. The memo was prepared in accordance with MTO's *Environmental Guide for Fish and Fish Habitat* (2009) to determine the risk of causing serious harm to fish under the federal *Fisheries Act*. As outlined in the *MTO/DFO/OMNRF Protocol for Protecting Fish and Fish Habitat on Provincial Transportation Undertakings* (2013), through Step 1 of the protocol, it was determined that all culvert replacement activities are located beyond 30 m of the high water level of a waterbody, and appropriate mitigation can prevent impacts. Accordingly, as per Step 8 of the Protocol, the project can proceed by implementing the necessary design considerations and mitigation measures.

It is not anticipated that the project will impact fish and/or fish habitat; however, to minimize potential negative impacts the following mitigation measures will be in place:

- All disturbed areas will be restored to pre-construction conditions and stabilized to prevent erosion
- Appropriate erosion and sediment control measures must be installed around the work area to prevent migration of loose soils and accumulated sediment downstream or to adjacent areas that may drain to fish habitat
- Effective erosion and sediment control will follow MTO's *Environmental Guide for Erosion and Sediment Control during Construction of Highway Projects* (2007). Important measures to protect fisheries include keeping clearing and grubbing to a minimum and installing silt fence along watercourse banks and around fill placement areas
- Fuel, excess materials and debris will be properly handled on-site and removed as per standard construction practices for the protection of watercourses
- All materials used or generated (e.g., organics, soils, woody debris, temporary stockpiles, construction debris, etc.) will be temporarily stored, handled and disposed of during site preparation, construction and clean-up to prevent entry into any watercourse.

### 5.1.2 Terrestrial Ecosystem

Site visits were completed on April 5, 2018, and August 31, 2018, and supplemented with existing conditions data from the 2015 Preliminary Design.

The project Study Area is located adjacent to the Dorchester Swamp PSW. The lands within the existing highway ROW are dominated primarily by the highly invasive European Common Reed (*Phragmites australis subsp. Australis*). Beyond the edge of the highway ROW, as the natural environment transitions into the well-defined Dorchester Swamp PSW, vegetation communities were previously documented as thicket swamp and deciduous thicket swamp, and are not expected to have changed since those field investigations. As indicated by MNRF, in the Information Request received for the project (see **Section 4.5**), and confirmed through the Municipality of Thames Centre Official Plan, the Dorchester Swamp PSW also supports significant woodlands.



Photo 4: Highly Invasive European Common Reed along Highway 401 ROW

The proposed improvements will be completed within existing ROW limits. To complete construction, minor vegetation removals are required within the project footprint. Vegetation removals will primarily include removing existing colonies of highly invasive European Common Reed, which will be a benefit to surrounding ecological communities. To minimize potential spread of European Common Reed as a result of disturbance, a European Common Reed Control Plan will be implemented during construction (**Appendix B**).

The anticipated vegetation removals are not expected to impact natural heritage features beyond the existing ROW. The ecological function of the Dorchester Swamp PSW is not anticipated to be affected by the proposed improvements.

The potential impacts of the proposed vegetation removals include:

- Increased erosion and sedimentation
- Decreased shade and cover for wildlife
- Localized temporary displacement of wildlife due to disturbance caused by clearing and construction activity
- Potential for imported materials (e.g., gravel) to be released into adjacent riparian habitat and displace native substrates.

These impacts will be mitigated by incorporating the following measures into the construction contract:

- Develop and implement an Erosion and Sedimentation Control Plan
- Minimize vegetation removal as much as possible
- Temporary work space and construction staging areas shall not be located in wetlands
- Areas cleared of vegetation to facilitate construction will be stabilized (e.g., vegetated) prior to removal of erosion and sedimentation control measures.

#### 5.1.2.1

### Migratory Birds

Species protected under the federal *Migratory Birds Convention Act*, 1994, were identified in the Study Area; however, evidence of nesting was not observed. Destruction and disturbance of active nests (with eggs or young birds), as well as wounding and/or killing protected species, is prohibited by the MBCA. To protect birds and comply with the legislation, the following measures will be incorporated into the construction contract:

- For tree nesting species, vegetation removal will be completed outside the breeding bird period **(April 1 to August 31)**
- Vegetation removal or culvert works can occur during restricted periods if a qualified Avian Biologist conducts a nest search of the area prior to work commencing (within 48 hours) and determines that active nests are not present in proximity to the work area
- If breeding birds and/or nests are encountered, works should not continue in the location until after August 31, or as soon as the young have left the nest.

