NPS 12 East Sixteen Mile Creek Pipeline Replacement Project: Environmental Report

DRAFT REPORT

Prepared for:
Sun-Canadian Pipe Line Company

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Sign-off Sheet

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Executive Summary

Sun-Canadian Pipe Line Company Limited (Sun-Canadian) owns and operates the NPS12 Pipeline which crosses East Sixteen Mile (E16M) Creek in Milton, Ontario. Sun-Canadian is proposing to replace approximately 480 metres (m) of the existing pipeline in the vicinity of the creek crossing with a new section of pipe which will be installed at a depth that will eliminate three existing areas of shallow depth of cover. Part of the proposed pipeline replacement will be constructed outside of the existing easement with a new alignment to accommodate the installation of the pipe by a Horizontal Directional Drill (HDD). Construction of the replacement pipeline is planned to begin as early as Summer 2022 and be completed by the end of 2022.

Sun-Canadian has retained Stantec Consulting Ltd. (Stantec) to undertake an environmental study of the construction and operation of the proposed pipeline. The environmental study fulfills the requirements of the Ontario Energy Board's (OEB) *Environmental Guidelines for the Location, Construction and Operation of Hydrocarbon Pipelines and Facilities in Ontario, 7th Edition (2016)*
(OEB Environmental Guidelines). The environmental study included the identification of a preferred route, a consultation program, an impact assessment, and a cumulative effects assessment.

A route evaluation was undertaken to identify environmentally acceptable alternative routes and confirm a preferred route. The preferred route is currently illustrated within a general location. Sun-Canadian will undertake detailed design to determine the exact location of the running line, permanent easement, temporary land use requirements and road/watercourse crossings. Detailed design will also be influenced by supplemental studies (including environmental studies) and site-specific requests from landowners and agencies. In general, this micrositing exercise will seek to avoid sensitive natural and socio-economic features to the extent practicable.

A consultation program was conducted for the project to engage with landowners, municipalities, agencies, Indigenous communities, and other interested parties. The consultation program included a notice in a local newspaper, letters, and virtual meetings. Sun-Canadian and Stantec have also been in direct contact with agency and municipal staff. Sun-Canadian has committed to on-going consultation with directly affected and interested parties throughout the detailed design and construction phases and will continue to respond to concerns through the life of the project.

The potential effects and impacts of the project on physical, biophysical and socio-economic features have been assessed. In the opinion of Stantec, the recommended program of supplemental studies, mitigation and protective measures are considered sufficient to protect the features encountered.

Where appropriate, post construction monitoring will be conducted to assess whether mitigation and protective measures were effective in both the short and long term.

The potential cumulative effects of the project were assessed by considering development that has a high probability of proceeding just prior to or concurrent with construction and operation of the project. The cumulative effects assessment determined that, provided the mitigation and protective measures outlined in this report are implemented and that concurrent projects implement similar mitigation and protective measures, potential cumulative effects are not anticipated to be significant.

With the implementation of the recommendations in this report, on-going communication and consultation, and adherence to permit, regulatory and legislative requirements, potential adverse residual environmental and socio-economic impacts of the project are not anticipated to be significant.

Abbreviations

AA	Archaeological Assessment
ANSI	Area of Natural and Scientific Interest
BGS	Below ground surface
CA	Conservation Authority
CEA	Cumulative Effects Assessment
CH	Conservation Halton
CHAR	Cultural Heritage Assessment Report
CLI	Canada Land Inventory for Agriculture
COSSARO	Committee on the Status of Species at Risk in Ontario
DFO	Fisheries and Oceans Canada
EASR	Environmental Activity and Sector Registry
ECCC	Environment and Climate Change Canada
END	Endangered
ENDM	Ministry of Energy, Northern Development and Mines
ER	Environmental Report
ESA	*Endangered Species Act*
ESC	Erosion and Sediment Control
GIS	Geographic Information System
HADD	Harmful Alteration Disruption and Destruction
HDD	Horizontal Directional Drill
IPZ	Intake Protection Zone
LIO	Land Information Ontario
MBCA	*Migratory Birds Convention Act*

MECP	Ministry of Environment, Conservation and Parks
MNR	Ministry of Natural Resources
MNRF	Ministry of Natural Resources and Forestry
MHSTCI	Ministry of Heritage, Sport, Tourism and Culture Industries
MTO	Ministry of Transportation
NHIC	Natural Heritage Information Centre
OBBA	Ontario Breeding Bird Atlas
OEB	Ontario Energy Board
OGS	Ontario Geological Survey
OHA	*Ontario Heritage Act*
OMAFRA	Ontario Ministry of Agriculture, Food and Rural Affairs
OPCC	Ontario Pipeline Coordinating Committee
O. Reg.	Ontario Regulation
ORAA	Ontario Reptile and Amphibian Atlas
OWES	Ontario Wetland Evaluation System
PTTW	Permit to Take Water
PSW	Provincially Significant Wetland
RoW	Right-of-way
SAR	Species at Risk
SARA	*Species at Risk Act*
SC	Special Concern
SGRA	Significant Groundwater Recharge Area
Stantec	Stantec Consulting Ltd.
Sun-Canadian	Sun-Canadian Pipe Line Company
SWH	Significant Wildlife Habitat
THR	Threatened

WHPA	Wellhead Protection Area
WWR	Water Well Record(s)

1.0 INTRODUCTION

1.1 PROJECT DESCRIPTION

Sun-Canadian Pipe Line Company Limited (Sun-Canadian) owns and operates the NPS12 Pipeline which crosses East Sixteen Mile (E16M) Creek southeast of the intersection of Britannia Road and Trafalgar Road in Milton, Ontario. Sun-Canadian is proposing to replace approximately 480 metres (m) of the existing pipeline in the vicinity of the creek crossing with a new section of pipe which will be installed at a depth that will eliminate three existing areas of shallow depth of cover. Part of the proposed pipeline replacement will be constructed outside of the existing easement with a new alignment to accommodate the installation of the pipeline by Horizontal Directional Drill (HDD). Construction of the replacement pipeline is planned to begin as early as Summer 2022 and be completed by the end of 2022.

Sun-Canadian has retained Stantec Consulting Ltd. (Stantec) to undertake an environmental study of the construction and operation of the proposed pipeline. The environmental study will fulfill the requirements of the Ontario Energy Board's (OEB) *Environmental Guidelines for the Location, Construction and Operation of Hydrocarbon Pipelines and Facilities in Ontario, 7th Edition (2016)* (OEB Environmental Guidelines). The environmental study process included consultation and engagement with landowners, municipalities, agencies, Indigenous communities, and other interested parties through notices, mailouts, a project webpage, and virtual meetings.

For the remainder of this report, the construction and operation of the proposed pipeline is referred to as 'the project'.

1.2 ENVIRONMENTAL STUDY

1.2.1 Objectives

A multidisciplinary team of environmental planners and scientists from Stantec conducted the environmental study. Sun-Canadian provided environmental support and engineering expertise throughout the study.

The environmental study was completed in accordance with the OEB Environmental Guidelines, as well as relevant provincial and federal environmental guidelines and regulations.

The principal objective of the environmental study was to identify an environmentally preferred route and outline various environmental mitigation and protection measures for the construction and operation of the project while meeting the intent of the OEB Environmental Guidelines. To meet this objective, the environmental study was prepared to:

- Identify a preferred route that reduces potential environmental impacts
- Complete a detailed review of environmental features along the preferred route and assess the potential environmental impacts of the project on these features
- Establish mitigation and protective measures that may be used to reduce or eliminate potential environmental impacts of the project
- Develop a consultation program to receive input from interested and potentially affected parties
- Identify any necessary supplemental studies, monitoring and contingency plans

1.2.2 Process

The environmental study was divided into three main phases:

Phase I: Identification of a Project Study Area and Preferred Route

The initial phase of the environmental study began by defining the project study area (Figure 1, Appendix A), the development of routing parameters and generating routing objectives. Routing was based on the location of the existing section of NPS 12 pipeline which crosses East Sixteen Mile Creek and the tie-in points where the replacement will connect to the existing pipeline. Environmental and socio-economic constraints and opportunities were evaluated through a detailed review of available literature, mapping and digital data, as well as engineering factors and constructability. Sun-Canadian determined a preferred route based on these criteria.

Phase II: Gather Information and Consultation

Phase II of the environmental study process was to gather relevant environmental and socio-economic background data relevant to the study area. Specific information requests were made to several agencies and stakeholders to assist with identifying environmental features, constraints, the potential for presence of Species at Risk (SAR) and their habitat. This data was used to develop mitigation and protective measures based on predicted effects and potential impacts. The gathering of information continued throughout the project.

Feedback on the proposed project was sought through newspaper notices and letters to agencies, municipal representatives, Indigenous communities, landowners and other stakeholders.

Phase III: Environmental Report

The third phase involved determining potential environmental and socio-economic impacts and cumulative effects that would result from the project and developing mitigation and protective measures, supplemental studies, monitoring and contingency plans to avoid or reduce potential impacts. The environmental study concluded with the preparation of this Environmental Report (ER).

1.2.3 The Environmental Report

The environmental study has relied on technically sound and consistently applied procedures that are replicable and transparent. As previously noted, the study was undertaken in accordance with the OEB Environmental Guidelines, as well as relevant federal and provincial environmental guidelines and regulations. The ER, which documents the environmental study, will form the foundation for future environmental management activities related to the project.

The ER is organized into the following sections:

1.0 **Introduction:** provides a description of the project and the environmental study

2.0 **Route Selection**: provides an overview of the pipeline routing process

3.0 **Consultation Program:** describes the consultation program

4.0 **Impact Identification, Assessment and Mitigation:** describes the existing conditions, predicts potential effects and impacts, recommends supplemental studies, mitigation and protective measures, and considers net impacts

5.0 **Cumulative Effects Assessment**: provides an analysis of potential cumulative effects associated with the proposed project

6.0 **Monitoring and Contingency Plans**: describes monitoring and contingency plans to address potential environmental impacts of the proposed project

7.0 **Conclusion:** provides a discussion and consideration of the potential environmental impacts associated with the proposed project

The ER also includes references, and appendices for documentation.

1.2.4 The OEB Regulatory Process

Once complete, the ER is circulated to affected municipalities, conservation authorities and to the Ontario Pipeline Coordinating Committee (OPCC) for their review and comment. The OPCC is an inter-ministerial committee that includes provincial government ministries, boards, and authorities with potential interest in the construction and operation of hydrocarbon transmission and storage facilities. The ER is also circulated to landowners, Indigenous communities, and other interested parties. The ER will support a future Sun-Canadian 'Leave-to-Construct' application to the OEB for the proposed project.

Upon receiving the application, the OEB will hold a public hearing. Communication about the hearing will include notices in local newspapers and letters to directly affected landowners, both of which will outline how the public and landowners can get involved with the hearing process. If after the public hearing the OEB finds the project is in the public interest it will approve construction of the project. The OEB typically attaches conditions to approved projects. Sun-Canadian must comply with these conditions at all stages of the project, including construction, site restoration and operation.

1.2.5 Additional Environmental Regulatory Processes

Sun-Canadian will also be required to obtain additional environmental permits, approvals and notifications from federal, provincial and municipal agencies as outlined in Table 1-1 below. This ER will serve to support these permit and approval applications and notifications.

Table 1.1: Summary of Potential Environmental Permits/Regulatory Requirements

Permit/Approval Name	Administering Agency	Description
FEDERAL PERMITS AND APPROVALS		
Clearing of Vegetation under the *Migratory Bird Convention Act* (MBCA) (1994)	Environment and Climate Change Canada (ECCC)	No permit is necessary; however, precautions need to be taken so that no breeding birds or their nests are harmed or destroyed during the bird nesting season (April 1 to August 31).
Review and authorization under the *Fisheries* Act (1985)	Fisheries and Oceans Canada (DFO)	DFO review and possible *Fisheries Act* authorization is required at watercourse crossings containing species protected under the *Species at Risk Act* (SARA) (2002). The DFO may authorize activities that have the potential to affect fish or mussel species protected under the SARA (2002). As per Section 35 (1) of the *Fisheries Act* (1985), "No person shall carry on any work, undertaking or activity that results in harmful alteration, disruption or destruction (HADD) of fish or fish habitat. As per Section 35 (2)(b) of the *Fisheries Act* (1985), there are some exceptions under which a person may carry on a work, undertaking or activity without contravening subsection (1), including an authorization from DFO, which typically includes a number of conditions.
Permitting under the *Species at Risk Act* (SARA) (2002)	DFO	As indicated in Section 32 (1) of the SARA (2002), "No person shall kill, harm, harass, capture or take an individual of a wildlife species that is listed as an extirpated species, an endangered species or a threatened species." As indicated in Section 73 (1) of the SARA (2002), "The competent minister may enter into an agreement with a person, or issue a permit to a person, authorizing the person to engage in an activity affecting a listed wildlife species, any part of its critical habitat or the residences of its individuals."
PROVINCIAL PERMITS AND APPROVALS		
Development Permits under *Ontario Regulations 162/06* (Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses), as per the *Conservation Authorities Act* (1990)	Conservation Halton (CH)	Required for works within CH Regulated Areas, including shorelines, watercourses, wetlands and hazardous lands (flooding and erosion hazards, and unstable soils and bedrock).
Permit to Take Water (PTTW) or Environmental Activity and Sector Registry (EASR) (surface and	Ministry of the Environment, Conservation and Parks (MECP)	Under Ontario Regulation (O. Reg.) 64/16 and O. Reg. 63/16, the MECP requires a PTTW for dewatering in excess of 400,000 L/day, and an EASR for dewatering between 50,000 and 400,000 L/day. This can include construction dewatering and taking water for hydrostatic

Table 1.1: Summary of Potential Environmental Permits/Regulatory Requirements

Permit/Approval Name	Administering Agency	Description
groundwater) under the *Ontario Water Resources Act* (1990)		testing from a pond, lake, etc. There are some exceptions for surface water takings where active or passive surface water diversions occur such that all water taken is returned to within another portion of the same surface water feature.
Permitting or registration under the *Endangered Species Act* (ESA) (2007)	MECP	An ESA permit or Registration is required for activities that could impact species protected under the ESA. Consultation will occur with the MECP to determine ESA permitting requirements. As indicated in Section 9 (1) a of the ESA (2007), "No person shall kill, harm, harass, capture or take a living member of a species that is listed on the Species at Risk in Ontario List as an extirpated, endangered or threatened species." As indicated in Section 17 (1), "the Minister may issue a permit to a person that, with respect to a species specified in the permit that is listed on the Species at Risk in Ontario List as an extirpated, endangered or threatened species, authorizes the person to engage in an activity specified in the permit that would otherwise be prohibited by section 9 or 10."
Archaeological clearance under the *Ontario Heritage Act* (OHA) (1990)	Ministry of Heritage, Sport, Tourism and Culture Industries (MHSTCI)	A Stage 1-2 archaeological assessment (AA) is required along the Right-of-Way (RoW) and temporary land use areas to identify areas of archaeological potential prior to any ground disturbances and/or site alterations. Depending on the results of the Stage 1-2 AA, Stage 3 and 4 AA's may be required. The completed AA reports are forwarded to the MHSTCI for review and comment.
Review of Built Heritage and Cultural Landscape under the OHA (1990)	MHSTCI	Screening for impacts to built heritage and cultural heritage landscapes. Based on the results of the screening a Cultural Heritage Assessment Report (CHAR) maybe be completed to determine the presence of built heritage and cultural landscapes. If identified, a Heritage Impact Assessment is required to determine the effects of the project on heritage resources and recommend mitigation measures, if necessary.
MUNICIPAL PERMITS AND APPROVALS		
Noise Control By-Law 133-2012	Town of Milton	Project activities should adhere to the local noise by-law.
By-Law 32-17 to prohibit, restrict, and regulate access to the regional road system	Regional Municipality of Halton	Project activities that may require approval to use the regional road system.
Tree By-Law 121-05	Regional Municipality of Halton	Project activities that may require tree removal should meet the intent of the tree cutting by-law.

Table 1.1: Summary of Potential Environmental Permits/Regulatory Requirements

Permit/Approval Name	Administering Agency	Description
Municipal Consent Permit	Regional Municipality of Halton	Project activities that may require authorization to occupy and install new infrastructure within a road Right-of Way.

2.0 ROUTING

2.1 THE PROCESS

The route selection process was undertaken in accordance with the OEB Environmental Guidelines which identify the environmental and socio-economic features, and the routing principles, to be considered. The proposed pipeline replacement parallels the existing pipeline, utilizing a combination of proposed new easement and existing easement. The drill entry and exit points are located within the existing easement. The drill path is located within both the existing easement and the proposed new easement. The location of the replacement pipeline was determined by considering the confines of available space and the tie-in locations to the existing pipeline. Routing also considered socio-economic constraints, environmental considerations, and constructability while utilizing the most reasonably direct route.

2.2 ROUTING PARAMETERS

2.2.1 Study Area

The study area is the area within which direct interactions with the socio-economic and natural environment could occur. It is within this area that desktop information on socio-economic and environmental features has been collected. The tie in points (drill entry and exit pits) of the replacement pipeline defined the study area boundaries with a 500 m buffer applied to these locations and the preferred route.

Study area boundaries were established by considering the potential impacts of the route on important biophysical and socio-economic factors that may be affected by the project.

The study area is shown on Figure 1, Appendix A.

2.2.2 Routing Objectives

The overarching objective in the route selection process is that the selected route presents the least potential for adverse environmental and socio-economic impacts. The following principles support that objective:

1. Routes should follow a reasonably direct path between end-points to reduce length; in general, a shorter route will help eliminate or minimize the extent of most potential environmental and socio-economic impacts.
2. Routes should avoid sensitive environmental and socio-economic features wherever practicable; where such features cannot be avoided, routes should be located to minimize potential impacts.

3. Existing linear infrastructure should be used or paralleled to the greatest extent feasible to minimize impacts on previously undisturbed environmental and socio-economic features and to limit constraints on future land development.
4. Where new easements are required, existing lot and property lines should be followed to the extent feasible to avoid deviations into previously undisturbed environmental and socio-economic features.

2.3 IDENTIFY PREFERRED ROUTE

The routing objectives were considered by Sun-Canadian and based on the alignment for the proposed pipeline it was determined the location of the preferred route (Figure 2, Appendix A) was environmentally acceptable and potential impacts could be mitigated. The preferred route is approximately 480 m long and will be constructed within a combination of existing easement and proposed new easement. The location of the south western tie-in is the HDD exit point approximately 380 m southwest of Trafalgar Road. The north eastern tie-in is the HDD entry point located approximately 100 m northeast of Trafalgar Road.

Opportunities and constraints were considered in routing the proposed replacement pipeline. Pipeline routing opportunities are existing features which provide a potential location for the alignment of a pipeline to avoid or reduce environmental or socio-economic impact. Pipeline routing constraints are existing features that meet the following criteria:

- Site-specific mitigation measures would be required to reduce potential effects
- The feature has been selected or designated for protection
- The feature has been recognized through local, regional, provincial, or federal policy, plan, or statute, or is otherwise valued as an environmental or socio-economic resource

Pipeline routing opportunities are limited to the existing easement. The pipeline routing constraints present are residences, businesses, engineering and constructability, and environmental features such as East Sixteen Mile Creek, riparian areas adjacent to East Sixteen Mile Creek and aquatic SAR in the creek.

An alternate that was considered was crossing East Sixteen Mile Creek by the open cut crossing method. This is less desirable than the proposed HDD crossing method as it would require physical disturbance to the watercourse and vegetation clearing on and adjacent to the watercourse banks. Additionally, there would be potential disturbance and impacts to aquatic SAR within the watercourse. Crossing by the HDD method reduces the potential environmental impacts. An open cut crossing would also result in disturbance to the property and residence immediately east of the watercourse because of construction equipment access requirements, construction techniques and engineering requirements associated with open cut crossings.

Another alternate considered was locating the HDD entry pit between Trafalgar Road and East Sixteen Mile Creek. This however would have resulted in the disturbance to the residence and property immediately east of East Sixteen Mile Creek due to construction equipment access requirements, construction techniques and engineering requirements associated with HDD.

Crossing East Sixteen Mile Creek by the HDD crossing method reduces potential environmental impacts. Locating the HDD entry pit east of Trafalgar Road eliminates socio-economic impacts, because of construction requirements, to the residence west of Trafalgar Road.

