Appendix A Dawn-Parkway System Expansion: Kirkwall-Hamilton Pipeline Section: Environmental Report (2019)

DRAFT

Dawn-Parkway System Expansion: Kirkwall-Hamilton Pipeline Section: Environmental Report

FINAL REPORT

Prepared for:
Enbridge Gas Inc. operating as
Union Gas
50 Keil Drive North
Chatham ON N7M 5M1

Prepared by:
Stantec Consulting Ltd.
1-70 Southgate Drive
Guelph ON N1G 4P5

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Sign-off Sheet

This document entitled Dawn-Parkway System Expansion: Kirkwall-Hamilton Pipeline Section: Environmental Report was prepared by ("Stantec") for the account of Enbridge Gas Inc. operating as Union Gas (the "Client"). The material in it reflects Stantec's professional judgment in light of the scope, schedule and other limitations stated in the document and in the contract between Stantec and the Client. The opinions in the document are based on conditions and information existing at the time the document was published and do not take into account any subsequent changes. Any use which a third party makes of this document is the responsibility of such third party. Such third party agrees that Stantec shall not be responsible for costs or damages of any kind, if any, suffered by it or any other third party as a result of decisions made or actions taken based on this document.

Prepared by _____
(signature)

Michael Candido, B.Sc.(Env.)
Environmental Scientist

Reviewed by _____
(signature)

Mark Knight, MA, MCIP, RPP
Team Leader – Assessment and Permitting

Reviewed by _____
(signature)

David Wesenger, BES
Managing Leader – Environmental Management

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Executive Summary

As of January 1, 2019, Union Gas and Enbridge Gas Distribution have amalgamated into one utility with the legal name Enbridge Gas Inc. (Enbridge Gas). To increase existing capacity and accommodate additional demand for natural gas, along its main natural gas transmission system, the Dawn Parkway System, Enbridge Gas is proposing to construct a new 48-inch diameter natural gas pipeline located within the City of Hamilton.

The proposed project will be constructed between Enbridge Gas' existing Kirkwall valve site, located northeast of the intersection of Safari Road and Valens Road and Enbridge Gas' existing Hamilton valve site, located east of Highway 6 and north of Carlisle Road. The proposed pipeline will parallel two existing Enbridge Gas pipelines from the Kirkwall valve site for approximately 7 km, then parallel three existing Enbridge Gas pipelines for approximately 3 km to the Hamilton valve site. The total length of the proposed pipeline will be approximately 10 km. If approved, construction of the pipeline could begin as early as spring/summer 2021 and be complete by the end of 2021.

Enbridge Gas has retained Stantec Consulting Ltd. (Stantec) to undertake an environmental study of the construction and operation of the proposed pipeline and related facilities. The environmental study included a route evaluation and selection process, a consultation program, an impact assessment, and a cumulative effects impact assessment.

A route evaluation and selection process was undertaken to identify environmentally acceptable alternative routes, determine a preliminary preferred route, and confirm a preferred route. The preferred route is currently illustrated within a general location. Enbridge Gas will undertake detailed design to determine the exact location of the running line, permanent easement, temporary land use requirements and road/watercourse crossing methods. 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. Enbridge Gas has also committed to reviewing the easement through and parallel to natural areas during detailed design to minimize the disturbance area to the extent possible.

A consultation program was conducted for the project to engage with landowners, municipalities, agencies, Indigenous communities, and other interested parties. The consultation program included notices in local newspapers, project mailouts and Information Sessions held on February 27, 2019 and May 9, 2019. Enbridge Gas and Stantec have also been in direct contact with agency and municipal staff. Enbridge Gas 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
CH	Conservation Halton
CHR	Cultural Heritage Resource
Class EA	Class Environmental Assessment
CLI	Canada Land Inventory for Agriculture
CRA	Commercial, Recreational, or Aboriginal
DFO	Fisheries and Oceans Canada
EASR	Environmental Activity and Sector Registry
ELC	Ecological Land Classification
Enbridge Gas	Enbridge Gas Inc. operating as Union Gas
END	Endangered
ER	Environmental Report
ERIS	Environmental Risk Information Services
ESA	*Endangered Species Act*
ESC	Erosion and sediment control
GIS	Geographic Information System
GRCA	Grand River Conservation Authority
HCA	Hamilton Conservation Authority
HDD	Horizontal Directional Drill
HONI	Hydro One Networks Inc.



IO	Infrastructure Ontario
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
MTCS	Ministry of Tourism, Culture and Sport
MTO	Ministry of Transportation
NHIC	Natural Heritage Information Centre
OBBA	Ontario Breeding Bird Atlas
OEB	Ontario Energy Board
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
PTTW	Permit to Take Water
PSOC	Potential Sources of Contamination
PSW	Provincially Significant Wetland
RoW	Right-of-way
SAR	Species at Risk
SARA	*Species at Risk Act*
SC	Special Concern
SC	Stream Crossing
Stantec	Stantec Consulting Ltd.



SWH	Significant Wildlife Habitat
THR	Threatened
WHPA	Wellhead Protection Area
WWR	Water Well Record(s)

1.0 INTRODUCTION

1.1 PROJECT DESCRIPTION

As of January 1, 2019, Union Gas and Enbridge Gas Distribution have amalgamated into one utility with the legal name Enbridge Gas Inc. (Enbridge Gas). To increase existing capacity and accommodate additional demand for natural gas along its main natural gas transmission system, the Dawn Parkway System, Enbridge Gas is proposing to construct a new 48-inch diameter natural gas pipeline located within the City of Hamilton.

The proposed project will be constructed between Enbridge Gas' existing Kirkwall valve site, located northeast of the intersection of Safari Road and Valens Road and Enbridge Gas' existing Hamilton valve site, located east of Highway 6 and north of Carlisle Road. The proposed pipeline will parallel two existing Enbridge Gas pipelines from the Kirkwall valve site for approximately 7 km, then parallel three existing Enbridge Gas pipelines for approximately 3 km to the Hamilton valve site. The total length of the proposed pipeline will be approximately 10 km. If approved, construction of the pipeline could begin as early as spring/summer 2021 and be complete by the end of 2021.

Enbridge Gas has retained Stantec Consulting Ltd. (Stantec) to undertake an environmental study of the construction and operation of the proposed pipeline and related facilities. 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, meetings, and Information Sessions.

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. Enbridge Gas 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 federal and provincial environmental guidelines and regulations.

The principal objective of the environmental study was to 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 minimizes 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 minimize 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 and Consultation on Preliminary Preferred Route

The environmental study began with the route generation and selection process. The first step was the development of routing parameters, including delineating the study area, generating routing objectives and identifying environmental and socio-economic constraints and opportunities through a detailed review of available literature and a field reconnaissance. A route evaluation was undertaken to identify environmentally acceptable routes within the study area in consideration of the routing objectives, environmental and socio-economic constraints and opportunities, and constructability. A preliminary preferred route was identified as an outcome of the evaluation. Feedback was sought on the preliminary preferred route, which included route deviations, and the alternative route through newspaper notices, letters, and an Information Session held on February 27, 2019.

Phase II: Gather Information and Consultation

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, and eventually with developing mitigation and protective measures based on predicted effects and potential impacts. Following the February 27, 2019 Information Session, based on feedback received, the preliminary preferred route was confirmed as the preferred route and presented at the May 9, 2019 Information Session. The gathering of information continued throughout the project.

Phase III: Environmental Report

Phase III 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 mentioned above, the study was also 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 route evaluation and selection 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 accompany a future Enbridge Gas ‘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 general 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. Enbridge Gas must comply with these conditions at all stages of the project, including during construction and site restoration.

1.2.5 Additional Environmental Regulatory Processes

Enbridge Gas 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 Canada	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. Nest sweeps will be required at a maximum of 7 days prior to vegetation removal during the MBCA 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 crossing 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 serious harm to fish that are part of a commercial, recreational or Aboriginal fishery, or to fish that support such a fishery. 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 SARA (2002)	DFO	A SARA permit is required to capture, handle and relocate SARA Schedule 1 fish or mussel species during construction. 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		
Approval under the Ministry of Infrastructure Public Work Class Environmental Assessment (Class EA)	Infrastructure Ontario (IO)	A Public Works Class EA may be required to obtain easements on lands managed by IO. Requirements will be determined through consultation with IO.
Development Permits under *Ontario Regulations 150/06* (Regulation of Development, Interference with Wetlands and Alterations to Shorelines	Grand River Conservation Authority (GRCA)	Required for works within GRCA Regulated Areas, including shorelines, watercourses, wetlands and hazardous lands (flooding and erosion hazards, and unstable soils and bedrock).

Table 1-1: Summary of Potential Environmental Permits/Regulatory Requirements

Permit/Approval Name	Administering Agency	Description
and Watercourses), as per the *Conservation Authorities Act* (1990)		
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).
Development Permits under *Ontario Regulations 161/06* (Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses), as per the *Conservation Authorities Act* (1990)	Hamilton Conservation Authority (HCA)	Required for works within HCA 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 groundwater) under the *Ontario Water Resources Act* (1990)	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 trench dewatering and taking water for hydrostatic 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)	Ministry of Tourism, Culture, and Sport (MTCS)	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

Table 1-1: Summary of Potential Environmental Permits/Regulatory Requirements

Permit/Approval Name	Administering Agency	Description
		and 4 AA's may be required. The completed archaeological assessment reports are forwarded to the MTCS for review and comment.
Review of Built Heritage and Cultural Landscape under the OHA	MTCS	A Heritage Overview Study will 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 11-285	City of Hamilton	Project activities should adhere to the local noise by-law.
Tree on Public Property By-Law 15-125	City of Hamilton	Project activities that may require tree removal should meet the intent of the tree cutting by-law.
Trees on Private Property in Rural Area Regional By-Law R00-054	Regional Municipality of Hamilton-Wentworth	Project activities that may require tree removal should meet the intent of the tree cutting by-law.