### 5.1.3 Species at Risk and Species of Conservation Concern

Background screening information from MNRF, received March 2018, indicates the potential for eight SAR and six Species of Conservation Concern (SCC) to occur within the project Study Area, including:

<b>Species at Risk</b>	<b>Species of Conservation Concern</b>
<p><b>Vegetation</b></p> <ul style="list-style-type: none"> <li>• Butternut</li> <li>• Eastern Flowering Dogwood</li> <li>• Spoon-leaved moss</li> </ul> <p><b>Birds</b></p> <ul style="list-style-type: none"> <li>• Bank Swallow</li> <li>• Barn Swallow</li> <li>• Bobolink</li> <li>• Eastern Meadowlark</li> </ul> <p><b>Reptiles</b></p> <ul style="list-style-type: none"> <li>• Blanding's Turtle</li> </ul>	<p><b>Vegetation</b></p> <ul style="list-style-type: none"> <li>• Parry's Sedge</li> <li>• Yellow Ladies-Tresses</li> <li>• Grass-leaved Rush</li> </ul> <p><b>Birds</b></p> <ul style="list-style-type: none"> <li>• Eastern Wood-Pewee</li> <li>• Wood Thrush</li> </ul> <p><b>Reptiles</b></p> <ul style="list-style-type: none"> <li>• Common Snapping Turtle</li> </ul>



**Photo 6: Blandings Turtle (*Emydoidea blandingii*)**

Based on natural environment investigations, there is no evidence of any SAR plant species or their habitat within the construction footprint area. Animal SAR habitat is present adjacent to the project Study Area but not within the construction footprint area and no animal SAR were observed during field investigations. In previously completed investigations, UTRCA confirmed the presence of Blanding's Turtle on lands adjacent to the project Study Area.

SCC and their associated habitat are located beyond the proposed construction footprint and are protected by the mitigation measures outlined below for SAR and SAR habitat.

The following mitigation measures will be implemented during construction:

- Provide SAR Fact Sheets and detection protocols for Blanding's Turtle to the contractor prior to construction (**Appendix C**)
- To exclude SAR Reptiles from entering the work area, exclusionary fencing shall be installed OR an experienced biologist will be onsite:
  - Exclusionary fencing (using light duty silt fencing) shall be installed prior to work at the locations indicated in the construction drawings to prevent SAR reptiles from entering construction areas. Exclusion fences shall be maintained in place until October 1



- A biologist experienced in the identification and handling of SAR reptiles maybe present during cleanout activities to remove any reptiles present of entering the work areas. All reptiles found shall be returned to suitable habitat within the Dorchester Swamp PSW
- If wildlife are encountered in the construction area, work must be temporarily suspended until the animals are out of harm's way. If suspected SAR species are encountered in the work area, a person qualified to handle these animals should be contacted to relocate the animal to suitable habitat outside of the construction area
- If SAR birds or other migratory birds are observed to be nesting in the construction area and/or nests are encountered, works should not continue in that location until after August 31, or as soon as the young have left the nest
- Temporary work space and construction staging areas shall not be located within wetlands where protected species are potentially present.

#### 5.1.4 Erosion and Sedimentation

Grading during construction has potential to cause erosion and sedimentation, including vegetation dieback at the edge of the construction area. A site specific Erosion and Sedimentation Control Plan, to contain the construction area, will be developed by the contractor following MTO's *Environmental Guide for Erosion and Sediment Control during Construction of Highway Projects* (MTO 2007). The primary intent of the mitigation measures developed for the project is to prevent erosion, where possible. The secondary intent is to capture sediment, should erosion occur. The Contract includes the following measures and provisions to minimize potential erosion and capture any sedimentation:

- Minimize the disturbance of existing well-vegetated ditches and grassed slopes
- Protect undisturbed slopes and sensitive ditching with silt fence and temporary straw bale flow checks or equivalent. These measures must remain in place until exposed soils are stabilized/re-vegetated
- Place erosion control blanket or equivalent on 3:1 or greater slopes where height warrants its use
- Place appropriately sized rip rap and geotextile at new and existing sewer outlets
- A maximum of 45 days shall be permitted between the commencement of any work which disturbs earth surfaces and the application of final cover.

## 5.2 Human Health

### 5.2.1 Source Water Protection

As outlined in the Source Protection Plan for the Thames-Sydenham Region (December 31, 2015), the Study Area is located in the Thames-Sydenham Source Protection Area. The primary objective of the Source Protection Plan, as provided for in the *Clean Water Act*, is to protect existing and future drinking water sources.

As shown in the Thames-Sydenham Source Protection Plan, the Project Study Area is located within a Highly Vulnerable Aquifer (HVA), and Well-Head Protection Area (WHPA). Threats to source water protection in the HVA area are considered moderate-low. WHPA areas are delineated for wells, which are under the direct influence of surface water and represent a travel time of two hours for surface water to reach the intake. The Dorchester Swamp PSW discharges into several drains that are located within the Dorchester System (which contains nine wells). Any spills or releases of deleterious substances within the WHPA have the potential to not only impact the wetland, but could pose a serious risk to the local drinking water supply. The contractor shall have a robust Spills Management Plan in place during construction, and the spill kit on-site should contain a supply of absorbent products, such as booms, pads and socks.