2.4 CONFIRMATION OF THE PREFERRED ROUTE

Input on the preferred route was sought through consultation (see Section 3). No feedback was received that resulted in a revision to the preferred route location. Based on the environmental and socio-economic factors as outlined in Section 2.3, as well as constructability and engineering factors, the preferred route was confirmed. The preferred route is currently illustrated within a general location. Sun-Canadian will undertake detailed design to determine the exact location of the running line, permanent easement for the section of pipeline that is to be constructed outside of the current RoW, and temporary land use requirements. Detailed design will also be influenced by supplemental studies (including environmental studies) and site-specific requests from landowners and agencies. In general, this micrositing exercise will seek to avoid sensitive natural features to the extent practicable while considering utilities and infrastructure.

3.0 CONSULTATION PROGRAM

3.1 OBJECTIVES

Consultation and engagement is an essential requirement of the OEB Environmental Guidelines. Consultation and engagement is the process of identifying interested and potentially affected parties and informing them about the project, soliciting information about their values and local environmental and socio-economic circumstances, and receiving advice about key project decisions before those decisions are finalized.

The consultation program for this project included the following objectives:

- Identify interested and potentially affected parties early in the process
- Inform and educate interested parties about the nature of the project, potential impacts, proposed mitigation measures and how to participate in the consultation program in a clear, concise, relevant and timely manner
- Provide a forum for the identification of issues
- Identify how input will be used in the planning stages of the project
- Summarize issues for resolution, and resolve as many issues as feasible
- Revise the program to meet the needs of those being consulted, as feasible
- Develop a framework for ongoing communication during the construction and operation phase of the project

3.2 IDENTIFYING INTERESTED AND POTENTIALLY AFFECTED PARTIES

The identification of interested and potentially affected parties was undertaken using a variety of sources, including the OEB's OPCC Members List, the MECP's Environmental Assessment Government Review Team Master Distribution List, and the experience of Sun-Canadian and Stantec. Indigenous communities were identified through provision of a Project Summary to the Ministry of Energy, Northern Development and Mines (ENDM) in June 2020 (see Appendix B1).

In addition, the parties listed below were among those considered when developing the initial stakeholder contact lists:

- Federal and provincial agencies and authorities, including the CH, and members of the OPCC
- Municipal personnel
- Special interest groups
- Indigenous communities

- Directly affected and adjacent landowners

The initial contact list was updated as the environmental study progressed based on changes in personnel. The Agency and Indigenous Contact List is in Appendix B1.

Directly affected and adjacent landowners were identified through use of publicly available mapping and were tracked in a Landowner Contact List. Sun-Canadian also undertook direct consultation with landowners.

3.3 COMMUNICATION METHODS

3.3.1 Newspaper Notices

A Notice of Commencement was published on August 20, 2020 in the Milton Champion. The Notice introduced and described the project, provided a map, and listed project contact information.

A copy of the tear sheet from the newspaper notice is in Appendix B2

3.3.2 Letters and Emails

3.3.2.1 Notice of Commencement

Notice of Commencement letters were sent via email to all parties identified on the Indigenous Contact List on August 12, 2020 and to all parties identified on the OPCC and Agency Contact List on August 21, 2020 to provide information on the project, the preferred route, and to request any available additional information. Letters were mailed to landowners and residents within approximately 500 m of the preferred route via Canada Post regular mail on August 21, 2020.

Generic copies of the letters noted above are in Appendix B3.

3.3.2.2 Project Updates

Project update letters were hand delivered to landowners and residents within approximately 500 m of the preferred route on September 24, 2020 and December 9, 2020. The letters were also mailed to several landowners via Canada Post regular mail on September 24, 2020 and December 9, 2020. Appended to the letters was a map of the preferred route.

Generic copies of the letters noted above are in Appendix B3.

3.3.3 Project Webpage

A project webpage was developed on the Sun-Canadian website (http://sun-canadian.com/media-releases/) to provide project details. The project webpage was communicated to interested and potentially affected parties on the newspaper notice, Notice of Commencement and Project update letters.

3.3.4 Project Email

A project specific email address was created that enabled all interested and potentially affected parties to contact the project team regarding the project. The email address was communicated on the newspaper notice, Notice of Commencement and project update letters.

3.4 CONSULTATION EVENTS

3.4.1 Virtual Meetings

Virtual meetings about the project have occurred between Sun-Canadian and agency staff, key stakeholders, Indigenous communities and with directly impacted landowners and will continue as the project progresses towards detailed design and construction.

3.5 INPUT RECEIVED

The consultation and engagement program allowed interested and potentially affected parties to provide input into the project. Input was evaluated and integrated into the project. The following sections summarize key input received.

A comment-response summary table and a copy of all written comments and responses are in Appendix B5.

3.5.1 Public Input

No comments were received from the public, including directly and indirectly impacted landowners at the time of writing this ER.

3.5.2 Agency Input

Four (4) comments were received from agencies at the time of writing this ER.

- MENDM identified Indigenous communities that should be consulted regarding the Project.
- CH noted that a permit under O. Reg. 162/06 will be required.
- MNRF noted no concerns with the project, but if any in-water works are required appropriate in-water works timing windows must be followed.
- MHSTCI recommended that a combined Stage 1-2 AA be completed for the entire study area, and that a Cultural Heritage Report is required to be completed.

3.5.3 Municipal Input

No comments were received from municipalities at the time of writing this ER. The Regional Municipality of Halton Public Works department noted that a Municipal Consent Permit will be required.

3.5.4 Indigenous Input

Sun-Canadian held virtual meetings with the Huron Wendat on September 9, 2020, Six Nations of the Grand River on September 22, 2020 and Mississaugas of the Credit on October 5, 2020. During these meetings, an overview of the Project was presented, Indigenous community participation in the Project was discussed and questions answered. A copy of the presentation and meeting notes can be found in Appendix B.

A summary of comments received from Indigenous communities are outlined below.

Huron-Wendat

- Expect the project design to preserve cultural resources as necessary
- Interests in the project remain with archaeology and will participate in the archaeological assessment

Six Nations of the Grand River

- Would like to participate in the archaeological assessment
- Would like to participate in construction monitoring

Mississaugas of the Credit

- Requested to participate in environmental studies and monitoring
- Would like to participate in the archaeological assessment

3.5.5 Interest Group Input

No comments were received from interest groups at the time of writing this ER.

3.6 REFINEMENTS BASED ON INPUT

At each stage of the consultation program input received was compiled, reviewed, and incorporated into the environmental study process. Responses were provided, as applicable, to questions and comments received.

Based on input received from agencies:

- Sun-Canadian will follow applicable fish timing window guidelines for any in-water works as required by the MNRF
- It was noted that a permit under O. Reg. 162/06 will be required from CH and correspondence will continue

Sun-Canadian has committed to on-going consultation with directly and indirectly affected landowners and interested parties during detailed design and construction and will continue to respond to concerns through the life of the project.

The Sun-Canadian lands department will work with directly and indirectly impacted landowners to address specific concerns they may have.

The proposed pipeline will be designed to meet or exceed all safety regulations and codes. In addition, Sun-Canadian has a rigorous safety and integrity program so that the pipeline is constructed and maintained to operate safely.

4.0 IMPACT IDENTIFICATION, ASSESSMENT AND MITIGATION

4.1 METHODOLOGY

The potential effects and impacts of the project on physical, biophysical and socio-economic features have been assessed along the proposed pipeline route. With an understanding of pipeline construction and operation activities (see Sections 4.1.1 and 4.1.2), the assessment:

- Describes the environmental and socio-economic setting along the proposed pipeline route and related facilities
- Predicts the effects and associated impacts of project construction and operation activities
- Recommends supplemental studies, mitigation and protective measures (including construction methods and timing, site-specific mitigation, environmental protection measures, and compensation measures)
- Outlines the net impacts that are likely to remain

The inventory of existing environmental conditions, determination of effects and impacts, and mitigation and protective measures reflect:

- Input received from the consultation program
- Information available from published and unpublished literature
- Maps and digital data
- Mitigation guidance documents
- Desktop assessments of environmental features conducted by Stantec technical staff
- A field assessment conducted by Stantec technical staff
- The pipeline development experience of Sun-Canadian and Stantec

By necessity, the analysis, integration, and synthesis of the data is an iterative process since information becomes available at various stages of the study and at different mapping scales. The level of detail of data and mapping increases as the study moves from analysis of the study area, to analysis of alternative corridors, to a site-specific survey of features along the proposed pipeline route. The data available at the current stage of the environmental study is appropriate for predicting effects and potential impacts and recommending mitigation and protective measures.

Specific information requests were made to several agencies throughout the project. The information collected assisted in identifying environmental features and constraints located on and adjacent to the proposed pipeline route. Information provided also identified the potential presence of SAR and their habitat, predicting effects and potential impacts, and developing mitigation and protective measures.

Where agencies requested that information be kept confidential, such as the precise location of rare, threatened, vulnerable or endangered species and archaeological sites, such information has been withheld from the report or mapped in such a way that specific site locations cannot be determined.

A field survey was completed in July 2020. Additional site-specific field surveys will be completed prior to construction.

The existing conditions maps (Appendix C) have been generated from data obtained from Land Information Ontario (LIO). Conservation Authority (CA) regulated area data was obtained from CH. Scales have been adjusted from the original source to better represent the features mapped. Stantec has digitally reproduced features added to the base maps. Additional mapping sources are identified on the respective map, and in the references.

There are instances where field investigations are recommended along the proposed pipeline route before construction. Given the location of the project components and experience of Stantec in providing environmental services for pipelines, these supplemental studies are not expected to change the conclusions regarding potential adverse residual impacts. The environmental and socio-economic information presented in the ER is based on sources cited throughout.

4.1.1 Construction

Constructing the Proposed Pipeline

The pipeline construction process includes various activities as described below:

1. Site Preparation and Clearing: The first activity is typically the survey and staking, which delineate the boundaries of the RoW and temporary work areas. Next, the RoW and temporary work areas are cleared of brush and trees where required. Safety fence is installed at the edge of the construction RoW where public safety considerations are required, and aspects of the traffic management plan are implemented (i.e., signs, vehicle access). Silt fence is installed at required locations.
2. Grading and Stripping: The RoW is graded where required to allow for access by construction equipment. At this stage, the topsoil (on agricultural lands) or the duff layer (on natural lands) is stripped by bulldozers and graders then segregated so it will not be mixed with the subsoil later removed from the entry and exit pits. Existing landscaping is also removed, and dewatering undertaken, where necessary.
3. Stringing: Stringing is the process where pipeline sections are delivered to the RoW, placed on wooded skids at the pipe laydown area.
4. Pipe Fabrication: The pipeline is welded into a continuous length. The pipe welds are non-destructively tested (e.g. x-ray) and coated.
5. Horizontal Directional Drilling (HDD): The drill set up area is graded; Temporary Work Space is prepared for stringing of the drill pull section and entry and exit pits are excavated. The pipeline is then installed utilizing HDD.

6. Backfilling: During backfilling the originally excavated subsoil is placed over the pipe in the entry and exit pits. The pipe will be sand-padded to protect the coating. Topsoil is then replaced.
7. Hydrostatic Testing: The pipeline is pressure tested by filling the pipe with water and holding it at a high pressure for a set period of time, typically 24 hours. Water is typically drawn from nearby source if available. Municipal water may also be used for hydrostatic testing. The suitable water source is determined based on discussions with the appropriate authorities. Upon completion of the hydrostatic testing, the pipeline is drained and dried, purged of air and then put into service.
8. Clean-Up and Restoration: Clean-up is the restoration of the RoW and other work areas. On agricultural land this may require decompaction of the subsoil to maintain productivity. In natural areas, clean-up restores the environment including re-seeding of the RoW and returning the topography after grading. Any erosion and sediment controls installed during construction are also removed. Clean-up will also restore landscaping, laneways and driveways.

4.1.2 Operation

Upon completion of the Project, the Project components will be transferred to Sun-Canadian's operations department. Sun-Canadian has procedures in place to inspect and maintain the pipelines, including RoW inspection. Sun-Canadian's Pipeline Integrity team has extensive technical, operational, and industry knowledge, and whose members remain current with industry practices. Detailed procedures and programs will be modified to include the replacement pipeline and to ensure the operation and maintenance activities for the Project comply with applicable provincial and federal legislation, regulations and guidelines.

Pipeline operation consists of oil flowing through the pipeline. Mainline valves located at the valve sites will serve to shut off and isolate the pipeline for maintenance and security purposes. Additional above-ground facilities along the pipeline include post-mounted signs identifying the pipeline, aerial patrol signs for fixed wing patrols, fence stiles, foot bridges for ditch crossings (if applicable), and "test boxes" located along fence lines at roads that are used to assess the adequacy of the corrosion protection system.

4.2 PHYSICAL FEATURES

4.2.1 Bedrock Geology and Drift Thickness

Existing Conditions

The bedrock geology along the proposed pipeline route is comprised of shale, siltstone, with variable calcareous siltstone to sandstone and limestone interbeds of the Queenston Formation (OGS, 1991; Liberty, Bond, Telford, 1976) (Figure 1, Appendix C).

The general depth from the soil surface to the bedrock indicates a drift thickness along the proposed pipeline route ranging from 9 – 15 m (Gao,et al, 2006) (Figure 2, Appendix C).

A geotechnical investigation was completed with boreholes located at the entry (BH1) and exit (BH3) pit locations. The subsurface conditions encountered in the boreholes were:

- Thin topsoil layer underlain by
- Clayey silt and sandy clay fill materials underlain by
- Very stiff to hard sandy clay till: underlain by
- Very dense silty sand (exit pit only): underlain by
- Shale bedrock with limestone interbedding

Highly to completely weathered shale bedrock of the Queenston Formation was encountered at depths of 13.3 m and 12.6 m in boreholes at BH1 and BH3, respectively. The thickness of this zone was 0.9 m and 1.4 m in the boreholes.

Underlying the upper highly weather zone, the moderately to slightly weathered zone of the shale with limestone interbedding extended to depths of 20.3 m BH1 and 15.8 m at BH3. Slightly weathered to unweathered bedrock extended to depths of 29.4 m at BH1 and 29.4 m at BH3. Unweathered bedrock extended to the termination depths of the boreholes.

Potential Impacts

The planned drill depth will be approximately 2 m below grade at the entry and exit pit locations approximately 15 m below Trafalgar Road and approximately 17 m below East Sixteen Mile Creek at the deepest point. The drill path will be designed to utilize stable soil and bedrock. Based on the moderately deep drift thickness bedrock is not likely to be encountered at the entry and exit locations. As such no potential impacts are anticipated.

Mitigation and Protective Measures

As no potential impacts are anticipated, no mitigation or protective measures are required.

Net Impacts

No significant adverse residual impacts to bedrock geology and drift thickness are anticipated.

4.2.2 Physiography and Surficial Geology

Existing Conditions

The proposed pipeline is located within the Peel Plain physiographic region of southern Ontario (Chapman and Putnam, 1984) which is a region characterized by relatively flat to undulating glaciolacustrine deltaic deposits of sands (up to 27 m thick) and silts which are observed to cover or partially cover the moraines in the area (Chapman and Putnam 1984; Barnett 1982). The proposed

pipeline route, from the location of the entry pit to the location of the exit pit, crosses the sand plains physiographic feature (Figure 3, Appendix C).

As described in surficial geology mapping (Figure 4, Appendix C), the pipeline route crosses modern alluvial deposits to fine textured glaciolacustrine deposits to glaciolacustrine-derived silty to clayey till. At the tie-in point to the existing system at the southwest extent of the route, the pipeline traverses fine-textured glaciolacustrine deposits for approximately 100 m (interbedded flow till, rainout deposits, and silt and clay) and then, for a short distance crosses glaciolacustrine-derived silty to clayey till. At the mid-point of the route, the pipeline crosses approximately 300 m of modern alluvial deposits and then re-enters an area with deposits of glaciolacustrine-derived silty to clayey till for the remaining extent to the northeastern tie-in point beyond Trafalgar Road (OGS, 2010).

Potential Impacts

Disturbance to the overburden along the proposed pipeline is limited to the entry and exit pit locations and may cause surface soil erosion. Slumping may occur within the entry and exit pits during construction.

Mitigation and Protective Measures

Surface soil erosion can occur in the absence of vegetative cover. Where there is potential for soil erosion, the need for and location of erosion and sediment control (ESC) measures should be determined by an inspector with appropriate qualifications and installed prior to the commencement of work in the area.

When land is exposed, the exposure should be kept to the shortest practical period. Natural features should be preserved to the extent practical. Temporary vegetation and mulching should be used to protect areas as appropriate. Where required, natural vegetation should be re-established as soon as practical.

The Contractor must obtain adequate quantities of materials to control erosion. Additional supplies should be maintained in a readily accessible location for maintenance and contingency purposes. ESC structures should be monitored to maintain their effectiveness through the life of construction and post-construction rehabilitation.

Extreme precipitation events could result in damage to ESC measures which could lead to erosion. When site conditions permit, ESC measures should be repaired and re-installed on erosion susceptible surfaces. If the erosion is resulting from a construction-related activity, the activity should be halted immediately until the situation is rectified.

To avoid the entry and exit pits from slumping, pit walls should be sloped and should be monitored during wet conditions. Trench boxes may be required depending on site specific conditions.

ESC and stabilization measures should be maintained during construction, restoration and rehabilitation until vegetative cover is established. Where evidence of erosion exists, corrective control measures should be implemented as soon as conditions permit. Permits obtained from CH may contain conditions pertaining to ESC.

Net Impacts

With the implementation of the above mitigation and protective measures, no significant adverse residual impacts on or from physiography and surficial geology are anticipated.

4.2.3 Hydrogeology

Existing Conditions

Based on physiographic and surficial geology mapping the proposed pipeline route will cross the Peel Plain (modern alluvial deposits to fine textured glaciolacustrine deposits to glaciolacustrine-derived silty to clayey till). It crosses East Sixteen Mile Creek at two locations.

According to CH aquifer vulnerability mapping as well as the Halton Region Source Protection Region, a portion of the route is located within a significant groundwater recharge area (SGRA) with a vulnerability score of 4. This area corresponds to the presence of alluvial and coarse-textured glaciolacustrine materials located in the area surrounding the East Sixteen Mile Creek tributary (Conservation Halton and OGS, 2013).

MECP Water Well Records (WWR) within 500 m of the proposed pipeline signify the presence of approximately 24 water supply wells, 14 of which are domestic (Figure 5, Appendix C). A review of the WWR's for these 14 wells, indicate that they are installed within the overburden at depths ranging from 0 m below ground surface (BGS) to 55.4 m BGS. Of these 14 wells two domestic water wells fall within 50 m of the proposed pipeline and as MECP WWR's indicate, these wells are installed in the overburden at depths ranging from 0 m to 12.5 m BGS. The depth to groundwater in these wells ranged from 6.1 m to 11 m BGS. Readings obtained at BH1 during geotechnical investigations indicate groundwater at a depth of 5.8 m BGS.

Regional groundwater flow near the proposed pipeline route in the overburden aquifer is generally to the south towards Lake Ontario (Town of Milton, 2009). Local groundwater flow conditions are impacted by surface water features.

Within the Halton Region Source Protection Area, municipal drinking water intakes use surface water from various sources to supply drinking water to the residents and other water users in the region. The proposed pipeline does not cross through any wellhead protection areas (WHPA). The closest WHPA is approximately 12 km northwest of the proposed pipeline (Halton Region, 2018). A review of nearby surface water system intake protection zones (IPZs) indicates that the proposed pipeline crosses an IPZ-3 for a surface water system (Conservation Halton, 2018).

Potential Impacts

Hydrostatic Testing and Dewatering/Sand-pointing

A hydrostatic test will be undertaken for the proposed pipeline.

Where the entry and exit pits encounter shallow groundwater conditions or following a large precipitation event, removing water (known as dewatering) may be necessary. During dewatering, discharge water will be released to the environment. An uncontrolled discharge of water could cause downstream flooding, erosion, sedimentation, or contamination.

Private Water Wells

There are approximately 24 water supply wells within 500 m of the proposed pipeline route, 14 of which are domestic. There are two water supply wells within 50 m of the proposed pipeline, both of which are domestic. Depending on the proximity to wells, the depth of the well installation and the groundwater levels encountered during excavation, dewatering has the potential to impact water well quality or quantity at some of the overburden supply wells.

