APPENDIX C:
FISH AND FISH HABITAT EXISTING CONDITIONS AND PRELIMINARY IMPACT ASSESSMENT REPORT

Prepared for:

Ministry of Transportation
Eastern Region
1355 John Counter Boulevard
Postal Bag 4000
Kingston, Ontario K7L 5A3

Prepared by:

Stantec Consulting Ltd.
100-300 Hagey Boulevard
Waterloo, Ontario N2L 0A4

Stantec

Fish and Fish Habitat Existing Conditions and Preliminary Impact Assessment Report

Highway 401 from 2 km West of Stewart Boulevard to 750 m East of North Augusta Road (GWP 4003-19-00)

March 2023
File: 165001160

Sign-off Page

The conclusions in the Report titled Fish and Fish Habitat Existing Conditions and Preliminary Impact Assessment Report Highway 401 from 2 km West of Stewart Boulevard to 750 m East of North Augusta Road (GWP 4003-19-00) are Stantec's professional opinion, as of the time of the Report, and concerning the scope described in the Report. The opinions in the document are based on conditions and information existing at the time the scope of work was conducted and do not take into account any subsequent changes. The Report relates solely to the specific project for which Stantec was retained and the stated purpose for which the Report was prepared. The Report is not to be used or relied on for any variation or extension of the project, or for any other project or purpose, and any unauthorized use or reliance is at the recipient's own risk.

Stantec has assumed all information received from Ministry of Transportation (the "Client") and third parties in the preparation of the Report to be correct. While Stantec has exercised a customary level of judgment or due diligence in the use of such information, Stantec assumes no responsibility for the consequences of any error or omission contained therein.

This Report is intended solely for use by the Client in accordance with Stantec's contract with the Client. While the Report may be provided to applicable authorities having jurisdiction and others for whom the Client is responsible, Stantec does not warrant the services to any third party. The report may not be relied upon by any other party without the express written consent of Stantec, which may be withheld at Stantec's discretion.

Prepared by _____ Digitally signed by Nancy Harttrup Date: 2023.03.30 10:09:40 -04'00'
(signature)

Nancy Harttrup, B.Sc.
Fisheries Assessment Specialist/ Senior Fisheries Biologist

Reviewed by _____ Digitally signed by Todd, Kathleen Date: 2023.03.29 17:01:13 -04'00'
(signature)

Kathleen Todd, M.Sc.
Fisheries Assessment Specialist/ Senior Aquatic Ecologist

Table of Contents

List of Figures

FISH AND FISH HABITAT EXISTING CONDITIONS AND PRELIMINARY IMPACT ASSESSMENT REPORT
Highway 401 from 2 km West of Stewart Boulevard to 750 m East of North Augusta Road (GWP 4003-19-00)

March 2023

List of Tables

List of Appendices

1.0 Introduction

The Ontario Ministry of Transportation (MTO) retained Stantec Consulting Ltd. (Stantec) to undertake a Planning, Preliminary Design, and Class Environmental Assessment (Class EA) Study for Highway 401 from 2 kilometres (km) west of Stewart Boulevard to 750 metres (m) east of North Augusta Road (about 4.5 km) (the Study Area), within the City of Brockville (**Figure 1**). The study will develop a plan for the rehabilitation and/or replacement of five (5) structures, determine the long-term plans for the Stewart Boulevard and North Augusta Road interchanges, and will establish the future footprint for the interim six and ultimate eight lanes of Highway 401.

A Recommended Plan will be confirmed and designated (protected) at the completion of the study. The project is following the approved planning process for a Group 'B' project in accordance with the *MTO Class EA for Provincial Transportation Facilities (2000)* (MTO 1999).

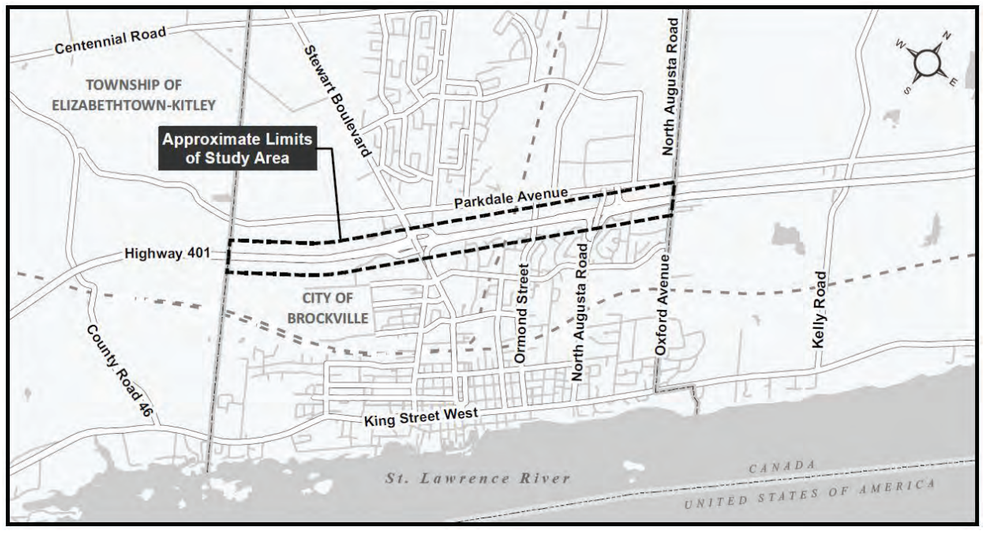


Figure 1: Approximate limits of the Highway 401 Brockville (GWP 4003-19-00) Study Area

FISH AND FISH HABITAT EXISTING CONDITIONS AND PRELIMINARY IMPACT ASSESSMENT REPORT
Highway 401 from 2 km West of Stewart Boulevard to 750 m East of North Augusta Road (GWP 4003-19-00)

March 2023

This *Fish and Fish Habitat Existing Conditions and Preliminary Impact Assessment Report* provides supporting documentation for GWP 4003-19-00 and describes fish communities and fish habitat within the Study Area. This report was completed in accordance with the MTO/DFO/MNRF *Fisheries Protocol for Protecting Fish* and *Fish Habitat on Provincial Transportation Undertakings* (the Protocol) (MTO 2020a), the *Environmental Guide for Fish and Fish Habitat* (MTO 2009), and the *Interim Environmental Guide for Fisheries* (MTO 2020b). Due to limitations resulting from the COVID-19 pandemic, 2021 field data were collected using field forms from the 2009 *Environmental Guide for Fish and Fish Habitat* (MTO 2009); therefore, both MTO guidance documents are referenced in this report.

Terrestrial environment features related to the project are described in a separate report (Stantec 2022).

2.0 Background Data

2.1 Data Sources

The Study Area is located within the jurisdictions of the Kemptville District of the Ministry of Natural Resources and Forestry (MNRF) and the Cataraqui Region Conservation Authority. The MNRF was consulted on the following occasions:

- July 2020 – to request a Licence to Collect Fish for Scientific Purposes for the 2020 field investigations
- October 2020 – to request background information regarding fish and fish habitat in the Study Area
- March 2021 – to request a renewal to the Licence to Collect Fish for Scientific Purposes for the 2021 field investigations

A copy of MNRF correspondence regarding available fish and fish habitat data in the Study Area is provided in **Appendix B**. Fisheries information was not requested from the conservation authority due to the availability of information from other sources.

Additional information was obtained from the following sources:

- MNRF's Land Information Ontario (LIO) database (MNRF 2022a) – to determine the location of drains and watercourses and, where available, watercourse flow and thermal regimes and fish community data
- Natural Heritage Information Centre's (NHIC) Biodiversity Explorer database (MNRF 2022b) – to determine if provincially regulated fish or freshwater mussel species at risk (SAR) have been documented in the Study Area
- Fisheries and Oceans Canada's (DFO) mapping of aquatic SAR (DFO 2022) – to determine if federally regulated fish or freshwater mussel SAR have been documented in the Study Area

2.2 Results

Where available online (MNRF 2022a), flow regimes, thermal regimes, and fish community data are summarized in **Tables 2** and **3** (**Appendix C**). Buells Creek and a Tributary to Grants Creek are the only mapped watercourses within the Study Area (**Figure 2, Appendix A**) (MNRF 2022a). There are no constructed drains within the Study Area (MNRF 2022a).

Buells Creek has a warmwater thermal regime and a permanent flow regime (MNRF 2022a) (**Table 2, Appendix C**). The Tributary to Grants Creek has a permanent flow regime and there is no assigned thermal regime (MNRF 2022a). There are no historical fish community data for Buells Creek or Grants Creek in close proximity to Highway 401 (MNRF 2022a).

The MNRF provided the Kemptville District's in-water construction timing windows but did not have additional data or updates to information already obtained by Stantec from LIO with respect to fish communities, flow regimes, or thermal regimes (MNRF 2020) (**Appendix B**).

There are no records of provincially or federally regulated aquatic SAR in the Study Area (DFO 2022; MNRF 2022b).

FISH AND FISH HABITAT EXISTING CONDITIONS AND PRELIMINARY IMPACT ASSESSMENT REPORT
Highway 401 from 2 km West of Stewart Boulevard to 750 m East of North Augusta Road (GWP 4003-19-00)

March 2023

3.0 Field Investigations

The purpose of the field investigations was to document aquatic ecological conditions in watercourses in the Study Area at Highway 401. Fish habitat characterization and fish community sampling were conducted on the dates indicated below. The field investigations were conducted at seven sites (**Figure 2, Appendix A** and **Table 1, Appendix C**) with the potential to support fish habitat and/or that were indicative of flow conveyance based on air photo interpretation, proximity to mapped surface water features, and culvert inspections completed by Stantec's hydrology staff (Stantec 2021). The field investigations were conducted by a crew of two aquatic biologists, overseen by a RAQS-approved Fisheries Assessment Specialist.

3.1 Habitat Assessment

Field investigations were conducted according to the *Environmental Reference for Highway Design* (MTO 2013), the *Environmental Guide for Fish and Fish Habitat* (MTO 2009) and the *Interim Environmental Guide for Fisheries* (MTO 2020b). The MTO Watercourse Field Record Form and MTO Fish Habitat Mapping Form were completed on the following dates at the locations indicated (**Figure 2, Appendix A**):

August 25, 2020 and May 18, 2021:

> One mapped watercourse that crosses Highway 401 within the Study Area (Buells Creek). Habitat data was also documented at the Buells Creek crossing of Ormond Street.

September 28, 2021:

> Five locations with potential to support fish and fish habitat: the Tributary to Grants Creek within the Highway 401 right-of-way (ROW), Culvert C1, Culvert C4, Culvert C5 and Culvert C7.

Where applicable, information collected during Stantec's hydrology team's culvert inspections, conducted on August 10 and 11, 2020 (Stantec 2021), was obtained to supplement the fisheries habitat assessments at Culverts C1, C4, C5 and C7.

Based on culvert inspection data (Stantec 2021), air photo interpretation and the absence of mapped surface water features (MNRF 2022a), habitat assessments were not conducted at Culverts C2 and C8.

3.2 Fisheries Inventory

An application for a Licence to Collect Fish for Scientific Purposes was submitted to the Kemptville District MNRF on July 8, 2020, and a renewal request was submitted on March 11, 2021. Upon receipt of the Licence, qualitative fish collections were conducted at Buells Creek in August 2020 and May 2021. Fish sampling was not conducted at stations where water depth was insufficient for sampling (i.e., at water depths less than approximately 5 cm), in areas of dense aquatic vegetation that precluded open water, or where isolated pools of water showed no direct connectivity to potential fish-bearing watercourses.

MTO Fish Community Inventory Records were completed at locations where fish were sampled. All fish captured were identified and live-released in the field at the site of capture. At each fish collection location, *in situ* water quality parameters (dissolved oxygen, conductivity, pH and temperature) were measured using a multi-parameter water quality meter.

4.0 Existing Fish and Fish Habitat Conditions

Photographs from Stantec's field investigations are provided in **Appendix D**. Existing conditions are illustrated in **Figure 2 (Appendix A)**.

A tabulated summary of existing fish habitat conditions in the Study Area is provided in **Table 2** (**Appendix C**), and the summary of existing fish community data for the Study Area is provided in **Table 3** (**Appendix C**). Both tables summarize data collected during Stantec's field investigations, available background data, and information received during MNRF consultation.

In situ water quality parameters recorded during Stantec's field investigations are provided in **Table 4**.