### 5.2.2 Construction Noise

Construction noise impacts are temporary in nature and largely unavoidable. With adequate controls, impacts can be minimized; however, for some periods of time and types of work (e.g., overnight underpass demolition), construction noise will be noticeable. To minimize impacts on adjacent lands, the following best practices related to noise shall be in place during construction:

- All equipment shall be maintained in an operating condition that prevents unnecessary noise, including non-defective muffler systems, properly secured components and the lubrication of moving parts
- Idling of equipment shall be restricted to the minimum necessary to perform the specified work.

Construction activities shall be completed in accordance with the Municipality of Thames Centre Unnecessary Noise By-law (By-law #62-2003). The by-law prohibits operation of any equipment in connection with construction from 8:00 p.m. to 7:00 a.m. of any day. A Noise By-law exemption was obtained (**Appendix D**) for the period between April 1, 2019, and October 31, 2019. The exemption permits overnight noise associated with construction activities for up to five nights during construction.

### 5.2.3 Air Quality and Dust

Dust generating activities during construction are anticipated to include milling of existing pavements, jacking of concrete and demolition of existing underpass and general movement of construction equipment typical with any construction project.

Negative dust and air quality impacts on adjoining land uses are anticipated to be minimal and short in duration. Fugitive dust impacts to the travelling public on Highway 401 and Elgin Road from construction activities are anticipated to be negligible. Potential impacts shall be minimized by general conditions during construction, including:

- Use well-maintained heavy equipment and machinery and comply with operating specifications
- Minimize operation and idling of gas-powered equipment and vehicles, especially during smog advisories

- Minimize vehicular traffic on exposed soils and stabilize high traffic areas with suitable cover material
- Avoid excavation and other construction activities with potential to release airborne particulates during windy and prolonged dry periods
- Cover or otherwise contain loose construction materials with potential to release airborne particulates during transport, installation or removal
- Restore disturbed areas as soon as possible to minimize the duration of soil exposure.

### 5.3 Land Uses and Socio-Economic Environment

#### 5.3.1 Commuter Parking Lot

Improvements to the Elgin Road commuter parking lot include repaving and full illumination. During construction, the parking lot will be closed in conjunction with the closure of the Elgin Road interchange ramps for a maximum of four months, and it is anticipated that commuters will make alternative arrangements for parking.

#### 5.3.2 Illumination

Illumination improvements include upgrades to existing luminaires on Elgin Road and full illumination of the Elgin Road commuter parking lot. To mitigate potential light trespass and increased night sky light pollution, all luminaires will be full cutoff luminaires and have zero uplight (i.e., zero light emitted above the horizontal plane of the luminaire). Cutoff luminaires are considered the most “dark sky friendly” luminaires by “dark sky” advocates. Full cutoff luminaires provide greater control of the light emitted and minimize light trespass to the extent possible.

### 5.4 Cultural Resources

#### 5.4.1 Archaeology

Preliminary Design for the Elgin Road Underpass replacement identified the need for completion of a Stage I & II Archaeology Assessment prior to construction. Fisher Archaeological Consulting completed a Stage I & II Archaeology Assessment for the project on October 31, 2017. The report indicated heavy disturbance of the existing highway ROW and limited to no archaeological potential within the adjacent wetland. No further archaeological investigations are required. The report was accepted by the Ministry of Tourism, Culture and Sport on November 28, 2017.

### 5.5 Drainage and Stormwater Management

As documented in Dillon’s Drainage Impact Report (September 2018), the proposed improvements do not impact the general configuration of the interchange ramps, the associated drainage system or the non-structural pipe culverts that convey runoff from within the interchange area to the ultimate receiving system, the Dorchester Swamp.

Based on a condition assessment, six existing pipe culverts require replacement. Five will be replaced with culverts of a similar size and length, with Culvert Elg-CVS being replaced with a slightly longer culvert to accommodate the grade raise of the ramp in that area. The culverts to be replaced include:

- Culvert Elg-CVP
- Culvert Elg-CVQ
- Culvert Elg-CVR
- Culvert Elg-CVS
- Culvert Elg-CVT
- Culvert Elg-CVU.

The Elgin Road grade raise will impact the profile of the ramp terminals along Elgin Road and subsequently impact the culvert (Elg-CVS) located along the E-N/S ramp. The ramp profile grade raise requires the non-structural pipe culvert to be lengthened to accommodate the slightly wider ramp embankment.

The new Elgin Road Underpass will directly impact the existing drainage infrastructure associated with the underpass. The increased length of the proposed underpass and the Elgin Road grade raise will require removal and replacement of the catch basins and storm sewer outlets located at the north and south ends of the structure. The new underpass structure will also require relocation and replacement of 150 m of the Highway 401 median storm sewer to accommodate the proposed bridge pier.