Municipal Water Supply

The proposed pipeline extends through a SGRA and an IPZ associated with the municipal groundwater supply system (Conservation Halton, 2018).

Based on *the Clean Water Act* (2006), there are no significant chemical, pathogen or dense non-aqueous phase liquids source water threats to municipal supply sources based on the construction or operation of the proposed pipeline.

Mitigation and Protective Measures

Hydrostatic Testing and Dewatering/Sand-pointing

For groundwater dewatering, the MECP allows registration under the EASR for construction dewatering projects where groundwater takings will be greater than 50,000 L/day and less than 400,000 L/day; however, should groundwater takings exceed 400,000 L/day, a PTTW may be required from the MECP.

If surface water is used as the source water for the hydrostatic test, a PTTW application would be required and would include an assessment of the capacity of the source to provide the required water without impacting the ecosystem, and recommendations for mitigation measures such as screened water intakes to limit intake of debris and organisms and energy dissipation/erosion control measures during discharge to limit erosion and sedimentation.

To reduce the potential for erosion and scouring at discharge locations during construction dewatering/sand-pointing and/or hydrostatic testing, energy dissipation techniques should be used. Discharge piping should be free of leaks and should be properly anchored to prevent bouncing or snaking

during surging. Protective measures may include dewatering at low velocities, dissipating water energy by discharging into a filter bag or diffuser and utilizing protective riprap or equivalent. If energy dissipation measures are found to be inadequate, the rate of dewatering should be reduced or dewatering discontinued until satisfactory mitigation measures are in place. Discharge should be monitored to make sure that no erosion or flooding occurs.

To assess the potential for introduction of contaminated water to soils or bodies of water, testing of hydrostatic and dewatering discharge water should be considered. Testing requirements can be influenced by the nature and quality of the source water used, any additives to the test water, the nature of the pipeline, and pipeline contents. An environmental consultant should be consulted to determine what testing is necessary for the discharge water.

Private Water Wells

A private well survey should take place to assess domestic groundwater use near the proposed pipeline and a private well monitoring program may be recommended for residents within 100 m of HDD activities who rely on overburden groundwater supply for domestic use.

Municipal Water Supply

There are no nearby municipal supply wells, and therefore additional mitigation measures are not required to protect groundwater drinking supply sources.

During construction, the primary concern to surface water quality is the potential for a contaminant spill during a large storm event. To address this concern, the following mitigation measures are proposed:

- Refueling of equipment should be undertaken a minimum of 30 m from wetlands and watercourses to reduce potential impacts to surface water and groundwater quality if an accidental spill occurs. If a 30 m refueling distance is not possible, under approval from on-site environmental personnel, special refueling procedures for sensitive areas should be undertaken that include, at a minimum, using a two-person refueling system with one worker at each end of the hose.
- To reduce the impact of potential contaminant spills, the Contractor should implement spill management protocols such as secondary containment of any temporary fuel storage and preparation of a spill response plan.
- Work should be limited or stopped during and immediately following significant precipitation events (i.e. 100-year storm event), at the discretion of on-site environmental personnel.

Net Impacts

With the implementation of the above mitigation and protective measures, no significant adverse residual impacts on groundwater are anticipated.

4.2.4 Extractive Resources: Aggregates and Petroleum Resources

Existing Conditions

No active or abandoned petroleum wells or aggregate resources are located along or near the proposed pipeline route. The proposed pipeline route is located more than approximately 2 km from the nearest active private gas well and more than 4 km from the nearest abandoned natural gas well.

A map of aggregate and petroleum resources is in Figure 6, Appendix C.

Potential Impacts

Since the proposed pipeline route is located more than approximately 2 km from the nearest active private gas well and more than 4 km from the nearest abandoned natural gas well, no impacts to these resources are anticipated. The pipeline is also not anticipated to constrain development of any aggregate site.

Mitigation and Protective Measures

As no potential impacts are anticipated, no mitigation or protective measures are required.

Net Impacts

No significant adverse residual impacts on aggregate and petroleum resources are anticipated.

4.2.5 Soil and Soil Capability

Existing Conditions

There are three soil types found along the pipeline route, entry and exit pit locations and pipe laydown area: Chinguacousy Clay Loam, Jeddo Clay Loam and Bottom Land. The following is a description of these soils from the Soils of Halton County (Gillespie et al.,1971):

Chinguacousy Clay Loam is part of the imperfectly drained Chinguacousy soil series that is comprised of calcareous, clay loam textured, till material. These imperfectly drained soils are moderately to slowly permeable and have a relatively high-water holding capacity. Excess soil water is often found in the upper soil horizons because of high groundwater or perched conditions during the growing season". While tile drainage is often necessary to improve crop yield, from an agricultural perspective, these soils are regarded as being agriculturally productive as they have only moderate limitation for common field crop.

Jeddo Clay Loam soil is a subsection of the Jeddo soil series, which are the poorly drained members of the Oneida catena. The soil parent material is a slightly stony calcareous clay till. The Jeddo soils are mainly found in narrow, shallow drainage basins or in the depressional areas associated with undulating or rolling topography (Gillespie et al., 1971).

Bottom Land is the “flat, frequently flooded land found adjacent to some streams”. Flood deposits occurring on Bottom Land are mainly comprised of fine sand and silt (Gillespie et al., 1971).

Soil capability for agriculture is mapped by Agriculture and Agri-Food Canada in the Canada Land Inventory (CLI). Lands classified as Class 1 are the most agriculturally productive, while those classified as Class 7 have the lowest capability for agriculture. Class 1 to 5 agricultural lands are generally arable, while classes 1 through 3 are defined by the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) to be prime agricultural soils for common field crop production.

Table 4.1 shows the soil types mapped along the proposed pipeline route (entry/exit pits and drill path), the percentage of the proposed pipeline route that the soil covers and the CLI for Agriculture rating of each soil type. The CLI rating of the majority of lands, approximately 64%, along the proposed pipeline route are rated as 1 under the Soil Capability Classification of Agriculture; soils in this class have no significant limitations in use for crops. Approximately 29% of the proposed pipeline route is rated as 5 under the Soil Capability Classification of Agriculture; soils in this class have very severe limitations that restrict their capacity in producing perennial forage crops, and improvement practices are deemed feasible. Approximately 7% of the proposed pipeline route is rated as 3 under the Soil Capability Classification for Agriculture; soils in this class have moderately severe limitations that restrict the range of crops or required special conservation practices. (AAFC, 2005).

Table 4.1: Soil Types and Soil Capability along Preferred Route

Soil Type	% of Route	CLI Class
Jeddo Clay Loam	7	3
Chinguacousy Clay Loam	64	1
Bottom Land	29	5

Maps of soil type and soil capability are on Figures 7 and 8 respectively, Appendix C.

Potential Impacts

The proposed pipeline crosses agricultural lands. Where there is interaction with agricultural lands, there are potential impacts to topsoil as a result of construction including compaction, loss of organic matter and degraded soil structure. No topsoil will be removed from the site. Excess subsoil may be removed from the site.

Excavation and construction activities across agricultural land have the potential to affect soil quality and agricultural capability. The movement of heavy machinery on wet soil may cause rutting, compaction, and mixing of topsoil with subsoil. When exposed, soils are more prone to erosion due to the loss of vegetative cover. Improperly salvaged topsoil can result in topsoil and subsoil mixing, compaction, rutting, and erosion, which can potentially decrease crop yields.

Mitigation and Protective Measures

Excess Soil

It is noted that O.Reg. 406/19 was filed in December 2019 and comes into force January 1, 2021. O.Reg. 406/19 includes regulations for the management of soil on-site as well as the movement of excess soils off-site in the province of Ontario, including stockpile size and setback requirements and environmental soil quality characterization requirements prior to the movement of drilling mud and soil off-site. It is recommended that Sun-Canadian retain a qualified person for environmental site assessment who is knowledgeable in environmental soil quality characterization, as well as O.Reg. 406/19.

The Contractor is solely responsible for the location and management of stockpiles on-site as they relate to traffic management, construction staging, and the effective management of construction productivity. With the exception of such variances as may be allowed under O.Reg. 406/19, Soil Rules, and/or site-specific instruments such as Environmental Compliance Approvals (ECAs), stockpiling and storage of soil shall be according to the Soil Rules referenced by O.Reg. 406/19, including, but not limited to, the following:

- Managed in such a way as to prevent adverse effects relating to noise, dust, mud tracking, leaching, run-off and erosion, and odour or other air impacts.
- Stored in stockpiles with total volume of less than 2,500 m^3.
- Soil of different quality, or from different areas, or that has not yet been sampled is segregated.
- Stored more than 30 m away from a waterbody, and more than 10 m away from property boundaries.
- Stored in a manner that prevents leaching of contaminants into the groundwater.

Materials that are surplus and required to be removed from site for disposal or reuse must be tested in accordance with O.Reg. 406/19, Reg. 347, or receiving site requirements under a site-specific instrument to determine management options. For excess soil, the Contractor Qualified Person (QP) shall determine sampling frequency and analytical parameters as required by O.Reg. 406/19 and Reg. 347, and in consultation with the CA. The Contractor QP shall be responsible for the production of all required documentation per O.Reg. 406/19.

Wet Soil Shutdown

To the extent feasible, construction activities should occur during drier times of the year. Lands affected by heavy rainfall events should be monitored for wet soil conditions, to avoid the potential for topsoil and subsoil mixing and loss of structure. Construction activities should be temporarily halted on agricultural lands where excessively wet soil conditions are encountered. Sun-Canadian's on-site inspection team should determine when construction activities may be resumed.

If a situation develops that necessitates construction during wet soil conditions, soil protection measures should be implemented, such as confining construction activity to the narrowest area practical, installing surface protection measures, and using wide tracked or low ground pressure vehicles.

High Winds

During construction activities, weather should be monitored to identify the potential onset of high wind conditions and to preserve topsoil. If high winds occur, the Contractor should implement protective measures such as:

- Suspend earth moving operations
- Apply dust suppressants or vegetate soil stockpiles
- Protect soil stockpiles with a barrier or windscreen

In conjunction with the above measures, all required materials and equipment should be readily accessible and available for use as required.

Soil Stripping

Topsoil depths should be measured prior to stripping so that the proper depth of topsoil is removed and replaced. Where stripping is undertaken on agricultural lands, topsoil and subsoil should be stripped and stockpiled separately to avoid mixing.

If clean-up is not practical during the construction year, it should be undertaken in the year following construction, starting once the soils have sufficiently dried. Interim soil protection measures should be implemented in sensitive areas to stabilize the RoW for over-wintering.

Soil Compaction

Within agricultural lands where soil has been compacted by the construction process, an agrologist should determine where decompaction may be necessary. Compaction can be alleviated by using farm equipment such as an agricultural subsoiler prior to replacing the topsoil. Sub-soiling with an agricultural subsoiler, followed by discing, chisel ploughing and cultivating, to smooth the surface, should be considered on agricultural lands. In high traffic areas of the RoW where deep compaction persists, additional deep tillage or subsoiling may be required on a site-specific basis. Soil density and/or penetrometer measurements on and off the easement may be used as a means of assessing the relative degree of soil compaction caused by construction along the RoW as well as determining that the RoW has been sufficiently decompacted.

Additionally, rig mats may be utilized during the construction process to aid in reducing the level of soil compaction.

Net Impacts

With the implementation of the above mitigation and protective measures, no significant adverse residual impacts on soil and soil capability are anticipated.

4.2.6 Agricultural Tile Drains

Existing Conditions

The preferred pipeline route does not cross any properties mapped as containing either systematic or random agricultural tile drains. A map of agricultural tile drains is located on Figure 9, Appendix C.

Potential Impacts

Construction activities, including excavation and the movement of heavy machinery, typically have the potential to crush and/or sever agricultural tile drains. As no agricultural tile drains are anticipated to be crossed, no impacts to these resources are anticipated.

Mitigation and Protective Measures

As no potential impacts are anticipated, no mitigation or protective measures are required.

Net Impacts

No significant adverse residual impacts on agricultural tile drains are anticipated.

4.2.7 Natural Hazards

Existing Conditions

Natural hazards are elements of the physical environment that have the potential to affect a project in an adverse manner. Potential natural hazards along the proposed pipeline route are limited. Natural hazards that may occur are seismic activity and flooding.

The proposed pipeline route lies within the southern Great Lakes Seismic Zone (Natural Resources Canada, 2016). This zone has a low to moderate level of seismicity when compared to the more active seismic zones to the east, along the Ottawa River and in Quebec. Over the past 30 years, on average, 2 to 3 magnitude 2.5 or larger earthquakes have been recorded in the southern Great Lakes region. By comparison, over the same time period, the smaller region of Western Quebec experienced 15 magnitude 2.5 or greater earthquakes per year.

A map of the regulation limits of CH is located on Figure 10, Appendix C,

Potential Impacts

The probability of significant seismic activity in the area traversed by the proposed pipeline is low; therefore, no potential impacts are anticipated.

The likelihood of a flooding event interfering with pipeline construction is reduced by construction occurring outside of the spring freshet. A flooding event during construction could result in construction delays, soil erosion, sedimentation of a watercourse, bore pit slumping, and damage or loss of construction equipment and contamination of a watercourse because of equipment entering a watercourse. The nature of these impacts would depend on the spatial extent, duration, and magnitude of the flooding event.

Mitigation and Protective Measures

If flooding necessitates a change in the construction schedule, affected landowners and regulatory agencies should be notified and construction should continue at non-affected locations. Temporary workspaces should be located above the floodplain to the extent practical, unless necessary for watercourse crossings. All work in the floodplains will be subject to a permit from CH.

Net Impacts

With the implementation of the above mitigation and protective measures, no significant adverse residual impacts from natural hazards are anticipated.

4.3 BIOPHYSICAL FEATURES

4.3.1 Aquatic Features

Fish and Fish Habitat

The proposed pipeline crosses the Lower Middle branch of East Sixteen Mile Creek, which is a large permanent watercourse supporting a diverse fish community. The proposed crossing location is shown on (Figure 11, Appendix C). At the proposed crossing location, the channel has an average width of 10 m. It meanders through a wooded valley with an average width of 200 m.

CH maintains a long-term monitoring station approximately 650 m north of the crossing location of the proposed pipeline at the crossing of Britannia Road 170 m west of Trafalgar Road (Station SXM-435) (Conservation Halton 2013). Fifteen (15) fish species were observed at this station in 2011 (Conservation Halton 2013), as summarized in Table 4.2.

Table 4.2: Fish Species Observed in the Lower East Sixteen Mile Creek in 2011[1]

Common Name	Latin Name	Thermal Preference[2]
Black Crappie	*Pomoxis nigromaculatus*	Cool

Table 4.2: Fish Species Observed in the Lower East Sixteen Mile Creek in 2011[1]

Common Name	Latin Name	Thermal Preference[2]
Bluntnose Minnow	*Pimephales notatus*	Warm
Carps and Minnows	*Cyprinidae*	Cool / Warm
Fantail Darter	*Etheostoma flabellare*	Unknown
Fathead Minnow	*Pimephales promelas*	Warm
Johnny Darter	*Etheostoma nigrum*	Unknown
Largemouth Bass	*Micropterus salmoides*	Warm
Longnose Dace	*Rhinichthys cataractae*	Cool
Northern Hogsucker	*Hypentelium nigricans*	Warm
Pumpkinseed	*Lepomis gibbosus*	Warm
Rainbow Darter	*Etheostoma caeruleum*	Cool
Rock Bass	*Ambloplites rupestris*	Cool
Silver Shiner	*Notropis photogenis*	Unknown
Stonecat	*Noturus flavus*	Warm
White Sucker	*Catostomus commersonii*	Cool

Sources:
1) Fish Captured at Station SXM-435 in 2011 by Conservation Halton (2013)
2) Coker, G.A., C.B Portt and C.K. Minns. 2001.

The fish species captured by CH (2013) belong to warm and cool water temperature preference classes (Coker et al. 2001). All species captured are common and widespread in southern Ontario except for Silver Shiner, a fish SAR.

Fish Species at Risk

The fish community in this reach of East Sixteen Mile Creek includes the presence of a fish SAR, detailed in the following reports:

- Long Term Environmental Monitoring Program Grindstone Creek, Sixteen Mile Creek and Supplemental Monitoring (Conservation Halton 2013)
- Silver Shiner (*Notropis photogenis*) in Ontario: Distribution and Habitat Use. (Glass et al. 2016)

Silver Shiner have been observed in this branch of East Sixteen Mile Creek (Conservation Halton 2013, Glass et al. 2016). Silver Shiner is listed as provincially and federally Threatened. It is afforded protection under the provincial *Endangered Species Act* (ESA) and under Schedule 1 of the federal *Species at Risk Act* (SARA).

Currently there is no specifically prescribed area, such as mapped critical habitat, for this species in a habitat regulation. Therefore, the protected habitat includes all areas described in a general description by MNRF (2017) as follows:

- Category 1: Flowing pools, runs, and riffles in occupied reaches
- Category 2: Shallow, nearshore habitats, and areas with aquatic vegetation in occupied reaches
- Category 3: Floodplains and riparian edges adjacent to occupied reaches

No other fish or mussel species at risk were identified in this reach of East Sixteen Mile Creek.

Potential Impacts

The proposed pipeline will cross underneath East Sixteen Mile Creek using the HDD method. The HDD process involves drilling a pilot bore hole underneath the watercourse and back-reaming the bore hole to the drill rig. Once the hole is of a sufficient diameter the pipeline is pulled into the hole by the drill rig. HDD typically uses a mixture of freshwater and bentonite to flush drill cutting from the hole and to act as a lubricant. The points of drill entry and exit will be outside the limits of the Sixteen Mile Creek valley. Therefore, there will be no disturbance in the active channel of the watercourse, nearshore habitats, or floodplain and riparian areas. No areas considered to be fish habitat or habitat for Silver Shiner will be disturbed.

HDD is intended to be a less intrusive construction method than traditional open cut crossing of a watercourse. However, there is a possibility of surface (water, riparian, wetland) disturbance if an inadvertent release of drilling fluid or a release of sediment laden groundwater occurs. There is also the potential for sediment laden water or other deleterious substances to enter a surface water feature as the result of grading, drilling excavations, equipment washing, or other construction related activities during directional boring.

Inadvertent releases are typically caused by the pressurization of the drill hole beyond the containment capability of the near surface geologic materials (soil and/or rock). Therefore, the type and depth of these materials, as well as the drilling pressure, are key factors in preventing and managing frac-outs.

Mitigation and Protective Measures

The following general environmental mitigation measures should be taken to protect fish and fish habitat:

- Data obtained from the geotechnical report aided in determining the feasibility of the HDD drill path.
- Design the directional drill so that drilling slurry pressure is reduced, and the drilling rate is reduced in porous materials to reduce the chance of loss of circulation of the drilling slurry.
- HDD should be completed within the permitted construction timing window of July 1 to September 15 to protect sensitive life stages for Silver Shiner and fishes in general. This window was established based on communications with MECP staff for a project in the CH jurisdiction.

- An experienced and certified environmental monitor (i.e., a Certified Inspector of Sediment and Erosion Control [CISEC]) should be on site during HDD activities.
- Prior to removal of the vegetation cover, effective mitigation techniques for erosion and sedimentation should be in place to protect water quality. Disturbance to the area during construction should be limited and grubbing activities should be delayed until immediately prior to grading operations.
- A drilling mud release contingency plan should be prepared and kept on-site.
- Install as appropriate berms, silt fencing and secondary containment measures (i.e., plastic tarp) around drilling and drilling mud management equipment at both bore entry and bore exit locations to contain operational spills.
- Immediately contain any drilling mud that escapes onto land and transfer it into an on-site containment system.
- Temporary erosion and sediment control measures should be maintained and kept in place until work near a watercourse has been completed and stabilized. Temporary sediment control measures should be removed at the completion of the work but not until permanent erosion control measures have been established.
- Construction material, excess material, construction debris and empty containers should be stored a minimum of 30 m from watercourses and watercourse banks, where practical.
- Equipment maintenance and refueling should be controlled to prevent entry of petroleum products or other deleterious substances, including any debris, waste, rubble, or concrete material, into a watercourse, unless otherwise specified in the contract.
- Deleterious substances (fuel, oil, spoil) should be stored a minimum of 30 m from the watercourse. Any such material that inadvertently enters a watercourse should be removed in a manner satisfactory to the environmental inspector.
- Maintain smooth operation of the drilling string and slurry pumping systems to avoid pressure surges.
- Reduce slurry viscosity through appropriate filtering of drilled material to reduce the pressure gradient along the drill path due to frictional effects.
- Continually monitor slurry volumes to enable a quick response to any indications of lost circulation.
- Clean up operational spills daily to prevent mobilization of drilling mud off site during rain events.
- Drilling mud should be disposed in accordance with the appropriate regulatory authority requirements.
- Following construction, any disturbed vegetation should be restored to pre-construction conditions to the extent possible in accordance with environmental permits.