As summarized in **Table 2** (**Appendix C**) and illustrated in **Figure 2** (**Appendix A**), the following locations provide direct fish habitat in the Study Area:

- Tributary to Grants Creek (parallel to the north side of Highway 401, within the Highway 401 ROW) (seasonal)
- Culvert C4 (north side of Highway 401) (seasonal)
- Culvert C5 (seasonal)

FISH AND FISH HABITAT EXISTING CONDITIONS AND PRELIMINARY IMPACT ASSESSMENT REPORT
Highway 401 from 2 km West of Stewart Boulevard to 750 m East of North Augusta Road (GWP 4003-19-00)

March 2023

- Culvert C6 (MTO Site 16X-0237/C0)
- Culvert C7 (seasonal)

Based on the assessment results, the features that connect some of the sites listed above also support seasonal fish habitat:

- Ditch between Culverts C4 and C5 (north side of Highway 401)
- Tributary to Buells Creek (ditch) between Culvert C7 and Ormond Street (north side of Highway 401)

The following location provides indirect fish habitat in the Study Area:

- Culvert C1

Based on culvert inspection data (Stantec 2021), air photo interpretation and the absence of mapped surface water features (MNRF 2022a), the following locations do not support fish habitat:

- Culvert C2
- Culvert C8

5.0 Constraints and Opportunities

As summarized in Section 4 and **Table 2** (**Appendix C**), direct fish habitat was identified at four centreline culverts, two ditches and the Tributary to Grants Creek.

Stantec determined that the none of the sites provide Significant Fish Habitat. Significant Fish Habitat means habitat that meets one or more of the following criteria (MTO 2020b):

- *Rare or uncommonly found habitat that may (but may not) be one of the limiting factors to the fish population*
- *Specialized habitat that fish populations are highly dependent on to support critical life functions*
- *Areas contributing to fisheries productivity that are exceptionally productive, likely to be limiting and are rare or relatively uncommon*

Opportunities for habitat enhancement in the Study Area include repairs to the gabion baskets at Buells Creek (Culvert C6; MTO Site 16X-0237/C0) and other bank stabilization measures on the south side of Highway 401. The addition of instream structure would enhance habitat in Buells Creek on the north side of Highway 401. Seasonal barriers to fish passage (i.e., isolated pools) were observed in the tributary to Buells Creek (Culvert C7) but the pools provide summer refuge and should be maintained or replaced, as appropriate.

Opportunities for habitat enhancement through the addition of riparian vegetation should be considered on a site-specific basis during Detail Design.

6.0 Preliminary Impact Assessment

6.1 Description of Work

The Recommended Plan for the Study Area (**Appendix E**) includes the following activities that have the potential to affect fish and fish habitat:

- Expansion of Highway 401 to an interim 6-lane and ultimate 8-lane cross-section
- Improvements to the management of stormwater (e.g., ditching)
- Culvert improvements (replace or line) (see **Table 5, Appendix C**)
- The Buells Creek culvert (Culvert C6, Site 16X-0237/C0) beneath Highway 401 will be removed
- Buells Creek will be realigned closer to (i.e., toward) Ormond Street
- The existing Ormond Street structure (i.e., the Highway 401 overpass over Ormond Street) will be removed and replaced with a new structure that will span both Buells Creek and Ormond Street. The bridge will be designed to accommodate the ultimate 8-lane Highway 401 cross-section

FISH AND FISH HABITAT EXISTING CONDITIONS AND PRELIMINARY IMPACT ASSESSMENT REPORT
Highway 401 from 2 km West of Stewart Boulevard to 750 m East of North Augusta Road (GWP 4003-19-00)

March 2023

6.2 Applicability of MTO Best Management Practices and Routine Works

In consultation with DFO, MTO has developed the *Best Management Practices Manual* (MTO 2020c). The Best Management Practices (BMPs) and Table 2 of the Protocol were developed for routine activities in or near water with minimal to no impacts to fish and fish habitat. If a project is located within 30 m of the high water level of a waterbody and the activity is listed in Table 2 of the Protocol, it can proceed without a fisheries assessment (Step 1 of the Protocol). Mitigation measures must be implemented to reduce the risk of the death of fish or the harmful alteration, disruption or destruction (HADD) of fish habitat.

The BMPs streamline the regulatory review process for routine highway activities and provide mitigation measures to reduce the risk of the death of fish and HADD of fish habitat. A project can proceed without DFO review if the conditions and mitigation measures outlined in a BMP can be met (Step 3 of the Protocol). Where a BMP is used, an MTO Project Notification Form is completed and filed by MTO (Step 5).

If a project cannot meet the conditions of a BMP at Step 3 of the Protocol (MTO 2020a), a fisheries assessment is conducted to determine the likelihood of the death of fish and HADD of fish habitat (Step 4). Projects proceed to Step 5 (MTO Notification) when there are no federally listed SAR and it is determined that the death of fish and HADD of fish habitat is not likely. Where HADD is likely and/or where federally listed SAR are present, the project proceeds to step 6 of the Protocol where an MTO Request for Review Application Form is submitted to DFO for review under the *Fisheries Act*.

The applicability of Table 2 of the Protocol and/or BMPs will be determined during the Detail Design phase of the project.

6.3 Preliminary Fisheries Assessment

Proposed changes to culverts and other work that has the potential to affect fish and fish habitat are summarized in **Table 5** (**Appendix C**). Constraints and opportunities associated with the sites are summarized with design considerations in **Table 6** (**Appendix C**).

At sites that support fish and fish habitat, the spatial extent of fish habitat directly affected by the project will need to be determined once the following information is confirmed:

- Culvert dimensions (applicable to replacements and extensions)
- The need for rock protection in the creek bed (areal extent, aggregate size)
- The need for channel realignments
- Details of other activities that may affect fish and fish habitat

Rock protection (waterbody material) is often added to the bed and/or banks of watercourses at both ends of culverts where extensions and replacements are proposed. The intent of the rock protection is to reduce the risk of scour and erosion of the bed and banks of watercourses. The area of rock protection should be determined using the *Drainage Management Manual* (MTO 1997). The extent (area) of rock protection to be added and the area that will directly affect fish habitat should be determined during Detail Design and documented in a fisheries assessment.

If rock protection (waterbody material) is proposed within the bankfull channel, the extent (area) of rock protection to be added and the area that will directly affect fish habitat should be determined during Detail Design and documented in the aquatic effects assessment. The rock protection (waterbody material) particle size should be determined using expected water velocities and selected from Table 3 or Table 4 of Ontario Provincial Standard Specification (OPSS) 1005. The addition of Granular B to the waterbody material should be considered to maintain wetted habitat to the extent possible by reducing water loss among the interstitial spaces in the rock protection.

As part of the fisheries assessments during Detail Design, Pathways of Effects (POEs) for land-based and in-water activities will need to be applied to determine the likelihood of the death of fish and/or HADD of fish habitat.

The details of the proposed work in the Study Area are not known at this time; therefore, the following list provides potential effects of the more common activities that may occur at or within 30 m of surface water features that provide fish habitat and culverts that convey watercourses that provide fish habitat:

Channel Realignment/Bridge Construction

- Loss of existing habitat
- Net loss of habitat if new channel length is shorter than existing conditions
- Infilling floodplain fish habitat with temporary construction access ramps and/or abutments

FISH AND FISH HABITAT EXISTING CONDITIONS AND PRELIMINARY IMPACT ASSESSMENT REPORT
Highway 401 from 2 km West of Stewart Boulevard to 750 m East of North Augusta Road (GWP 4003-19-00)

March 2023

- Removal of riparian vegetation and cover along the banks of a waterbody
- Removal of edge habitat (e.g., undercut bank, shallower areas with lower velocity, aquatic vegetation)
- Creation of barriers to fish movement (e.g., velocity barriers, alteration of the natural stream gradient)
- Introduction of sediments, concrete and other deleterious substances (e.g., salt, paint, solvents, oil and grease) into waterbodies
- Operation of machinery may impact habitat on the waterbody banks and bed and result in erosion and sedimentation
- Death of fish

Culvert Replacement/Extension

- Loss of habitat due to additional culvert length
- Changes to (or loss of) habitat if channel realignment is required for a culvert extension
- Infilling floodplain fish habitat with temporary construction access ramps
- Removal of riparian vegetation and cover along the banks of a waterbody
- Removal of edge habitat (e.g., undercut bank, shallower areas with lower velocity, aquatic vegetation)
- Creation of barriers to fish movement (e.g., perched crossings, velocity barriers, alteration of the natural stream gradient)
- Introduction of sediments, concrete and other deleterious substances (e.g., salt, paint, solvents, oil and grease) into waterbodies
- Operation of machinery may impact habitat on the waterbody banks and bed and result in erosion and sedimentation
- Death of fish

Culvert Maintenance

- Removal of woody debris that is important for cover and food production
- Flooding and excessive waterbody scouring if blockages are removed too quickly
- Excessive erosion and sedimentation from the use of equipment along the waterbody bank
- Disruption of critical fish life stages
- Replacement of eroded rock armouring can alter flows and fish movement patterns if done excessively
- Removal of riparian vegetation and cover along the banks or shoreline of a waterbody
- Removal of edge habitat (e.g., undercut bank, shallower areas with lower velocity, aquatic vegetation)
- Introduction of sediments, concrete and other deleterious substances (e.g., salt, paint, solvents, oil and grease) into waterbodies

7.0 Mitigation Measures

7.1 Design

The following measures should be considered during Detail Design to reduce the risk of impacts to fish and fish habitat:

- Design the replacement channel for Buells Creek using natural channel design principles such that it continues to provide habitat and fish passage
- If applicable, design other channel relocations using natural channel design principles
- Design drainage system to reduce changes in drainage to watercourses that provide fish habitat
- Design and plan activities and works such that loss of fish habitat or disturbance to fish habitat is reduced to the extent possible

FISH AND FISH HABITAT EXISTING CONDITIONS AND PRELIMINARY IMPACT ASSESSMENT REPORT
Highway 401 from 2 km West of Stewart Boulevard to 750 m East of North Augusta Road (GWP 4003-19-00)

March 2023

- Design stormwater management measures to reduce effects on watercourses that provide fish habitat to the extent possible
- Design a rehabilitation/re-vegetation plan for long-term stability of the areas disturbed during construction
- For rock reinforcement below the normal high water level, use appropriately-sized material and install at a similar slope to the existing, maintain a uniform bank/shoreline and maintain a natural bank/shoreline alignment such that it does not interfere with fish passage or alter the bankfull channel profile.

7.2 Construction

7.2.1 Timing

The in-water construction window for watercourses in the Study Area where fish habitat was identified is July 1 to March 14 inclusive (i.e., in-water work is not permitted from March 15 to June 30) (MNRF 2020). The timing window does not apply to work above the high water level.

Additional timing considerations are as follows:

- Reduce the duration of in-water work to the extent possible
- Conduct in-water work during periods of low flow to allow work in water to be isolated from flows
- Schedule work to avoid wet, windy, and rainy periods that may increase erosion and sedimentation
- Allow time for re-stabilization and re-vegetation as appropriate prior to winter

See OPSS.PROV 182 for fish protection measures regarding fish transfers and fish screens.

7.2.2 General

The following general measures are applicable to the project and should be designed and implemented following the OPSSs listed below:

- Limit access to banks or areas adjacent to watercourses to the extent required for construction activities
- Watercourse crossing (fording) is not permitted
- Manage and treat dewatering (or other) discharge water to reduce the risk of erosion and/or release of sediment-laden or contaminated water to surface water features
- Operate machinery on land above the high water level
- Operate, store, and maintain (e.g., refuel) equipment, vehicles, and materials in a manner that reduces the risk of the entry of deleterious substances to surface water features
- Equipment operating within 30 m of surface water features will be free of fluid leaks, invasive species, and noxious weeds
- Design and implement erosion and sediment controls (ESC) to contain/isolate the construction zone, manage site drainage/runoff and reduce the risk of erosion of exposed soils and migration of sediment to surface water features during construction and site restoration
- ESC measures should be maintained until disturbed ground has been permanently stabilized. The plan should include the following items:
  - Install effective ESC measures before starting work to reduce the risk of sediment entering surface water features
  - Regularly inspect, maintain and repair ESC measures during construction
  - Remove non-biodegradable ESC materials once the site is stable
- Develop a Spill Management Plan and have it on site for implementation in the event of an accidental spill
- Stabilize and re-vegetate areas of disturbed/exposed soil, as per the rehabilitation/re-vegetation plan.

FISH AND FISH HABITAT EXISTING CONDITIONS AND PRELIMINARY IMPACT ASSESSMENT REPORT
Highway 401 from 2 km West of Stewart Boulevard to 750 m East of North Augusta Road (GWP 4003-19-00)

March 2023

Ontario Provincial Standard Specifications

The following OPSSs are applicable to the project:

- OPSS.PROV 180 - General Specification for the Management of Excess Materials
- OPSS.PROV 182 - General Specification for Environmental Protection for Construction In and Around Waterbodies and on Waterbody Banks
- OPSS.PROV 517 - Construction Specification for Dewatering
- OPSS.PROV 803 - Construction Specification for Vegetative Cover (issued in November 2020 to replace former OPSS.PROV 804)
- OPSS.PROV 804 - Construction Specification for Temporary Erosion Control (issued in April 2021 to replace the erosion control components of former OPSS 805)
- OPSS.PROV 805 - Construction Specification for Temporary Sediment Control (issued in November 2020 to replace the sediment control components of former OPSS 805)
- OPSS.PROV 825 - Construction Specification for Placement of Aggregates in Waterbodies
- OPSS.PROV 1005 - Material Specification for Aggregates - Waterbody

The OPSSs are applicable to the following general activities:

- **Equipment Use -** Use of equipment shall be in accordance with OPSS.PROV 182.
- **Dewatering and Temporary Flow Passage** - Dewatering and/or temporary flow passage shall be according to OPSS.PROV 517 and OPSS.PROV 182.
- **Fish Salvage** - Fish salvage operations shall be conducted in accordance with OPSS.PROV 182.
- **Preservation of Riparian Vegetation** - Removal of riparian vegetation shall be in accordance with OPSS.PROV 182.
- **Erosion and Sediment Control** - Installation, monitoring, maintenance, and removal of temporary erosion and sediment control measures shall be according to OPSS.PROV 182, OPSS.PROV 804 and OPSS.PROV 805.
- **Placement of Aggregates in Waterbodies** - Use of aggregate in waterbodies shall be according to OPSS.PROV 825 and OPSS.PROV 1005.