Based on projected flow velocities, soil conditions and historic evidence it is anticipated that non-standard erosion and scour protection systems will not be required. In general, disturbance of existing well-vegetated channel slopes can be avoided. Where disturbance of existing channel slopes is unavoidable, standard rip rap protection will be installed, particularly around the inlet and outlet of each culvert. Rip rap protection should be installed to an elevation of 300 mm above the headwater and tail water elevations at each culvert location. Erosion control blanket should be placed on slopes exceeding 3:1. Standard light duty silt fence should be placed at the base of disturbed slopes parallel with the drain to guard against sediment entering drain during the construction period.

## 5.6 Highway and Traffic Engineering

### 5.6.1 Traffic and Emergency Services

Lane reductions on Highway 401 may result in potential emergency service delays to incident locations. To minimize delays, emergency vehicles will be given priority access through the construction zone, where possible, and Emergency Medical Service (EMS) Providers (OPP, fire and ambulance) will be updated throughout the project on construction staging and closures, including the construction start date and any significant changes to traffic operations.

The Highway 401/Elgin Road Interchange and Elgin Road will be closed for up to four months for ramp reconstruction and underpass replacement, during which signed detour routes will be in place. It is recognized construction will cause inconvenience and delays to local residents, businesses and the travelling public. Mitigation measures include:

- Signed detour routes following Cromarty Drive, Dorchester Road and Hamilton Road
- Advanced signing advising of the planned closures
- Project website updated throughout construction
- Staging requirements for maintaining access.

### 5.6.2 Construction Traffic

Construction traffic will access the construction area from the existing road network. A construction staging area will be provided within the existing interchange, minimizing construction related travel on local roads. Traffic control, in accordance with the Ontario Traffic Manual Book 7, Temporary Conditions, will be required during construction. The Contractor is responsible for implementing these plans.

### 5.6.3 Emergency Services

All EMS providers (OPP, fire and ambulance) shall be notified in advance of construction start and prior to highway and/or road closures. Closures and lane reductions may result in potential emergency service delays to incident locations. To minimize delays, EMS will be updated throughout the project on construction staging, including the construction start date and any significant changes to traffic operations.

### 5.6.4 Utilities

Utility impacts for this project are limited, as no embedded or surface mounted utilities cross the existing structure, and no embedded utilities are being incorporated into the new underpass construction.

An existing Advanced Traffic Management System (ATMS) camera is located approximately 35 metres east of the existing underpass on the south side. Relocation of the ATMS camera is not required but the servicing to the camera will be relocated by the contractor to avoid conflict with the work required to widen the embankment for the structure replacement. Relocation of the ATMS power supply from the south may be required in the future to accommodate the ultimate interchange configuration.

No other impacts to utilities are anticipated for this project.

## 6.0 Summary of Environmental Concerns and Commitments

The proposed works are not anticipated to have significant impacts on the, natural, cultural or socio-economic environment in close proximity to the Project Area. To the extent possible, adverse impacts can be avoided or mitigated by the measures and provisions outlined in **Table 2**.

### 6.1 Environmental Clearance and Approvals

As required by the MTO Class EA, all permits, approvals, and exemptions required for the project must be obtained prior to Environmental Clearance – Construction Start being issued. Design-related environmental approvals and permits required prior to construction are included in **Appendix D** and include:

- MTCS Acceptance of Stage I and II Archaeology Assessment, received November 28, 2017
- Noise By-law Exemption, Municipality of Thames Centre, received September 17, 2018.

### 6.2 Review of DCR

A Notice of Submission for the DCR will be sent to the Contact List. The DCR will be available for a 30-day public and agency review period. Although the report is not subject to Bump-up (Part II Order) Requests, MTO will consider all comments received. Following the 30-day review period, the DCR is considered to be cleared under MTO's Class EA.

### 6.3 Environmental Construction Inspection and Monitoring

To ensure the implementation and effectiveness of the environmental mitigation measures and provisions included in the construction Contract, an Environmental Management Plan (EMP) has been created for the project. The objective of the EMP is to maintain, and where possible improve, the state of the environment affected by the proposed improvements. This includes the development of appropriate mitigation measures for implementation during construction to fulfill the regulatory and contract requirements, protect the environment and meet MTO obligations.

During construction environmental monitoring for this project will:

- Inspect and monitor pre-construction, construction and post-construction environmental work specified in the Contract
- Thoroughly evaluate any changes proposed by the Contractor to ensure that changes meet the intent of the measures and provisions, as outlined in this DCR, and reflect prevailing conditions on site.

The implementation and effectiveness of the measures and provisions included in the Contract will be monitored and documented monthly.