2.0 ROUTE SELECTION

2.1 THE PROCESS

The route evaluation and 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.

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 and allows for a reasonable number of alternative routes to be considered. It is within this area that desktop information on socio-economic and environmental features has been collected. The terminal points of the proposed pipeline defined the western and eastern study area boundaries. The location of the western tie-in is Enbridge Gas' existing Kirkwall valve site. The eastern terminal point tie-in is the existing Enbridge Gas Hamilton valve site. The northern study area boundary was defined as approximately 1000 m north of and parallel to Concession 8 West. A pipeline north of this location would require routing through large portions of the Beverly Swamp Wetland Complex and other provincially significant wetlands. The southern study area boundary was defined as approximately 250 m south of and parallel to Concession 6 West. A pipeline south of this location would significantly increase length and would have limited opportunities to parallel existing infrastructure.

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

2.2.2 Routing Objectives

The overarching objective in the route evaluation and 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.

2.2.3 Identify Constraints and Opportunities

Chapter 4 of the OEB Environmental Guidelines (2016), 'Route or Site Selection', outlines environmental and socio-economic features that should be considered during the route evaluation and selection process. Features in the study area were considered as either pipeline routing opportunities or constraints.

Pipeline routing opportunities are existing features which provide a potential location for the alignment of a pipeline so as to avoid or minimize unnecessary 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

Constraints and opportunities were mapped in a Geographic Information System (GIS) database from existing government databases, including base data and environmental data provided through the Ministry of Natural Resources and Forestry (MNRF's) Land Information Ontario (LIO) data warehouse. LIO is the province's central repository for authoritative digital data, from the MNRF itself as well as other governmental departments and agencies.

After creating a GIS database of pipeline corridor opportunities and constraints, a field reconnaissance was undertaken by personnel of Stantec Consulting Ltd. (Stantec) on August 10, 2016. This field reconnaissance both verified the features that had been mapped and considered whether there were any additional features that were not identified in the records review but that nonetheless required mapping.

In the study area, three pipeline routing opportunities (as defined above) are present: two existing Enbridge Gas pipeline easements (referred to as the northern and southern easements) and a hydroelectric corridor operated by Hydro One Networks Inc. (HONI). In the study area, a variety of pipeline routing constraints (as defined above) are present: developed areas (campgrounds, communities and homes), topography (i.e. slope, drumlins), roads and environmental features such as waterbodies, watercourses, wetlands and wooded areas.

2.3 IDENTIFY ALTERNATIVE ROUTES

To review whether any of the existing Enbridge Gas pipeline easements could be paralleled by an additional pipeline, a field reconnaissance was undertaken by personnel of Stantec and Enbridge Gas on June 1, 2016. The field reconnaissance determined that the existing northern pipeline easement was constrained by wetlands and wooded areas, and by encroaching development within the communities of Beverly Hills Estates, Antrim Glen and the Ponderosa Nature Resort and would not be a feasible

alternative. Based on this, two alternative routes were identified. The routes follow existing linear infrastructure where available and avoid, to the extent possible, existing environmental and socio-economic features. The field reconnaissance also determined that the existing southern pipeline easement (Route A) travelled through the Antrim Glen and Ponderosa Nature Resort communities. To avoid these communities two route deviations were identified (Route A1 and Route A2) which would be further evaluated based on landowner input and engineering and construction considerations.

Route B parallels a combination of an existing HONI corridor and lot lines. Part of the route does not follow the HONI corridor and lots lines so as to avoid sensitive environmental features.

2.4 REFINING ALTERNATIVE ROUTES

Given the rolling topography in the study area, abundance of vegetation and relative lack of roads from which to observe the alternative routes, it was difficult to determine whether they were environmentally acceptable or constructible. As such, an aerial reconnaissance of the alternative routes was undertaken by personnel of Enbridge Gas, Stantec and Banister Pipelines (a contractor experienced in large diameter pipeline construction) on December 5, 2016.

The following observations were made of the alternative routes during the aerial reconnaissance:

- Route A: The challenges of constructing through the communities of Antrim Glen and the Ponderosa Nature Resort were confirmed. It was also noted that the area of Brock Road (particularly a house to the west and Verbinnen's Nursery to the east) would present construction challenges. A subsequent review of the Brock Road crossing could not identify an acceptable alternative crossing location to avoid the house and nursery.
- Route Deviation A1: The proximity to the communities of Antrim Glen and the Ponderosa Nature Resort, and the amount of vegetation clearing required, were noted.
- Route Deviation A2: Constructability refinements were suggested for the crossing location of Spencer Creek.
- Route B: It was noted that the route faced few constructability challenges, other than the crossing of Brock Road.

Based on the above observations, one refinement was made to the alternative routes:

- Route Deviation A2 was refined to enable a different crossing location of Spencer Creek.

The alternate routes and corresponding route deviations are shown on Figure 2, Appendix A

2.5 IDENTIFY PRELIMINARY PREFERRED ROUTE

A comparative evaluation identified that Routes A and B were both environmentally acceptable, however Route A was preferred for operational efficiencies due to the ability to locate the proposed pipeline parallel and overlapping an existing Enbridge Gas pipeline easement, taking into account the experience of the project team in routing linear infrastructure. Enbridge Gas has determined that over 40% (12 of the



28 m total) of the required permanent easement for the project could be overlapped with the existing, previously disturbed pipeline easement. The ability to overlap the existing easement by 12 m reduces the impact to previously undisturbed land to 16 m, including the agricultural fields, residential properties and natural heritage communities they contain. A field visit by Enbridge Gas in the fall of 2018 confirmed that from a construction and engineering aspect, it was feasible to construct Route A through the community of Antrim Glen. Additionally, the overlap enables Enbridge and Stantec to make use of the knowledge gained from the 1991 construction of the 48-inch diameter pipeline regarding potential to encounter groundwater and archaeological finds.

The preliminary preferred route is shown on Figure 3, Appendix A.

2.6 CONFIRMATION OF THE PRELIMINARY PREFERRED ROUTE

Input on the preliminary preferred route, route deviations and alternative route was sought through consultation (see Section 3). Landowners along Route deviations A1 and A2 expressed concerns regarding loss of income due to proximity of the route to a Christmas Tree farm and the amount of tree removal required for a new easement. Landowners along Route deviation A2 expressed concerns due to slope/topography, the crossing location of Spencer Creek and tree removal. Feedback on the preliminary preferred route from the community of Antrim Glen included access to residences during construction, access/use of trails during construction and tree removal. Feedback received from Verbinnen's Nursery included features on the property that may be impacted by construction (irrigation pond, location of container stock during the growing season, water well used for irrigation). The majority of feedback received favoured the preliminary preferred route. As such the preliminary preferred route was confirmed as the preferred route (Figure 4, Appendix A).

The preferred route is currently illustrated within a general location. Enbridge Gas will undertake detailed design to determine the exact location of the running line, permanent easement, temporary land use requirements and road/watercourse crossing methods. 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 socio-economic features and sensitive natural features to the extent practicable.

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 Enbridge Gas and Stantec. Indigenous communities were identified through provision of a Project Summary to the Ministry of Energy, Northern Development and Mines in November 2018 (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 GRCA, CH, HCA 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 because of changes in personnel, correspondence received and attendees at meetings and Information Sessions. The final Agency and Indigenous Contact List is located in Appendix B1.

Directly affected and adjacent landowners were identified through a search of municipal tax rolls and were tracked in a Landowner Contact List. Enbridge Gas also undertook direct consultation with landowners and elected officials. Members of the public who provided feedback or who attended an Information Session were documented in a Public Contact List.

3.3 COMMUNICATION METHODS

3.3.1 Newspaper Notices

A Notice of Commencement and Information Session was published on February 13, 2019 in the Hamilton Spectator and on February 14, 2019 in the Flamborough Review, respectively. The Notice introduced and described the project, provided a map, noted the format, time and location of the Information Session, and listed project contact information.

A Notice of Second Information Session was published on April 23, 2019 in the Hamilton Spectator and on April 25, 2019 in the Flamborough Review, respectively. The Notice described the project, provided a map, noted the format, time and location of the Information Session, and listed project contact information.

Copies of tear sheets from the newspaper notices are located in Appendix B2.

3.3.2 Letters and Emails

3.3.2.1 Notice of Commencement and Information Session

Letters and emails were sent to all parties identified on the OPCC, Agency and Indigenous Contact List on February 12, 2019 to provide information on the project, the preliminary preferred route, and on the Information Session. A second email was sent to the OPCC chair on February 19, 2019, as the first email sent on February 12, 2019 failed to send. Letters were mailed to landowners located along the preliminary preferred route, the route deviations, and the alternative route via Canada Post regular mail on February 11, 2019. Letters were hand delivered to residents in Beverly Hills Estates, Antrim Glen and Ponderosa Nature Resort on February 13, 2019. Appended to the letters and emails was a map of the preliminary preferred route, route deviations and the alternative route.