- **Restoration of Disturbed Areas** - Vegetation protection and rehabilitation shall be in accordance with OPSS.PROV 182, OPSS.PROV 803 (Vegetative Cover, Non-Standard Special Provision - Amendment to OPSS.PROV 803) and OPSS.PROV 804.
- **Management of Excess Materials** - All excess material shall be managed in accordance with OPSS.PROV 180.

8.0 Recommendations and Next Steps

Design details, construction methods and additional mitigation measures (if required) will be necessary to update this Preliminary Impact Assessment.

The design details will be used to determine if BMPs (MTO 2020c) are applicable at Step 3 of the Protocol and/or to conduct a Fisheries Assessment at Step 4 of the Protocol to determine if the project may result in the death of fish or HADD of fish habitat.

As part of the Fisheries Assessment at Step 4 of the Protocol, the following items must be completed:

- MTO Template D3 - Aquatic Effect Summary Table
- MTO Template D4 - Fish and Fish Habitat Impact Documentation

The MTO Project Notification Form(s) cannot be completed based on the Recommended Plan, since the form documents applicable BMPs or summarizes and provides supporting documentation of a Fisheries Assessment. The Project Notification Form(s) will need to be completed at Step 5 of the Protocol for the sites where work will occur at or within 30 m of fish habitat.

Fluvial geomorphology field studies are recommended during Detail Design to support channel realignment at Buells Creek, the Fisheries Assessment, and DFO review of the channel realignment.

FISH AND FISH HABITAT EXISTING CONDITIONS AND PRELIMINARY IMPACT ASSESSMENT REPORT
Highway 401 from 2 km West of Stewart Boulevard to 750 m East of North Augusta Road (GWP 4003-19-00)

March 2023

9.0 Summary

The MTO has retained Stantec to undertake a Preliminary Design and Class EA Study for approximately 4.5 km of Highway 401 in Brockville, from 2 km west of Stewart Boulevard to 750 m east of Augusta Road. The purpose of the study is to identify a Recommended Plan for the rehabilitation and/or replacement of structures, for interchange modifications, and to establish the footprint of future six and eight lanes, to address current and future transportation needs. This *Fish and Fish Habitat Existing Conditions and Preliminary Impact Assessment Report* provides supporting documentation for the project and describes fish communities and fish habitat within the Study Area.

Within the Study Area, direct fish habitat was identified at four centreline culverts, two ditches and the Tributary to Grants Creek. Significant Fish Habitat, as defined in the *Interim Environmental Guide for Fisheries* (MTO 2020b), was not identified at any of the assessed sites.

Design details, construction methods and additional mitigation measures (if required) will be necessary to update this Preliminary Impact Assessment. The information will be used to determine if BMPs are applicable at Step 3 of the Protocol and/or to conduct a Fisheries Assessment at Step 4 of the Protocol to determine if the project may result in the death of fish or HADD of fish habitat. The information will also be used to support DFO's review of the proposed channel realignment at Buells Creek. Subsequent to the assessment of impacts following the Protocol, the MTO Project Notification Form(s) will need to be completed at Step 5 of the Protocol.

10.0 References

Fisheries and Oceans Canada (DFO). 2021. Aquatic Species at Risk Map – Available at: https://www.dfo-mpo.gc.ca/species-especes/sara-lep/map-carte/index-eng.html Accessed October 2022. Last modified August 11, 2022.

Ontario Ministry of Natural Resources and Forestry (MNRF). 2020. Email message from Lisa McShane (MNRF, Kemptville District) to Alexis Richardson (Stantec) in reply to background data request. October 16, 2020

Ontario Ministry of Natural Resources and Forestry (MNRF). 2022a. Land Information Ontario (LIO) database. Distributed and updated continuously by Land Information Ontario. Available at: https://www.javacoeapp.lrc.gov.on.ca/geonetwork/srv/en/main.home

Ontario Ministry of Natural Resources and Forestry (MNRF). 2022b. Natural Heritage Information Centre (NHIC) Biodiversity Explorer database. Available at: http://nhic.mnr.gov.on.ca

Ontario Ministry of Transportation (MTO). 1997. Drainage Management Manual. MTO Drainage and Hydrology Section, Transportation Engineering Branch.

Ontario Ministry of Transportation (MTO). 1999. Class Environmental Assessment for Provincial Transportation Facilities. October 6, 1999 (Amended July 14, 2000). Planning and Environmental Office, Environmental Policy and Standards Branch. Ministry of Transportation St. Catharines, Ontario

Ontario Ministry of Transportation (MTO). 2009. Environmental Guide for Fish and Fish Habitat. Version June, 2009. Provincial and Environmental Planning Office, Ministry of Transportation, St. Catharines, Ontario.

Ontario Ministry of Transportation (MTO). 2013. Environmental Reference for Highway Design. Provincial and Environmental Planning Office. The Queen's Printer for Ontario.

Ontario Ministry of Transportation (MTO). 2020a. MTO/DFO/MNRF Protocol for Protecting Fish and Fish Habitat on Provincial Transportation Undertakings. Version 4, 2020.

FISH AND FISH HABITAT EXISTING CONDITIONS AND PRELIMINARY IMPACT ASSESSMENT REPORT
Highway 401 from 2 km West of Stewart Boulevard to 750 m East of North Augusta Road (GWP 4003-19-00)

March 2023

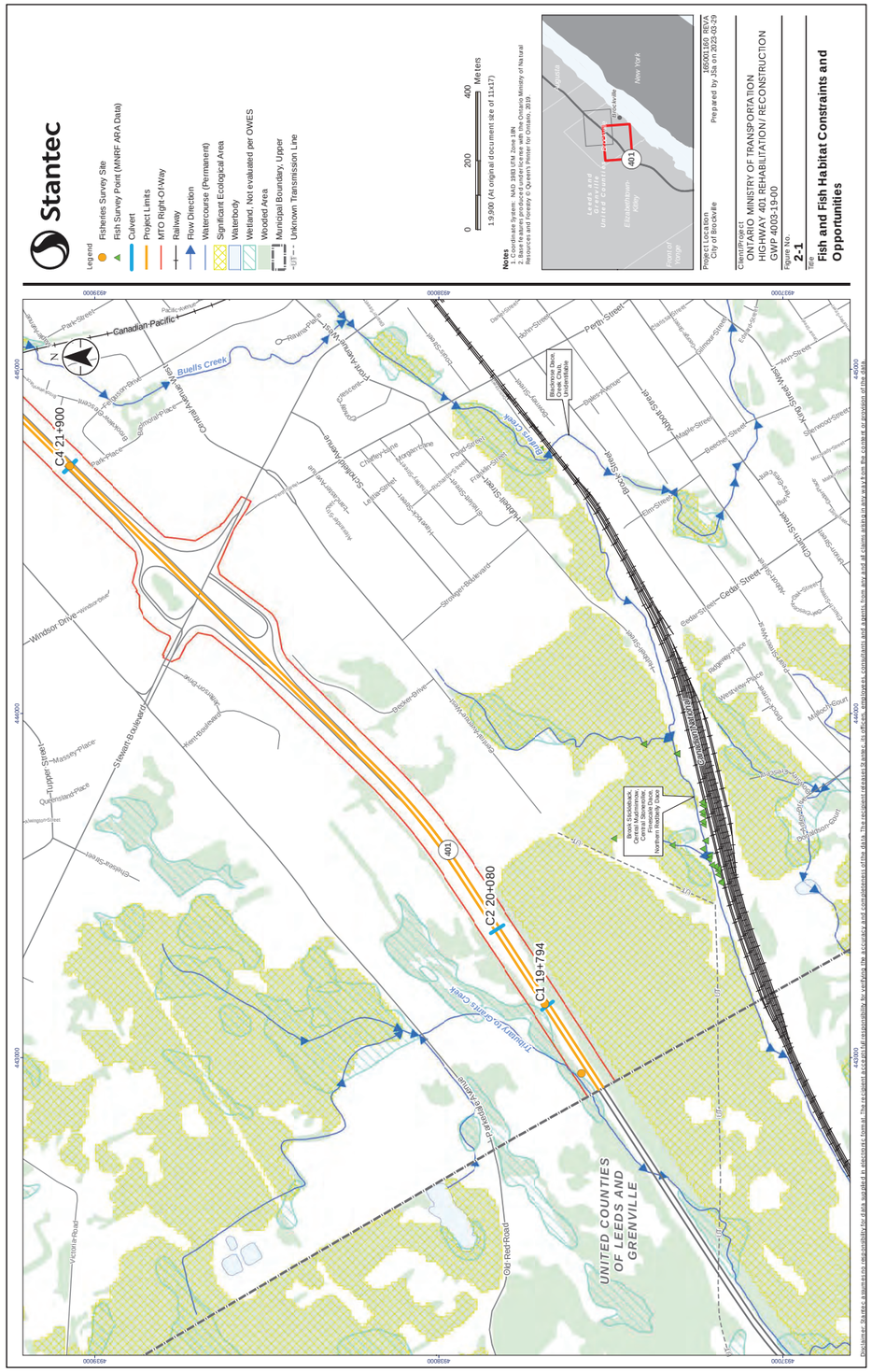
Ontario Ministry of Transportation (MTO). 2020b. Interim Environmental Guide for Fisheries. Version 3, April 2020. MTO Environmental Policy Office, St. Catharines, Ontario.

Ontario Ministry of Transportation (MTO). 2020c. Interim Environmental Guide for Fisheries – Best Management Practices Manual (April 2020).

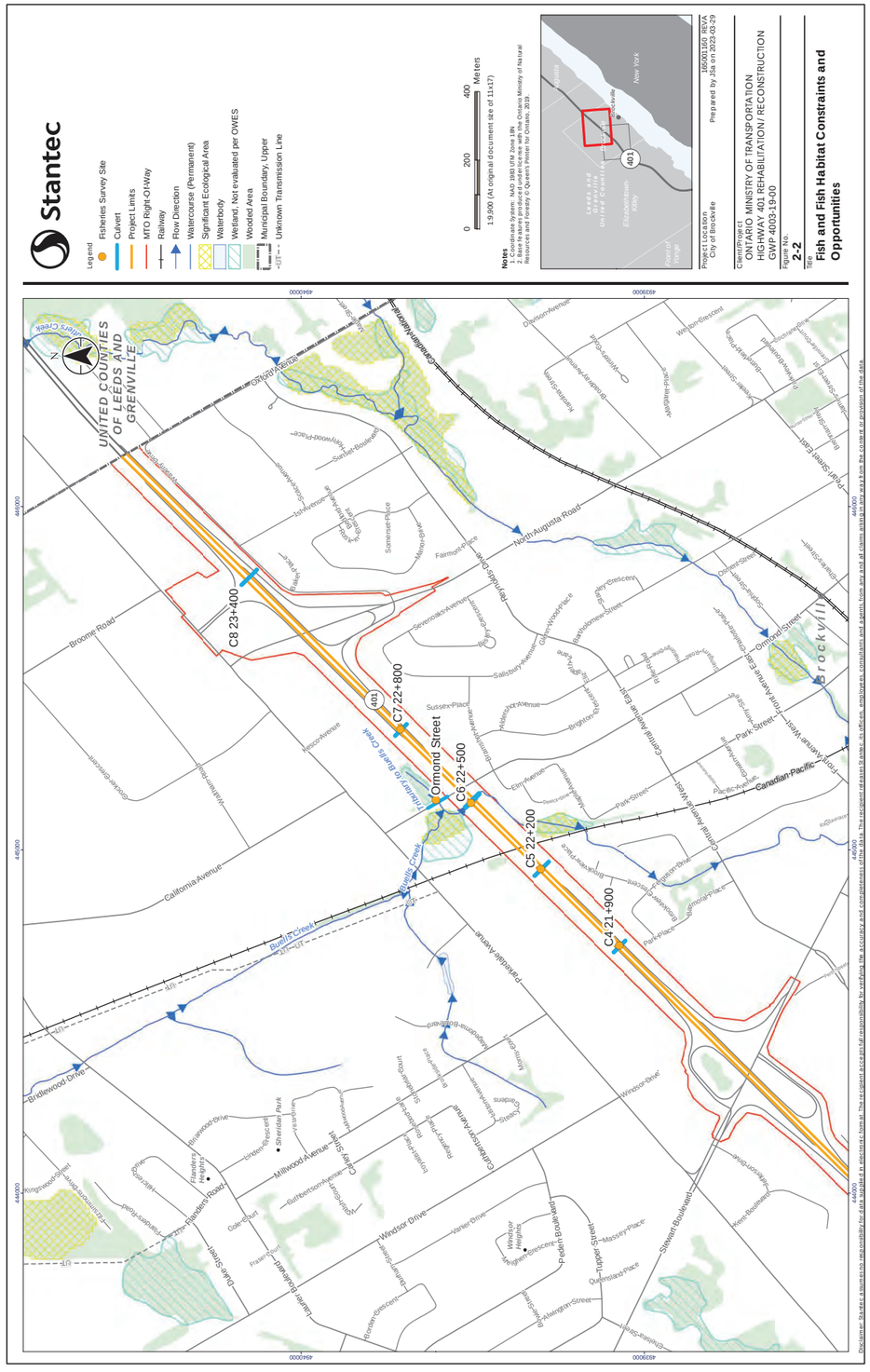
Stantec. 2021. Highway 401 Brockville Planning Study, GWP 4003-19-00, Culvert Inspection Report. January 2021.