<u>Bore Path Collapse Mitigation Measures</u>

The following mitigation measures should be applied as recommended by geotechnical studies to prevent HDD borehole collapse from occurring in susceptible soils:

- Fluid volumes, annular pressure and cutting returns should be strictly monitored to ensure bore hole plugging and fluid losses are detected and addressed immediately.
- Alternative drill paths should be evaluated to reduce exposure to challenging soil materials.
- Drilling mud should be maintained in the borehole until the pipeline is installed. This can be facilitated by positioning the entry and exit points in areas with cohesion less soils (e.g., silt-sand zones).

Contingency Plan

A drilling mud release contingency plan will be prepared and kept on-site. Spills containment and clean-up procedures will be implemented immediately in the unlikely event of a spill. The proponent will immediately contact the MECP Spills Action Centre. The MECP Spills Action Centre is the first point of contact for spills at the provincial and federal level. In addition, the following agencies will be contacted should conditions warrant:

- DFO (Toll-free: 1-855-852-8320)
- MNRF (Toll-free:1-866-517-0571)
- CH (Tel: 1-905-336-1158)

A contingency plan will be in place to effectively address inadvertent releases of sediment through frac-outs, or other releases of sediment laden water from the project site. The contingency plan outlines the steps that the Contractor is to take in the event of a sediment release or other type of spill. The contingency plan will also outline the steps involved to mitigate an inadvertent release after it occurs.

If a sediment spill occurs within the watercourse, adequate isolation of the release should be provided to contain the sediment. For example, a vacuum truck may be on-site during construction and ready to remove the drilling fluid and any other frac out soil.

The following materials should be readily available during drilling operations and prepared to employ them in the event of a drilling mud spill or inadvertent release: sandbags, straw bales, silt fencing and a hydrovac truck.

All products used on site are to be environmentally safe. Inadvertent release mitigation wells may also be considered to relieve drilling pressures. The Contingency Plan should indicate if, and when, HDD activities are to resume. For example, when mitigation measures have been implemented are deemed to be effective at mitigating potential ecological impacts.

Permitting

The federal *Fisheries Act* prohibits causing harmful alteration disruption and destruction (HADD) of fish or fish habitat unless authorized by the DFO. It protects all fish and fish habitat and prohibits against causing the death of fish by means other than fishing. HDD construction methods for pipeline water crossings do not require review or Authorization under the *Fisheries Act* provided measures to avoid causing HADD of fish habitat and death of fish are followed during construction. These measures include locating entry and

exit points at sufficient distance to avoid disturbance to the bed and banks, locating the drill path at an appropriate depth below the channel and installation of appropriate sediment and erosion control measures (i.e., silt fencing around disturbed areas, development of a contingency plan, etc.). If these measures are followed, a project of this nature is low risk to fish and fish habitat and can proceed without review by DFO.

Silver Shiner and its habitat is protected under Sections 9 and 10 of the provincial ESA. The federal SARA also contains prohibitions against the killing and harming of this species and damage or destruction of their habitat (i.e. residences).

The pipeline route will be located within a regulated boundary of CH. A permit under O. Reg. 162/06 will be required prior to construction activities in the regulated boundaries.

Net Impact

With the implementation of the horizontal directional drilling method and the mitigation and contingency measures described in this report, no adverse residual impacts on fish species or fish habitat are anticipated.

With the implementation of the HDD method and the mitigation and contingency measures described in this report, no adverse residual impacts on Silver Shiner or their habitat (residences) are anticipated.

4.3.2 Designated Natural Areas and Vegetation

Existing Conditions

The proposed pipeline replacement falls within the Niagara section of the Deciduous Forest Region (Rowe, 1972). According to CH (2018), forest conditions in proximity to the proposed pipeline replacement are ranked as Poor or Very Poor, based on a ranking system that considers percentage of forest cover, forest interior (100 m from the forest edge) and forested streamside vegetation. The pipeline replacement will occur within or under (from west to east) an existing private access road, mature forested riparian area, East Sixteen Mile Creek, another forested riparian area, a rural residence and Trafalgar Road.

A map of designated natural areas is provided on Figure 12, Appendix C.

<u>Wetlands</u>

The Ontario Wetland Evaluation System (OWES) is used to identify Provincially Significant Wetlands (PSW). An evaluated wetland may be one contiguous unit or may be a series of smaller wetlands functioning as a whole. Evaluated wetlands that do not qualify as provincially significant may be designated as locally significant and may be protected through local planning and policy measures. There may also be unevaluated wetlands in an area.

A review of MNRF LIO mapping (MNRF, 2019a) and the Natural Heritage Information Centre (NHIC) database (MNRF, 2019b) did not identify any PSWs or unevaluated wetlands within 120 m of the pipeline replacement project.

Significant Woodlands

A woodland is defined as a treed area, woodlot, or forested area. The Natural Heritage Reference Manual notes that the local planning authority has the responsibility for designating significant woodlands (MNR, 2010). The criteria for designating significant woodlands at a provincial level includes: woodland size; ecological function (shape, proximity to other woodlands or natural features, linkages); species diversity; uncommon characteristics; and, economic and social values (MNR, 2010).

It is the local planning authority's responsibility to designate significant woodlands. The proposed pipeline replacement is in the Town of Milton. The Town of Milton's Official Plan (OP; consolidated August 2008) was reviewed for the identification and designation of significant woodlands that occur within the construction footprint.

The town of Milton identified a significant woodlot as: …*woodlands determined to be significant through an application of the following criteria: size of woodlands, the occurrence of other identified natural heritage features or areas in the woodland, the occurrence of woodlands that are of a composition, age, size or site quality that is uncommon for the planning area for which the evaluation is being undertaken and the provision of important ecological functions such as linkage, buffering or hydrological flow.*

As per OP Section 4.9.1.2, (g), Significant Woodlands are included as part of Greenlands B Area, which are identified on Schedule A. No Greenlands B Areas were identified within 120 m of the proposed pipeline replacement.

Other Woodlands

Woodlands were identified adjacent to the proposed pipeline replacement in LIO (MNRF 2019a) and confirmed in the field during a site visit conducted by Stantec on July 28, 2020. The vegetation communities observed are common in the province, comprised of a mid-aged to mature deciduous forest community on the west bank of Sixteen Mile Creek. There was a larger mid-aged to mature sugar maple forest and a smaller coniferous plantation comprised of Scot's pine adjacent to the south end of the pipeline laydown area. The edge of the sugar maple forest overlaps with the pipeline laydown area. A narrow hedgerow comprised of young to mid-aged deciduous trees and invasive buckthorn overlapped with the pipeline laydown area located between East Sixteen Mile Creek and the sugar maple forest.

Areas of Natural and Scientific Interest (ANSI)

Life science ANSIs are significant representative segments of Ontario's biodiversity and natural landscapes, including specific types of forests, valleys, prairies, savannahs, alvars and wetlands, their native plants and animals, and their supporting environments. They contain relatively undisturbed vegetation and landforms, and their associated species and communities. Provincially significant life science ANSIs include the most significant and best examples of the natural heritage features in the

province, and many will correspond to other significant features and areas such as wetlands, valleylands and woodlands (MNR, 2010).

A review of MNRF LIO mapping (MNRF, 2019a) and the NHIC (MNRF, 2019b) identified one candidate life science ANSI, Sixteen Mile Creek, within 120 m of the proposed pipeline route. The pipeline laydown area encroaches on a small section of the candidate ANSI, located to the north of the work area.

Potential Impacts

The proposed pipeline replacement will be completed using HDD under East Sixteen Mile Creek, reducing impact to riparian woodlands.

Where there is natural vegetation within or adjacent to the proposed pipeline route, potential impacts include the removal of native vegetation, introduction or spread of invasive species, and indirect effects such as dust, erosion, and accidental spills.

Mitigation and Protective Measures

Environmental mitigation and protective measures during construction include the following:

- Where the RoW abuts a woodland on one side, detailed design should avoid the feature where possible.
- Determine municipal requirements or permits for tree removal (if required) prior to construction.
- Clearing should be minimized/avoided to the extent possible in sensitive areas such as woodlots, along watercourses, adjacent to the ANSI and in areas of significant groundwater recharge.
- The limits of clearing should be surveyed and staked in the field, to allow for the protection of off-site natural areas and vegetation.
- All brush and trees should be felled (if required) within the project footprint.
- Clearing should be done during dry soil conditions to the extent practical to limit disturbance to vegetation and terrain.
- Precautionary measures (e.g., equipment washing before site access) may be necessary to mitigate for the spread of non-native species.
- A re-vegetation program should be initiated for all vegetated temporary work areas. Sun-Canadian should consult with landowners and CH to confirm replanting plans.
- Seeding of the disturbed temporary work areas and permanent easement should be done with a native seed mix reviewed by CH. Replaced soils should contain native seed bank, facilitating successful revegetation.
- One year following construction, planted vegetation should be inspected for survival; in areas of severe dieback, dead and diseased planted vegetation should be replaced.

Mitigation and protective measures are outlined in Section 4.4.5 for dust, Section 4.2.2 for erosion and Section 4.3.1 for accidental spills.

Net Impacts

With the implementation of the above mitigation and protective measures, no significant adverse residual impacts on designated natural areas and vegetation are anticipated.

4.3.3 Wildlife, Wildlife Habitat and Species at Risk

Significant Wildlife Habitat

Wildlife habitat is defined as an area where plants, animals and other organisms live, including areas where species concentrate at a vulnerable point in their life cycle, and areas that are important to migratory and non-migratory species (MNR, 2000). Significant wildlife habitats (SWHs) are grouped into four categories:

1. Seasonal concentration areas
2. Animal movement corridors
3. Rare vegetation communities or specialized habitats
4. Habitats of species of conservation concern

The presence of SWH along the proposed pipeline replacement area was determined in two ways. First, publicly available NHIC data was reviewed for SWH (MNRF 2019b). Second, potential SWH was identified using the Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E (MNRF, 2015) which provide descriptions of wildlife habitats and guidance on criteria for determining the presence of SWH. These descriptions were then compared to results of the July 28, 2020 vegetation and wildlife habitat assessment with support from air photo interpretation and GIS data. Details of the significant wildlife assessment are summarized below.

Seasonal Concentration Areas

Seasonal Concentration Areas are sites where large numbers of a species gather together at one time of the year, or where several species congregate. Only the best examples of these concentration areas are typically designated as SWH. The potential for seasonal concentration areas to occur within 120 m of the proposed pipeline replacement is assessed in Table D-1, Appendix D. Candidate habitat for the following seasonal concentration areas may be present along the proposed pipeline replacement route:

- Bat maternity roost colonies
- Turtle wintering areas

Rare vegetation communities or specialized habitats

Rare vegetation communities or specialized habitats are defined as separate components of SWH. Rare vegetation communities are habitats that are considered rare or uncommon in the ecoregion, as defined in the SWH Criteria Schedules (MNRF, 2019b). These habitats may support wildlife species that are considered significant. Specialized habitats are microhabitats that are critical to some wildlife species. Review of the NHIC (MNRF, 2019b) database did not identify any rare vegetation communities or specialized habitats within the proposed pipeline replacement. Potential rare vegetation communities or specialized habitats based on the SWH Criteria Schedule for Ecoregion 6E (MNRF, 2015) are discussed in Table D-1, Appendix D. Rare communities and specialized habitats were not identified in proximity to the proposed pipeline replacement area.

Animal Movement Corridors

Animal movement corridors are elongated, naturally vegetated parts of the landscape used by animals to move from one habitat to another (MNR, 2000). As wetlands and vernal pools that support breeding amphibians and deer wintering areas were absent in proximity to the proposed pipeline replacement, animal movement corridors are also considered absent.

Habitat for Species of Conservation Concern

Habitats of Species of Conservation Concern include wildlife species that are listed as Special Concern or rare, that are declining, or are featured species in the province. This includes marsh breeding birds, shrub/early successional breeding bird habitat, terrestrial crayfish, as well as rare species, as defined in the SWH Criteria Schedules (MNRF, 2019b).

Provincially rare (S1-S3 ranked species) are determined by status rankings (S-ranks) for wildlife are based on the number of occurrences in Ontario and have the following meanings:

- S1: critically imperiled; often fewer than 5 occurrences
- S2: imperiled; often fewer than 20 occurrences
- S3: vulnerable; often fewer than 80 occurrences

Designation of Special Concern is determined by the Committee on the Status of Species at Risk in Ontario (COSSARO).

The NHIC database was searched to obtain recent records (1990 - present) of Species of Conservation Concern (S1-S3 ranked species and provincially designated Special Concern species) in the vicinity of the proposed pipeline route. The Ontario Breeding Bird Atlas (Cadman et al., 2007), the Ontario Reptile and Amphibian Atlas (Ontario Nature, 2017) and the Ontario Mammal Atlas (Dobbyn, 1994) were also searched. The exact location of species occurrences is not available from these atlases; instead, occurrences are recorded within 1 x 1 km or 10 x 10 km squares.

Based on a review of background information, 5 species of conservation concern are known to occur in the vicinity of the proposed pipeline replacement, as shown in Table 4-3 2 reptiles and 3 birds.

Table 4.3: Potential Terrestrial Species of Conservation Concern Within the Proposed Pipeline Replacement

Common Name	Scientific Name	Srank	Provincial Status (COSSARO)	Source
Reptiles				
Eastern Milksnake	*Lampropeltis triangulum*	S3	SC	ORAA
Snapping Turtle	*Chelydra serpentina*	S3	SC	ORAA
Birds				
Eastern Wood-pewee	*Contopus virens*	S4B	SC	OBBA
Red-headed Woodpecker	*Melanerpes erythrocephalus*	S4B	SC	OBBA
Wood Thrush	*Hylocichla mustelina*	S4B	SC	OBBA

Notes:
Sources: MNRF 2019 (NHIC), Cadman et. al. 2007 (OBBA), Ontario Nature 2018 (ORAA), Dobbyn 1994 (AMO)
SC - Special Concern - a species with characteristics that make it sensitive to human activities or natural events
S1: Critically Imperiled—Critically imperiled in the province (often 5 or fewer occurrences)
S2: Imperiled—Imperiled in the province, few populations (often 20 or fewer)
S3: Vulnerable—Vulnerable in the province, relatively few populations (often 80 or fewer)
S4: Apparently Secure—Uncommon but not rare
S#B- Breeding status rank
S#N- Non Breeding status rank

The potential for species of conservation concern to be present along the proposed pipeline route is limited by habitat suitability and availability; therefore, species listed in Table 4-3 may not occur along the proposed pipeline route. Results of the vegetation and habitat assessment conducted on July 28, 2020 is discussed in Table D-1, Appendix D. Potentially suitable habitat for the following species of conservation concern occur within proximity to the pipeline replacement:

- Snapping Turtle
- Eastern Wood-pewee
- Wood Thrush

Species at Risk

Species at Risk (SAR) are those species identified as Endangered or Threatened by provincial (ESA) legislation. The NHIC database was searched to obtain recent records (1990– present) of SAR from the vicinity of the proposed pipeline route. The Ontario Breeding Bird Atlas (Cadman et al., 2007), the Ontario

Reptile and Amphibian Atlas (Ontario Nature, 2017) and the Ontario Mammal Atlas (Dobbyn, 1994) were also searched. The exact location of species occurrences is not available from these atlases; instead, occurrences are recorded within 1 x 1 km or 10 x 10 km squares.

Based on a review of background information, 10 SAR are known to occur in the vicinity of the proposed pipeline route, as shown in Table 4-4: 1 plant, 1 amphibian, 4 birds and 4 mammals.

Table 4.4: Potential Terrestrial Species at Risk (Threatened or Endangered) within Proximity of the Proposed Replacement

Common Name	Scientific Name	Provincial Status (COSSARO)	Source
Plant			
Butternut	*Juglans cinerea*	END	Stantec
Amphibians			
Jefferson Salamander	*Ambystoma jeffersonianum*	END	NHIC
Birds			
Barn Swallow	*Hirundo rustica*	THR	OBBA
Bobolink	*Dolichonyx oryzivorus*	THR	NHIC, OBBA
Chimney Swift	*Chaetura pelagica*	THR	OBBA
Eastern Meadowlark	*Sturnella magna*	THR	NHIC, OBBA
Mammals			

Table 4.4: Potential Terrestrial Species at Risk (Threatened or Endangered) within Proximity of the Proposed Replacement

Common Name	Scientific Name	Provincial Status (COSSARO)	Source
Little Brown Myotis	*Myotis lucifugus*	END	AMO
Northern Myotis	*Myotis septentrionalis*	END	AMO
Eastern Small-footed Myotis	*Myotis leibii*	END	AMO
Tri-coloured Bat	*Perimyotis subflavus*	END	AMO

Notes:
Sources: MNRF, 2019 (NHIC); Cadman et. al., 2007 (OBBA); Ontario Nature, 2013 (ORAA); Dobbyn 1994 (AMO)
END – Endangered - a species facing imminent extinction or extirpation
THR – Threatened - a species that is at risk of becoming endangered
SC - Special Concern - a species with characteristics that make it sensitive to human activities or natural events
S1: Critically Imperiled—Critically imperiled in the province (often 5 or fewer occurrences)
S2: Imperiled—Imperiled in the province, few populations (often 20 or fewer)
S3: Vulnerable—Vulnerable in the province, relatively few populations (often 80 or fewer)
S4: Apparently Secure—Uncommon but not rare
S? – Rank Uncertain
SH: Possibly Extirpated (Historical)
S#B- Breeding status rank
S#N- Non-Breeding status rank

Results of the vegetation and habitat assessment conducted on July 28, 2020, in addition with air photo interpretation, were compared to habitat preferences of the SAR identified in Table 4-4, summarized in Table D-2, Appendix D. The following SAR have the potential to occur within proximity to the proposed pipeline replacement:

- Butternut
- Bat SAR
  - Little Brown Myotis
  - Northern Myotis
  - Small-footed Myotis
  - Tri-colored Bat

Results of the bat maternity colony survey conducted on December 9, 2020 identified 11 candidate bat maternity roost trees. Two trees were located in the deciduous forest on the valley slope on the southwest bank of East Sixteen Mile Creek. The other 9 trees were located along the edge of the woodlands adjacent to the pipe laydown area.

Potential Impacts

Potential impacts on wildlife and wildlife habitat from construction include direct mortality from construction vehicles, habitat destruction through vegetation removal, habitat degradation through spills and sensory disturbance of wildlife during construction.

There are no impacts anticipated to the two trees on the valley slope of East Sixteen Mile Creek as they are within the HDD area, and tree removal is not anticipated to be required. Additionally, there are no impacts anticipated to the 9 trees adjacent to the pipe laydown area as tree removal is not anticipated at this location.

Mitigation and Protective Measures

Environmental mitigation and protective measures during construction include the following:

- Detailed design of the proposed pipeline should be reviewed to avoid and reduce the likelihood of impact upon wildlife habitat to the extent possible, and in particular habitats of Endangered, Threatened, Special Concern and rare species.
- Equipment and vehicles should yield the RoW to wildlife.
- Fencing should be erected around deep excavations to prevent wildlife entrapment.
- The Contractor should inform their personnel to not threaten, harass or injure wildlife.
- If wildlife are encountered during construction, personnel are required to move away from the animal and wait for the animal to move off the construction site.
- A butternut tree is located within 25m of the pipeline laydown area. Avoidance of the tree is recommended. For work within 25m of the trees, consultation with MECP is recommended to confirm requirements under the ESA.
- Tree removal is not anticipated; however, if removal of trees identified as potential bat maternity roots is required, removal should not occur between April 1 and October 1 to avoid direct impacts to bats. Consultation with MECP is recommended to confirm requirements under the ESA.
- Silt fencing is recommended along the perimeter of the HDD work zone to prevent encroachment into East Sixteen Mile Creek, exclude reptiles and amphibians during their active period (approximately April 1 – October 31), as well as prevent sedimentation.
- Construction activities with the potential to remove migratory bird habitat, such as vegetation clearing, should be avoided during the breeding season which is generally from April 1- August 31 in southern Ontario (Environment Canada, 2017). Should vegetation clearing activities be unavoidable during this window, a mitigation program should be developed, which includes measures to reduce and avoid impacts to migratory birds and their nests (Government of Canada, 2018). This program should include preventative and mitigation measures but may also include avoidance of clearing during key sensitive periods and in key locations.