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

3.3.2.2 Notice of Second Information Session

Letters and emails were sent to all parties identified on the OPCC, Agency and Indigenous Contact List on April 18, 2019 to provide information on the project, the preferred route, and the second Information Session. Letters were mailed to landowners whose property was located on or adjacent to the preferred route, and to the landowners whose property was located on the previously identified alternative route and/or the route deviations via Canada Post regular mail on April 17, 2019. Letters were hand delivered to residents of Beverly Hills Estates and Antrim Glen on April 22, 2019. Letters were dropped off to management of Ponderosa Nature Resort for distribution to residents on April 22, 2019. Appended to the letters and emails was a map of the preferred route.

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

3.3.3 Display Boards, Newsletter and Exit Questionnaire

Display boards were developed for both the first and second Information Session. The display boards at the first Information Session provided information on the project, the regulatory process, the preliminary preferred route, route deviations, and alternative route, anticipated environmental and socio-economic impacts and mitigation, and next steps. A newsletter was prepared for distribution at the first Information Session to summarize the content provided on the display boards. An exit questionnaire was provided to the Information Session attendees. The exit questionnaire requested feedback on potential impacts, the presented routes, and the content of the first Information Session.

The display boards at the second Information Session provided information on the project, the regulatory process, route evaluation methodology, the preferred route, anticipated environmental and socio-economic impacts and mitigation, and next steps. A newsletter was prepared for distribution at the second Information Session to summarize the content provided on the display boards. An exit questionnaire was provided to Information Session attendees. The exit questionnaire requested feedback on potential impacts, the preferred route, and the content of the second Information Session.

Copies of the display boards, newsletters and exit questionnaires are in Appendix B4.

3.3.4 Project Webpage

A project webpage was developed on the Enbridge Gas website (uniongas.com/projects/kirkwall-hamilton). The webpage contains information on the project, the regulatory process and Enbridge Gas' commitment to the environment. Communication materials were regularly updated on the webpage as the environmental study progressed. The project webpage was communicated to interested and potentially affected parties on the newspaper notices, display boards and newsletters.

3.4 CONSULTATION EVENTS

3.4.1 Meetings

Meetings about the project have occurred between Enbridge Gas and agency staff, key stakeholders, Indigenous communities and between Enbridge Gas and Stantec with directly impacted landowners, and will continue as the project progresses towards detailed design and construction.

3.4.2 Information Sessions

Two Information Sessions were held for the Project. The first occurred on February 27, 2019 from 5:00 p.m. to 8:00 p.m. at the Carlisle Arena in the Town of Carlisle. The second Information Session occurred on May 9, 2019 from 5:00 p.m. to 8:00 p.m. at the Valens Community Centre in the community of Valens.

The purpose of the Information Sessions were to:

- Inform the community about the project
- Outline the preliminary preferred route, route deviations and alternative route (at the first Information Session); and outline the preferred route (at the second Information Session)
- Outline proposed mitigation for likely project impacts
- Provide attendees the opportunities to ask questions and comment on the project
- Respond to questions and comments

At each Information Session, Enbridge Gas and Stantec representatives were present to provide details on the project, answer questions and receive comments. Display boards and newsletters were provided to inform attendees about the project, and exit questionnaires were provided to encourage feedback (see Section 3.3.3). Twelve completed exit questionnaires were received following the first Information Session, and three completed exit questionnaires were received following the second Information Session.

The first Information Session registered 33 attendees and the second Information Session registered 36 attendees. Attendees who registered their attendance were added to the appropriate contact list to receive future project notices. Attendees at the first Information Session were mainly landowners in the area of the preliminary preferred route who had questions about the project (compensation, traffic impacts, location of facilities, access etc.). Attendees at the second Information Session were mainly landowners along the preferred route who had similar questions about the project.

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 located in Appendix B5.

3.5.1 Public Input

Seventeen (17) completed questionnaires were received from the public at the time of writing this ER. The main areas of input included:

- Traffic, noise, vibration and dust impacts and mitigation measures
- Property access during construction
- Monetary compensation for landscaping and/or enjoyment of property
- Tree removal
- Impacts to business operations/loss of income due to construction
- Unique features along the route, such as Spencer Creek and slope/topography of the area
- Timing of Information Session material being available on the project website

3.5.2 Agency Input

Two (2) comments were received from agencies at the time of writing this ER.

- The GRCA noted the study area contains natural hazard and natural heritage features, including wetland, watercourses, floodplain, and slope valley hazards. The GRCA also noted that only a portion of the study area falls within the GRCA watershed, and recommended contacting HCA and HC.
- HONI noted that the proposed pipeline will affect HONI distribution line facilities, as well as two separate transmission line ROWs (HONI easement ROW, and a provincially owned HONI ROW)

3.5.3 Municipal Input

The City of Hamilton Clerk's office recommended that the second Information Session not be held on a day that conflicted with Council meetings so that Councilors could attend if they wished to. This request was accommodated, and the date was scheduled based upon City Council's online meeting calendar.

3.5.4 Indigenous Input

No comments were received from Indigenous communities at the time of writing this ER.

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 the public the following occurred:

- A meeting between Stantec, Enbridge and a landowner along Route deviation A2 resulted in the identification of unique features, including a drumlin and the crossing location of Spencer Creek, which informed the project team and assisted in the preferred route selection process
- A meeting between Stantec and a landowner along route deviation A1 and A2 resulted in the identification of unique features, including a Christmas tree farm, which informed the project team and assisted in the preferred route selection process
- More detailed maps were included with letters and emails for the notice of second Information Session
- Material related to the second Information Session (display boards and project questionnaire) was made available on the project website the day of the second Information Session
- Identification of site-specific features that will aid the project team during detail design

The Enbridge Gas lands department will work with landowners and businesses to address specific concerns they may have regarding monetary compensation, land access during construction, enjoyment and use of property, field crew access, and safety.

Based on input received from agencies:

- It was acknowledged that permits may be required from GRCA and correspondence will continue
- Enbridge will work with HONI regarding construction and use of easements

Based on municipal input the second Information Session was scheduled on a Thursday to avoid conflicting with Hamilton City Council meetings.

Enbridge Gas has committed to on-going consultation with directly affected and interested parties during detailed design and construction and will continue to respond to concerns through the life of the project. The proposed pipeline will be designed to meet or exceed all safety regulations and codes. In addition, Enbridge Gas 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 are a reflection of:

- 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
- Field assessments conducted by Stantec technical staff
- The pipeline development experience of Enbridge Gas 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, 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.

Site-specific field surveys will be completed prior to construction.

The existing conditions maps (Appendix C) have been generated from data obtained from LIO. Conservation Authority (CA) regulated area data was obtained from GRCA, CH and HCA. 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 natural gas 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 (typically during winter, under frozen ground conditions). In the spring the fences that break up the linear RoW are braced and cut to permit an uninterrupted work area. 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. Pre-tiling work is completed to accommodate agricultural drainage.
2. Grading and Stripping: The RoW is graded 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 trench. Existing landscaping is also removed, and dewatering undertaken, where necessary.
3. Stringing: Stringing is the process where pipe sections are delivered to the full length of the RoW, placed on wooded skids and generally parallel to where the trench will be excavated.
4. Pipe Fabrication: The pipe is bent as required and the welding crew welds the pipe into continuous lengths. The pipe welds are non-destructively tested (e.g. x-ray) and coated.
5. Trenching and Lowering: After the pipe is fabricated, a trenching machine or hydraulic hoe can begin excavating a new trench. In areas of shallow bedrock, hoe-ramming and/or blasting may be required. In agricultural areas, tiles that are cut during the trench excavation are flagged and repaired as quickly as practical. In some areas the pipeline cannot be installed by trenching due to obstacles such

as roads or watercourses. In these locations the pipeline is installed using a trenchless approach through a variety of different means. Laneways and driveways are left over the trench as long as feasible where requested by the landowner.

6. Backfilling: During backfilling the originally excavated subsoil is placed over the pipe in the trench. In stony areas, the pipe may be sand-padded to protect the coating. In shallow water table areas, the pipeline may be weighted to provide negative buoyancy. In agricultural areas, after the trench is backfilled, tiling is repaired that was disturbed or broken by construction. Landowners with tile drainage are given the opportunity to inspect tile repairs. Typically, a tile consultant is retained to oversee tile repairs and the design of a header tile system if required.
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 by permit from nearby water sources such as watercourses or lakes, if available. Municipal water may also be used for hydrostatic testing. Upon completion of the hydrostatic testing, the pipeline is drained and dried then put into service with natural gas.
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 and stone picking to maintain productivity. In natural areas, clean-up restores the environment including re-seeding of the RoW, returning the topography after grading, restoring ditch banks and watercourse crossings. Any erosion and sediment controls installed during construction are also removed. Clean-up will also restore landscaping, laneways and driveways.

4.1.2 Operation

Pipeline operation consists of pressurized natural gas 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.

Once the pipeline is operational, the following activities are undertaken to patrol and maintain the pipeline:

- Completing a ‘line walk’ of the entire pipeline by Enbridge Gas personnel once a year to check for exposed pipelines, evidence of damage to aboveground equipment and piping, evidence of damage to underground piping and gas leaks, and identify any unassociated construction activity near the pipeline RoW
- Conducting fixed wing aerial patrols weekly from April 1 to December 31 and monthly from January 1 to March 31 to detect the presence of soil erosion and third-party structures or activities that could damage the pipeline
- Checking cathodic corrosion protection – a low voltage electric circuit that runs along the length of the pipeline to prevent the development of external corrosion



- Completing regular checks and maintenance at pipeline facilities such as valve sites
- Completing depth of cover surveys, so that the amount of soil cover over the pipeline is maintained
- Performing periodic inspection by running electronic tools through the interior of the pipeline to assess for the presence of corrosion or dents and the need for repairs
- completing class location surveys, adding all new buildings and structures to the Enbridge Gas mapping system.