Stantec. 2022. Terrestrial Ecosystems Existing Conditions and Preliminary Impact Assessment Report Highway 401 Planning Study, Brockville (GWP 4003-19-00).

Appendix A:
Figure 2



165001160



Appendix B:
Agency Correspondence and Background Data

165001160

Stantec Consulting Ltd.
400-1331 Clyde Ave., Ottawa, ON K2C 3G4

October 14, 2020
File: 165001160

Attention: Ministry of Natural Resources and Forestry, Kemptville District
Sent by email: Kemptville.Inforequest@ontario.ca

To Whom it May Concern,

Reference: Natural Heritage Information Request - Ministry of Transportation Highway 401 Corridor in Brockville, Ontario

The Ontario Ministry of Transportation (MTO) has retained Stantec Consulting Ltd. to complete the Preliminary Design (PD), Environmental Assessment (EA), and Design Build Ready (DBR) work for the rehabilitation and/or replacement of five structures along Highway 401 in the City of Brockville, from 2 km west of the Stewart Blvd Interchange to 750 m east of the North Augusta Road Interchange, a distance of approximately 4.5 km (the Study Area, see **Attachment A**).

The purpose of this letter is to request your input with respect to existing conditions within the Study Area, and to identify issues, concerns, or approval requirements that the Ministry of Natural Resources and Forestry (MNRF) may have. Stantec has completed a search of the Natural Heritage Information Center (NHIC) Biodiversity explorer database and summarized the results below under separate headers for fish and fish habitat, significant species, and natural features and areas. We are requesting updates and/or corrections to the information, as available. This information is required to complete our natural heritage review for the project.

FISH AND FISH HABITAT

The LIO database includes fish species lists for some of the watercourses in the Study Area (**Table 1** and **Attachment A**). As per the Step 2 of MTO/ DFO/MNRF Fisheries Protocol, we are requesting confirmation or updates to the following information related to fish and fish habitat in the Study Area:

- Species/community information from locations within 1 km upstream or downstream of the Study Area
- Watercourse thermal regime(s) and flow regime(s)
- Special habitat features
- Construction timing window(s)
- Important/exceptional fish habitat (e.g. groundwater upwelling, spawning areas, refugia, migratory routes)
- MNRF fisheries management objectives, if applicable

A summary of the information we obtained from available sources is provided in **Table 1** (see **Attachment A** for watercourse crossings). A Word version of the table is also provided to facilitate the update of information by your office.

Table 1 Highway 401 Corridor in Brockville Watercourse Crossings

Location (MTO Structure ID, see Attachment A)	Waterbody Name	Waterbody Coordinates (Zone 18T, Easting Northing)	Thermal Regime*	Habitat Information (based on Stantec field data, 2020)	Historical Data*+	MNRF Fisheries Management Objectives	In-Water Timing Window(s) for Construction
16-121	Stewart Boulevard Interchange drainage/ditch	444346E, 4938699N	No data	Engineered, trapezoidal drainage feature	MNRF 2020, NHIC 2020, DFO 2020 – No data Stantec 2020 – Not amenable to fish sampling (no water)		
16-122	Rail overpass drainage/ditch	445010E, 4939364N	No data	No feature	MNRF 2020, NHIC 2020, DFO 2020 – No data Stantec 2020 – Not amenable to fish sampling (no feature present)		
16-123	Buells Creek	445142E, 4939498N	No data	~8 m wide watercourse with natural substrates, floating and emergent aquatic vegetation.	MNRF 2020, NHIC 2020, DFO 2020 – No data Stantec 2020 – Creek Chub, Iowa Darter, Common White Sucker		
16-237/C	Buells Creek	445137E, 4939601N	No data	~4 m wide watercourse with natural substrates, floating and emergent aquatic vegetation	MNRF 2020, NHIC 2020, DFO 2020 – No data Stantec 2020 – Creek Chub, Common White Sucker, Banded Killifish		
16-124	North August Road Interchange drainage/ditch	445634E, 4939994N	No data	Engineered, trapezoidal drainage feature	MNRF 2020, NHIC 2020, DFO 2020 – No data Stantec 2020 – No catch		

Notes/References:
Highlighted cells represent data gaps where MNRF input is requested
*MNRF 2020. Land Information Ontario database. Ontario Ministry of Natural Resources and Forestry. Queen's Printer for Ontario.
+Based on presence of fish community data in NHIC and DFO Aquatic Species at Risk Map; others to be confirmed during field investigations

Reference: Natural Heritage Information Request - Ministry of Transportation Highway 401 Corridor in Brockville, Ontario

SIGNIFICANT SPECIES

Recent records (1980+) of species at risk and provincially rare species that overlap with the Study Area are summarized below:

- Snapping Turtle
- Blanding's Turtle
- Eastern Musk Turtle
- Northern Map Turtle
- Spotted Turtle
- Western Chorus Frog
- Gray Ratsnake
- Eastern Ribbon Snake
- Eastern Milksnake
- Bald Eagle
- Bank Swallow
- Barn Swallow
- Black-Crowned Night-Heron
- Bobolink
- Chimney Swift
- Common Nighthawk
- Eastern Wood-Pewee
- Eastern Whip-Poor-Will
- Eastern Meadowlark
- Evening Grosbeak
- Grasshopper Sparrow
- Great Black-Backed Gull
- Golden-Winged Warbler
- Henslow's Sparrow
- Least Bittern
- Peregrine Falcon
- Red-Headed Woodpecker
- Short-Eared Owl
- Wood Thrush
- Monarch
- Small-Footed Myotis
- Little Brown Myotis
- Northern Myotis
- Tri-Colored Bat
- Grey Fox
- Butternut
- American Ginseng
- Eastern Prairie Fringed-Orchid
- Olney's Grimmia

NATURAL FEATURES AND AREAS

The presence of natural features and areas that overlap with the Study Area are shown in **Attachment A**. This includes provincially designated features such as Provincially Significant Wetlands (PSWs) and Areas on Natural and Scientific Interest (ANSIs), and other features such as conservation areas, locally significant wetlands, woodlands, and valleylands.

CLOSING

We respectfully request confirmation of the above findings and the identification of any additional natural heritage resources information you may have for the Study Area. Please contact the undersigned if you have any questions regarding this information request.

Regards,

Reference: Natural Heritage Information Request - Ministry of Transportation Highway 401 Corridor in Brockville, Ontario

Stantec Consulting Ltd.

Alexis Richardson B.Sc., M.N.R.M.
Ecologist
Phone: 613-291-2638
Alexis.Richardson@stantec.com

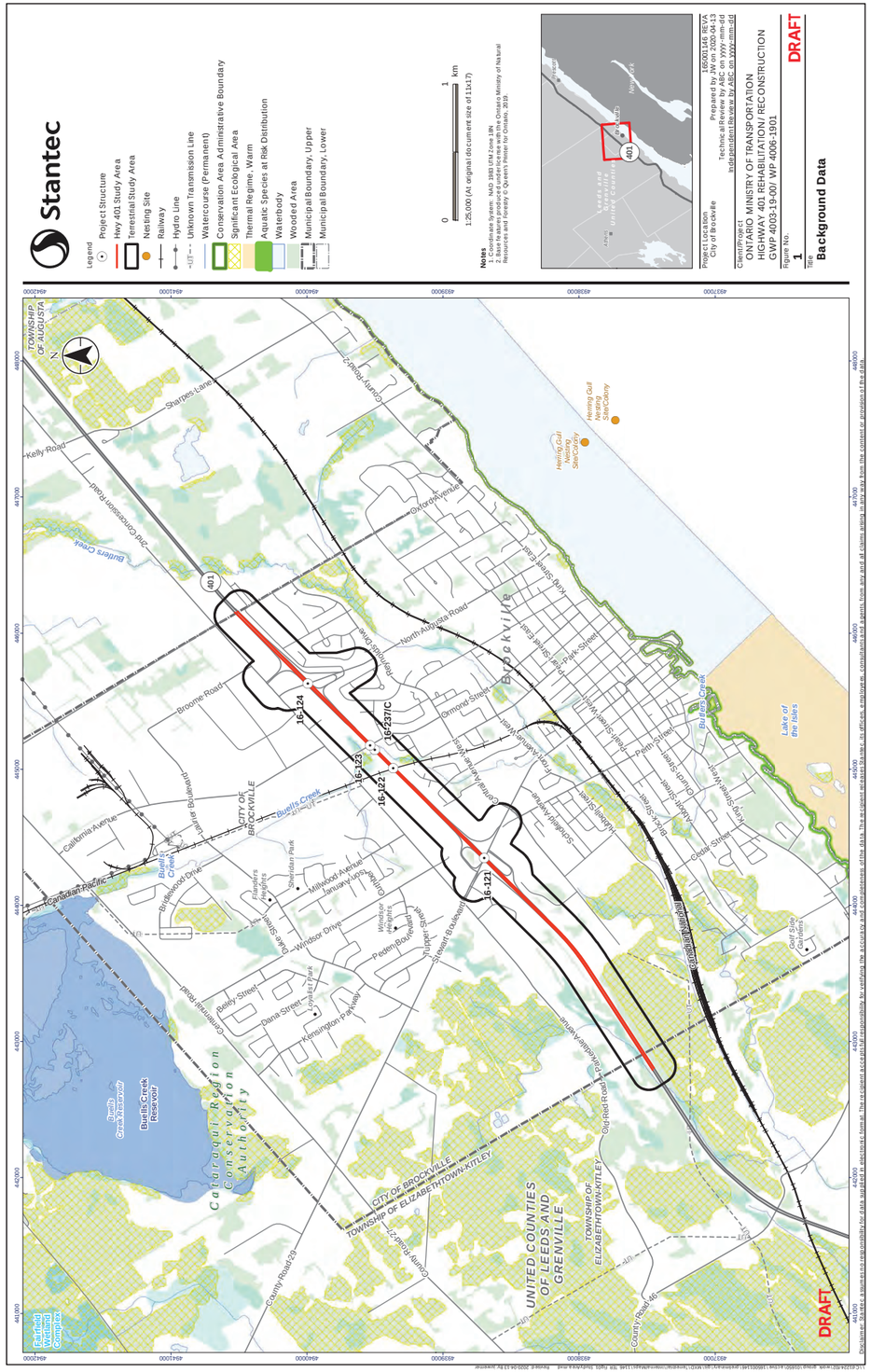
Attachment A: Study Area and Watercourse Crossings