- If SAR are encountered during the proposed pipeline replacement, work will stop and consultation with the MECP regarding the potential need for a permit under the ESA and/or species-specific mitigation will be conducted.

Mitigation and protective measures are outlined in Section 4.3.2 for vegetation removal and Section 4.3.1 for accidental spills.

Net Impacts

With the implementation of the above mitigation and protective measures, no significant adverse residual impacts on wildlife, wildlife habitat and SAR are anticipated.

4.4 SOCIO-ECONOMIC ENVIRONMENT

4.4.1 Employment and Business

Existing Conditions

In the Town of Milton, the number of people employed increased from 48,060 in 2011, to 59,815 in 2016, while the unemployment rate decreased from 5.7% to 5.6% over the same period. The unemployment rate in the Town of Milton was below the provincial and national average rates of 7.4% and 7.8%, respectively, for 2016. Refer to Table 4-5 for labour characteristics.

Table 4.5: Labour Characteristics, Ontario and Milton, 2016

Location	Total Population 15 years and Over	Labour Force	Employed	Participation Rate (percent)	Employment Rate (percent)	Unemployment Rate (percent)
Ontario	11,038,440	7,141,675	6,612,150	64.7	59.9	7.4
Milton (Town)	80,560	59,815	56,485	74.2	70.1	5.6

Source: Statistics Canada, 2011; 2017

The median income for all census households in Milton in 2015 was $104,730; the median income for individuals aged 15 years and over was $32,917 (Table 4-6).

Table 4.6: Median Income, Ontario and Milton, 2015

Location	Median Family Income	Median Income of individuals - 15 Years and Over		
		All individuals	Male	Female
Ontario	$74,287	$33,539	$39,889	$28,676
Milton (Town)	$104,730	$42,682	$52,860	$34,384

Source: Statistics Canada, 2017

In 2016, the main sources of employment by industry for Milton were retail trade (11.8%), manufacturing (10%), professional, scientific and technical services (9.0%) and health care and social assistance (8.5%) (Statistics Canada, 2017).

Milton's labour force is concentrated in three main occupations: sales and services occupations (20.9%), business, finance and administration occupations (17.9%), and management occupations (14.1%) (Statistics Canada, 2017).

Potential Impacts

Project construction is expected to take place in the Summer of 2022 and take an estimated 3 months to complete. Project demands for labour and goods and services can result in both beneficial and adverse effects. Positive effects may not be evenly distributed among populations, with some residents in a better position to receive economic benefits than others. Similarly, adverse effects may affect some residents more than others.

Residual effects on employment are related to the project's labour demand compared to the labour supply. Three types of employment are considered:

- Direct employment: labour that is hired directly for the project
- Indirect employment: labour hired by companies to produce and provide goods and services needed for the project
- Induced employment: labour hired by industries that produce and provide consumer items and services purchased by people who are directly or indirectly employed by the project

Labour conditions will be affected by direct, indirect and induced employment during all project phases.

The project could affect business through purchases of labour, goods and services from local businesses, including businesses owned by Indigenous peoples, and will result in increased local employment income and municipal government revenue. Local businesses will likely benefit from supplying the project with goods and services.

Land clearing and other construction-related project activities could adversely affect agricultural productivity and operations, and businesses along the proposed pipeline route that include PAO Horticultural, Jade Gardens & Greenhouse and Piper's Heath Golf Club. Other potential adverse effects include impairment to the use and enjoyment of property and conflicts with vehicular movement.

Mitigation and Protective Measures

It is expected that the project will generally result in positive effects on employment by employing local and Indigenous people, and by reducing the unemployment rate in the region. These positive effects do not require mitigation, but Sun-Canadian will identify and implement various mechanisms to enhance project benefits.

The potential effects of the project because of employment opportunities and purchasing local goods and services is expected to be positive during construction and operation, so no mitigation will be required.

With respect to potential adverse effects on agricultural and non-agricultural businesses (commercial and industrial), Sun-Canadian will engage with land owners, business operators, and the Town of Milton to address access to the project area, the portion of land that will be altered as part of site preparation, long-term changes to agricultural and non-agricultural land and the development of appropriate and feasible mitigation measures.

Net Impacts

With the above initiatives to encourage local and Indigenous participation on the project, it is anticipated that the effects from the project on employment and business will be positive, including creating positive economic activity through new direct, indirect, and induced employment. Project expenditures on local businesses and suppliers also have the potential to positively affect the local economies. Additionally, those who have worked on the project will gain transferrable skills and experience that could help them gain employment in other industries. Consultation with businesses and landowners will address any concerns to their operations.

With the implementation of the above mitigation and protective measures, no significant adverse residual impacts on employment and business are anticipated.

4.4.2 Community Services & Infrastructure

Existing Conditions

Demographics

In 2016, the Town of Milton had a population of 111,128 (Statistics Canada, 2017). Milton experienced a large population increase between 2011 and 2016, above the population growth in Ontario (Table 4-7).

Table 4.7: Population Ontario and Milton 2016

Location	Total Population	Percent Change from 2011
Ontario	13,448,494	4.6
Milton	111,128	30.5

*Numbers are rounded by Statistics Canada and are reported herein exactly as they are reported by Statistics Canada. Totals may not necessarily add up as a result of rounding.

Source: Statistics Canada, 2017

In 2016, the median age of the population of Milton was 35.3years (Statistics Canada, 2017); Ontario's median age was 41.3 (Statistics Canada, 2017).

In 2016, 1,040 residents of Milton identified themselves as Aboriginal (Statistics Canada, 2017). Together this represents approximately 0.003% of the provincial Aboriginal population (Statistics Canada, 2017).

By 2021, Milton is projected to have a population of 145,000 and by 2031 a projected population of 235,000 (Town of Milton, 2019a).

Permanent and Temporary Accommodations

In 2016, there were 34,260 private dwellings in the Town of Milton. The majority (85.9%) of homes were owned and 4,840 were rental homes (Statistics Canada, 2017).

Within the Town of Milton, there are 3 hotels/motels, as well as one privately owned campground.

Municipal Services and Infrastructure

Halton Region operates Waste Management Site, which provides recycling, hazardous household waste, yard waste and other garbage disposal services (Halton Region, 2011). The Town of Milton water supply is a groundwater system from two well fields, Kelso and Walker's Line (Halton Region, 2019).

Health and Education Services and Infrastructure

The Town of Milton is serviced by the Halton Region Health Department. There is currently one hospital within Milton, the Milton District Hospital.

Roads and Highways

The proposed pipeline route crosses Trafalgar Road. This four-lane road carries high volumes of traffic.

The Development Services Department of the Town of Milton is responsible for managing the Town of Milton Road system, including pothole repairs, street lighting and sign maintenance, entrance culverts and rural roadside mowing. Within the Town of Milton, there are various classifications of roads and highways, from high volume urban arterials to rural collector roads.

Policing, Fire and Emergency Response Services

The Halton Regional Police Service serves the entire Town of Milton. Patrol 1 Division provides policing services to for the Town of Milton and the Town of Halton Hills. There is one Ontario Provincial Police detachment in the Town of Milton (Ontario Provincial Police, 2019).

The Town of Milton's Fire Department provides fire prevention/public education, fire communications/dispatch, firefighting and rescue operations, medical response with the Milton Paramedic Service, emergency planning/preparedness, and mechanical and fleet services for both Fire and Milton Paramedic Service. There are 3 fire stations within the Town of Milton, with the closest fire station to the study area being Fire Station 4 located at 405 James Snow Parkway South (Town of Milton, 2019b).

Potential Impacts

The presence of temporary workers in the local communities during the construction period has the potential to increase the demand for housing and local community services and infrastructure. Non-local

project workers are expected to stay in temporary accommodations, including hotels, motels, and campgrounds. They may also choose to rent houses or apartments. The vacancy rate for temporary rentals will likely be able to accommodate the temporary increase. The short duration that the workers will reside near any one community, as well as the structure of the work shifts, will limit the need for workers to use the services and infrastructure in local communities.

The transportation of project goods, services and workers has the potential to lead to increased use of existing transportation infrastructure. Also, increased traffic volumes along local road networks could increase travel times and reduce road safety, which might lead to increased use of local emergency services due to potential vehicle accidents and workplace accidents. In addition, the production of project-related waste could place additional stress on the capacity of local landfills.

Potential impacts to roads are outlined in Sections 4.4.3 and 4.4.4

Mitigation and Protective Measures

Project employees might require medical attention while staying in the area. The Contractor and Sun-Canadian will have emergency response equipment and trained personnel on-site during construction. In addition, an Emergency Response Plan will be developed and implemented, which will address field health services, emergency call-out procedures and fire response plans. Safety fencing will be used where necessary to separate the work area.

Environmental mitigation and contingency and management plans will be in place to reduce the likelihood of emergency events and to prepare for the management of emergency events on site. If an emergency incident were to occur, it is anticipated that the comprehensive mitigation, contingency plans, and safety strategies will result in a localized and low-intensity response.

A Traffic Management Plan should be in place for all roads affected by construction, which at a minimum outline measures to:

- Control the movement of materials and personnel to and from the construction site
- Post signs to warn oncoming motorists of construction activity
- Control traffic at road crossings
- Reduce on-road disturbance and land closures
- Store equipment as far from the edge of the road as practical
- Install construction barricades at road crossings

Traffic disruptions during construction will be reduced by adherence to the Traffic Management Plan. Guidelines will be developed for vehicular use on the RoW and associated access roads to avoid traffic congestion and accidents. Access to existing transportation infrastructure will be addressed through standard mitigation and will be reversible once the construction phase ends. Additional mitigation and protective measures for roads are outlined in Section 4.4.3 and 4.4.4.

The capacity of waste disposal sites will be considered and if project needs are not easily accommodated, alternative disposal locations will be considered.

Additional consultation with residents and businesses adjacent to the proposed pipeline route will be held in advance of construction commencement. Contact information for a designated Sun-Canadian representative will be available to address questions and concerns during construction. Consultation has been initiated and will continue with municipal personnel.

Net Impacts

Community services and infrastructure appear to have additional capacity to absorb potential increased temporary demands that may result from the project. Adverse effects on traffic will be minimal because the proposed pipeline route crosses Trafalgar Road by HDD and access to the RoW will be by private road off of Trafalgar Road (passenger vehicles). Construction equipment will access the RoW from 6th Line where alternate routes are readily accessible.

Given the available capacity of the local community services and infrastructure, along with the implementation of the mitigation and protective measures outlined above, no significant adverse residual impacts on community services and infrastructure are anticipated.

4.4.3 Perceived Health and Well-Being

Existing Conditions

Health Indicators

Health indicators are measures that are regularly reported and provide relevant information about a population's health or the performance of the health system. This allows for comparable information between regions and can be used to track changes over time (CIHI, 2009).

Statistics Canada and the Canadian Institute for Health Information completed a survey of health indicators to determine the perceived health and well-being of residents aged 12 years and older within the Halton Regional Health Unit. This health unit is a geographical region created by Statistics Canada. The results represent qualitative perceptions of health and well-being from individuals living within these municipalities (Table 4-8).

Table 4.8: Health Indicators, Halton Regional Health Unit and Ontario, 2017/2018

Indicators	Halton Regional Health Unit (%)	Ontario (%)
Perceived health, very good or excellent	69.8	60.7
Perceived mental health, very good or excellent	76.1	69.1
Perceived life stress, most days quite a bit or extremely stressful	23.4	21.6

Source: Statistics Canada, 2019.

In 2017/2018 the population in the project area had perceptions of their health, mental health and life stress which were higher than Ontario as a whole.

Traffic and Congestion

Existing conditions for traffic and congestion are outlined in Section 4.4.2.

Recreation

There are 4 community centres and 10 recreational facilities in Milton providing many services such as ice arenas, aquatic centres and various sports for all ages. There are over 50 parks, 7 conservation areas within CH regulated boundaries. There are 10 18-hole golf courses and golf centres within the Town of Milton.

Potential Impacts

Perceived health and well-being is influenced by a number of factors such as individual lifestyles, social and community networks, living conditions, general socio-economic and environmental conditions. The project has the potential to affect a number of these factors, which could change the way that local residents perceive their health and well-being.

Since perceived health and well-being is influenced by improved economic conditions, the project is expected to have positive effects by creating direct, indirect, and induced employment, and through project spending within the Town of Milton (see Section 4.4.1). There is also the potential to enhance these benefits further by selecting local and Indigenous businesses to provide services to the project, thus increasing economic activity and the associated benefits (see Section 4.4.1). This economic stimulus could increase local spending and increase income for some residents and their families. Higher income from project employment could increase the real and perceived quality of life of some local residents.

Construction activity will temporarily affect the landscape of the construction area and could impede property access. The potential for project activities to interfere with aesthetic value, property enjoyment, access to business, and with the production of nursery products, could have an adverse effect on perceived health and well-being of some residents. Potential safety concerns also exist at locations where properties, residents and vehicles come in proximity to construction activities.

Potential increases in noise, dust, exhaust (see Section 4.4.5) and traffic congestion on roads could also cause stress and affect how people perceive their quality of life. Increased traffic could also impede customer access to businesses.

The temporary workforce may increase demands on existing recreation facilities and conservation areas, including arenas and swimming pools. Since project construction is scheduled to occur during summer and fall months, winter recreation activities will not be affected.

Mitigation and Protective Measures

Mitigation and protective measures for air quality and noise are outlined in Section 4.4.5.

Access to businesses should always be maintained to reduce stress on local residents and safety fences should be installed at the edge of the construction RoW, where public safety considerations are required.

A Traffic Management Plan should be implemented to reduce effects of project-related traffic on traffic volumes, which could reduce access to businesses (see Section 4.4.2). In addition, Sun-Canadian will work with landowners to address specific concerns they may have regarding monetary compensation and their property, such as access and disruption to business.

While pipeline construction activities have the potential to temporarily affect the local landscape, restoration of the construction area will leave little evidence that a pipeline exists in the area.

Additional consultation with residents and businesses along and adjacent to the proposed pipeline route will take place in advance of construction activity. Sun-Canadian will develop an issues resolution framework to help resolve stakeholder issues that may arise during project construction and operation, and to select the appropriate mitigation measures to resolve these issues.

Net Impacts

With planned restoration of the construction site after the proposed pipeline has been built, changes to landscapes are anticipated to be short-term. Additionally, Sun-Canadian will complete restoration of the construction area. This will reduce any adverse impact that construction may have on the aesthetic value placed on the land by residents.

In terms of economic contributions to perceived health and well-being, the effect from local economic activity is anticipated to have a positive effect on residents' perceived health and well-being.

With the implementation of the above mitigation and protective measures, the project is not anticipated to alter the lifestyles of residents. Nor will it adversely affect social and community networks or living and environmental conditions. Therefore, no significant adverse residual impacts on perceived health and well-being are anticipated.

4.4.4 Infrastructure

Existing Conditions

Infrastructure crossed by the proposed pipeline route includes roads, access roads/driveways, hydroelectric lines and a watermain. Other than a private access road at the western extent of the pipeline replacement route, these features will be crossed by HDD. Existing conditions for roads are outlined in Section 4.4.2.

The proposed pipeline route is located adjacent to residences, businesses and a golf course along Trafalgar Road.

The proposed pipeline route intersects with existing overhead hydroelectric and telecommunications utilities.

A variety of buried utilities such as telecommunication cables, low-voltage hydroelectric lines and watermains are in the road RoWs.

Mapped infrastructure crossed by the proposed pipeline route is shown on Figure 13, Appendix C.

Potential Impacts

Construction activity has the potential to temporarily affect access roads and driveways and landscaping features to residences, businesses and the golf course.

The proposed project will be constructed parallel and overlapping an existing Sun-Canadian easement, with some temporary lands required for construction purposes. Where temporary lands are required limited impacts to residences and businesses may occur. The proposed pipeline has the potential to interact with buildings, roads, hydroelectric lines, and buried and overhead utilities. Potential impacts include damage to the infrastructure and harm to personnel.

The crossing of Trafalgar Road will be completed by way of HDD. This has the potential to produce extended periods of noise and vibration. There is also the possibility of extended work hours and the need for construction lighting (due to low light conditions).

Mitigation and Protective Measures

Access to residential properties and businesses should always be maintained to reduce stress on local residents and safety fences should be installed at the edge of the construction RoW, where public safety considerations are required.

Arrangements will be made with the community and landowners for replacement of features that are impacted by construction activities.

Mitigation and protective measures for roads is outlined in Section 4.4.2. Consultation is ongoing with the Region of Halton regarding watermain interaction.

The Contractor will be responsible for locating and exposing existing pipelines and utilities on lands that will be affected by excavation and HDD. During construction, machine operators will be informed where electrical transmission lines are present overhead. Lines that may interfere with the operation of construction equipment will be identified with warning poles and red flags.

When crossing Trafalgar Road, the Traffic Management Plan (Section 4.4.2) and additional traffic controls should be implemented. Sun-Canadian will work with nearby landowners and businesses to develop appropriate mitigation measures for noise, vibration and lighting.

Standard construction mitigation measures will be implemented that include:

- Safety fencing will be erected around bore pits
- Wood decking may be installed to support continuous construction access during wet soil conditions, and assist in protecting vegetation and seed beds
- Excavated topsoil and subsoil for bore pits and temporary work areas will be separated prior to stockpiling
- Erosion and sediment control measures will be installed around soil stockpiles

Net Impacts

With the implementation of the above mitigation and protective measures, no significant adverse residual impacts on infrastructure are anticipated.

4.4.5 Air Quality and Noise

Existing Conditions

The landscape along the proposed pipeline route is urban, commercial, residential and natural heritage. Urban and commercial operations have the potential to expel air emissions through automobile and equipment use.

According to the MECP's Environmental Noise Guideline (2016), the majority of the landscape along the proposed pipeline route would be categorized as a Class 2 area, meaning "an area with an acoustical environment that has quality representative of both Class 1 and Class 3 areas" with an acoustical environmental dominated by the activities of people, usually road traffic during the day, and evening and night background sound defined by natural environment and infrequent human activity.

The area experiences a higher traffic volume on Trafalgar Road that represents a source of noise for most of the proposed pipeline route.

Other minor noise sources within the study area include occasional sounds due to anthropogenic nursery and golf course maintenance activities and occasional sounds due to anthropogenic domestic activities such as property maintenance and recreation.

Potential Impacts

Residential and business properties may experience noise, dust, vibration and equipment exhaust associated with construction activity. During operation, no substantial air or noise emissions are anticipated to occur.

Mitigation and Protective Measures

During construction, motorized construction equipment should be equipped with functioning mufflers and silencers. Company and construction personnel should avoid excessive idling of vehicles; vehicles and equipment should be turned off when not in use unless required for operation. To the greatest extent practical, activities that could create noise should be restricted to daylight hours and adhere to local noise by-laws. Sources of continuous noise, such as portable generators, should be shielded or located to reduce disturbance to residents and businesses.

The Contractor should implement site practices during construction that are in line with the Environment Canada document 'Best Practices for the Reduction of Air Emissions from Construction and Demolition Activities' (Cheminfo Services Inc., 2005), which may include:

- Maintaining equipment in compliance with regulatory requirements
- Protecting stockpiles of friable material with a barrier or windscreen in the event of dry conditions and dust
- Dust suppression of source areas
- Covering loads of friable materials during transport

Watering for dust control must not result in the formation of puddles, rutting by equipment or vehicles, the tracking of mud onto roads or the siltation of watercourses.

See Section 4.2.1 for mitigation and protective measures for blasting activities.

Net Impacts

With the implementation of the above mitigation and protective measures, no significant adverse residual impacts from air quality and noise are anticipated.

4.4.6 Waste Management and Landfills

There are no waste management facilities, active landfills or closed landfills within the study area. Construction activities generate waste that requires appropriate disposal.

Potential Impacts

Improper disposal of waste material generated during construction may result in contamination to soil, groundwater, and/or surface water resources on and off the construction RoW. Litter generated during construction may also become a nuisance to landowners and/or surrounding residents if not contained.