4.2 PHYSICAL FEATURES

4.2.1 Bedrock Geology

Existing Conditions

The bedrock geology along the proposed pipeline route is comprised of sandstone, dolostone and shale of the Guelph Formation and Armabel Formation (OGS, 1991) (Figure 1, Appendix C).

To determine the general depth from the soil surface to the bedrock, drift thickness was reviewed, and results indicate a drift thickness along the proposed pipeline route ranging from 0 – 20 m (Gao,et al, 2006)(Figure 2, Appendix C).

Potential Impacts

The planned excavation depth of the project is approximately 2.5 m below grade, with the potential to exceed this depth for watercourse crossings, road crossings and at the undercrossing location where the proposed pipeline shifts from the south side of the easement to the north side of the easement (approximately 750 m west of Brock Road) undercrossing three existing Enbridge Gas pipelines. Based on the shallow drift thickness over bedrock and knowledge from previous pipeline installation, bedrock will be encountered.

Bedrock encountered during trench excavation will be excavated by means of a hoe-ram and/or blasting. Noise, vibration, fly rock damage and dust may impact wildlife, residences, water wells and businesses.

Mitigation and Protective Measures

If the bedrock encountered during trenching is fractured, the preferred method of trenching is with the use of a bucket or hoe-ram. Where hoe-ramming is undertaken the addition of water to reduce dust should be considered where appropriate. In locations where hoe-ramming is required in close proximity to residential homes or buildings the construction contractor should inspect foundations and other structures for integrity prior to and after hoe-ramming. Ripping or hoe ramming may not be feasible in all locations and blasting may be required.

Where blasting is required, blasting mats should be used to assist in controlling the blast. Immediately after blasting/hoe-ramming, any fly rock dispersed should be collected from the area surrounding the work site and stockpiled. If a significant quantity of bedrock has been removed, the material should be

temporarily stockpiled and later transported to a local aggregate producer for reduction to crushed stone. Additionally the material will be offered to interested landowners and businesses in the vicinity of the project.

In locations where blasting is required in close proximity to residential homes or buildings, a blasting consultant should be retained to monitor potential blasting impacts. The monitoring program should include the inspection of foundations and other structures for integrity prior to and after blasting activity. The identification of homes and buildings to be monitored, in proximity to the blast, should be determined by the blasting consultant. Notices of blasting/hoe-ramming should be circulated to residents in the area of blasting/hoe-ramming locations. Monitoring of adjacent wells is recommended.

Blasting procedures should be developed in conjunction with existing construction specifications, a licenced blasting contractor and a blasting design consultant in accordance to applicable regulations.

Net Impacts

With the implementation of the above mitigation and protective measures, no significant adverse residual impacts to bedrock geology are anticipated.

4.2.2 Physiography and Surficial Geology

Existing Conditions

The majority of the proposed pipeline route is located within the Flamborough Plain, with a small section located within the Norfolk Sand Plain physiographic region of southern Ontario (Chapman and Putnam, 1984). The physiography along the proposed pipeline route between the Kirkwall valve site and Westover Road is characterized by limestone plains and till plains (drumlinized). Between Westover Road and Middletown Road the physiography of proposed pipeline route consists of till plains (drumlinized) and areas of drumlins. Between Westover Road and Brock Road the physiography consists of till plains (drumlinized) and limestone plains. Between Brock Road and the Hamilton valve site the area is again characterized by limestone plains with an area between Highway 6 and the Hamilton valve site on the boundary of limestone plains and sand plains. (Figure 3, Appendix C). The topography along the proposed pipeline route is varied. Approximately 83% of the route crosses slopes 0-5%, approximately 14% of the route crosses slopes between 6-10% and approximately 3% of the route crosses slopes greater than 10% (Figure 16, Appendix C).

Surficial geology mapping indicates that a portion of the pipeline from the Kirkwall valve site to Westover Road, and an area east of Spencer Creek crosses Paleozoic bedrock. The majority of the pipeline between Westover Road and approximately 1 km west of Brock Road crosses stone-poor, carbonate derived silty to sandy till. The area approximately 1 km west of Brock Road to approximately 400 m west of Highway 6 is characterized as ice contact stratified deposits. The area approximately 400 m west of Highway 6 to the Hamilton valve site crosses coarse textured glaciolacustrine deposits. There is an isolated area of organic deposits east of Middletown Road. (Figure 4, Appendix C).



Potential Impacts

Disturbance to the overburden along the proposed pipeline may cause surface soil erosion and/or watercourse sedimentation during construction and post-construction, particularly in areas of steep slopes. Trench slumping may occur 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 trench from slumping, trench walls should be sloped and should be monitored during wet conditions. Trench boxes may be required depending on site specific conditions.

At areas of the landscape with steep slopes site-specific mitigation and protective measures should be considered at the discretion of Enbridge Gas’s on-site inspection team, including:

- placing erosion control measures at intervals along the slopes
- restricting the movement of heavy machinery and construction personnel during construction on the slope
- re-establishing existing contours and drainage upon completion of construction
- re-establishing slopes as soon as practical, including at the conclusion of each stage of construction from the top of slope down, through hydromulching and hydroseeding with quick germinating seed mixture appropriate to surrounding vegetation
- monitoring of vegetation until established

Slope stability should be reviewed at watercourse crossing locations. Watercourse banks should be seeded and stabilized immediately following crossing. 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 under O.Reg. 150/06 from GRCA, O.Reg. 161/06 from HCA or O.Reg. 162/06 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 (Chapman and Putnam, 1984) and surficial geology mapping (OGS, 2010), the proposed pipeline route will cross limestone plains and till plains. It will cross Spencer Creek and tributaries of Bronte Creek. Aquifer vulnerability mapping by the Halton Region Source Protection Region indicates portions of the route are within a highly vulnerability aquifer with minimal significant groundwater recharge. There are areas of significant groundwater recharge which are present at the eastern portion of the route, in the vicinity of Brock Road, which primarily correspond to areas with coarser textured material.

The MECP Water Well Records (WWR) within 500 m of the proposed pipeline indicate approximately 163 water supply wells, 111 of which are domestic (Figure 5, Appendix C). A review of 105 MECP WWR for which water level data was available indicated that wells are installed within the overburden at depths ranging from 1 m below ground surface (BGS) to 59 m BGS. The groundwater level measured in these wells ranged from 0.6 m BGS to 24.4 m BGS. There are seven water supply wells within 50 m of the pipeline, two of which are domestic. These wells are installed in the overburden at depths ranging from 0 m to 6.7 m BGS. The groundwater in these wells ranged from 1.5 m to 10.6 m BGS.

Regional groundwater flow near the proposed pipeline route in the overburden aquifer is generally to the south towards Lake Ontario and Hamilton Harbour (City of Hamilton, 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 2.1 km northwest of the proposed pipeline. A review of nearby surface water system intake protection zones (IPZs) indicates that the proposed pipeline does not cross any IPZ-1 or IPZ-2 for a surface water system (HHSPA 2017).

Figure 5, Appendix C shows groundwater conditions.



Potential Impacts

Hydrostatic Testing and Dewatering/Sand-pointing

A hydrostatic test will be undertaken for the proposed pipeline.

Where trenches encounter shallow groundwater conditions or following a large precipitation event, removing water from the trench (known as dewatering) may be necessary. During trench 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 163 water supply wells within 500 m of the proposed pipeline route, 111 of which are domestic. The majority of these private domestic supply wells are bedrock wells. There are seven water supply wells within 50 m of the proposed pipeline, two of which are domestic. Depending on the proximity to wells, the depth of the well installation and the groundwater levels encountered during excavation, trench dewatering has the potential to impact water well quality or quantity at some of the overburden supply wells.

Municipal Water Supply

The proposed pipeline does not extend through any WHPAs or IPZ associated with any municipal groundwater supply system.

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 trench 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 will take place to assess domestic groundwater use near the proposed pipeline and a private well monitoring program may be recommended for residents 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 in the event that 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 in close proximity to the proposed pipeline route. The proposed pipeline route is located more than approximately 1.4 km from the nearest abandoned petroleum well and more than 5.5 km from the nearest active aggregate site.

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

Potential Impacts

Since the proposed pipeline route is located more than approximately 1.4 km from the nearest abandoned petroleum well and more than 5.5 km from the nearest active aggregate site, 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

The soils along the proposed pipeline route range from loam to muck. In the Soils of Wentworth County Report (Presant et al, 1965) there are 11 soil types identified; Farmington Loam, Guelph Loam, Guelph Loam - Shallow Phase, Grimsby Sandy Loam - Shallow Phase, London Loam, London Loam - Shallow Phase, Flamborough Sandy Loam, Parkhill Loam, Burford Loam, Muck, and Stream Course. A description of each, from the soil survey report, is included in this section.

Farmington Loam is a well-drained, shallow soil with a depth of soil over bedrock that does not exceed 12 inches (30 cm). Most of the Farmington soils occur on level or very gently sloping areas of the Flamborough Plain. These soils have limited agricultural potential due to the shallow rooting depth.

Guelph Loam is a well-drained loam soil commonly found in local drumlin areas where the slopes range between 6 and 15 percent. These soils are principally used for forage crops, spring grains and winter wheat. There is also a Guelph Loam - Shallow Phase of this soil mapped along the proposed pipeline route. The shallow phase has developed on material that has a thickness of 12-36 inches (30-90 cm) over the bedrock.