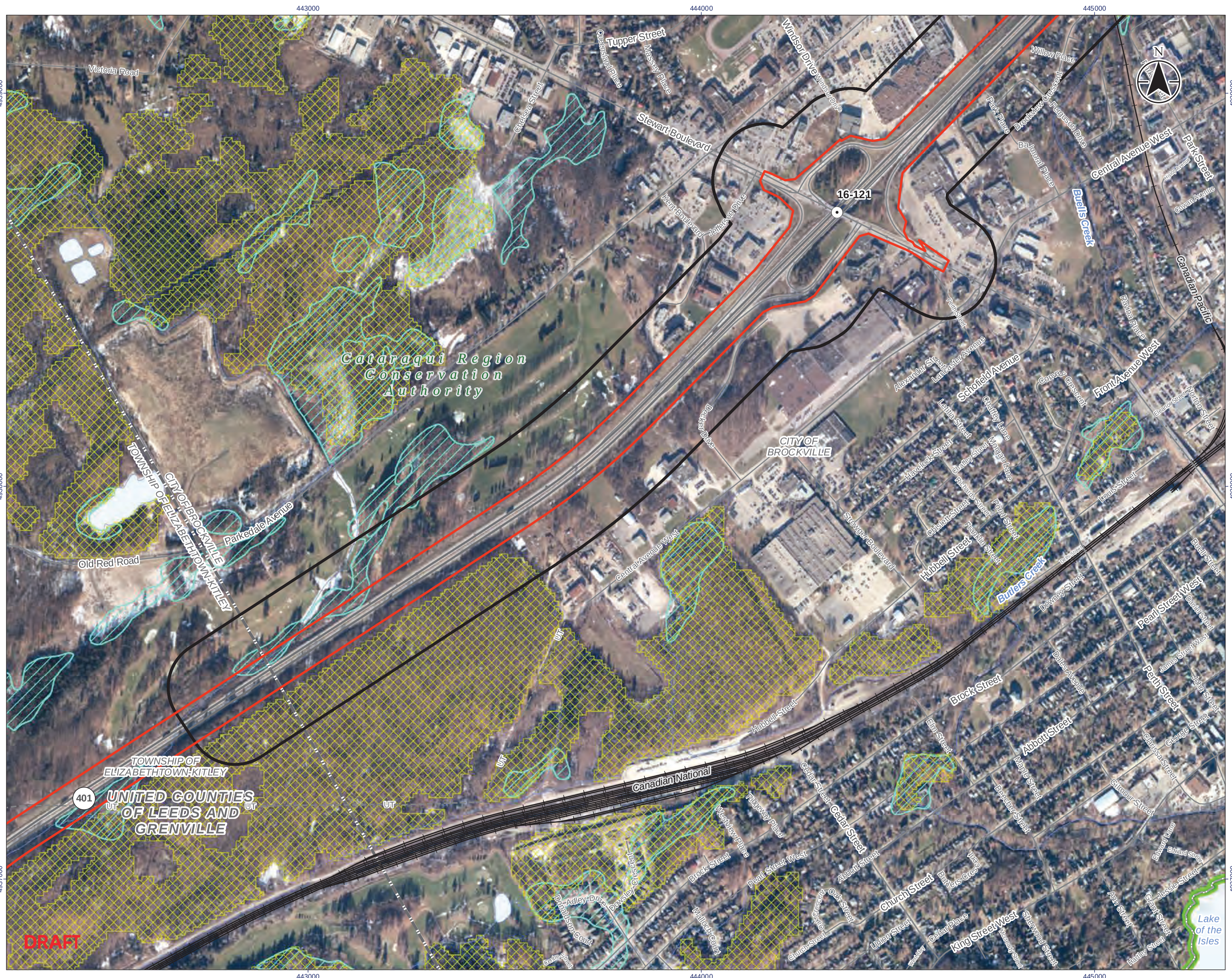
c. Debra.Giesbrecht@stantec.com
Kathleen.Todd@stantec.com
Josh.Mansell@stantec.com

Design with community in mind

ATTACHMENT A

Study Area and Watercourse Crossings





Stantec

Legend

- Project Structure
- MTO Right-of-Way
- Terrestrial Study Area
- Railway
- Unknown Transmission Line
- Watercourse (Permanent)
- Conservation Area Administrative Boundary
- Significant Ecological Area
- Aquatic Species at Risk Distribution
- Waterbody
- Wetland, Not evaluated per OWES
- Municipal Boundary, Upper
- Municipal Boundary, Lower

0 200 400 Meters

1:10,000 (At original document size of 11x17)

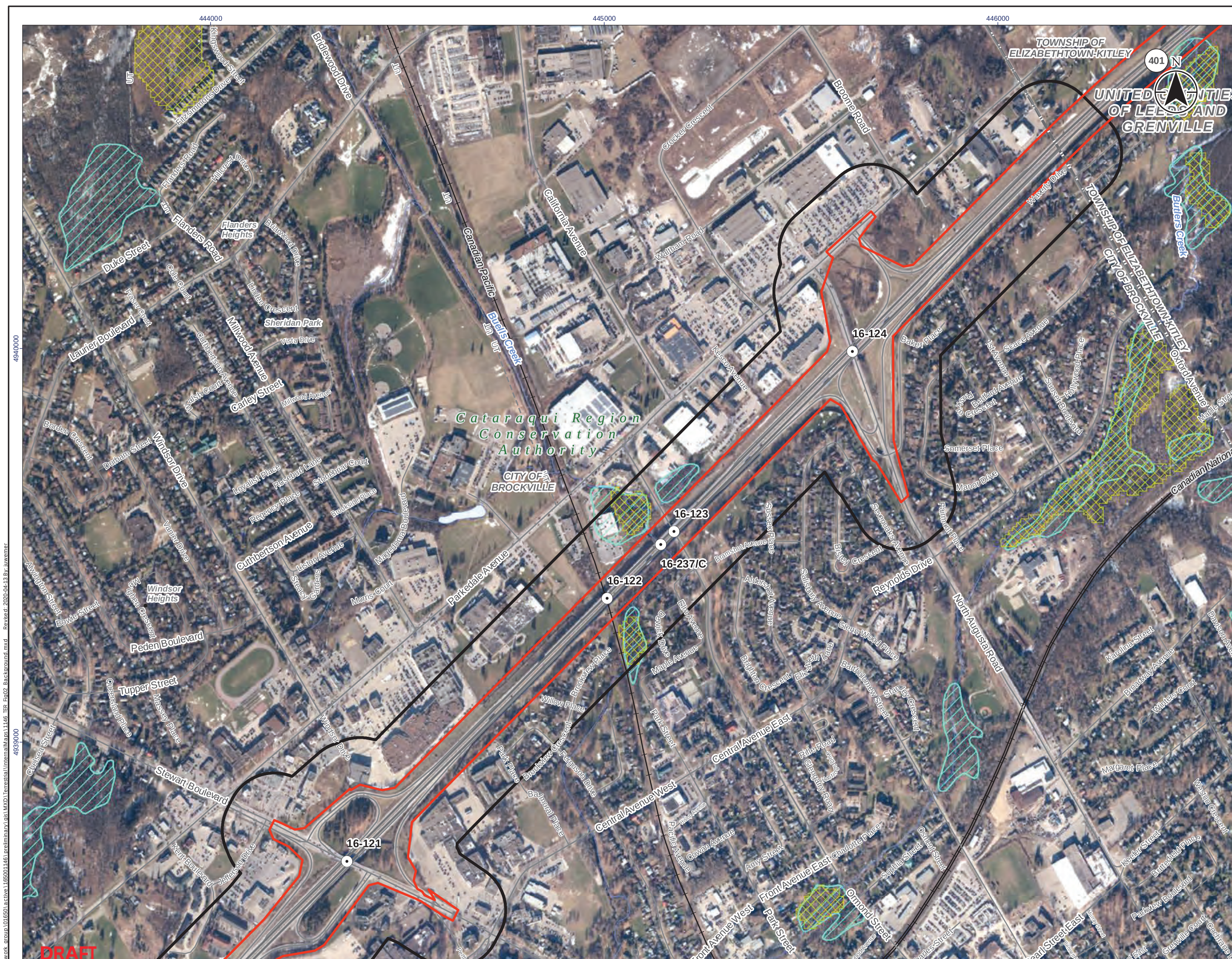
Notes
1. Coordinate System: NAD 1983 UTM Zone 18N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2019.

Project Location: City of Brockville
165001146 REVA
Prepared by JW on 2020-04-13
Technical Review by ABC on yyyy-mm-dd
Independent Review by ABC on yyyy-mm-dd

Client/Project
ONTARIO MINISTRY OF TRANSPORTATION
HIGHWAY 401 REHABILITATION/ RECONSTRUCTION
GWP 4003-19-00/ WP 4006-1901

Figure No.
2-1
DRAFT

Title
Background Data



Stantec

Legend

- Project Structure
- MTO Right-of-Way
- Terrestrial Study Area
- Railway
- Unknown Transmission Line
- Watercourse (Permanent)
- Conservation Area Administrative Boundary
- Significant Ecological Area
- Waterbody
- Wetland, Not evaluated per OWES
- Municipal Boundary, Upper
- Municipal Boundary, Lower

0 200 400 Meters

1:10,000 (At original document size of 11x17)

Notes
1. Coordinate System: NAD 1983 UTM Zone 18N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2019.

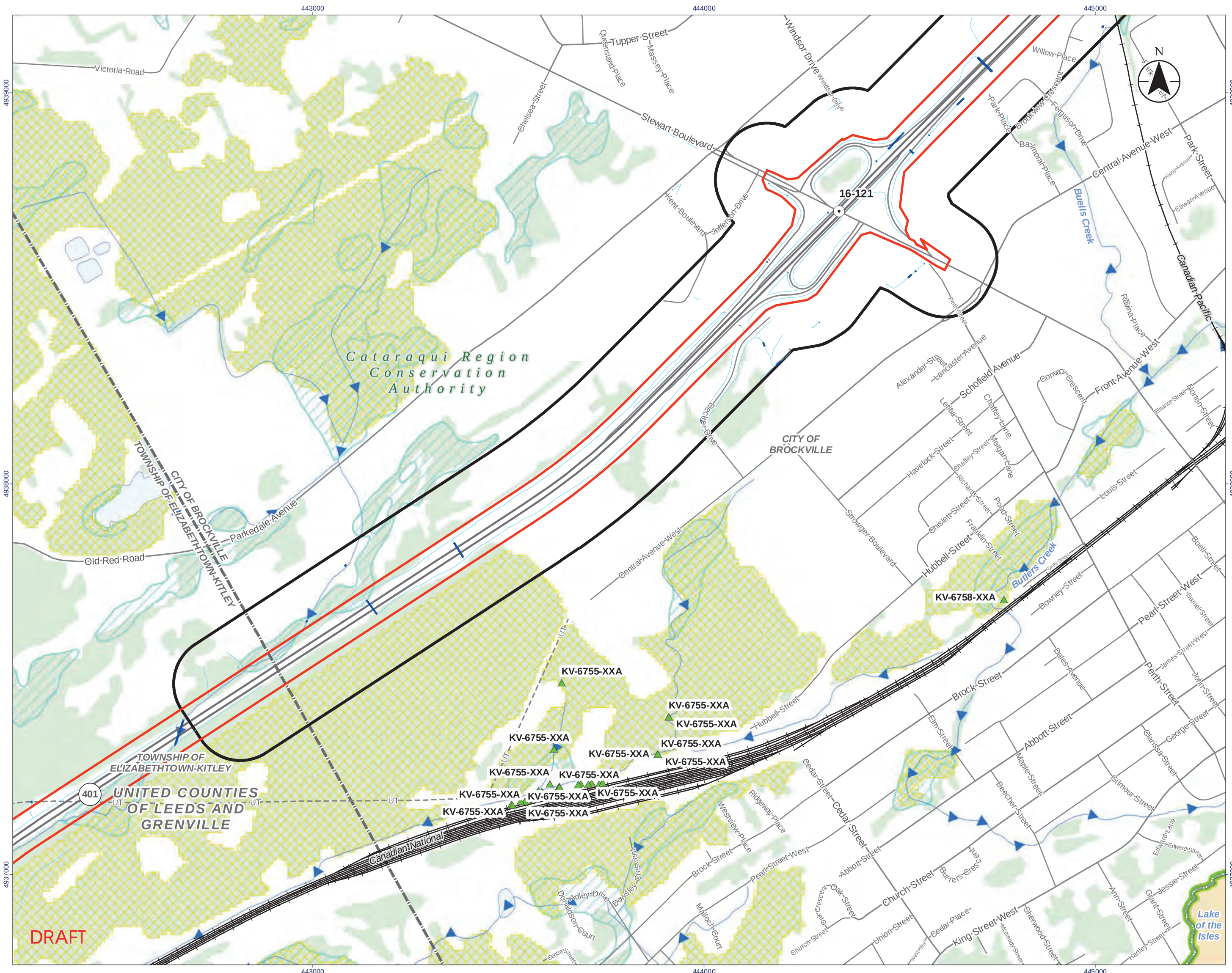
Project Location: City of Brockville
165001146 REVA
Prepared by JW on 2020-04-13
Technical Review by ABC on yyyy-mm-dd
Independent Review by ABC on yyyy-mm-dd

Client/Project
ONTARIO MINISTRY OF TRANSPORTATION
HIGHWAY 401 REHABILITATION/ RECONSTRUCTION
GWP 4003-19-00/ WP 4006-1901

Figure No.
2-2
DRAFT

Title
Background Data

Disclaimer: Stantec assumes no responsibility for data supplied in electronic format. The recipient accepts full responsibility for verifying the accuracy and completeness of the data. The recipient releases Stantec, its officers, employees, consultants and agents, from any and all claims arising in any way from the content or provision of the data.