DILLON CONSULTING LIMITED  
LONDON, ONTARIO

Report Prepared by:

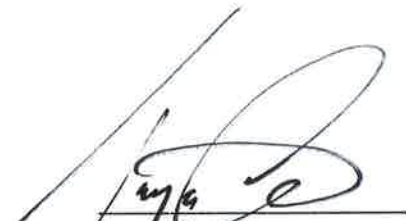


Brandon Fox, BES, MCIP, RPP  
Environmental Planner

Report Reviewed by:



Adele Mochrie, B.Sc.  
Environmental Manager



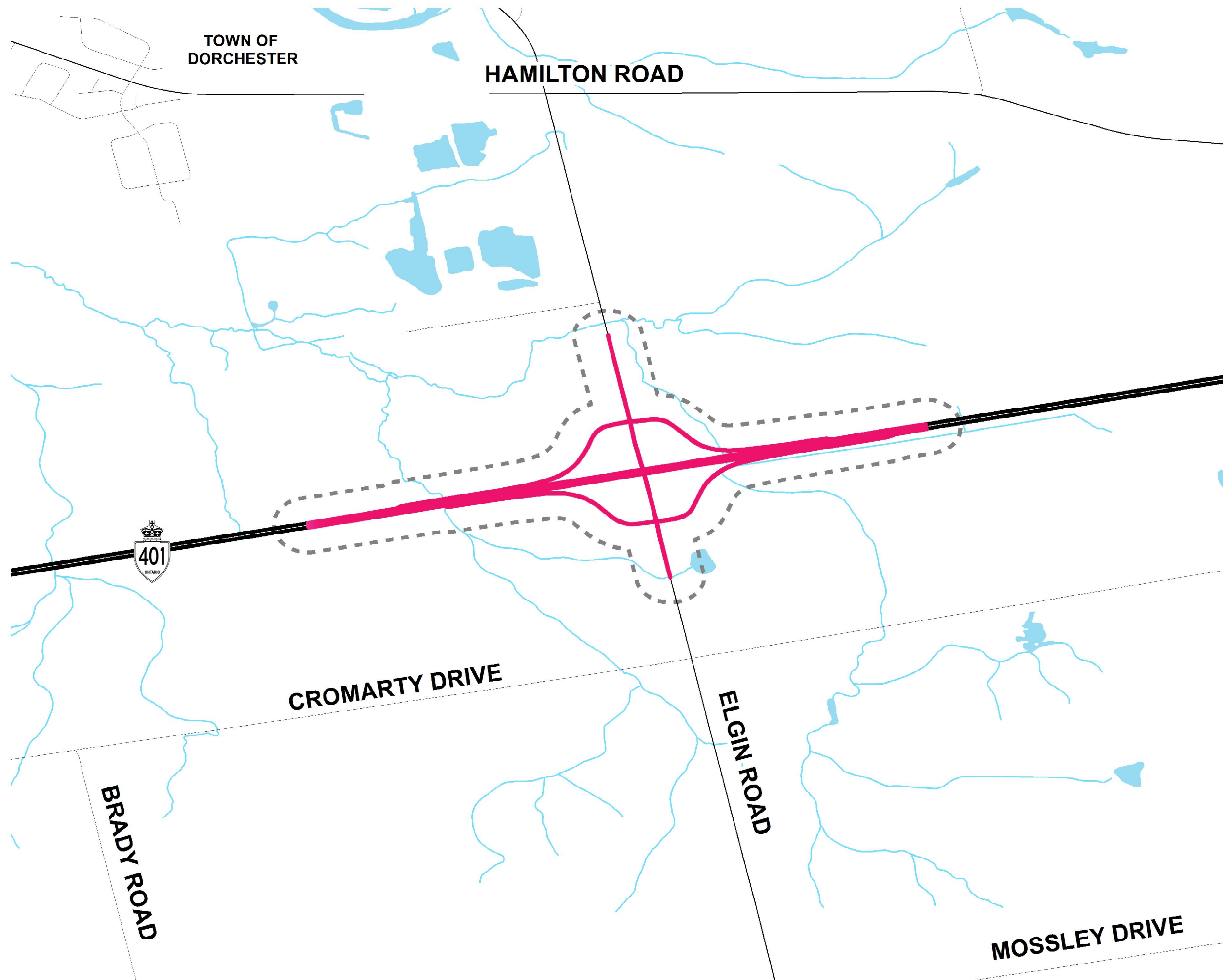
Tanya Cross, P.Eng  
Design Project Manager





## Figures

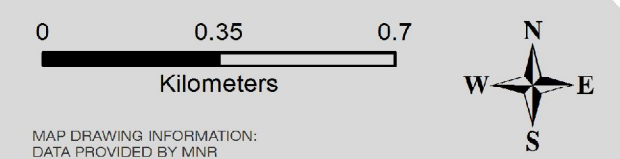




**MINISTRY OF TRANSPORTATION,  
ONTARIO**  
Elgin Road Underpass Replacement  
and Interchange Ramp Reconstruction

**Project Study Area**  
Figure 1

- Project Limits
- - - Project Study Area
- Highway 401
- Local Road Network
- Water