Grimsby Sandy Loam - Shallow Phase soils have developed on well-drained medium and fine sandy loams. The topography is gently to moderately sloping. Droughtiness is a problem on the shallow phase soils of the Flamborough Plain.

London Loam is the imperfectly drained soils found in association with the Guelph Loam. The London soils are often sandier than the Guelph soils. They occur mainly on the level areas within the drumlin field and along the Flamborough plain. London Loam - Shallow Phase is identified along the proposed pipeline route. The shallow phase has developed on material that has a thickness of 12-36 inches (30-90 cm) over the bedrock.

Flamborough Sandy Loam is a poorly drained soil that has developed from calcareous sand deposits. Most of these soils are found on level or depressional areas. Much of these lands are cleared for pasture and some is used for market gardening.

Parkhill Loam is a poorly drained soil associated with the landscape of the Guelph soils. It occurs mainly on the flat or depressional areas between drumlins. These soils have a high organic matter content. The most common agricultural use is for unimproved pasture.

Burford Loam is a well-drained soil developed on deposits of loam over gravel. The soils are most prevalent on the gently rolling outwash plain that fringes the southern part of the drumlins found in the area. Forage crops, spring grains, winter wheat, and corn are the major crops grown on the Burford soils.

Muck soils include poorly drained soils consisting of deposits in which 12 inches (30 cm) or more of organic materials have accumulated. The surface material in the muck deposits consists of black, friable, well decomposed organic debris.

In Wentworth County, stream courses are defined as boulder beds or bedrock over which streams are actively flowing for most of the year. Stream erosion has removed most of the fine soil materials, leaving gravel, boulders, and bedrock of the main constituents of the stream beds.

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, 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 the agricultural lands, approximately 60%, along the proposed pipeline route are considered to be prime agricultural lands. Soils in the prime classes, 1-3, have moderate to no significant limitations that restrict the range of crops or require moderate conservation practices (AAFC, 2005). Approximately 40% of the proposed pipeline route is considered to be less than prime agricultural land. These soils are the very shallow Farmington Loam, the coarse sandy soils and the Muck.



Table 4-1: Soil and Soil Capability along Preferred Route

Soil Type	% of Route	CLI Class
Burford Loam	3	2
Farmington Loam	8	6, 7
Flamborough Sandy Loam	4	3
Grimsby Sandy Loam – Shallow Phase	>1	4
Guelph Loam	25	1, 2, 4, 5
Guelph Loam – Shallow Phase	6	3
London Loam	18	1
London Loam – Shallow Phase	8	3
Parkhill Loam	7	2
Muck	17	O
Stream Course	4	5

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

Potential Impacts

The potential exists for surface stoniness following pipeline construction due to soils in the area along the proposed pipeline route developing on stony till parent materials.

The proposed pipeline crosses agricultural land with a range of agricultural capability. Where there is interaction with agricultural land, 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.

Trenching 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.

Where equipment is moving from one agricultural field to another there is the potential for the spread of soil pests/diseases to previously unimpacted fields.

Mitigation and Protective Measures

To prevent recurring soil surface stoniness on agricultural fields picking of stones 10 cm and larger should be employed following soil replacement activities and subsoiling with an agricultural subsoiler. Repeated stone picking following sub-soiling, discing, chisel ploughing and cultivating should be undertaken.

Excess Soil

It is noted that the MECP has proposed regulating the movement of excess soils in the province of Ontario. It is recommended that Enbridge Gas retain a qualified person for environmental site assessment who is knowledgeable in the current excess soils guidelines, as well as the proposed regulation, in order to make recommendations for the management of excess soils for this project.

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. Enbridge Gas' 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. In the event that 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. Where the pipeline crosses woodlands or wetlands the organic and duff layer should be stripped where feasible, given local substrate conditions. Where stripping is undertaken in woodlands or wetlands, organic material 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.

Soil Pests/Diseases

In consultation with the landowner and an agrologist, Enbridge Gas will develop and implement a soil sampling plan on agricultural lands for potential pests and/or diseases that are known to the area. If the results indicate an issue or concern, in consultation with the landowner, Enbridge Gas will work with the agrologist to develop a best practice protocol.

Any imported topsoil used for rehabilitation will also have a composite sample analyzed for identified concerns before it is placed on the easement.

Net Impacts

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

4.2.6 Agricultural Tile Drains

Existing Conditions

Along the proposed pipeline route there are two properties mapped as containing systematic agricultural tile drains. No properties are mapped as having random agricultural tile drains. A map of agricultural tile drains is located on Figure 9, Appendix C.

Potential Impacts

Construction activities, including trenching and the movement of heavy machinery, have the potential to crush and/or sever agricultural tile drains.

Mitigation and Protective Measures

Enbridge Gas should undertake consultation with landowners of agricultural fields to confirm where systematic tile drainage is present. If tile drainage is present, Enbridge Gas should undertake standard mitigation during trenching, including:

- Develop site specific tile plans with an independent tile contractor
- Conduct pre-tiling, and install header tile to maintain tile system function
- Excavate the pipeline trench to a depth that allows clearance between the top of the proposed pipeline and the bottom of existing drainage systems
- Record and flag severed or crushed tile drains
- If a main drain, header drain, or large diameter drain is severed, maintain field drainage and prevent flooding of the work area and adjacent lands through temporary repairs
- Cap the downstream side of severed drains that cross the trench to prevent the entry of soil, debris and rodents, as required
- Repair damaged and severed drains following construction
- After repair and before backfilling, invite the landowner to inspect and approve the repair

Net Impacts

With the implementation of the above mitigation and protective measures, 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.

Three moderately sized (magnitude 5) events have occurred in the 250 years of European settlement of this region, all of them in the United States - 1929, Attica, New York, 1986, near Cleveland, Ohio, and 1998, near the Pennsylvania/Ohio border. All three of these earthquakes were widely felt but caused no damage in Ontario.

A map of the floodplain and regulation limits of GRCA, HCA and 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, trench slumping, and damage or loss of construction equipment and contamination of a watercourse as a result 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 under O.Reg. 150/06 from GRCA, O.Reg. 161/06 from HCA or O.Reg. 162/06 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

Existing Conditions

The proposed pipeline route passes through three upper tier watersheds (Grand River, Spencer Creek and Bronte Creek). These watersheds lie within the jurisdiction of three CAs: the GRCA, the HCA (Spencer Creek) and CH (Bronte Creek).

The proposed pipeline route crosses four watercourses, identified as stream crossings SC1, SC2, SC3 and SC4 (Figure 11, Appendix C)

Background data was used to provide a preliminary identification of potential that a watercourse supports fish that are part of or support a Commercial, Recreational, or Aboriginal (CRA) fishery. Additional field investigations will be conducted in summer 2020 to further refine the fish habitat designation at each crossing. A watercourse supports a CRA fishery if it meets one or more of the following criteria:

1. Mapping from LIO database suggests that watercourse is directly connected to fish habitat downstream.

2. Absence of visible barriers to fish passage (i.e., steep slopes, waterfalls).
3. Presence of aquatic species at risk indicated by DFO aquatic species at risk mapping (DFO 2017).

Additional criteria for determining presence of fish habitat will be added following the 2020 summer field investigations.

The following is a summary of the watercourses in proximity to the proposed pipeline route organized by subwatershed. Fish species documented in available background data are provided in Table 4-2.

Barlow Creek Subwatershed (Not crossed)

The Kirkwall valve site is located in an area that is connected to the headwaters of Barlow Creek; a subwatershed of the Lower Grand River that is classified as warmwater habitat. The tributaries of the Lower Grand tend to be highly meandering, with narrow and deep channels and substrates consisting of silt and sand. Fish habitat impacts within the subwatershed are primarily associated with agricultural land use (GRCA 2005). No crossing of Barlow Creek is required.

Spencer Creek Watershed (Stream Crossings: SC1 and SC2)

Stream crossings SC1 and SC2 cross an unnamed tributary to Spencer Creek (SC1) and the main branch of Spencer Creek (SC2). The unnamed tributary to Spencer Creek is classified as Small Riverine Warmwater habitat. This habitat type within the Spencer Creek watershed includes small watercourses that may have similar characteristics to coldwater habitat on the Niagara Escarpment (steep gradient, large substrate materials), however they have variable flow regimes and may dry up during the summer months (Bowlby et al 2009). The main branch of Spencer Creek (SC2) is classified as Intermediate Riverine Coldwater habitat which is typically defined as medium to high-gradient streams with medium to large substrate materials. This area of Spencer Creek contains some of the most significant areas of this habitat type within the Hamilton Harbour Watershed (Bowlby et al 2009).

Bronte Creek Watershed (Stream Crossings: SC3 and SC4)

The two crossings within the Bronte Creek watershed (SC3 and SC4) cross the same unnamed tributary to Bronte Creek. Habitat within this tributary is considered moderate to high due to good water quality, a moderately diverse fish community, marginally coldwater thermal regime, moderately natural in-stream habitat, and riparian habitat that provides good to patchy buffering to the watercourse (CH 2002).