Stantec

Legend

- Project Structure
- MTO Right-Of-Way
- Terrestrial Study Area
- Bottom of Ditch
- Centreline Culvert
- Railway
- Unknown Transmission Line
- Flow Direction
- Watercourse (Permanent)
- Conservation Area Administrative Boundary
- Significant Ecological Area
- Thermal Regime, Warm
- Aquatic Species at Risk Distribution
- Waterbody
- Wetland, Not evaluated per OWES
- Wooded Area
- Municipal Boundary, Upper
- Municipal Boundary, Lower

0 200 400 Meters

1:10,000 (At original document size of 11x17)

Notes
1. Coordinate System: NAD 1983 UTM Zone 18N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2019.

Project Location: City of Brockville

165001146 REVA
Prepared by JW on 2020-04-13
Technical Review by ABC on yyyy-mm-dd
Independent Review by ABC on yyyy-mm-dd

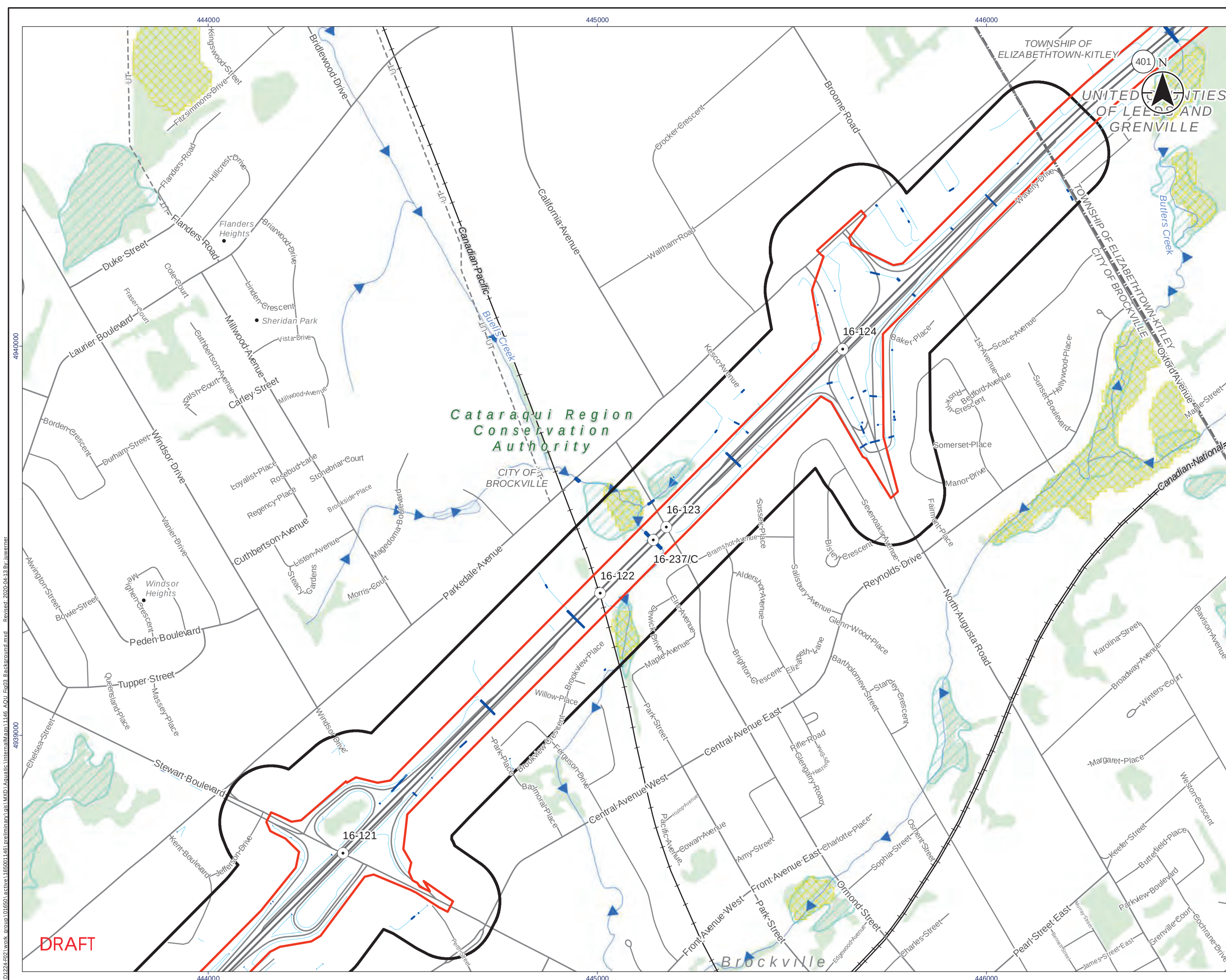
Client/Project
ONTARIO MINISTRY OF TRANSPORTATION
HIGHWAY 401 REHABILITATION/ RECONSTRUCTION
GWP 4003-19-00/ WP 4006-1901

Figure No.
3-1

DRAFT

Title
Background Data

Disclaimer: Stantec assumes no responsibility for data supplied in electronic format. The recipient accepts full responsibility for verifying the accuracy and completeness of the data. The recipient releases Stantec, its officers, employees, consultants and agents, from any and all claims arising in any way from the content or provision of the data.



Stantec

Legend

- Project Structure
- MTO Right-Of-Way
- Terrestrial Study Area
- Bottom of Ditch
- Centreline Culvert
- Railway
- Unknown Transmission Line
- Flow Direction
- Watercourse (Permanent)
- Conservation Area Administrative Boundary
- Significant Ecological Area
- Waterbody
- Wetland, Not evaluated per OWES
- Wooded Area
- Municipal Boundary, Upper
- Municipal Boundary, Lower

0 200 400 Meters

1:10,000 (At original document size of 11x17)

Notes
1. Coordinate System: NAD 1983 UTM Zone 18N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2019.

Project Location: City of Brockville

165001146 REVA
Prepared by JW on 2020-04-13
Technical Review by ABC on yyyy-mm-dd
Independent Review by ABC on yyyy-mm-dd

Client/Project
ONTARIO MINISTRY OF TRANSPORTATION
HIGHWAY 401 REHABILITATION/ RECONSTRUCTION
GWP 4003-19-00/ WP 4006-1901

Figure No.
3-2

DRAFT

Title
Background Data

Disclaimer: Stantec assumes no responsibility for data supplied in electronic format. The recipient accepts full responsibility for verifying the accuracy and completeness of the data. The recipient releases Stantec, its officers, employees, consultants and agents, from any and all claims arising in any way from the content or provision of the data.

From: Inforequest, Kemptville (MNRF)
To: Richardson, Alexis
Subject: RE: Information request for MTO Brockville
Date: Friday, October 16, 2020 11:53:35 AM
Attachments: KVD_In_Water_Work_Timing_Guidelines_2018-02-27(1) (1).pdf

Hi Alexis,
I am in agreement with the species assessments you have done for the watercourses, we do not have any further data for these streams/creeks. They are within FMZ 18 but there are no management objectives specific to them. I am attaching our in water work timing windows for you.
If you have any questions you can contact me directly,
Lisa

Lisa McShane |Management Biologist|Kemptville District |Ontario Ministry of Natural Resources and Forestry | (613) 504-2268| lisa.mcshane@ontario.ca

From: Richardson, Alexis <Alexis.Richardson@stantec.com>
Sent: October 14, 2020 3:14 PM
To: Inforequest, Kemptville (MNRF) <Kemptville.Inforequest@ontario.ca>
Cc: Todd, Kathleen <kathleen.todd@stantec.com>; Mansell, Josh <Josh.Mansell@stantec.com>; Giesbrecht, Debra <debbie.giesbrecht@stantec.com>
Subject: Information request for MTO Brockville

Hello,

Stantec Consulting has been hired by the Ministry of Transportation to complete an Environmental Assessment for a project along Highway 401 near the city of Brockville. Attached is an information request seeking input from the MNRF with respect to existing conditions, issues/concerns, and/or approval requirements that MNRF may have.

Please let me know if you have any questions or require further information.

Thank you,

Alexis Richardson B.Sc., M.N.R.M.
Ecologist

Mobile: 613-291-2638
Alexis.Richardson@stantec.com

Stantec
400 - 1331 Clyde Avenue
Ottawa ON K2C 3G4

Ministry of Natural Resources and Forestry
Kemptville District
10 Campus Drive
Postal Box 2002
Kemptville ON K0G 1J0
Tel.: 613 258-8204
Fax: 613 258-3920

Ministère des Richesses naturelles et des Forêts
District de Kemptville
10, promenade Campus
Case postale, 2002
Kemptville ON K0G 1J0
Tél.: 613 258-8204
Téléc.: 613 258-3920

Ontario

Last Revised: February 27, 2018

SUBJECT: UPDATED IN-WATER WORK TIMING GUIDELINES IN KEMPTVILLE DISTRICT

To: all interested parties

The Ministry of Natural Resources and Forestry Kemptville District Office has recently reviewed and updated its In-water Work Timing Guidelines. These guidelines are intended to provide the timing for in-water work related to an activity, in order to protect fish during spawning and other critical life stages. Timing guidelines are based on species* presence and are therefore subject to change if new information becomes available.

Timing Guidelines in Kemptville District are:

Waterbody (and applicable geography or Fisheries Management Zone)	Timing Guidelines (no in-water works)
o St. Lawrence River (FMZ 20)	March 15 – July 15 (Spring spawning species)
o Ottawa River – Lac Des Chats (FMZ 12)	October 1 to July 15 (Spring and fall spawning species, including Lake Trout and Lake Whitefish)
o Ottawa River – Lac Deschenes (FMZ 12)	October 15 to July 15 (Spring and fall spawning species, including Cisco)
o Ottawa River – Lac Dollard des Ormeaux (FMZ 12)	January 1 to July 15 (Winter and spring spawning species, including Burbot)
o Big Rideau Lake (South Burgess, North Burgess, Bastard and South Elmsley Twps) o Charleston Lake (Lansdowne and Escott Twps) o Crow Lake (South Crosby Twp)	October 1 to June 30 (Spring and fall spawning species, including Lake Trout)
o Bass Lake (South Elmsley Twp) o Lower Rideau Lake (South Elmsley Twp) o Bob's Lake (South Sherbrooke Twp) o Christie Lake (South Sherbrooke Twp) o Dalhousie Lake (Dalhousie Twp) o Davern Lake (South Sherbrooke Twp) o Farren Lake (South Sherbrooke Twp) o Grippen Lake (Leeds Twp) o Indian Lake (South Crosby Twp) o Little Long Lake (Lansdowne Twp) o Millpond Lake (South Burgess) o Otter Lake (South Elmsley, South Burgess and Bastard Twps)	October 15 to June 30 (Spring and Fall spawning species, including Lake Whitefish and Cisco)

o Otty Lake (North Burgess and North Elmsley Twps) o Pike Lake (North Burgess Twp) o Silver Lake (South Sherbrooke Twp) o Redhorse Lake (Lansdowne Twp) o Tay River (South Sherbrooke, Bathurst, Drummond and North Elmsley Twps) o Wolfe Lake (North Crosby Twp)	
o Bennett Lake (Bathurst Twp) o Crosby Lake (North Crosby Twp) o Gananoque River (Leeds Twp) o Lac Georges (Plantagenet and Alfred Twps) o Gillies Lake (Lanark Twp) o Little Crosby Lake (North Crosby Twp) o McLaren Lake (North Burgess Twp) o Mississippi Lake (Drummond, Beckwith and Ramsay Twps) o Mississippi River (Beckwith, Ramsay, Pakenham and Fitzroy Twps) o Raisin River below Martintown dam (Charlottenburgh Twp) o Rideau River (Wolford, Oxford, Montague, Marlborough, South Gower, North Gower, Osgood, Nepean and Gloucester Twps) o South Lake (Leeds Twp) o South Nation River below Plantagenet weir (Plantagenet Twp) o Upper Rideau Lake (North Crosby Twp) o Westport Sand Lake (North Crosby Twp)	January 1 – June 30 (Winter and spring spawning species, including Burbot)
o Small rivers and streams (denoted on 1:50,000 National Topographic System maps as being one-lined) o All other waterbodies in FMZ 18	March 15 to June 30 (Spring spawning species)

**Additional timing guidelines may apply as they relate to endangered and threatened species for works in both water and wetland areas. Timing guidelines are subject to change, depending on species found in a given waterbody.*

Should you have any questions, please do not hesitate to contact Joffre Côté, Management Biologist (at 613-258-8214 or joff.cote@ontario.ca) or Jane Devlin, Management Biologist (at 613-258-8418 or jane.devlin@ontario.ca).