Mitigation and Protective Measures

The Contractor should implement a site-specific waste collection and disposal management plan, which may include:

- Waste materials, sanitary waste and recycling transported off-site by licensed waste contractors.
- The responsible management of fill (see Section 4.2.5).
- Labelling and storage of hazardous and liquid wastes in a secure area that would contain material in the event of a spill.
- Implementation of a waste management program consisting of reduction, reuse, and recycling of materials.

Net Impacts

With the implementation of the above mitigation and protective measures, no significant adverse residual impacts from waste management are anticipated.

4.4.7 Land Use

Existing Conditions

The proposed pipeline route is in the Town of Milton. According to the Town of Milton Official Plan (Town of Milton, 2008), the proposed pipeline route crosses land designated as “Agricultural Area” and “Greenlands A Area”. According to Section 2.6.3.41 “major oil and gas transmission pipelines and related facilities […] shall be permitted in all land use designations with the exception of the Escarpment Natural Area designation and the Greenlands A Area designation within the Niagara Escarpment Plan” (Town of Milton, 2008). The proposed pipeline is outside of the Niagara Escarpment Plan (Niagara Escarpment Commission, 2020).

The proposed pipeline route crosses Trafalgar Road, a designated major arterial road in the Town of Milton Official Plan (2018). According to Section 2.6.3.4 of the Official Plan, major arterial roads “accommodate truck traffic, carry high volumes of traffic and distribute traffic to and from provincial freeways and highways”.

The proposed pipeline route includes areas designated as “protected countryside” under the Greenbelt Plan (Government of Ontario, 2017). These areas are identified under the Greenbelt Plan’s protected countryside. The protected countryside is a continuous agricultural system maintaining the agriculture-food network (Government of Ontario, 2017). According to Section 3.3.3.4 of the Greenbelt Plan, preserving the continuous integrity of utility corridors should be considered by the municipalities for all lands within the protected countryside.

Potential Impacts

As noted above, oil pipelines are permitted facilities in the various municipal land uses, and thus no impacts to municipal land use designations will occur.

Potential impacts on agricultural and non-agricultural businesses are discussed in Section 4.4.1. Potential impacts on uses of land will be interruption to access or use, including potential increases in traffic during construction.

Mitigation and Protective Measures

Mitigation and protective measures for agricultural soils and for businesses are discussed in Sections 4.2.5 and 4.4.1, respectively.

Consultation has been initiated, and will continue, with the Town of Milton as well as landowners along the proposed pipeline route in order to identify methods of minimizing disturbance to property and maintaining access to lands, to the extent possible. Where work is to occur within CA regulated areas, permits will be obtained from CH as per O. Reg. 162/06.

Net Impacts

With the implementation of the above mitigation and protective measures, no significant adverse residual impacts on land use are anticipated.

4.4.8 Archaeological Resources

Existing Conditions

A Stage 1 Archaeological Assessment (AA) (Appendix E) has been conducted for the entire route. A copy of the completed Stage 1 AA report has been submitted to the MHSTCI for review and inclusion in the *Ontario Public Register of Archaeological Reports.*

Initial background research included a review of current land use, historic and modern maps and past settlement history. It also involved a review of previously registered archeological resources within 1 km of the project area and previous archaeological assessments within 50 m.

Overall, the Stage 1 AA determined that the majority of the study area has archaeological potential.

Potential Impacts

The Stage 1 AA determined that the majority of the study area has the potential for archaeological resources due to the proximity to East Sixteen Mile Creek, mapped 19th century structures and previously registered archaeological sites. A map of archaeological potential is provided in Appendix E.

Mitigation and Protective Measures

Based on the findings of the Stage 1 AA, further necessary stages of archaeological assessment (i.e., Stage 2 AA) are required, which will provide for the assessment and mitigation of identified archaeological resources, if any are found. Wherever possible, archaeological sites that are determined to have cultural heritage value and interest should be mitigated in whole or in part by avoidance and

preservation. However, if avoidance and preservation is not feasible, mitigation by excavation is an approved alternative. For identified Indigenous sites that could be subject to impact by the project, Stage 2, 3 and Stage 4 work will include engagement with the appropriate Indigenous community.

Net Effects

With the implementation of the above mitigation and protective measures, no significant adverse residual impacts on archaeological resources are anticipated.

4.4.9 Cultural Heritage Resources

Existing Conditions

A Heritage Checklist (Appendix F) has been completed for the preferred route through agency consultation and review of historic mapping. Based on desktop review and consultation with the Town of Milton, indicators of potential cultural heritage value were identified within the study area. These features will be mapped and further assessed to avoid potential effects on the resources as part of a Cultural Heritage Assessment Report (CHAR).

Potential Impacts

The Project may have the potential to directly impact heritage resources during construction. A CHAR will be completed prior to construction. The report will assess the potential heritage resources, the relationship of each heritage resource to the Project and the impacts of the proposed undertaking on heritage resources. The Report will also provide recommendations pertaining to the mitigation of negative impacts to safeguard these resources during the construction and operation phases of the Project.

Mitigation and Protective Measures

Prior to construction, the above-referenced CHAR will be undertaken and submitted to the MHSTCI for their review and comment. The Report will contain mitigation measures for potential impacts, if required.

Net Impacts

With the implementation of the above mitigation and protective measures, no significant adverse residual impacts on cultural heritage resources are anticipated.

4.4.10 Indigenous Interests

Existing Conditions

ENDM identified the potential for impacts to the following Indigenous communities:

- Mississaugas of the Credit First Nation;
- Six Nations of the Grand River (Six Nations of the Grand River Elected Council);

- Six Nations of the Grand River (Haudenosaunee Confederacy Chiefs); and
- Huron Wendat;

Ontario, as the Crown, has a legal duty to consult with Indigenous peoples regarding projects or decisions that may adversely impact constitutionally protected Indigenous or treaty rights.

Potential Impacts

Although not known to occur, the project may affect traditional territories of Indigenous communities and during construction harvesting and hunting in the construction RoW could be impeded. There is the potential to disturb culturally significant resources or artifacts. Archaeological surveys could also result in the finding of Indigenous artifacts.

Mitigation and Protective Measures

Sun-Canadian has sought input from the identified Indigenous communities and will continue engaging with Indigenous communities as the project moves forward. Information on the current state of Indigenous engagement will be provided in the application to the OEB.

Mitigation and protective measures for archaeology are discussed in Section 4.4.8.

Net Impacts

By undertaking the above engagement and archaeological assessments, no significant adverse residual impacts on Indigenous interests are anticipated.

4.5 SUMMARY OF RECOMMENDATIONS

Table 4-9 provides a summary of the recommended supplemental studies, mitigation and protective measures identified in Sections 4.2-4.4.

Table 4-9: Summary of Potential Impacts and Recommended Mitigation and Protective Measures

Environmental Feature(s)	Potential Impact(s)	Mitigation and Protective Measures
PHYSICAL FEATURES		
Bedrock Geology *Section 4.2.1*	No impacts anticipated.	N/A
Physiography and Surficial Geology *Section 4.2.2*	Disturbance to the overburden along the proposed pipeline is limited to the entry and exit pit locations and may cause surface soil erosion. Slumping may occur within the entry and exit pits during construction.	Surface soil erosion can occur in the absence of vegetative cover. Where there is potential for soil erosion, the need for and location of erosion and sediment control (ESC) measures should be determined by an inspector with appropriate qualifications and installed prior to the commencement of work in the area. When land is exposed, the exposure should be kept to the shortest practical period. Natural features should be preserved to the extent practical. Temporary vegetation and mulching should be used to protect areas as appropriate. Where required, natural vegetation should be re-established as soon as practical. The Contractor must obtain adequate quantities of materials to control erosion. Additional supplies should be maintained in a readily accessible location for maintenance and contingency purposes. ESC structures should be monitored to maintain their effectiveness through the life of construction and post-construction rehabilitation. Extreme precipitation events could result in damage to ESC measures which could lead to erosion. When site conditions permit, ESC measures should be repaired and re-installed on erosion susceptible surfaces. If the erosion is resulting from a construction-related activity, the activity should be halted immediately until the situation is rectified. To avoid the entry and exit pits from slumping, pit walls should be sloped and should be monitored during wet conditions. Trench boxes may be required depending on site specific conditions. ESC and stabilization measures should be maintained during construction, restoration and rehabilitation until vegetative cover is established. Where evidence of erosion exists, corrective control measures should be implemented as soon as conditions permit. Permits obtained from CH may contain conditions pertaining to ESC.
Hydrogeology *Section 4.2.3*	Hydrostatic Testing and Dewatering/Sand-pointing	Hydrostatic Testing and Dewatering/Sand-pointing

Table 4-9: Summary of Potential Impacts and Recommended Mitigation and Protective Measures

Environmental Feature(s)	Potential Impact(s)	Mitigation and Protective Measures
	A hydrostatic test will be undertaken for the proposed pipeline. Where the entry and exit pits encounter shallow groundwater conditions or following a large precipitation event, removing water (known as dewatering) may be necessary. During dewatering, discharge water will be released to the environment. An uncontrolled discharge of water could cause downstream flooding, erosion, sedimentation, or contamination. <u>Private Water Wells</u> There are approximately 24 water supply wells within 500 m of the proposed pipeline route, 14 of which are domestic. There are two water supply wells within 50 m of the proposed pipeline, both of which are domestic. Depending on the proximity to wells, the depth of the well installation and the groundwater levels encountered during excavation, dewatering has the potential to impact water well quality or quantity at some of the overburden supply wells. <u>Municipal Water Supply</u> The proposed pipeline extends through a SGRA and an IPZ associated with the municipal groundwater supply system (Conservation Halton, 2018). Based on *the Clean Water Act* (2006), there are no significant chemical, pathogen or dense non-aqueous phase liquids	For groundwater dewatering, the MECP allows registration under the EASR for construction dewatering projects where groundwater takings will be greater than 50,000 L/day and less than 400,000 L/day; however, should groundwater takings exceed 400,000 L/day, a PTTW may be required from the MECP. If surface water is used as the source water for the hydrostatic test, a PTTW application would be required and would include an assessment of the capacity of the source to provide the required water without impacting the ecosystem, and recommendations for mitigation measures such as screened water intakes to limit intake of debris and organisms and energy dissipation/erosion control measures during discharge to limit erosion and sedimentation. To reduce the potential for erosion and scouring at discharge locations during construction dewatering/sand-pointing and/or hydrostatic testing, energy dissipation techniques should be used. Discharge piping should be free of leaks and should be properly anchored to prevent bouncing or snaking during surging. Protective measures may include dewatering at low velocities, dissipating water energy by discharging into a filter bag or diffuser and utilizing protective riprap or equivalent. If energy dissipation measures are found to be inadequate, the rate of dewatering should be reduced or dewatering discontinued until satisfactory mitigation measures are in place. Discharge should be monitored to make sure that no erosion or flooding occurs. To assess the potential for introduction of contaminated water to soils or bodies of water, testing of hydrostatic and dewatering discharge water should be considered. Testing requirements can be influenced by the nature and quality of the source water used, any additives to the test water, the nature of the pipeline, and pipeline contents. An environmental consultant should be consulted to determine what testing is necessary for the discharge water. <u>Private Water Wells</u> A private well survey should take place to assess domestic groundwater use near the proposed pipeline and a private well monitoring program may be recommended within 100 m of HDD activities for residents who rely on overburden groundwater supply for domestic use.

Table 4-9: Summary of Potential Impacts and Recommended Mitigation and Protective Measures

Environmental Feature(s)	Potential Impact(s)	Mitigation and Protective Measures
	source water threats to municipal supply sources based on the construction or operation of the proposed pipeline.	Municipal Water Supply There are no nearby municipal supply wells, and therefore additional mitigation measures are not required to protect groundwater drinking supply sources. During construction, the primary concern to surface water quality is the potential for a contaminant spill during a large storm event. To address this concern, the following mitigation measures are proposed: Refueling of equipment should be undertaken a minimum of 30 m from wetlands and watercourses to reduce potential impacts to surface water and groundwater quality if an accidental spill occurs. If a 30 m refueling distance is not possible, under approval from on-site environmental personnel, special refueling procedures for sensitive areas should be undertaken that include, at a minimum, using a two-person refueling system with one worker at each end of the hose. To reduce the impact of potential contaminant spills, the Contractor should implement spill management protocols such as secondary containment of any temporary fuel storage and preparation of a spill response plan. Work should be limited or stopped during and immediately following significant precipitation events (i.e. 100-year storm event), at the discretion of on-site environmental personnel.
Extractive Resources: Aggregates and Petroleum Resources *Section 4.2.4*	No impacts anticipated.	N/A
Soil and Soil Capability *Section 4.2.5*	The proposed pipeline route crosses agricultural land. There are potential impacts to topsoil as a result of construction including compaction, loss of organic matter and degraded soil structure. Excess subsoil may be removed from the site. Excavation and construction activities across agricultural land have the potential	Excess Soil It is noted that O.Reg. 406/19 was filed in December 2019 and comes into force January 1, 2021. O.Reg. 406/19 includes regulations for the management of soil on-site as well as the movement of excess soils off-site in the province of Ontario, including stockpile size and setback requirements and environmental soil quality characterization requirements prior to the movement of drilling mud and soil off-site. It is recommended that Sun-Canadian retain a qualified person for environmental site assessment who is knowledgeable in environmental soil quality characterization, as well as O.Reg. 406/19.

Table 4-9: Summary of Potential Impacts and Recommended Mitigation and Protective Measures

Environmental Feature(s)	Potential Impact(s)	Mitigation and Protective Measures
	to affect soil quality and agricultural capability. The movement of heavy machinery on wet soil may cause rutting, compaction, and mixing of topsoil with subsoil. When exposed, soils are more prone to erosion from the loss of vegetative cover. Improperly salvaged topsoil can result in topsoil and subsoil mixing, compaction, rutting, and erosion, which can potentially decrease crop yields.	The Contractor is solely responsible for the location and management of stockpiles on-site as they relate to traffic management, construction staging, and the effective management of construction productivity. With the exception of such variances as may be allowed under O.Reg. 406/19, Soil Rules, and/or site-specific instruments such as Environmental Compliance Approvals (ECAs), stockpiling and storage of soil shall be according to the Soil Rules referenced by O.Reg. 406/19, including, but not limited to, the following: • Managed in such a way as to prevent adverse effects relating to noise, dust, mud tracking, leaching, run-off and erosion, and odour or other air impacts. • Stored in stockpiles with total volume of less than 2,500 m^3. • Soil of different quality, or from different areas, or that has not yet been sampled is segregated. • Stored more than 30 m away from a waterbody, and more than 10 m away from property boundaries. • Stored in a manner that prevents leaching of contaminants into the groundwater. Materials that are surplus and required to be removed from site for disposal or reuse must be tested in accordance with O.Reg. 406/19, Reg. 347, or receiving site requirements under a site-specific instrument to determine management options. For excess soil, the Contractor Qualified Person (QP) shall determine sampling frequency and analytical parameters as required by O.Reg. 406/19 and Reg. 347, and in consultation with the CA. The Contractor QP shall be responsible for the production of all required documentation per O.Reg. 406/19. <u>Wet Soil Shutdown</u> To the extent feasible, construction activities should occur during drier times of the year. Lands affected by heavy rainfall events should be monitored for wet soil conditions, to avoid the potential for topsoil and subsoil mixing and loss of structure. Construction activities should be temporarily halted on agricultural lands where excessively wet soil conditions are encountered, as per Sun-Canadian's standard wet soils shutdown practice. Sun-Canadian's on-site inspection team should determine when construction activities may be resumed.

Table 4-9: Summary of Potential Impacts and Recommended Mitigation and Protective Measures

Environmental Feature(s)	Potential Impact(s)	Mitigation and Protective Measures
		If a situation develops that necessitates construction during wet soil conditions, soil protection measures should be implemented, such as confining construction activity to the narrowest area practical, installing surface protection measures, and using wide tracked or low ground pressure vehicles. <u>High Winds</u> During construction activities, weather should be monitored to identify the potential onset of high wind conditions and to preserve topsoil. In the event that high winds occur, the Contractor should implement protective measures such as: suspend earth moving operations; apply dust suppressants or vegetate the soil stockpiles; protect soil stockpiles with a barrier or windscreen. In conjunction with the above measures, all required materials and equipment should be readily accessible and available for use as required. <u>Soil Stripping</u> Topsoil depths should be measured prior to stripping so that the proper depth of topsoil is removed and replaced. Where stripping is undertaken on agricultural lands, topsoil and subsoil should be stripped and stockpiled separately to avoid mixing. If clean-up is not practical during the construction year, it should be undertaken in the year following construction, starting once the soils have sufficiently dried. Interim soil protection measures should be implemented in sensitive areas to stabilize the RoW for over-wintering. <u>Soil Compaction</u> Where soil has been compacted by the construction process on agricultural lands, an agrologist should determine where decompaction may be necessary. Compaction can be alleviated by using farm equipment such as an agricultural subsoiler prior to replacing the topsoil. Sub-soiling with an agricultural subsoiler, followed by discing, chisel ploughing and cultivating, to smooth the surface, should be considered on agricultural lands. In high traffic areas of the RoW where deep compaction persists, additional deep tillage or subsoiling may be required on a site-specific basis. Soil density and/or penetrometer measurements on and off the easement may be used as a means of assessing the relative degree of soil compaction caused by construction along the RoW as well as determining that the RoW has been sufficiently decompacted.

Table 4-9: Summary of Potential Impacts and Recommended Mitigation and Protective Measures

Environmental Feature(s)	Potential Impact(s)	Mitigation and Protective Measures
		Additionally, rig mats may be utilized during the construction process to aid in reducing the level of soil compaction.
Agricultural Tile Drains *Section 4.2.6*	No impacts anticipated	N/A
Natural Hazards *Section 4.2.7*	A flooding event during construction could result in construction delays, soil erosion, sedimentation of a watercourse, bore pit slumping, and damage or loss of construction equipment and contamination of a watercourse because of equipment entering a watercourse.	If flooding necessitates a change in the construction schedule, affected landowners and regulatory agencies should be notified and construction should continue at non-affected locations. Temporary workspaces should be located above the floodplain to the extent practical, unless necessary for watercourse crossings. All work in the floodplains will be subject to a permit from CH.
BIOPHYSICAL FEATURES		
Aquatic Features *Section 4.3.1*	The proposed pipeline will cross underneath East Sixteen Mile Creek using the HDD method. The HDD process involves drilling a pilot bore hole underneath the watercourse and back-reaming the bore hole to the drill rig. Once the hole is of a sufficient diameter the pipeline is pulled into the hole by the drill rig. HDD typically uses a mixture of freshwater and bentonite to flush drill cutting from the hole and to act as a lubricant. The points of drill entry and exit will be outside the limits of the Sixteen Mile Creek valley. Therefore, there will be no disturbance in the active channel of the watercourse, nearshore habitats, or floodplain and riparian areas. No areas	The following general environmental mitigation measures should be taken to protect fish and fish habitat: • Data obtained from the geotechnical report aided in determining the feasibility of the HDD drill path. • Design the directional drill so that drilling slurry pressure is minimized, and the drilling rate is reduced in porous materials to minimize the chance of loss of circulation of the drilling slurry. • HDD should be completed within the permitted construction timing window of July 1 to September 15 to protect sensitive life stages for Silver Shiner and fishes in general. This window was established based on communications with MECP staff for a project in the CH jurisdiction. • An experienced and certified environmental monitor (i.e., a Certified Inspector of Sediment and Erosion Control [CISEC]) should be on site during HDD activities. • Prior to removal of the vegetation cover, effective mitigation techniques for erosion and sedimentation should be in place to protect water quality. Disturbance to the area during construction should be limited and

Table 4-9: Summary of Potential Impacts and Recommended Mitigation and Protective Measures

Environmental Feature(s)	Potential Impact(s)	Mitigation and Protective Measures
	considered to be fish habitat or habitat for Silver Shiner will be disturbed. HDD is intended to be a less intrusive construction method than traditional open cut crossing of a watercourse. However, there is a possibility of surface (water, riparian, wetland) disturbance if an inadvertent release of drilling fluid or a release of sediment laden groundwater occurs. There is also the potential for sediment laden water or other deleterious substances to enter a surface water feature as the result of grading, drilling excavations, equipment washing, or other construction related activities during directional boring. Inadvertent releases are typically caused by the pressurization of the drill hole beyond the containment capability of the near surface geologic materials (soil and/or rock). Therefore, the type and depth of these materials, as well as the drilling pressure, are key factors in preventing and managing frac-outs.	grubbing activities should be delayed until immediately prior to grading operations. • A drilling mud release contingency plan should be prepared and kept on-site. • Install as appropriate berms, silt fencing and secondary containment measures (i.e., plastic tarp) around drilling and drilling mud management equipment at both bore entry and bore exit locations to contain operational spills. • Immediately contain any drilling mud that escapes onto land and transfer it into an on-site containment system. • Temporary erosion and sediment control measures should be maintained and kept in place until work within or near a watercourse has been completed and stabilized. Temporary sediment control measures should be removed at the completion of the work but not until permanent erosion control measures have been established. • Construction material, excess material, construction debris and empty containers should be stored a minimum of 30 m from watercourses and watercourse banks, where practical. • Equipment maintenance and refueling should be controlled to prevent entry of petroleum products or other deleterious substances, including any debris, waste, rubble, or concrete material, into a watercourse, unless otherwise specified in the contract. • Deleterious substances (fuel, oil, spoil) should be stored a minimum of 30 m from the watercourse. Any such material that inadvertently enters a watercourse should be removed in a manner satisfactory to the environmental inspector. • Maintain smooth operation of the drilling string and slurry pumping systems to avoid pressure surges. • Reduce slurry viscosity through appropriate filtering of drilled material to reduce the pressure gradient along the drill path due to frictional effects.