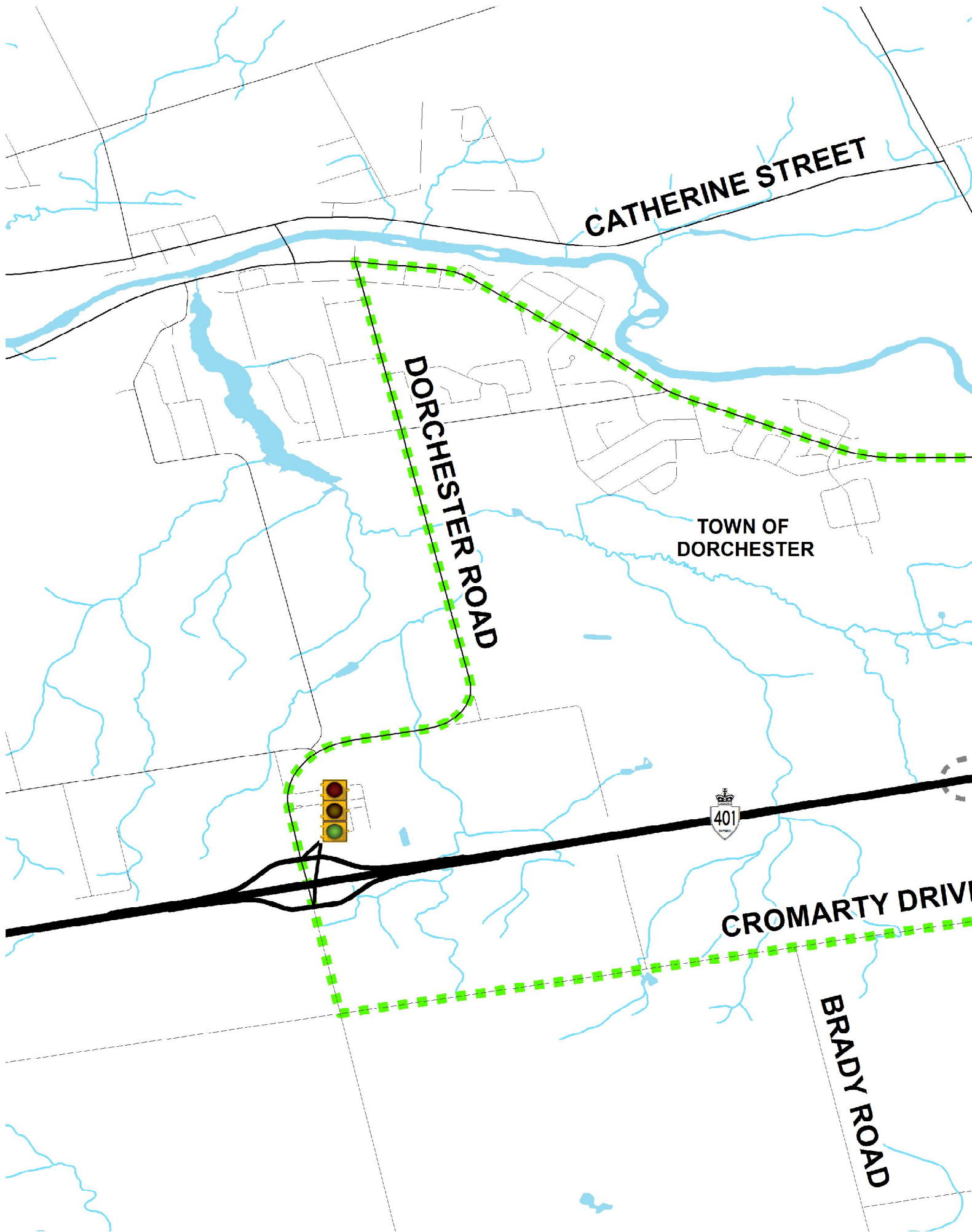
MAP DRAWING INFORMATION:  
DATA PROVIDED BY MNR