Sincerely,

John Boos

Resources Management Supervisor
Kemptville District Office
Ministry of Natural Resources and Forestry

Appendix C: Tables

Table 1: Location of Work - Highway 401 Brockville (GWP 4003-19-00) (MTO Template D1)

Stantec Culvert ID / MTO Site / Waterbody Name	Highway	MTO Station / Municipality	Latitude (W)	Longitude (N)
Stantec ID: Not Applicable Tributary to Grants Creek within the Highway 401 Right-of-Way (ROW)	401	Not Applicable	44.589354	-75.71868
Stantec ID: Culvert C1 No Mapped Feature	401	19+794 Elizabethtown	44.590326	-75.71616
Stantec ID: Culvert C2* No Mapped Feature	401	20+080 Elizabethtown	44.591601	-75.71338
Stantec ID: Culvert C4 No Mapped Feature	401	21+899 Elizabethtown	44.602885	-75.69659
Stantec ID: Culvert C5 No Mapped Feature	401	22+219 Elizabethtown	44.60496	-75.69379
Stantec ID: Culvert C6 MTO Site: 16X-0237/C0 Buells Creek	401	22+503 Elizabethtown	44.606804	-75.69138
Stantec ID: Ormond Street Tributary to Buells Creek (at Ormond Street)	401	9+925 Elizabethtown	44.607725	-75.6913
Stantec ID: Culvert C7 No Mapped Feature	401	22+796 Elizabethtown	44.608668	-75.68871
Stantec Culvert ID: Culvert C8* No Mapped Feature	401	23+400 Elizabethtown	44.612646	-75.68318

* Based on culvert inspection data, air photo interpretation and the absence of mapped surface water features (MNRF 2022a), habitat assessments were not conducted at Culverts C2 and C8

Table 2: Fish Habitat Existing Conditions - Highway 401 Brockville (GWP 4003-19-00) (MTO Template D2A)

Stantec Culvert ID / MTO Site / Waterbody Name	Stantec Field Date(s)	Flow Regime[1,2]	Thermal Regime[1,2]	Fish Habitat	Substrate Type	Channel Morphology	Vegetation	Constraints and Opportunities	Significant Fish Habitat[3]
Stantec ID: Not Applicable Tributary to Grants Creek (within the Highway 401 Right-of-Way, west of Culvert C1)	September 28, 2021	Permanent	No Data	Direct fish habitat (seasonal)	Silt and clay	Sept 2021: Wetland-like feature with damp substrates; no defined banks at survey location but channel bed and banks were visible downstream	Riparian: Deciduous trees and shrubs, *Typha*, reed canary grass Instream: *Typha*, reed canary grass	Maintain wetland characteristics, flow contribution, and connection to downstream habitat	No
Stantec ID: Culvert C1 No Mapped Feature	August 10, 2020 September 28, 2021	No Data (no mapped feature)	No Data (no mapped feature)	Indirect fish habitat	Silt and muck	Aug 2020: Upstream - Standing pool Downstream - Dry with poorly defined flow path Sept 2021: Upstream – Standing pool with no defined banks Width: 11 m Depth: 1.5 m Downstream – Dry with no defined flow path	Riparian: Deciduous trees and shrubs, *Typha, Phragmites* Instream: None	Maintain flow to the north side of Highway 401	No
Stantec ID: Culvert C2 No Mapped Feature	August 10, 2020	No Data (no mapped feature)	No Data (no mapped feature)	Not fish habitat	Not Applicable	Dry with no visible flow path	Deciduous trees and shrubs, grasses	Not Applicable	No
Stantec ID: Culvert C4 No Mapped Feature	August 10, 2020 September 28, 2021	No Data (no mapped feature)	No Data (no mapped feature)	Direct fish habitat (seasonal) (on north side of Highway 401)	Silt, clay and muck	Aug 2020: Upstream - Dry, visible flow path Downstream - Large pool of standing water flowing into a defined channel (ditch) Sept 2021: Downstream – Run morphology, defined channel with some flowing water Width: 0.25 m Depth: 0.2 m	Riparian: *Typha, Phragmites*, grasses, asters Instream: Downstream – *Typha* Upstream - Grasses	None	No

Stantec Culvert ID / MTO Site / Waterbody Name	Stantec Field Date(s)	Flow Regime[1,2]	Thermal Regime[1,2]	Fish Habitat	Substrate Type	Channel Morphology	Vegetation	Constraints and Opportunities	Significant Fish Habitat[3]
Stantec ID: Culvert C5 No Mapped Feature	August 10, 2020 September 28, 2021	No Data (no mapped feature)	No Data (no mapped feature)	Direct fish habitat (seasonal)	Sand, clay, gravel and cobble	<u>Aug 2020:</u> Upstream - Run morphology, defined channel with some flowing water Downstream - Run morphology, defined channel with flowing water <u>Sept 2021:</u> Upstream – Run morphology, defined channel with flowing water	<u>Riparian:</u> *Typha*, grasses, some deciduous trees and shrubs, asters <u>Instream:</u> Downstream - None Upstream - *Typha*	Embed culvert further into channel	No
Stantec ID: Culvert C6 MTO Site: 16X-0237/C0 / Buells Creek	August 25, 2020 May 18, 2021	Permanent	No Data	Direct fish habitat	Sand, boulder, cobble, gravel, silt, muck and detritus	<u>Aug 2020:</u> Upstream – Primarily run morphology with a pool Width: 4.0 to 4.5 m Depth: 0.25 m (run), 0.35 m (pool) Downstream – Riffle-pool-run morphology Width: 3.0 m Depth: 0.03 m (riffle), 0.3 m (run), 0.35 m (pool) <u>May 2021:</u> Upstream – Run morphology Width: 6.5 m Depth: 0.2 m Downstream – Riffle-pool-run morphology Width: 3.8 to 5.0 m Depth: 0.07 m (riffle), 0.3 m (run), 0.35 m (pool)	<u>Riparian:</u> Deciduous trees and shrubs, grasses, blueflag, smartweed, arrowhead <u>Instream:</u> Watercress, Canada waterweed, pondweed species, tapegrass	In-stream structure on upstream side, bank stability / repair gabion baskets on downstream side	No

Stantec Culvert ID / MTO Site / Waterbody Name	Stantec Field Date(s)	Flow Regime[1,2]	Thermal Regime[1,2]	Fish Habitat	Substrate Type	Channel Morphology	Vegetation	Constraints and Opportunities	Significant Fish Habitat[3]
Stantec ID: Ormond Street Tributary to Buells Creek (at Ormond Street)	August 25, 2020 May 18, 2021	No Data	No Data	Direct fish habitat	Sand, silt, clay, gravel, boulder and muck	<u>Aug 2020:</u> Upstream – Run morphology Width: 0.4 m Depth: 0.05 m Downstream – Primarily refuge pool with small run and riffle Width: 1.4 to 3.5 m Depth: 0.02 m (riffle), 0.15 m (run), 0.4 m (pool) <u>May 2021:</u> Upstream – Primarily run morphology with small riffle and pool Width: 1.1 to 2.5 m Depth: 0.01 m (riffle), 0.1 m (run), 0.25 m (pool) Downstream – Refuge pool Width: 5.0 m Depth: 0.3 m	<u>Riparian:</u> Deciduous trees and shrubs, *Typha*, grasses <u>Instream:</u> Watercress, Canada waterweed	Likely limited flow on upstream side most of the year, connectivity to Buells Creek may be limited during dry periods	No
Stantec ID: Culvert C7 No Mapped Feature	August 10, 2020 September 28, 2021	No Data (no mapped feature)	No Data (no mapped feature)	Direct fish habitat (seasonal)	Silt, clay and muck	<u>Aug 2020:</u> Upstream - Standing pool with poorly defined channels Downstream - Standing pool with defined channel <u>Sept 2021:</u> Upstream – Isolated pool Width: 6 m Depth: 1 m Downstream – Isolated pool Width: 8 m Depth: 1 m	<u>Riparian:</u> *Typha*, *Phragmites*, grasses <u>Instream:</u> None	Seasonal isolation	No

Stantec Culvert ID / MTO Site / Waterbody Name	Stantec Field Date(s)	Flow Regime[1,2]	Thermal Regime[1,2]	Fish Habitat	Substrate Type	Channel Morphology	Vegetation	Constraints and Opportunities	Significant Fish Habitat[3]
Stantec ID: Culvert C8 No Mapped Feature	August 25, 2020	No Data (no mapped feature)	No Data (no mapped feature)	Not fish habitat	Not Applicable	Visible flow path on the north side of Highway 401. No connection to surface water features that support fish habitat.	*Typha*, *Phragmites*	Not Applicable	No

Notes:
***** Based on culvert inspection data, air photo interpretation and the absence of mapped surface water features (MNRF 2022a), habitat assessments were not conducted at Culverts C2 and C8
[1] MNRF 2020
[2] MNRF 2022a
[3] MTO 2020b
References are provided in Section 10.0 of this *Fish and Fish Habitat Existing Conditions and Preliminary Impact Assessment Report*.

Table 3: Fish Community Existing Conditions - Highway 401 Brockville (GWP 4003-19-00) (MTO Template D2B)

Stantec Culvert ID* / MTO Site / Waterbody Name	Stantec Field Date(s)	Fish Species Present	Year Class	Species at Risk (SAR) Present	In-water Works Timing Window
Stantec ID: Not Applicable Tributary to Grants Creek (within the Highway 401 Right-of-Way [ROW], west of Culvert C1)	September 28, 2021	MNRF 2022a – No data near Highway 401 Stantec 2021 – Not fished, no fish observed	Not applicable	DFO 2022; MNRF 2022b – No records of federally or provincially regulated aquatic SAR	MNRF 2020 – July 1 to March 14 (no in-water work from March 15 to June 30)
Stantec ID: Culvert C4 No Mapped Feature	September 28, 2021	MNRF 2022a – No data (not a mapped watercourse) Stantec 2021 – Not fished, no fish observed	Not applicable	DFO 2022; MNRF 2022b – No records of federally or provincially regulated aquatic SAR	MNRF 2020 – July 1 to March 14 (no in-water work from March 15 to June 30)
Stantec ID: Culvert C5 No Mapped Feature	September 28, 2021	MNRF 2022a – No data (not a mapped watercourse) Stantec 2021 – Not fished, no fish observed	Not applicable	DFO 2022; MNRF 2022b – No records of federally or provincially regulated aquatic SAR	MNRF 2020 – July 1 to March 14 (no in-water work from March 15 to June 30)
Stantec ID: Culvert C6 MTO Site: 16X-0237/C0 / Buells Creek	August 25, 2020 May 18, 2021	MNRF 2022a – No data near Highway 401 Stantec 2020, 2021 – Brown Bullhead, Iowa Darter, Creek Chub, unidentified sunfish	Young-of year (YOY) sunfish	DFO 2022; MNRF 2022b – No records of federally or provincially regulated aquatic SAR	MNRF 2020 – July 1 to March 14 (no in-water work from March 15 to June 30)
Stantec ID: Ormond Street Tributary to Buells Creek (at Ormond Street)	August 25, 2020 May 18, 2021	MNRF 2022a – No data Stantec 2020, 2021 – Banded Killifish, Creek Chub, Brook Stickleback, White Sucker, unidentified sunfish	YOY sunfish	DFO 2022; MNRF 2022b – No records of federally or provincially regulated aquatic SAR	MNRF 2020 – July 1 to March 14 (no in-water work from March 15 to June 30)
Stantec ID: Culvert C7 No Mapped Feature	September 28, 2021	MNRF 2022a – No data Stantec 2021 – Not fished, unidentified small-bodied fish observed	Not available	DFO 2022; MNRF 2022b – No records of federally or provincially regulated aquatic SAR	MNRF 2020 – July 1 to March 14 (no in-water work from March 15 to June 30)

Note:
Culvert C1 supports indirect fish habitat; therefore, is not included
Culverts C2 and C8 do not support fish habitat; therefore, are excluded
References are provided in Section 10 of this *Fish and Fish Habitat Existing Conditions and Preliminary Impact Assessment Report*.