Table 4-9: Summary of Potential Impacts and Recommended Mitigation and Protective Measures

Environmental Feature(s)	Potential Impact(s)	Mitigation and Protective Measures
		• Continually monitor slurry volumes to enable a quick response to any indications of lost circulation. • Clean up operational spills daily to prevent mobilization of drilling mud off site during rain events. • Drilling mud should be disposed in accordance with the appropriate regulatory authority requirements. • Following construction, any disturbed vegetation will be restored to pre-construction conditions to the extent possible in accordance with environmental permits. <u>Bore Path Collapse Mitigation Measures</u> The following mitigation measures should be applied as recommended by geotechnical studies to prevent HDD borehole collapse from occurring in susceptible soils: • Fluid volumes, annular pressure and cutting returns should be strictly monitored to ensure bore hole plugging and fluid losses are detected and addressed immediately. • Alternative drill paths should be evaluated to minimize exposure to challenging soil materials. • Drilling mud should be maintained in the borehole until the pipeline is installed. This can be facilitated by positioning the entry and exit points in areas with cohesion less soils (e.g., silt-sand zones). <u>Contingency Plan</u> A drilling mud release contingency plan should be prepared and kept on-site. Spills containment and clean-up procedures will be implemented immediately in the unlikely event of a spill. The proponent will immediately contact the Ministry of Environment and Conservation and Parks (MECP) Spills Action Centre. The MECP Spills Action Centre is the first point of contact for spills at the provincial and federal level. In addition, the following agencies will be contacted: • DFO (Toll-free: 1-855-852-8320) • MNRF (Toll-free:1-866-517-0571)

Table 4-9: Summary of Potential Impacts and Recommended Mitigation and Protective Measures

Environmental Feature(s)	Potential Impact(s)	Mitigation and Protective Measures
		• CH (Tel: 1-905-336-1158) A contingency plan will be in place to effectively address inadvertent releases of sediment through frac-outs, or other releases of sediment laden water from the project site. The contingency plan outlines the steps that the Contractor is to take in the event of a sediment release or other type of spill. The contingency plan will also outline the steps involved to mitigate an inadvertent release after it occurs. If a sediment spill occurs within the watercourse, adequate isolation of the release should be provided to contain the sediment. For example, a vacuum truck may be on-site during construction and ready to remove the drilling fluid and any other frac out soil. The following materials should be readily available during drilling operations and prepared to employ them in the event of a drilling mud spill or inadvertent release: sand bags, straw bales, silt fencing and a hydrovac truck. All products used on site are to be environmentally safe. Inadvertent release mitigation wells may also be considered to relieve drilling pressures. The Contingency Plan should indicate if, and when, HDD activities are to resume. For example, when mitigation measures have been implemented are deemed to be effective at mitigating potential ecological impacts.
Designated Natural Areas and Vegetation *Section 4.3.2*	Where there is natural vegetation within or adjacent to the proposed pipeline route, potential impacts include the removal of native vegetation, introduction or spread of invasive species, and indirect effects such as dust, erosion, and accidental spills.	Environmental mitigation and protective measures during construction include the following: • Where the RoW abuts a woodland on one side, detailed design should avoid the feature where possible. • Determine municipal requirements or permits for tree removal (if required) prior to construction. • Clearing should be minimized/avoided to the extent possible in sensitive areas such as woodlots, along watercourses, adjacent to the ANSI and in areas of significant groundwater recharge. • The limits of clearing should be surveyed and staked in the field, to allow for the protection of off-site natural areas and vegetation. • All brush and trees should be felled (if required) within the project footprint.

Table 4-9: Summary of Potential Impacts and Recommended Mitigation and Protective Measures

Environmental Feature(s)	Potential Impact(s)	Mitigation and Protective Measures
		• Clearing should be done during dry soil conditions to the extent practical to limit disturbance to vegetation and terrain. • Precautionary measures (e.g., equipment washing before site access) may be necessary to mitigate for the spread of non-native species. • A re-vegetation program should be initiated for all vegetated temporary work areas. Sun Canadian should consult with landowners and CH to confirm replanting plans. • Seeding of the disturbed temporary work areas and permanent easement should be done with a native seed mix reviewed CH. Replaced soils should contain native seed bank, facilitating successful revegetation. • One year following construction, planted vegetation should be inspected for survival; in areas of severe dieback, dead and diseased planted vegetation should be replaced. Mitigation and protective measures are outlined in Section 4.4.5 for dust, Section 4.2.2 for erosion and Section 4.3.1 for accidental spills.
Wildlife, Wildlife Habitat and Species at Risk *Section 4.3.3*	Potential impacts on wildlife and wildlife habitat from construction include direct mortality from construction vehicles, habitat destruction through vegetation removal, habitat degradation through spills and sensory disturbance of wildlife during construction.	Environmental mitigation and protective measures during construction include the following: • Detailed design of the proposed pipeline should be reviewed to avoid and reduce the likelihood of impact upon wildlife habitat to the extent possible, and in particular habitats of Endangered, Threatened, Special Concern and rare species. • Equipment and vehicles should yield the RoW to wildlife. • Fencing should be erected around deep excavations to prevent wildlife entrapment. • The Contractor should inform their personnel to not threaten, harass or injure wildlife. • If wildlife are encountered during construction, personnel are required to move away from the animal and wait for the animal to move off the construction site. • A butternut tree is located within 25m of the pipeline laydown area. Avoidance of the tree is recommended. For work within 25m of the trees, consultation with MECP is recommended to confirm requirements under the ESA.

Table 4-9: Summary of Potential Impacts and Recommended Mitigation and Protective Measures

Environmental Feature(s)	Potential Impact(s)	Mitigation and Protective Measures
		• Tree removal is not anticipated; however if removal of trees identified as potential bat maternity roots is required, removal should not occur between April 1 and October 1 to avoid direct impacts to bats. Consultation with MECP is recommended to confirm requirements under the ESA. • Silt fencing is recommended along the perimeter of the HDD work zone to prevent encroachment into East Sixteen Mile Creek, exclude reptiles and amphibians during their active period (approximately April 1 – October 31), as well as prevent sedimentation. • Construction activities with the potential to remove migratory bird habitat, such as vegetation clearing, should be avoided during the breeding season which is generally from April 1- August 31 in southern Ontario (Environment Canada, 2017). Should vegetation clearing activities be unavoidable during this window, a mitigation program should be developed, which includes measures to reduce and avoid impacts to migratory birds and their nests (Government of Canada, 2018). This program should include preventative and mitigation measures but may also include avoidance of clearing during key sensitive periods and in key locations. • If SAR are encountered during the proposed pipeline replacement, work will stop and consultation with the MECP regarding the potential need for a permit under the ESA and/or species-specific mitigation will be conducted. Mitigation and protective measures are outlined in Section 4.3.2 for vegetation removal and Section 4.3.1 for accidental spills.
SOCIO-ECONOMIC ENVIRONMENT		
Employment and Business *Section 4.4.1*	Project demands for labour and goods and services can result in both beneficial and adverse effects. Positive effects may not be evenly distributed among populations, with some residents in a better position to receive economic benefits than others. Similarly, adverse effects may affect some residents more than others. Residual effects on employment are related to the project's labour demand	It is expected that the project will generally result in positive effects on employment by employing local and Indigenous people, and by reducing the unemployment rate in the region. These positive effects do not require mitigation, but Sun-Canadian will identify and implement various mechanisms to enhance project benefits. The potential effects of the project because employment opportunities and purchasing local goods and services is expected to be positive during construction and operation, so no mitigation will be required. With respect to potential adverse effects on agricultural and non-agricultural businesses (commercial and industrial), Sun-Canadian will engage with land

Table 4-9: Summary of Potential Impacts and Recommended Mitigation and Protective Measures

Environmental Feature(s)	Potential Impact(s)	Mitigation and Protective Measures
	compared to the labour supply. Three types of employment are considered: • Direct employment: labour that is hired directly for the project • Indirect employment: labour hired by companies to produce and provide goods and services needed for the project • Induced employment: labour hired by industries that produce and provide consumer items and services purchased by people who are directly or indirectly employed by the project Labour conditions will be affected by direct, indirect and induced employment during all project phases. The project could affect business through purchases of labour, goods and services from local businesses, including businesses owned by Indigenous peoples, and will result in increased local employment income and municipal government revenue. Local businesses will likely benefit from supplying the project with goods and services. Land clearing and other construction-related project activities could adversely affect agricultural productivity and operations, and businesses along the proposed pipeline route that include PAO Horticultural, Jade Gardens & Greenhouse and Piper's Heath Golf Club. Other potential adverse effects include impairment to the use and enjoyment of	owners, business operators, and the Town of Milton to address access to the project area, the portion of land that will be altered as part of site preparation, long-term changes to agricultural and non-agricultural land and the development of appropriate and feasible mitigation measures.

Table 4-9: Summary of Potential Impacts and Recommended Mitigation and Protective Measures

Environmental Feature(s)	Potential Impact(s)	Mitigation and Protective Measures
	property and conflicts with farm machinery and other vehicular movement.	
Community Services and Infrastructure *Section 4.4.2*	The presence of temporary workers in the local communities during the construction period has the potential to increase the demand for housing and local community services and infrastructure. Non-local project workers are expected to stay in temporary accommodations, including hotels, motels, and campgrounds. They may also choose to rent houses or apartments. The vacancy rate for temporary rentals will likely be able to accommodate the temporary increase. The short duration that the workers will reside near any one community, as well as the structure of the work shifts, will limit the need for workers to use the services and infrastructure in local communities. The transportation of project goods, services and workers has the potential to lead to increased use of existing transportation infrastructure. Also, increased traffic volumes along local road networks could increase travel times and reduce road safety, which might lead to increased use of local emergency services due to potential vehicle accidents and workplace accidents. In addition, the production of project-related waste could place additional stress on the capacity of local landfills.	Project employees might require medical attention while staying in the area. The Contractor and Sun-Canadian will have emergency response equipment and trained personnel on-site during construction. In addition, an Emergency Response Plan will be developed and implemented, which will address field health services, emergency call-out procedures and fire response plans. Safety fencing will be used where necessary to separate the work area. Environmental mitigation and contingency and management plans will be in place to reduce the likelihood of emergency events and to prepare for the management of emergency events on site. If an emergency incident were to occur, it is anticipated that the comprehensive mitigation, contingency plans, and safety strategies will result in a localized and low-intensity response. A Traffic Management Plan should be in place for all roads affected by construction, which at a minimum outline measures to: • Control the movement of materials and personnel to and from the construction site • Post signs to warn oncoming motorists of construction activity • Control traffic at road crossings • Reduce on-road disturbance and land closures • Store equipment as far from the edge of the road as practical • Install construction barricades at road crossings Traffic disruptions during construction will be reduced by adherence to the Traffic Management Plan. Guidelines will be developed for vehicular use on the RoW and associated access roads to avoid traffic congestion and accidents. Access to existing transportation infrastructure will be addressed through standard mitigation and will be reversible once the construction phase ends. The capacity of waste disposal sites will be considered and if project needs are not easily accommodated, alternative disposal locations will be considered. Additional consultation with residents and businesses adjacent to the proposed pipeline route will be held in advance of construction commencement. Contact

Table 4-9: Summary of Potential Impacts and Recommended Mitigation and Protective Measures

Environmental Feature(s)	Potential Impact(s)	Mitigation and Protective Measures
		information for a designated Sun-Canadian representative will be available to address questions and concerns during construction. Consultation has been initiated and will continue with municipal personnel. The proposed pipeline does not cross any roads and access to the RoW will be by private road off of Trafalgar Road (passenger vehicles). Construction equipment will access the RoW from 6th Line where alternate routes are readily accessible.
Perceived Health and Well-Being *Section 4.4.3*	Perceived health and well-being is influenced by a number of factors such as individual lifestyles, social and community networks, living conditions, general socio-economic and environmental conditions. The project has the potential to affect a number of these factors, which could change the way that local residents perceive their health and well-being. Since perceived health and well-being is influenced by improved economic conditions, the project is expected to have positive effects by creating direct, indirect, and induced employment, and through project spending within the Town of Milton (see Section 4.4.1). There is also the potential to enhance these benefits further by selecting local and Indigenous businesses to provide services to the project, thus increasing economic activity and the associated benefits (see Section 4.4.1). This economic stimulus could increase local spending and increase income for some residents and their families. Higher income from project employment could increase the real and	Mitigation and protective measures for air quality and noise are outlined in Section 4.4.5. Access to businesses should always be to reduce stress on local residents and safety fences should be installed at the edge of the construction RoW, where public safety considerations are required. A Traffic Management Plan should be implemented to reduce effects of project-related traffic on traffic volumes, which could reduce access to businesses and farmland (see Section 4.4.2). In addition, Sun-Canadian will work with landowners to address specific concerns they may have regarding monetary compensation and their property, such as access and disruption to business. While pipeline construction activities have the potential to temporarily affect the local landscape, restoration of the construction area will leave little evidence that a pipeline exists in the area. Additional consultation with residents and businesses along and adjacent to the proposed pipeline route will take place in advance of construction activity. Sun-Canadian will develop an issues resolution framework to help resolve stakeholder issues that may arise during project construction and operation, and to select the appropriate mitigation measures to resolve these issues.

Table 4-9: Summary of Potential Impacts and Recommended Mitigation and Protective Measures

Environmental Feature(s)	Potential Impact(s)	Mitigation and Protective Measures
	perceived quality of life of some local residents. Construction activity will temporarily affect the landscape of the construction area and could impede property access. Construction activities also have the potential to disturb the perceived aesthetic value that residents place on their property and the area in general. The potential for project activities to interfere with aesthetic value, property enjoyment, access to business and production of nursery products, could have an adverse effect on perceived health and well-being of some residents. Potential safety concerns also exist at locations where properties, residents and vehicles come in proximity to construction activities. Potential increases in noise, dust, exhaust (see Section 4.4.5) and traffic congestion on roads could also cause stress and affect how people perceive their quality of life. Increased traffic could also impede customer access to businesses. The temporary workforce may increase demands on existing recreation facilities and conservation areas, including arenas and swimming pools. Since project construction is scheduled to occur during summer and fall months, winter recreation activities will not be affected.	
Infrastructure *Section 4.4.4*	Construction activity has the potential to temporarily affect access roads and driveways and landscaping features to	Access to residential properties and businesses should always be maintained to reduce stress on local residents and safety fences should be installed at the edge of the construction RoW, where public safety considerations are required.

Table 4-9: Summary of Potential Impacts and Recommended Mitigation and Protective Measures

Environmental Feature(s)	Potential Impact(s)	Mitigation and Protective Measures
	residences, businesses and the golf course. The proposed project will be constructed parallel and overlapping an existing Sun-Canadian easement, with some temporary lands required for construction purposes. Where temporary lands are required limited impacts to residences and businesses may occur. The proposed pipeline has the potential to interact with buildings, roads/highways, hydroelectric lines, and buried and overhead utilities. Potential impacts include damage to the infrastructure and harm to personnel. The crossing of Trafalgar Road will be completed by way of Horizontal Directional Drill (HDD). This has the potential produce extended periods of noise and vibration. There is also the possibility of extended work hours and the need for construction lighting (due to low light conditions).	Arrangements will be made with the community and landowners for replacement of features that are impacted by construction activities. Mitigation and protective measures for roads is outlined in Section 4.4.2. Consultation is ongoing with the Region of Halton regarding watermain interaction. The Contractor will be responsible for locating and exposing existing pipelines and utilities on lands that will be affected by excavation and HDD. During construction, machine operators will be informed where electrical transmission lines are present overhead. Lines that may interfere with the operation of construction equipment will be identified with warning poles and red flags. When crossing Trafalgar Road the Traffic Management Plan (Section 4.4.2) and additional traffic controls should be implemented. Sun-Canadian will work with nearby landowners and businesses to develop appropriate mitigation measures for noise, vibration and lighting. Standard construction mitigation measures will be implemented that include: • Safety fencing will be erected around bore pits • Wood decking should be installed to support continuous construction access during wet soil conditions, and assist in protecting vegetation and seed beds • Excavated topsoil and subsoil for bore pits will be separated prior to stockpiling • Erosion and sediment control measures will be installed around soil stockpiles
Air Quality and Noise *Section 4.4.5*	Residential and business properties may experience noise, dust, vibration and equipment exhaust associated with construction activity. During operation, no substantial air or noise emissions are anticipated to occur.	During construction, motorized construction equipment should be equipped with functioning mufflers and silencers. Company and construction personnel should avoid excessive idling of vehicles; vehicles and equipment should be turned off when not in use unless required for operation. To the greatest extent practical, activities that could create noise should be restricted to daylight hours and adhere to local noise by-laws. Sources of continuous noise, such as portable generators, should be shielded or located to reduce disturbance to residents and businesses. The Contractor should implement site practices during construction that are in line with the Environment Canada document ‘Best Practices for the Reduction of Air

Table 4-9: Summary of Potential Impacts and Recommended Mitigation and Protective Measures

Environmental Feature(s)	Potential Impact(s)	Mitigation and Protective Measures
		Emissions from Construction and Demolition Activities' (Cheminfo Services Inc., 2005), which may include: • Maintaining equipment in compliance with regulatory requirements • Protecting stockpiles of friable material with a barrier or windscreen in the event of dry conditions and dust • Dust suppression of source areas • Covering loads of friable materials during transport Watering for dust control must not result in the formation of puddles, rutting by equipment or vehicles, the tracking of mud onto roads or the siltation of watercourses.
Waste Management and Landfills *Section 4.4.6*	Improper disposal of waste material generated during construction may result in contamination to soil, groundwater, and/or surface water resources on and off the construction RoW. Litter generated during construction may also become a nuisance to landowners and/or surrounding residents if not contained.	The Contractor should implement a site-specific waste collection and disposal management plan, which may include: • Waste materials, sanitary waste and recycling transported off-site by licensed waste contractors. • The responsible management of fill (see Section 4.2.5). • Labelling and storage of hazardous and liquid wastes in a secure area that would contain material in the event of a spill. • Implementation of a waste management program consisting of reduction, reuse, and recycling of materials.
Land Use *Section 4.4.7*	Oil pipelines are permitted facilities in the various municipal land uses, and thus no impacts to municipal land use designations will occur. Potential impacts on agricultural and non-agricultural businesses are discussed in Section 4.4.1. Potential impacts on uses of land will be interruption to access or use, including potential increases in traffic during construction.	Mitigation and protective measures for agricultural soils and for businesses are discussed in Sections 4.2.5 and 4.4.1, respectively. Consultation has been initiated, and will continue, with the Town of Milton as well as landowners along the proposed pipeline route in order to identify methods of minimizing disturbance to property and maintaining access to lands, to the extent possible. Where work is to occur within CA regulated areas, permits will be obtained from CH as per O. Reg. 162/06.
Archaeological Resources	The Stage 1 AA determined that the majority of the study area has the potential for recovery of archaeological resources	Based on the findings of the Stage 1 AA, further necessary stages of archaeological assessment (i.e., Stage 2 AA) are required, which will provide for the assessment and mitigation of identified archaeological resources, if any are

Table 4-9: Summary of Potential Impacts and Recommended Mitigation and Protective Measures

Environmental Feature(s)	Potential Impact(s)	Mitigation and Protective Measures
Section 4.4.8	due to the proximity to East Sixteen Mile Creek, mapped 19th century structures and previously registered archaeological sites.	found. Wherever possible, archaeological sites that are determined to have cultural heritage value and interest should be mitigated in whole or in part by avoidance and preservation. However, if avoidance and preservation is not feasible, mitigation by excavation is an approved alternative. For identified Indigenous sites that could be subject to impact by the project, Stage 2, 3 and Stage 4 work will include engagement with the appropriate Indigenous community.
Cultural Heritage Resources *Section 4.4.9*	The Project may have the potential to directly impact heritage resources during construction. A CHAR will be completed prior to construction. The report will assess the potential heritage resources, the relationship of each heritage resource to the Project and the impacts of the proposed undertaking on heritage resources. The Report will also provide recommendations pertaining to the mitigation of negative impacts to safeguard these resources during the construction and operation phases of the Project.	Prior to construction, the above-referenced CHAR will be undertaken and submitted to the MHSTCI for their review and comment. The Report will contain mitigation measures for potential impacts, if required.
Indigenous Interests *Section 4.4.10*	Although not known to occur, the project may affect traditional territories of Indigenous communities and during construction harvesting and hunting in the construction RoW could be impeded. There is the potential to disturb culturally significant resources or artifacts. Archaeological surveys could also result in the finding of Indigenous artifacts. Potential permits and approvals required for the project (see Section 1.2.5) may trigger a duty to consult.	Sun-Canadian has sought input from the identified Indigenous communities and will continue engaging with Indigenous communities as the project moves forward. Information on the current state of Indigenous engagement will be provided in the application to the OEB. Mitigation and protective measures for archaeology are discussed in Section 4.4.8.