Table 4-2: Fish Species Along the Proposed Route

Fish Species		Grand River Watershed (GRCA 2005)	Spencer Creek Watershed (Bowlby et al 2009)		Bronte Creek Watershed (CH 2013)
Common Name	**Latin Name**	**Barlow Creek Warmwater Habitat (No crossings)**	**Small Riverine Warmwater Habitat (SC1)**	**Intermediate Riverine Coldwater Habitat (SC2)**	**SC3 and SC4**
Black Crappie	*Pomoxis nigromaculatus*		X		
Blacknose Dace	*Rhinichthys atratulus*			X	X
Blacknose Shiner	*Notropis heterolepis*		X	X	
Blackside Darter	*Percina maculata*				X
Bluntnose Minnow	*Pimephales notatus*			X	X
Brook Stickleback	*Culaea inconstans*	X			X
Brown Bullhead	*Ameiurus nebulosus*		X		X
Brown Trout	*Salmo trutta*				X
Central Mudminnow	*Umbra limi*	X	X	X	X
Common Carp	*Cyprinus carpio*				X
Common Shiner	*Luxilus cornutus*		X	X	X
Creek Chub	*Semotilus atromaculatus*	X	X	X	X
Fathead Minnow	*Pimephales promelas*			X	X
Green Sunfish	*Lepomis cyanellus*				X
Hornyhead Chub	*Nocomis biguttatus*			X	
Johnny Darter	*Etheostoma nigrum*			X	X
Largemouth Bass	*Micropterus salmoides*		X		
Mottled Sculpin	*Cottus bairdii*			X	
Northern Hog Sucker	*Hypentelium nigricans*				X

Table 4-2: Fish Species Along the Proposed Route

Fish Species		Grand River Watershed (GRCA 2005)	Spencer Creek Watershed (Bowlby et al 2009)		Bronte Creek Watershed (CH 2013)
Common Name	**Latin Name**	**Barlow Creek Warmwater Habitat (No crossings)**	**Small Riverine Warmwater Habitat (SC1)**	**Intermediate Riverine Coldwater Habitat (SC2)**	**SC3 and SC4**
Northern Pearl Dace	*Margariscus nachtriebi*				X
Northern Pike	*Esox lucius*	X			X
Pumpkinseed	*Lepomis gibbosus*	X	X		X
Redside Dace	*Clinostomus elongatus*			X	
River Chub	*Nocomis micropogon*			X	
Rosyface Shiner	*Notropis rubellus*			X	
White Sucker	*Catostomus commersonii*				X

Aquatic Species at Risk

The main branch of Spencer Creek (SC2) contains records for Redside Dace (DFO 2019). Redside Dace is Endangered under the provincial ESA and Schedule 1 of the federal SARA and therefore receives protection under these Acts. Critical habitat is not found in this watercourse (DFO 2019). As Spencer Creek is provincially regulated as Occupied habitat, Enbridge should assume that Redside Dace are present within the RoW.

Potential Impacts

The proposed pipeline route crosses four watercourses. Summer habitat assessments will be conducted in 2020 to confirm aquatic habitat conditions. During construction contamination of surface water features can occur due to accidental spills. The results of the surveys will be used to confirm mitigation and protection measures.

Industry standard watercourse crossing methods that meet the requirements of DFO for fish and fish habitat protection will be used during construction. These plans include “isolated” watercourse crossing methods such as the Dam and Pump crossing method.

Dam and Pump Crossing

The Dam and Pump Crossing method isolates water flow from the construction area and avoids the majority of the technical risks inherent in other crossing techniques, such as damage to pipe integrity, achieving good cathodic protection, being accessible for maintenance, and increased cost and schedule.



Construction of an open cut crossing has the potential to affect fish directly through impacts on water quality (erosion, sedimentation, and accidental spills), disruption/harassment (vibration and noise) and loss of habitat. Indirect impacts include restrictions to habitat use and fish passage. Long term impacts can include changes to habitat such as substrate, increased erosion potential, loss of in-stream cover and riparian shading.

Mitigation and Protective Measures

Mitigation and protective measures for erosion and sediment control are outlined in Section 4.2.2.

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 in the event that 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.

Temporary vehicle crossings and dam and pump pipeline crossings should be completed following the measures outlined in industry standards and the Enbridge Environmental Guidelines for Construction (Enbridge 2012).

The following general mitigation measures, or equivalent, are recommended at watercourse crossings along the preferred pipeline route. Additional, activity-specific measures related to the crossing methods are provided following the general mitigation measures. All measures presented are intended to be consistent with DFO's measures to avoid serious harm (DFO 2016), but DFO's website (http://www.dfo-mpo.gc.ca/pnw-ppe/measures-mesures/measures-mesures-eng.html) should be consulted immediately prior to construction to confirm that the construction plan is consistent with the most up-to-date list of DFO avoidance measures.

General Mitigation Measures

- In-water work for warmwater habitats is typically permitted from July 1 to March 15 (no work from March 16 to June 30).
- In-water work for Redside Dace habitat is typically permitted from July 1 to September 15 (no work from September 16 to June 30).
- Watercourses should not be obstructed in a way that impedes the free movement of water and fish.

- 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.
- Soil exposure should be reduced prior to commencing construction, and the period that soil remains exposed for grading should be limited. Exposed soils surrounding watercourses should be seeded immediately following construction.
- 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 possible.
- 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 >30 m from the watercourse, where possible. Any such material that inadvertently enters a watercourse should be removed in a manner satisfactory to the environmental inspector.
- In the unlikely event of a spill, spills containment and clean-up procedures should be implemented immediately. Enbridge will 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.
- Conditions of water crossing permit(s), if applicable, will be adhered to.
- Additional supplies should be maintained in a readily accessible location for maintenance and contingency purposes:
  - Sediment control fencing
  - Sediment control logs (i.e., SiltSoxx™)
  - Straw bales
  - Wooden stakes
  - Sand bags
  - Water energy dissipater
  - Filter cloth
  - Water pumps (including stand-by pumps and sufficient lengths of hose)
  - Culvert

Additional Measures

The following measures are applicable to trenched crossings:

Flow Diversion/Dewatering

If in-water works are required, the work area should be isolated from the remainder of the surface water feature. Downstream flows should be maintained using dam and pump techniques. When dewatering the work area, dewatering operations should be managed to prevent erosion and/or release of sediment laden or contaminated water to the waterbody (e.g. settling basin, filter bag, energy dispersion measures). An isolation/contamination plan should be designed and implemented to isolate temporary in-water work zones and maintain flow around the work zone. Maintenance of downstream flow should avoid potential upstream flooding and desiccation of downstream aquatic habitat and organisms.

Fish Rescue Plan

Prior to dewatering the work zone, fish trapped in the construction area shall be collected and moved using capture, handling, and release techniques to reduce harm and stress. The intakes of pumping hoses should be equipped with an appropriate device to avoid entraining and impinging fish (see *Measures to Avoid Causing Harm to Fish and Fish Habitat* (2013) at the following DFO website http://www.dfo-mpo.gc.ca/pnw-ppe/measures-mesures/measures-mesures-eng.html). Fish rescue plans should be developed on a site-specific basis and implemented by qualified professionals with the appropriate permitting in place (i.e. MNRF Licence to Collect Fish for Scientific Purposes).

Site Restoration and Riparian Planting

Following construction, the bed and banks of the crossing locations should be restored to pre-construction conditions to the extent possible in accordance with environmental permits. Bank slopes should be restored to match existing grades; however, alterations may be made to maintain slope stability and limit future erosion. Exposed banks should be re-vegetated with native plants to provide riparian cover and aid in erosion and sediment control. Stream beds should be restored to maintain slopes and tie in with existing grades. Bed material should be replaced to match pre-construction conditions.

Permitting

The *Fisheries Act* prohibits causing serious harm to fish unless authorized by the DFO. This applies to work being conducted in or near water bodies that support fish that are part of or that support a CRA fishery. Since November 25, 2013, proponents must take the responsibility to determine whether or not their projects meet the DFO requirements under the Self-Assessment process. If serious harm cannot be avoided, proponents should contact DFO for a formal review and/or approval under the *Fisheries Act*. Following finalization of plans, a Self-Assessment should be completed for all project activities that have the potential to cause serious harm to fish. If it is determined that serious harm is likely to occur as a result of project-related activities, a Request for Review should be completed and submitted to DFO to determine approvals requirements under the *Fisheries Act*. Revision to the *Fisheries Act* were proposed on February 16, 2018 that may come into force in 2019. Should the proposed revisions come into force

prior to construction, the proposed mitigation measures should be reviewed to ensure that they are consistent with the revised *Fisheries Act*.

The pipeline route will be located within the regulated boundary of the GRCA, HCA and CH. Permits under Ontario Regulation 150/06, 161/06 and 162/06, respectively, will be required prior to construction activities in the regulated boundaries. If activities are required below the high-water line, then the DFO and MECP must be contacted to determine if a SARA and ESA Permits are required.

Net Impacts

With the implementation of standard construction methods and the above mitigation and protective measures, no adverse residual impacts on aquatic species or habitat are anticipated.

4.3.2 Designated Natural Areas and Vegetation

Existing Conditions

The proposed pipeline route falls within the Niagara section of the Deciduous Forest Region (Rowe, 1972). The vegetation communities in the area have been significantly altered by anthropogenic activities (predominantly clearing and draining of land for agricultural purposes). Forest cover for the watersheds that the proposed pipeline crosses range from 19% (GRCA no date, HCA 2013) to 26.4% (CH 2013). The proposed pipeline is located adjacent to an existing RoW, crossing approximately 1.9 km of woodlands, 0.4 km of wetlands, as well as various hedgerows, located primarily at property boundaries, roads, and watercourses. Hayfields, pastures or fallow fields, which may provide habitat for grassland birds, occur along the route, interspersed with row crops (e.g., corn, soy). A map of designated natural areas is provided on Figure 12, Appendix C.