Table 4 Summary of *in situ* Water Quality Parameters at Culvert Locations that Support Fish Habitat - Highway 401 Brockville (GWP 4003-19-00)

Stantec Culvert ID* / MTO Site / Waterbody Name (See Figure 2)	Date (yyyy/mm/dd)	Air Temperature (°C)	Water Temperature (°C)	Dissolved Oxygen (mg/L)	Conductivity (µS/cm)	pH
Stantec ID: Not Applicable Tributary to Grants Creek within the Highway 401 Right-of-Way (ROW)	2021/09/28	12	No standing water	No standing water	No standing water	No standing water
Stantec ID: Culvert C1 (Westbound Lanes)	2021/09/28	11	14.6	3.2	2022	7.49
Stantec ID: Culvert C1 (Eastbound Lanes)	2021/09/28	14	14.2	1.75	1757	Not available
Stantec ID: Culvert C4 (Westbound Lanes)	2021/09/28	14	17	8.1	1400	Not available
Stantec ID: Culvert C5 (Westbound Lanes)	2021/09/28	15	15.6	7.8	1400	7.86
Stantec ID: Culvert C6 Site 16X-0237/C0 Buells Creek	2020/08/25	23	20.6	9.5	792	Not available
Stantec ID: Culvert C6 MTO Site: 16X-0237/C0 / Buells Creek	2021/05/18	16	16.4	9.2	593	Not available
Stantec ID: Ormond Street Tributary to Buells Creek (at Ormond Street)	2020/08/25	22	18.2	9.6	1169	7.73
Stantec ID: Ormond Street Tributary to Buells Creek (at Ormond Street)	2021/05/18	10	10.7	7.34	1216	8.14
Stantec ID: Culvert C7 (Westbound Lanes)	2021/09/28	14	15.5	4.5	2032	Not available
Stantec ID: Culvert C7 (Westbound Lanes)	2021/09/28	15	16.4	5	3592	7.70

Table 5: Proposed Work Based on the Recommended Plan at Culvert Locations that Support Fish Habitat - Highway 401 Brockville (GWP 4003-19-00)

Stantec Culvert ID / MTO Site / Waterbody Name (see Figure 2)	Existing Conditions - Culvert Type	Existing Conditions - Culvert Size (mm) (Diameter or Span x Height)	Existing Conditions - Culvert Length (m)	Proposed Conditions	Additional Information	Assessment - Table 2 Routine MTO Works?	Assessment - Applicable BMP?	Assessment - Fisheries Assessment Required?	Next Steps
Stantec ID: Not Applicable Tributary to Grants Creek (within the Highway 401 Right-of-Way, west of Culvert C1)	Not Applicable	Not Applicable	Not Applicable	Unknown	Additional ROW required; therefore, work may occur within 30 m of the watercourse	To be determined	To be determined	To be determined	Determine proximity of work and/or if channel relocation is required to accommodate highway widening. DFO review required for channel realignment.
Stantec ID: Culvert C1 No Mapped Feature	CSP* (circular)	914	55.00	Replace or line Extend culvert	-	No	No	No	Indirect fish habitat; fisheries assessment not likely required. Design to maintain flow contribution to downstream habitat.
Stantec ID: Culvert C4 No Mapped Feature	Concrete box (NFRB)**	1220 x 12120	48.77	Remove and provide highway drainage ditch on south side of Highway 401 to the channel at the outlet of Culvert C5	-	No	No	Yes	Confirm seasonal use by fish. Design new ditch to maintain flow and seasonal habitat, as appropriate. May require DFO review, pending confirmation of use by fish.
Stantec ID: Culvert C5 No Mapped Feature	CSP (circular)	1524	57.30	Replace or Line	Retaining wall on south side of Highway 401, east and west of Culvert C5	No	No	Yes	Confirm seasonal use by fish; design to maintain flow and seasonal habitat, as appropriate. May require DFO review, pending confirmation of use by fish.
Stantec ID: Culvert C6	CSP Arch	5004 x 3023 (south end)	42.67 + 15.25 m extension at north end	Replace with bridge and realign Buells Creek	Retaining wall on south side of Highway 401, within	No	No	Yes	Design and construct replacement channel using natural channel design principles and to avoid the death of fish

Stantec Culvert ID / MTO Site / Waterbody Name (see Figure 2)	Existing Conditions - Culvert Type	Existing Conditions - Culvert Size (mm) (Diameter or Span x Height)	Existing Conditions - Culvert Length (m)	Proposed Conditions	Additional Information	Assessment - Table 2 Routine MTO Works?	Assessment - Applicable BMP?	Assessment - Fisheries Assessment Required?	Next Steps
MTO Site: 16X-0237/C0 Buells Creek		4207 x 2134 (north end extension)			30 m of Buells Creek				and the harmful alteration, disruption or destruction of fish habitat. DFO review required for channel realignment.
Stantec ID: Ormond Street Tributary to Buells Creek (at Ormond Street)	One CSP (circular) and One concrete (circular)	CSP: 2000 Concrete: 1000	Not available	To be determined	Construction activities related to replacement of the Highway 401 overpass over Ormond Street /Buells Creek culvert may occur within 30 m	To be determined	To be determined	To be determined	Determine if culvert replacement and/or channel relocation or changes are required at Ormond Street and/or between Ormond Street and Culvert C7. DFO review required for channel realignment and/or culvert extension(s).
Stantec ID: Culvert C7 No Mapped Feature	Concrete box (NFRB)*	1200 x 12000	48.77	Extend culvert (both ends)	-	No	No	Yes	Determine if changes are required to the flow path from Culvert C7 to Ormond Street. Design and construct replacement channel, as required, to avoid the death of fish and the harmful alteration, disruption or destruction of fish habitat. DFO review required for culvert extension and pending additional Detail Design plans for channel relocation.

* CSP = Corrugated Steel Pipe
** NFRB = Non-Rigid Frame Box (concrete with concrete floor)

Table 6: Design Considerations - Highway 401 Brockville (GWP 4003-19-00)

Factors to Consider	Design Considerations Provided by the Fisheries Assessment Specialist	Describe How Each Factor Was Addressed Through Design
In-water Works Timing Window	At sites where direct fish habitat was identified, the following in-water timing windows is applicable: Schedule work to occur from July 1 to March 14 (no in-water work from March 15 to June 30).	To be determined as the project progresses through design
Fish Passage	Drainage between Culvert C4 and C5 is being moved to the south side. Although fish passage through new culverts is not applicable, design of the relocated channel should consider fish passage. Design Buells Creek to maintain fish passage.	To be determined as the project progresses through design
Significant Fish Habitat	Not applicable	To be determined as the project progresses through design
Constraints and Opportunities	Maintain flow at Culvert C1, as it supports habitat downstream in the Tributary to Grants Creek. Include habitat elements in the ditch design on the south side of Highway 401 between Culvert C4 and C5. Design Buells Creek using natural channel design principles to provide stable banks and riparian vegetation.	To be determined as the project progresses through design

Appendix D:
Photographic Record

Photo 1: Tributary to Grants Creek; Highway 401 Westbound, south of the tributary facing north (September 28, 2021)

Photo 2: Tributary to Grants Creek; Highway 401 Westbound, facing north toward the tributary (before it enters the Highway 401 ROW) (September 28, 2021)

Photo 3: Tributary to Grants Creek; Highway 401 Westbound, within the Highway 401 ROW (September 28, 2021)

Photo 4: Tributary to Grants Creek; Highway 401 Westbound, within the Highway 401 ROW, facing southwest (downstream) (September 28, 2021)

Photo 5: Culvert C1; Station 19+794 (Elizabethtown); Highway 401 Westbound, facing northwest (downstream) (September 28, 2021)

Photo 6: Culvert C1; Station 19+794 (Elizabethtown); Highway 401 Westbound, culvert outlet facing south (upstream) (September 28, 2021)

Photo 7: Culvert C1; Station 19+794 (Elizabethtown); Highway 401 Westbound, facing west (downstream) (September 28, 2021)

Photo 8: Culvert C1; Station 19+794 (Elizabethtown); Highway 401 Westbound, facing northwest (downstream) toward the confluence with the Tributary to Grants Creek (September 28, 2021)

Photo 9: Culvert C1; Station 19+794 (Elizabethtown); Highway 401 Eastbound, culvert inlet facing north (downstream) (September 28, 2021)

Photo 10: Culvert C1; Station 19+794 (Elizabethtown); Highway 401 Eastbound, facing north (downstream) (September 28, 2021)

Photo 11: Culvert C1; Station 19+794 (Elizabethtown); Highway 401 Eastbound, facing south (upstream) (September 28, 2021)

Photo 12: Culvert C2; Station 20+080 (Elizabethtown); Highway 401 Eastbound, facing west (August 10, 2020)

Photo 13: Culvert C2; Station 20+080 (Elizabethtown); Highway 401 Eastbound, facing north (August 10, 2020)

Photo 14: Culvert C2; Station 20+080 (Elizabethtown); Highway 401 Eastbound, facing east (August 10, 2020)

Photo 15: Culvert C4; Station 21+899 (Elizabethtown); Highway 401 Westbound, culvert outlet facing southwest (upstream) (August 10, 2020)

Photo 16: Culvert C4; Station 21+899 (Elizabethtown); Highway 401 Westbound, facing northeast (downstream) (September 28, 2021)

Photo 17: Culvert C4; Station 21+899 (Elizabethtown); Highway 401 Westbound, facing northwest (downstream) (September 28, 2021)

Photo 18: Culvert C4; Station 21+899 (Elizabethtown); Highway 401 Eastbound, culvert inlet facing north (downstream) (August 10, 2020)

Photo 19: Culvert C5; Station 22+219 (Elizabethtown); Highway 401 Westbound, facing north (upstream) (August 10, 2020)

Photo 20: Culvert C5; Station 22+219 (Elizabethtown); Highway 401 Westbound, culvert inlet facing south (downstream) (September 28, 2021)

Photo 21: Culvert C5; Station 22+219 (Elizabethtown); Highway 401 Westbound, facing northwest (upstream) (September 28, 2021)

Photo 22: Culvert C5; Station 22+219 (Elizabethtown); Highway 401 Eastbound, culvert outlet facing northwest (upstream) (August 10, 2020)

Photo 23: Culvert C6 (MTO Site 16X-0237/C0); Station 22+503 (Elizabethtown); Buells Creek, Highway 401 Westbound, culvert inlet facing southeast (downstream) (May 18, 2021)

Photo 24: Culvert C6 (MTO Site 16X-0237/C0); Station 22+503 (Elizabethtown); Buells Creek, Highway 401 Westbound, facing the streambed (May 18, 2021)

Photo 25: Culvert C6 (MTO Site 16X-0237/C0); Station 22+503 (Elizabethtown); Buells Creek, Highway 401 Westbound, facing north (upstream) (May 18, 2021)

Photo 26: Culvert C6 (MTO Site 16X-0237/C0); Station 22+503 (Elizabethtown); Buells Creek, Highway 401 Westbound, culvert inlet facing southeast (downstream) (August 25, 2020)

Photo 27: Culvert C6 (MTO Site 16X-0237/C0); Station 22+503 (Elizabethtown); Buells Creek, Highway 401 Westbound, facing north (upstream) (August 25, 2020)

Photo 28: Culvert C6 (MTO Site 16X-0237/C0); Station 22+503 (Elizabethtown); Buells Creek, Highway 401 Westbound, facing the streambed (August 25, 2020)

Photo 29: Culvert C6 (MTO Site 16X-0237/C0); Station 22+503 (Elizabethtown); Buells Creek, Highway 401 Eastbound, culvert outlet facing northwest (upstream) (May 18, 2021)

Photo 30: Culvert C6 (MTO Site 16X-0237/C0); Station 22+503 (Elizabethtown); Buells Creek, Highway 401 Eastbound, facing southeast (downstream) (May 18, 2021)

Photo 31: Culvert C6 (MTO Site 16X-0237/C0); Station 22+503 (Elizabethtown); Buells Creek, Highway 401 Eastbound, culvert outlet facing west (August 25, 2020)

Photo 32: Culvert C6 (MTO Site 16X-0237/C0); Station 22+503 (Elizabethtown); Buells Creek, Highway 401 Eastbound, facing southeast (downstream) (August 25, 2020)

Photo 33: Culvert C6 (MTO Site 16X-0237/C0); Station 22+503 (Elizabethtown); Buells Creek, Highway 401 Eastbound, facing the streambed (August 25, 2020)

Photo 34: Ormond Street; Tributary to Buells Creek, Ormond Street Southbound, facing east (upstream) (May 18, 2021)

Photo 35: Ormond Street; Tributary to Buells Creek, Ormond Street, Southbound, facing west (downstream) (May 18, 2021)

Photo 36: Ormond Street; Tributary to Buells Creek, Ormond Street, Southbound, facing west (downstream) (August 25, 2020)

Photo 37: Ormond Street; Tributary to Buells Creek, Ormond Street, Northbound, facing west (downstream) (May 18, 2021)

Photo 38: Ormond Street; Tributary to Buells Creek, Ormond Street, Northbound, facing east (upstream) (August 25, 2020)

Photo 39: Culvert C7; Station 22+796 (Elizabethtown); Highway 401 Westbound, facing northwest (August 25, 2020)

Photo 40: Culvert C7; Station 22+796 (Elizabethtown); Highway 401 Westbound, facing northwest (downstream) (August 25, 2020)

Photo 41: Culvert C7; Station 22+796 (Elizabethtown); Highway 401 Westbound, culvert outlet facing north (August 25, 2020)

Photo 42: Culvert C7; Station 22+796 (Elizabethtown); Highway 401 Eastbound, culvert inlet facing northwest (upstream) (August 25, 2020)

Photo 43: Culvert C7; Station 22+796 (Elizabethtown); Highway 401 East-bound, facing southwest (upstream) (August 25, 2020)

Photo 44: Cuvlert C8; Station 23+400 (Elizabethtown); Highway 401 West-bound, facing southeast (north end of culvert) (August 25, 2020)

Photo 45: Cuvlert C8; Station 23+400 (Elizabethtown); Highway 401 West-bound, facing northwest from culvert (August 25, 2020)

Photo 46: Cuvlert C8; Station 23+400 (Elizabethtown); Highway 401 East-bound on-ramp, south side of ramp, facing west (May 18, 2021)

Appendix E: Recommended Plan

Highway 401 Preferred Plan

Highway 401 Planning Study - Brockville