MAP CREATED BY: BJF  
MAP CHECKED BY: ANM  
MAP PROJECTION: NAD 1983 UTM Zone 17N

FILE LOCATION: G:\GIS\187393 - Elgin Road Interchange Design-Build\MXD



PROJECT: 10-7393  
STATUS: FINAL  
DATE: 10/10/2018



CATHERINE STREET

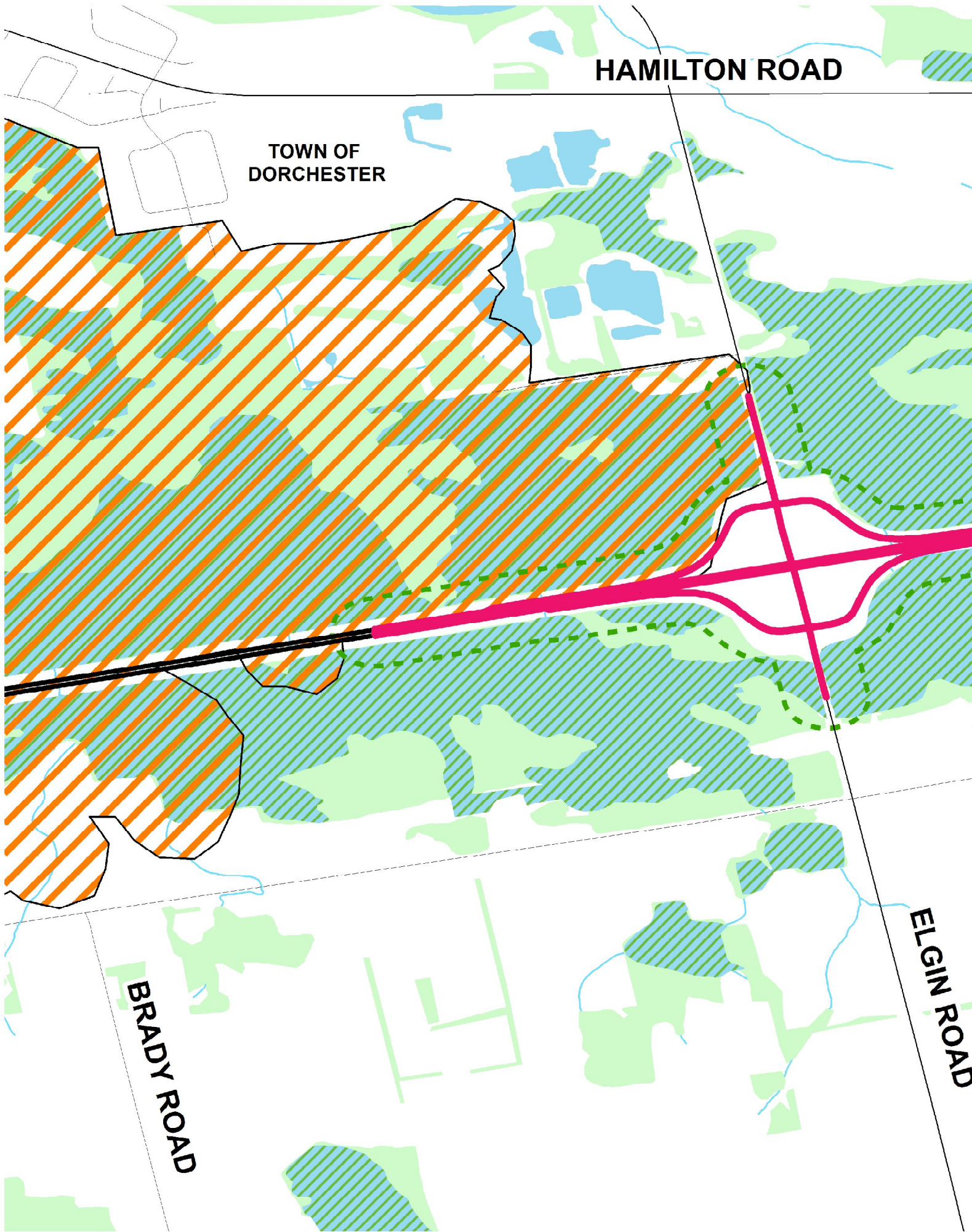
DORCHESTER ROAD

TOWN OF DORCHESTER



CROMARTY DRIVE

BRADY ROAD



HAMILTON ROAD

TOWN OF DORCHESTER

BRADY ROAD

ELGIN ROAD



# Table





Table 2: Summary of Environmental Concerns and Commitments

I.D. #	I.D. # Sub-Issues	Potential Impacts/Concerns	Potentially Concerned Agencies/Stakeholders	Mitigation/Protection/Monitoring
1. Highway safety, construction traffic, and emergency service access	1.1 Traffic operations and safety	<ul style="list-style-type: none"> <li>Traffic delays caused by interchange closures, lane reductions on Highway 401 and Elgin Road closure</li> <li>Commuter inconvenience caused by closure of Elgin Road commuter parking lot</li> <li>Potential traffic disruption caused by construction vehicles.</li> </ul>	Municipality of Thames Centre, County of Middlesex, Emergency Service Providers and Provincial Highway Road Users	<ul style="list-style-type: none"> <li>Advanced signage will be posted at least seven days in advance of construction start, advising motorists of potential traffic delays</li> <li>All traffic staging will be implemented following Ontario Traffic Manual Book 7 – Temporary Conditions</li> <li>Elgin Road detour route will be provided following Cromarty Drive, Dorchester Road and Hamilton Road.</li> </ul>
	1.2 Emergency services access	<ul style="list-style-type: none"> <li>Potential emergency service delays to incident locations during construction.</li> </ul>	Municipality of Thames Centre, County of Middlesex, Emergency Service Providers	<ul style="list-style-type: none"> <li>Delays to EMS response times mitigated by: <ul style="list-style-type: none"> <li>Regular communication with emergency services throughout construction</li> <li>Notices provided to EMS at least seven days in advance of any lane reductions and/or closures</li> <li>EMS contacts will be provided to the contractor</li> <li>EMS shall be invited to attend regularly scheduled progress meetings with the contractor for the duration of construction.</li> </ul> </li> </ul>
2. Utilities	2.1 Utility Impacts	<ul style="list-style-type: none"> <li>Potential disturbance to the existing utilities.</li> </ul>	Utility service providers	<ul style="list-style-type: none"> <li>Impacts to third party utilities are not anticipated as part of this project. Relocation of ATMS servicing will be completed as part of the construction contract.</li> </ul>
3. Cultural Resources	3.1 Deeply buried cultural deposits and unmarked human remains	<ul style="list-style-type: none"> <li>Potential destruction/disturbance during construction.</li> </ul>	Ministry of Tourism, Culture and Sport (MTCS)	<ul style="list-style-type: none"> <li>Mitigated by Contract's Special Provision for "Archaeological Material". Requires immediate contact with MTCS upon the discovery of cultural resources. The Ontario <i>Cemeteries Act</i> applies to discovery of unmarked human remains.</li> </ul>
4. Natural Features	4.1 Fish and fish Habitat	<ul style="list-style-type: none"> <li>Impacts to downstream fisheries and fish habitat caused by replacement of six culverts.