5.0 CUMULATIVE EFFECTS ASSESSMENT

The recognition of cumulative effects assessment as a best practice is reflected in many regulatory and guidance documents. Regarding the development of hydrocarbon pipelines in Ontario, the *OEB Environmental Guidelines* (2016) note that cumulative effects of pipeline construction should be identified and discussed in the ER as an integral part of the assessment.

Building upon the intent of the *OEB Environmental Guidelines* (2016), the OEB has specified that only those effects that are additive or that interact with effects that have already been identified as resulting from the Project are to be considered under cumulative effects. In such cases, it will be necessary to determine whether these effects warrant mitigation measures such as alterations in routing, timing of construction, or other measures that can address the cumulative effects. The cumulative effects assessment (CEA) has been prepared with consideration of this direction from the OEB.

5.1 METHODOLOGY

This assessment describes the potential cumulative effects resulting from the interaction of residual effects of the construction and operation of the proposed pipeline with the effects of other unrelated projects. The other projects assessed are those that are either existing or approved and that have a high likelihood of proceeding.

Cumulative effects include the temporal and spatial accumulations of change that occur within an area or system due to past, present, and future activities. Change can accumulate within systems by either an additive (i.e., cumulative) or interactive (i.e., synergistic) manner. Positive residual effects, such as the continued supply of oil, employment or in property taxes, have not been assessed in the CEA.

By applying the principles of avoidance, minimization, and compensation to limit project-specific effects, potential adverse residual effects on environmental and socio-economic features have been greatly limited before accounting for the effects of other unrelated projects.

The cumulative effects assessment methodology is designed to evaluate and manage the additive and interactive effects from the following sources:

- Existing infrastructure, facilities, and activities as determined from available data sets
- The proposed pipeline
- Future activities where the undertaking will proceed, or has a high probability of proceeding

Although rare in occurrence, it is plausible that accidents or emergency events may arise due to an unforeseen chain of events during the project's construction or operational life. Due to the rarity and magnitude of such events, they have not been assessed here, as they are extreme in nature when

compared to the effects of normal construction and operation activities and require separate response plans.

5.2 STUDY BOUNDARIES

Spatial

To make assumptions about the magnitude and probability of effects, an approximate 100 m boundary around the proposed pipeline route was used for the CEA. The 100 m boundary has been found, through previous experience with pipeline construction, to be appropriate for the most common net effects. The boundary selected is considered conservative in terms of managing both effects and risks in that it considers all those features and areas that could be affected by construction.

Temporal

The temporal boundaries for the CEA reflect the nature and timing of project activities, and the availability of information surrounding future projects with a high probability of proceeding. The project schedule identifies three key milestone activities:

1. ER and technical design – 2020/2021
2. Construction – 2022 (summer and fall)
3. Operation and Maintenance – 2022 to 2072*

**Fifty years of operation is used as an assumption, although the pipeline may be operational beyond fifty years.*

Based upon these milestone activities, two time periods were selected for evaluation: 2022 and 2024. The year 2022 was selected to represent the construction period, and the year 2024 was selected to represent the operation and maintenance period. Forecasting beyond 2024 increases the uncertainty in predicting whether projects will proceed, and the effects associated with these projects.

5.3 PROJECT INCLUSION LIST

The project inclusion list was developed by reviewing publicly available information for projects and activities with the potential to interact with the identified effects of the proposed pipeline within the spatial and temporal study boundaries. The following resources were reviewed:

- Impact Assessment Agency of Canada, Canadian Impact Assessment Registry (IAAC, 2020)
- Government of Ontario, Environmental Assessment Projects by Category (Government of Ontario, 2020)
- Ministry of Transportation (MTO), Southern Highways Program (2017-2021) (MTO, nd)
- Halton Region, Construction Projects (2020)

- Town of Milton, Town Projects (2019)
- Canada Energy Regulator, Major Facilities Applications (CER, 2020)
- OEB Applications Currently Before the Board (facilities applications only) (OEB, 2020)

Based on the review of publicly available resources, the project inclusion list in Table 5-1 identifies the following projects for consideration of cumulative effects:

Table 5.1: Project Inclusion List for Cumulative Effects

Project Name	Project Location	Proponent	Schedule	Project Description	Interaction with the Proposed Pipeline
Trafalgar Secondary Plan	The Trafalgar Secondary Plan is in the Town of Milton's Urban Expansion Area, bounded by Derry Road (north), Eighth Line (east), and Greenbelt Plan Area (south/west)	Town of Milton	Halton Region is reviewing the Plan as of March 25, 2019. The overall growth and development plan for the Town of Milton is scheduled from 2021 – 2031.	A proposed major transit station was identified in the area at Derry and Trafalgar Roads. This area is physically separated from the urban area by the Sixteen Mile Creek Valley and has an opportunity to accommodate higher density development and taller buildings.	Potential for traffic management issues and congestion due to construction vehicles.
*Milton Logistics Hub Project[1]	Milton, Ontario	Canadian National Railway Company	The IAAC is currently hosting virtual information sessions on the potential environmental assessment conditions of the project.	The Canadian National Railway Company is proposing the construction and operation of a logistics hub, designed to transfer containers between trucks and railcars.	Potential for traffic management issues and congestion due to construction vehicles.
*Britannia Road Corridor Improvement	Milton, ON (James Snow Parkway to Highway 407)	Halton Region	Construction for the James Snow Parkway to Highway 407 segment anticipated to start in 2020 and conclude in 2024	To accommodate growth, provide safe alternative transit options and improve traffic flow, Halton Region is planning to make improvements to Britannia Road.	Britannia Road is parallel to the proposed pipeline route, located approximately 600m north-west of the proposed route. This may result in traffic management issues and congestion due to construction vehicles.

1. Canadian National Railway Company (2019)

*The projects referenced are more that 100 m away however are large in magnitude and therefore have been included in this assessment to be conservative.

In addition to the above, it is assumed that on-going improvements, upgrades and maintenance to municipal infrastructure such as bridges, culverts, drains or roads will occur within the spatial and temporal study boundaries.

5.4 ANALYSIS OF CUMULATIVE EFFECTS

Sections 4.2-4.4 of the ER consider the potential impacts of the project on specific features and conditions and propose mitigation and protective measures to eliminate or reduce the potential impacts. The cumulative effects assessment evaluates the significance of residual impacts (after mitigation) of the project along with the effects of other unrelated projects.

5.4.1 Construction – Summer and Fall 2022

Residual project impacts which may occur during project construction are outlined in Sections 4.2-4.4. To consider the additive and interactive effects at their maximum intensity, the cumulative effects assessment assumes that construction of other unrelated projects and the proposed pipeline construction will occur concurrently.

Potential cumulative effects resulting from the proposed pipeline construction and the concurrent projects are additive effects on soil, vegetation, wildlife and wildlife habitat, air quality and the acoustic environment.

Soil

Soil erosion and reduced soil capability is a potential residual effect associated with construction of the project. Mitigation and protective measures for soil are outlined in Section 4.2.2. Provided that concurrent projects follow mitigation measures similar to those outlined in this report, the probability of erosion control failure occurring concurrently is low and based on the nature of the proposed projects the magnitude of such an event would be low. As such, adverse cumulative residual effects on the natural environment from erosion are not anticipated to be significant, and cumulative effects on soil capability are not anticipated to occur.

Vegetation

Where there is natural vegetation within or adjacent to the proposed pipeline route, potential impacts include the removal of native vegetation, and indirect effects such as dust, erosion, and accidental spills. However, with the implementation of the mitigation and protective measures outlined in this report, such as vegetation replanting, and provided that concurrent projects follow mitigation measures similar to those outlined in this report, adverse cumulative residual effects on vegetation are not anticipated to be significant.

Wildlife and Wildlife Habitat

Potential residual effects on wildlife and wildlife habitat associated with construction of the project are accidental direct mortality, habitat removal and sensory disturbance. Mitigation and protective measures for wildlife and wildlife habitat are outlined in Section 4.3.3. In the event of project-related wildlife deaths, the MNRF and/or MECP will be contacted. If mortality occurs between concurrent projects for similar species, the Ministry will be able to note the occurrences and coordinate with Sun-Canadian to adjust construction activities. Potential cumulative effects resulting from sensory disturbance (i.e., noise, air pollution and dust) are discussed below.

Provided that the above measures are undertaken, and provided that concurrent projects follow mitigation measures similar to those outlined in this report, adverse cumulative residual effects on wildlife and wildlife habitat will be of low probability and will be mitigated as coordinated through the MECP, and therefore are not anticipated to be significant.

Air Quality and Acoustic Environment

Potential residual effects on air quality associated with construction of the project and concurrent projects are an increase in noise and air pollutants from operation of vehicles and equipment, and an increase in dust from construction activities. Mitigation and protective measures for air quality and the acoustic environment are outlined in Section 4.4.5. Provided that the concurrent projects follow mitigation measures similar to those outlined in this report, cumulative effects will be of low magnitude and reversible. Therefore, adverse residual cumulative effects on air quality and the acoustic environment are not anticipated to be significant.

5.4.2 Operation and Maintenance – Year 2024

Development and maintenance activities which have a probability of proceeding during operation and maintenance of the project include:

- Road works: Future road rehabilitation and resurfacing
- Water works: Future installation of water and wastewater pipelines
- Pipeline construction and maintenance: Future pipeline construction and maintenance of existing hydrocarbon pipelines

Operation and maintenance activities undertaken by Sun-Canadian will be completed in a manner that considers potential impacts on natural heritage and socio-economic environment. Appropriate mitigation measures will be developed and implemented based on the proposed maintenance work. Sun-Canadian will obtain all necessary agency permits and approvals, as required. Given the limited scale of impact of any potential operation and maintenance activities, it is anticipated that residual impacts will be minimal and that should any interaction occur with other projects, significant adverse residual effects are not anticipated to be significant.

5.5 SUMMARY OF CUMULATIVE EFFECTS

The potential cumulative effects of the project were assessed by considering development that has a high probability of proceeding just prior to or concurrent with construction of the project. An approximate 100 m boundary around the project site was used to assess the potential for additive and interactive effects of the project and other developments on environmental and socio-economic features.

Municipal projects may contribute to cumulative effects within the study boundaries. Improvements to municipal infrastructure such as bridges, culverts, drains or roads may occur during the operational phase of the project. The cumulative effects assessment determined that, provided the mitigation and protective measures outlined in this report are implemented and that concurrent projects implement similar mitigation and protective measures, potential cumulative effects are not anticipated to occur, or if they do occur are not anticipated to be significant.

6.0 MONITORING AND CONTINGENCY PLANS

6.1 MONITORING

The primary objective of compliance and effects monitoring is to check that mitigation and protective measures are effectively implemented and to measure the impacts of activities associated with construction on environmental and socio-economic features. Ultimately, the knowledge gained from monitoring is used to avoid or reduce issues which may arise during construction of subsequent pipeline projects.

Previous pipeline construction experience, and a review of post-construction monitoring reports from other projects, indicates that impacts from pipeline construction are for the most part temporary. The mitigation and protective measures to eliminate or reduce impacts are well known and have been shown to be effective. Accordingly, Sun-Canadian should adhere to the following general monitoring practices:

- Trained personnel should be on-site to monitor construction and should be responsible for checking that the mitigation and protective measures and monitoring requirements within the ER are executed. Sun-Canadian should implement an orientation program for inspectors and Contractor personnel to provide information regarding Sun-Canadian's environmental program and commitments, as well as safety measures;
- Recommendations and commitments made in this ER and other applicable permits and reports should be incorporated into clearing and construction activities. The commitments of this ER and other permits and reports should become part of the contract specification with the Contractor selected to construct the project, as noted in section 5.8.4 of the OEB Environmental Guidelines;
- A walking inspection of the entire pipeline route should be done approximately one year after construction to determine whether areas require further rehabilitation. Additional rehabilitation measures should be completed as necessary, and additional follow-up monitoring should be conducted.

The following sections list specific environmental monitoring activities recommended for the project.

6.1.1 Exposed Soils

Where soils are exposed for construction activities, potential effects may include surface soil erosion, entry/exit pit slumping, and sedimentation of natural features. The movement of heavy machinery on wet soil may cause excessive rutting, compaction, and mixing of topsoil and subsoil. Improperly salvaged topsoil can result in mixing topsoil with subsoil, compaction, rutting and erosion, which can potentially decrease crop yields. Improper water discharge can lead to erosion, sedimentation or flooding. Monitoring of potential effects on exposed soils should occur during construction by Sun-Canadian's on-site inspection team. Restored areas should be inspected one year after construction for erosion, and restoration measures should occur as necessary.

6.1.2 Water Wells

Before construction, a private water well survey should take place to assess domestic groundwater use near the proposed pipeline route and determine the need for a water well monitoring program, as outlined in Section 4.2.3.

6.1.3 Watercourse Crossing

The watercourse crossing has the potential to affect fish, fish habitat, and water quality. Sun-Canadian's on-site inspection team should oversee the watercourse crossing and confirm that work is conducted as outlined in Section 4.3.1, and as per the conditions of relevant permits (see Section 1.2.5).

6.1.4 Vegetation

For at least one year after construction, planted vegetation should be inspected for survival. Dead and diseased vegetation should be replaced in areas of severe dieback or in areas with important environmental functions (e.g. riparian or slope cover).

6.1.5 Species at Risk

Should SAR be identified during vegetation, wildlife, and/or wildlife habitat field surveys, construction monitoring may need to be undertaken. The exact nature of monitoring will be determined in consultation with the MECP and DFO and will depend on the species present.

6.1.6 Cultural Heritage Resources

Any cultural heritage resources within 50 m of the proposed pipeline route will require site plan controls that will need monitoring. In addition, if a vibration assessment results in additional mitigation measures, these will need to be monitored where construction activities occur within 50 m of a cultural heritage resource. Further details are provided in Section 4.4.9.

6.1.7 Residents and Business

Construction activities will impact directly affected landowners and surrounding residents and businesses. During construction, a designated Sun-Canadian representative will be available to monitor and respond to requests and concerns voiced by residents and business owners. Landowners affected by construction will be notified in advance of construction activities in their area, as feasible. The notification will provide the contact information for a designated Sun-Canadian representative.

Sun-Canadian's on-site inspection team will also monitor the Contractors' implementation of the Traffic Management Plan, to see that site access to residences and businesses has been maintained and that traffic is not being unnecessarily interrupted.

While efforts will be undertaken to reduce impacts, a comment tracking system will also be implemented. A Sun-Canadian representative will record the time and date of calls, the nature of the concern, the corrective action taken, and the time and date of follow-up contact.

Following completion of construction, Sun-Canadian will contact residents and businesses along the easement to continue ongoing communications where necessary. During the first two years, particular attention will be paid to monitoring and documenting impacts associated with construction of the proposed pipeline.

6.2 CONTINGENCY

Contingency planning is necessary to prevent a delayed or ineffective response to unexpected events or conditions that may occur during construction of the proposed pipeline. An essential element of contingency planning is the preparation of plans and procedures that can be implemented if unexpected events occur. The absence of contingency plans may result in short or long term environmental or socio-economic impacts and possibly threaten public safety.

The following unexpected events require contingency planning during construction: adverse weather causing watercourse sedimentation, human error causing accidental spills, and the discovery of unexpected finds. Although unexpected problems are not anticipated to occur during construction, Sun-Canadian and the Contractor should be prepared to act when unexpected events occur. Construction personnel should be made aware of and know how to implement contingency measures.

6.2.1 Inadvertent Releases during HDD

For the watercourse being crossed by HDD, operations should be monitored continuously by qualified personnel. An emergency response and contingency plan for an inadvertent fluid release should be developed by the Contractor and implemented during construction. At the very least, the plan should address containment, clean-up and remediation, alternative drilling/crossing plans, disposal of waste materials, monitoring and reporting.

6.2.2 Watercourse Sedimentation

Even with properly installed ESC measures, extreme runoff events could result in collapse of silt fencing, overflow or bypass of barriers, slope or bore pit failures, and other problems which could lead to sedimentation of watercourses.

If sedimentation occurs, immediate action should be taken to repair dysfunctional ESC features or install temporary measures that will contain the erosion as quickly as practical. When site conditions permit, permanent protection measures should be installed on erosion-susceptible surfaces. If the erosion and sedimentation results from a construction-related activity, the activity should be halted immediately until the situation is rectified.

6.2.3 Accidental Spills

During construction, an accidental spill of fluids may occur. The impact of the spill will depend upon the magnitude, extent, and nature of the spill and the environmental and socio-economic conditions in which it takes place. Upon release of a hydrocarbon-based construction fluid, Sun-Canadian should immediately determine the magnitude and extent of the spill and rapidly take measures to contain it. Release of sediment should also be treated as a spill depending on the magnitude and extent. If necessary, the MECP Spills Action Center should be notified at 1-800-268-6060.

A Spills Response Plan should be developed, reviewed with personnel, and posted in site trailers. Spill containment equipment should be readily available, especially near watercourses. Personnel should be trained in the use of spill containment equipment.

Should a spill occur in the project area the spill response contingency plan should be implemented. Specifics of the contingency plan will be documented on site.

6.2.4 Unexpected Finds: Archaeological or Heritage Resources and Unknown Contaminated Soils

Should previously unknown archaeological or heritage resources be uncovered or suspected of being uncovered during construction, ground disturbance in the find location should cease immediately. The MHSTCI and an archaeologist licensed in the Province of Ontario should be notified immediately. A site-specific response plan should then be employed following further investigation of the specific find. The response plan would indicate under which conditions the ground disturbance activity in the find location may resume.

In the event that human remains are uncovered or suspected of being uncovered during ground disturbance, the above measures should be implemented along with notifying local police, the coroner's office, and the Cemeteries Regulation Unit of the Ontario Ministry of Government and Consumer Services (1-800-889-9768).

If previously unknown materials or contaminated soils are uncovered or suspected of being uncovered, construction in the find location should cease immediately. In such an instance, Sun-Canadian should retain expert advice on assessing and developing a plan to include soil sampling, handling, disposal and remediation.

7.0 CONCLUSION

The environmental study investigated data on the physical, biophysical, and socio-economic environment along the proposed pipeline route. In the opinion of Stantec, the recommended program of supplemental studies, mitigation and protective measures, and contingency measures are considered appropriate to protect the features encountered. Monitoring will assess whether mitigation and protective measures were effective in both the short and long term.

With the implementation of the recommendations in this report, on-going communication and consultation, and adherence to permit, regulatory and legislative requirements, potential adverse residual environmental and socio-economic impacts of the project are not anticipated to be significant.

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