Wetlands

The Ontario Wetland Evaluation System 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) indicates that the proposed pipeline route is within 120 m of three PSWs, including Beverley Swamp Wetland Complex, Hayesland Christie Wetland Complex, and Sheffield Rockton Wetland Complex. One small pocket of unevaluated wetland was also identified along the proposed pipeline route based on MNRF mapping, located west of the Hamilton valve site. Vegetation and Ecological Land Classification (ELC) surveys will be completed in 2019-2020 to assess presence or absence of wetlands within 120 m of the proposed pipeline route.



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 is located in the City of Hamilton rural planning area. The Official Plan was reviewed for the criteria and identification of significant woodlands that occur within the construction footprint.

The City of Hamilton's Rural Official Plan (2012) states that significant woodlands are defined as "*an area which is ecologically important in terms of: a) Features such as species composition, age of trees, stand history; b) Functionally important due to its contribution to the broader landscape because of its location, size, or due to the amount of forest cover in the planning area; and c) Economically important due to site quality, species composition or past management history*."

Specifically, to be identified as significant, a woodland in the City of Hamilton must meet two or more of the following criteria:

Table 4-3: City of Hamilton Significant Woodland Criteria

Criterion	Description	
Size	**Forest Cover (by planning unit)**	**Minimum patch size for significance**
	< 5 %	1 ha
	5-10 %	2 ha
	11-15 %	4 ha
	16-20 %	10 ha
	21-30 %	15 ha
Interior Forest	Woodlands that contain interior forest habitat. Interior forest habitat is defined as 100 metres from edge.	
Proximity/Connectivity	Woodlands that are located within 50 metres of a significant natural area (defined as wetlands 0.5 hectares or greater in size, ESAs, PSWs, and Life Science ANSIs).	
Proximity to Water	Woodlands where any portion is within 30 metres of any hydrological feature, including all streams, headwater areas, wetlands, and lakes.	
Age	Woodlands with trees of 100 years or more in age. Age will be determined initially using FRI mapping and can be verified during the EIS.	
Rare Species	Any woodland containing threatened, endangered, special concern, provincially or locally rare plant or wildlife species.	

The City of Hamilton identifies significant woodlands on Schedule B-2 of their Official Plan, which includes the application of a 30 m vegetation protection zone to the woodlot edge. Significant woodlands are identified within 120 m of the proposed pipeline route.

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 life science ANSI, the Beverly Swamp, within 120m of the proposed pipeline route.

Potential Impacts

The proposed pipeline route occurs along an existing RoW, however it crosses approximately 1.9 km of woodlands and 0.4 km of wetlands. Field surveys will be conducted prior to construction to confirm the presence or absence of wetlands. ELC and botanical surveys will be conducted prior to construction to assess the significance and boundaries of vegetation communities and to identify vascular plant species,



including plant species of concern. The results of the surveys will be used to confirm mitigation and protection measures.

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 prior to construction.
- Clearing should be minimized 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 within the project footprint.
- Clearing should be done during dry soil conditions to the extent practical to limit disturbance to vegetation and terrain.
- A screening field program of wetlands and riparian areas should be undertaken prior to construction, to determine where precautionary measures (ex. 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. Enbridge Gas should consult with landowners, GRCA, HCA, and CH to confirm replanting plans.
- A tree replacement program will be completed, which involves the replanting of twice the area of woodlot removed during construction. The replacement/compensation for the removal of individual landscape trees will be completed outside of the tree replacement program and will be discussed between the landowner and an Enbridge Gas Land Agent. Tree replacement consists of species native to the area, and ideally the same species removed. Enbridge Gas encourages planting of replacement trees on the same property where the trees were removed, with the goal of enhancing a natural area and its associated wildlife habitat. If a landowner is not interested in planting trees on their property, Enbridge Gas will offer the trees to a CA or to a local community group. Enbridge Gas will maintain the trees for a period of 5 years, or until the trees reach a ‘free to grow’ status as defined by a height of 1 metre (m) and tree of adjacent brush competition.
- Seeding of the disturbed temporary work areas and permanent easement should be done with a native seed mix reviewed by GRCA, HCA, or HC. Replaced soils will 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 route 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. 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. Review of the NHIC (MNRF, 2019b) identified deer wintering areas in proximity to the proposed pipeline route. The potential for seasonal concentration areas to occur within 120 m of the proposed pipeline is assessed in Table D-1, Appendix D. Candidate habitat for the following seasonal concentration areas may be present along the proposed pipeline route:

- Waterfowl stopover and staging areas (terrestrial and aquatic)
- Raptor wintering area
- Bat maternity roost colonies



- Turtle wintering areas
- Reptile (snake) hibernaculum
- Colonially-nesting breeding bird habitat (bank, tree/shrub and ground)
- Deer Winter Congregation Areas.

Field investigations in 2019-2020 will assess the presence and quality of candidate seasonal concentration 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 route. 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. Candidate habitat for the following specialized habitats may be present in the proposed pipeline route:

- Waterfowl nesting area
- Bald Eagle and Osprey nesting, foraging and perching habitat
- Woodland Raptor Nesting Areas
- Turtle nesting areas
- Seeps and springs
- Amphibian breeding habitat (woodland and wetland)
- Woodland area-sensitive bird breeding habitat.

Field investigations in 2019-2020 will assess the presence and quality of rare vegetation communities or candidate specialized habitats.

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). Rivers and creeks may be used as amphibian movement corridors; these features were present within 120 m of the proposed pipeline route. Deer movement into/out of the identified wintering area is anticipated along riparian areas and hedgerows, as hedgerows may also serve as small linkages (MNR, 2000).



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).

Candidate habitat for species of conservation concern may be present in the proposed pipeline route, as detailed in Table D-1, Appendix D.

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, 24 species of conservation concern are known to occur in the vicinity of the proposed pipeline route, as shown in Table 4-4: 9 plants, 3 insects, 5 reptiles, 1 amphibian, and 6 birds. 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 4-5 may not occur along the proposed pipeline route. An assessment of candidate habitat and/or habitat use for individual species of conservation concern will be completed during 2019-2020 field investigations.



Table 4-4: Potential Terrestrial Species of Conservation Concern Along the Proposed Route

Common Name	Scientific Name	Srank	Provincial Status (COSSARO)	Source
Plants				
Broad Beech Fern	*Phegopteris hexagonoptera*	S3	SC	NHIC
Downy Yellow False Foxglove	*Aureolaria virginica*	S1		NHIC
Eastern Burning Bush	*Euonymus atropurpureus*	S3		NHIC
Eastern Few-fruited Sedge	*Carex oligocarpa*	S3		NHIC
Fern-leaved Yellow False Foxglove	*Aureolaria pedicularia*	S2?		NHIC
Green Arrow Arum	*Peltandra virginica*	S3		NHIC
Perfoliate Bellwort	*Uvularia perfoliata*	S1S2		NHIC
Scarlet Beebalm	*Monarda didyma*	S3		NHIC
Slender Mountain-mint	*Pycnanthemum tenuifolium*	S3		NHIC
Insects				
Gypsy Cuckoo Bumble Bee	*Bombus bohemicus*	S1S2		NHIC
River Bluet	*Enallagma anna*	S2		NHIC
Sleepy Duskywing	*Erynnis brizo*	S1		NHIC
Reptiles				
Eastern Musk Turtle	*Sternotherus odoratus*	S3	SC	NHIC
Eastern Ribbonsnake	*Thamnophis sauritus*	S4	SC	NHIC, ORRA
Northern Map Turtle	*Graptemys geographica*	S3	SC	NHIC
Eastern Milksnake	*Lampropeltis triangulum*	S3	SC	ORAA
Snapping Turtle	*Chelydra serpentina*	S3	SC	ORAA
Amphibians				
Jefferson X Blue-spotted Salamander, Jefferson genome dominates	Ambystoma hybrid pop. 1	S2		NHIC

Table 4-4: Potential Terrestrial Species of Conservation Concern Along the Proposed Route

Common Name	Scientific Name	Srank	Provincial Status (COSSARO)	Source
Birds				
Canada Warbler	*Cardellina canadensis*	S4B	SC	OBBA
Caspian Tern	Hydroprogne caspia	S3B	NAR	NHIC
Eastern Wood-pewee	*Contopus virens*	S4B	SC	NHIC, OBBA
Grasshopper Sparrow	*Ammodramus savannarum*	S4B	SC	OBBA
Prairie Warbler	Setophaga discolor	S3B	NAR	NHIC
Wood Thrush	*Hylocichla mustelina*	S4B	SC	NHIC, OBBA

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

Species at Risk

For the purpose of this report, Species at Risk (SAR) are those species identified as endangered or threatened by provincial (ESA) legislation. As federal SARA protections do not apply to the area along the proposed pipeline route, species protected as endangered or threatened under SARA, but not protected under the ESA, are included in Table 4-4, above.

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, 25 SAR are known to occur in the vicinity of the proposed pipeline route, as shown in Table 4-5: 7 plants, 2 reptiles, 1 amphibian, 11 birds and 4 mammals. An assessment of candidate habitat and/or habitat use for SAR will be completed during 2019-2020 field investigations.