</li> </ul>	Ministry of Natural Resources and Forestry (MNRF), Conservation Authority, Municipality of Thames Centre, County of Middlesex	<ul style="list-style-type: none"> <li>All disturbed areas will be restored to pre-construction conditions and stabilized to prevent erosion</li> <li>Appropriate erosion and sediment control measures must be installed around the work area to prevent migration of loose soils and accumulated sediment downstream or to adjacent areas that may drain to fish habitat</li> <li>Effective erosion and sediment control will follow MTO's Environmental Guide for Erosion and Sediment Control during Construction of Highway Projects (MTO 2007). Important measures to protect fisheries include keeping clearing and grubbing to a minimum and installing silt fence along watercourse banks and around fill placement areas</li> <li>Fuel, excess materials and debris will be properly handled on-site and removed as per standard construction practices for the protection of watercourses</li> <li>All materials used or generated (e.g., organics, soils, woody debris, temporary stockpiles, construction debris, etc.) will be temporarily stored, handled and disposed of during site preparation, construction and clean-up to prevent entry into any watercourse.</li> </ul>
	4.2 Vegetation	<ul style="list-style-type: none"> <li>Increased erosion and sedimentation</li> <li>Decreased shade and cover for wildlife</li> <li>Localized temporary displacement of wildlife due to disturbance caused by clearing and construction activity</li> <li>Potential for imported materials (e.g., gravel) to be released into adjacent riparian habitat and displace native substrates.</li> </ul>	Ministry of Natural Resources and Forestry (MNRF), Conservation Authority, Municipality of Thames Centre, County of Middlesex	<ul style="list-style-type: none"> <li>Vegetation removal and/or trimming may be necessary to complete the underpass replacement, ramp reconstruction and Elgin Road reconstruction work. No Species at Risk (SAR) or significant trees of concern are expected to be impacted by the removals. Impacts to vegetation shall be minimized by: <ul style="list-style-type: none"> <li>Vegetation removal will be completed outside of sensitive breeding periods for birds (April 1 to August 31 of any given year)</li> <li>Contractor shall develop and implement an Erosion and Sedimentation Control Plan prior to construction start</li> <li>Minimize vegetation removal as much as possible</li> <li>Temporary work space and construction staging areas shall not be located in the Dorchester swamp Provincially Significant Wetland</li> </ul> </li> </ul>

I.D. #	I.D. # Sub-Issues	Potential Impacts/Concerns
	4.3 Wildlife and Wildlife Habitat including Species at Risk	<ul style="list-style-type: none"> <li>• Potential to impact SAR, Blanding’s Turtle entering, nesting, or foraging within the construction area</li> <li>• Temporary disruption to wildlife movement and wildlife habitat areas adjacent to the underpass during rehabilitation disturbance associated with construction activity.</li> </ul>
	4.4 Migratory Nesting Birds	<ul style="list-style-type: none"> <li>• Potential removal or destruction of avian nests, eggs or young and during construction.</li> </ul>
	4.5 Erosion and Sediment Control	<ul style="list-style-type: none"> <li>• Potential erosion and sedimentation impacts caused by construction activities during construction.</li> </ul>
	4.6 Well Head Protection Area (WHPA)	<ul style="list-style-type: none"> <li>• Potential for surface water impacts resulting from release of deleterious substances into designated well head protection area.</li> </ul>

I.D. #	I.D. # Sub-Issues	Potential Impacts/Concerns
	4.7 Spills handling and Contaminated Materials	<ul style="list-style-type: none"> <li>Potential adverse impacts of spills on environmental and cultural resources including release of deleterious substances.</li> </ul>
5. Human Health	5.1 Construction Noise	<ul style="list-style-type: none"> <li>Potential noise impacts during construction.</li> </ul>
	5.2 Air Quality	<ul style="list-style-type: none"> <li>Potential dust and air quality impacts caused by construction activities and construction traffic.</li> </ul>