Table 4-5: Potential Terrestrial Species at Risk (Threatened or Endangered) Along the Proposed Route

Common Name	Scientific Name	Provincial Status (COSSARO)	Source
Plant			
American Chestnut	Castanea dentata	END	NHIC
American Columbo	Frasera caroliniensis	END	NHIC
Bashful Clubrush	Trichophorum planifolium	END	NHIC
Butternut	Juglans cinerea	END	NHIC
Eastern Flowering Dogwood	Cornus florida	END	NHIC
Red Mulberry	Morus rubra	END	NHIC
Spotted Wintergreen	Chimaphila maculata	END	NHIC
Reptiles			
Blanding's Turtle	Emydoidea blandingii	THR	NHIC, ORAA
Spiny Softshell	Apalone spinifera	END	NHIC
Amphibians			
Jefferson Salamander	Ambystoma jeffersonianum	END	NHIC
Birds			
Barn Swallow	Hirundo rustica	THR	NHIC, OBBA
Bank Swallow	*Riparia riparia*	THR	OBBA
Bobolink	Dolichonyx oryzivorus	THR	NHIC, OBBA
Cerulean Warbler	Setophaga cerulea	THR	NHIC
Chimney Swift	*Chaetura pelagica*	THR	OBBA
Eastern Meadowlark	Sturnella magna	THR	NHIC, OBBA
Eastern Whip-poor-will	*Antrostomus vociferus*	THR	NHIC
Least Bittern	Ixobrychus exilis	THR	NHIC, OBBA
Loggerhead Shrike	Lanius ludovicianus	END	NHIC
Louisiana Waterthrush	Parkesia motacilla	THR	NHIC
Yellow-breasted Chat	Icteria virens	END	NHIC

Table 4-5: Potential Terrestrial Species at Risk (Threatened or Endangered) Along the Proposed Route

Common Name	Scientific Name	Provincial Status (COSSARO)	Source
Mammals			
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

Stantec completed a desktop assessment to evaluate the existing conditions of the proposed pipeline route. The proposed pipeline route crosses a variety of habitats (agricultural fields, woodlands, wetlands, watercourses and hedgerows). A general assessment of potential habitat for SAR along or adjacent to the proposed route is provided in Table D-2, Appendix D.

Potential Impacts

Due to the presence of woodlots, wetlands, hedgerows, watercourses and open fields in proximity to the proposed pipeline route, field surveys will be undertaken before construction to assess the presence or absence of wildlife and wildlife habitat. Planned surveys include those for amphibians, reptiles (turtle and snake habitat assessment), mammals (bat habitat assessment), breeding birds, nesting raptors, Bald Eagle and Osprey perching, assessment for species at risk, and a search for seeps and springs. If required, species surveys to evaluate candidate significant wildlife habitat identified during habitat assessments may be undertaken, which could include surveys for colonial nesting birds, wintering raptors, waterfowl and turtle nesting. The results of all surveys, including any additional appropriate mitigation or protection measures, will be summarized in a report and shared with the MECP to determine any regulatory requirements.

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.

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.
- Trench operations should be followed as closely as practical with backfill operations, to facilitate the movement of wildlife across the trench.
- Gaps in stockpiles should be created, in consultation with a biologist, to allow for the potential movement of wildlife across the RoW.
- 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.
- Where practical, avoid construction in the vicinity of areas that may provide habitat for amphibians during the amphibian breeding season (March 1 – June 30).
- Areas of potential bat maternity roosting habitat will be identified during field investigations. Tree removal in identified areas should be limited to the extent possible and will avoid the active season for bats (May 1 to August 31). Mitigation recommendations for SAR bats will be prepared upon consultation with MECP.
- Work (soil excavation) within wetlands is recommended to occur outside of the winter months (i.e., not between November 1 and March 30) to avoid potential impacts to hibernating frogs and turtles. Silt fencing is recommended along the perimeter of the work zone to prevent encroachment into the wetland, exclude reptiles and amphibians, 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.
- Habitat assessments and species occurrence surveys will be conducted for SAR. A report will be prepared to document results and recommend mitigation measures.



- If SAR are found along the proposed pipeline route Enbridge Gas will undertake consultation with the MECP regarding the potential need for a permit under the ESA and/or species-specific mitigation.

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 City of Hamilton, the number of people employed increased from 243,075 in 2011, to 259,065 in 2016, while the unemployment rate decreased from 8.7% to 7.0% over the same period. The unemployment rate in the City of Hamilton was below the provincial and national average rates of 7.4% and 7.8%, respectively, for 2016. Refer to Table 4-6 for labour characteristics.

Table 4-6: Labour Characteristics, Ontario and Hamilton, 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
Hamilton (City)	441,055	278,640	259,065	63.2	58.7	7.0

Source: Statistics Canada, 2011; 2017

The median income for all census households in Hamilton in 2015 was $69,024; the median income for individuals aged 15 years and over was $32,917 (Table 4-7).

Table 4-7: Median Income, Ontario and Hamilton, 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
Hamilton (City)	$69,024	$32,917	$39,174	$28,056

Source: Statistics Canada, 2017

In 2016, the main sources of employment by industry for Hamilton were health care and social assistance (13.0%), manufacturing (11.9%), and retail trade (11.6%) (Statistics Canada, 2017).

Hamilton's labour force is concentrated in three main occupations: sales and services occupations (23.9%), transport and equipment operators and related occupations (14.6%) and business, finance and administration occupations (13.9%) (Statistics Canada, 2017).

Potential Impacts

During construction, the labour force will peak at approximately 370 workers. Approximately 99% of the labour force is expected to come from Ontario and other areas of Canada, while 65% will likely be local residents. Project construction is expected to take place in the Spring/Summer/Fall of 2021 and take an estimated 6 months to complete. Enbridge Gas will schedule shifts so that employees are working six days per week for 10 to 12 hours each day. Workers will be at the work site for as long as is required to complete specific construction tasks. Operation will require only 32 person-hours a year to manage and maintain the proposed pipeline. 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 in order 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 Verbinnen's Nursery, Taylor Hills Equine Centre and Green Relief. Other potential adverse effects include impairment to the use and enjoyment of property and conflicts with farm machinery and other 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 Enbridge Gas will identify and implement various mechanisms to enhance project benefits.

The potential effects of the project as a result of purchasing labour, goods and services is expected to be positive during construction and operation, so no mitigation will be required. However, Enbridge Gas has and will continue to work with local and Indigenous businesses to enhance their potential for successfully bidding on project contracts regarding the supply of goods and services, particularly for the operation phase. One initiative to help encourage further local and Indigenous content on the project is to post project purchasing requirements in advance, so that businesses can position themselves to effectively bid to supply goods and services needed for construction and operation. Increased participation of local and Indigenous businesses will enhance positive local economic effects.

With respect to potential adverse effects on agricultural and non-agricultural businesses (commercial and industrial), Enbridge Gas will engage with land owners, business operators, and the City of Hamilton 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 City of Hamilton had a population of 536,917 (Statistics Canada, 2017). Hamilton experienced a modest population increase between 2011 and 2016, slightly below the population growth in Ontario (Table 4-8).

Table 4-8: Population Ontario and Hamilton 2016

Location	Total Population	Percent Change from 2011
Ontario	13,448,494	4.6
Hamilton	536,917	3.3

*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 Hamilton was 41.5 years (Statistics Canada, 2017); Ontario's median age was 41.3 (Statistics Canada, 2017).

In 2016, 17,665 residents of Hamilton identified themselves as Aboriginal (Statistics Canada, 2017). Together this represents approximately 3.4% of the provincial Aboriginal population (Statistics Canada, 2017).

Permanent and Temporary Accommodations

In 2016, there were 211,600 private dwellings in the City of Hamilton. The majority (57%) of homes were single-detached dwellings and 68,545 rental homes (Statistics Canada, 2017).

Within the City of Hamilton, there are nine bed-and-breakfasts and 60 hotels/motels, as well as two CA regulated campgrounds, and nine private campgrounds (Tourism Hamilton, n.d.).

Municipal Services and Infrastructure

The City of Hamilton operates one landfill, the Glanbrook Landfill, and three Community Recycling Centres (City of Hamilton, 2019). The City of Hamilton water supply is taken from Lake Ontario and distributed to residences and businesses in Hamilton, Stoney Creek, Dundas, Ancaster, Waterdown, and parts of Flamborough and Glanbrook. Four areas within the City of Hamilton rely on groundwater as their drinking water source; Carlisle, Freelton, Greensville and Lynden (City of Hamilton, 2016b).

Health and Education Services and Infrastructure

The City of Hamilton is serviced by Hamilton Public Health Services, located within the Hamilton-Niagara-Haldimand-Brant Local Health Integration Network (Ontario Ministry of Health and Long-Term Care, 2018). There are currently 10 facilities in the City of Hamilton providing health care services: Chedoke Hospital, Hamilton General Hospital, Juravinski Cancer Centre, Juravinski Hospital, St. Joseph's Healthcare Hamilton, McMaster Children's Hospital, McMaster University Medical Centre, St. Peter's Hospital and Main Street West Urgent Care Centre. (City of Hamilton, 2016c).

Roads and Highways

The proposed pipeline route crosses Westover Road, Middletown Road and Brock Road. These are two lane roads that do not carry high volumes of traffic and are rural in nature. The route crosses Bushmill Circle which is a private road in the community of Antrim Glen. The proposed pipeline route also crosses Highway 6 which is a four-lane highway that carries high volumes of traffic.

The Streets and Transportation department of the City of Hamilton is responsible for managing the City of Hamilton Road system, including pothole repairs, street lighting and sign maintenance, entrance culverts and rural roadside mowing. Within the City of Hamilton, there are various classifications of roads and highways, from high volume urban arterials to rural collector roads.

Policing, Fire and Emergency Response Services

The Hamilton Police Service serves the entire City of Hamilton. Patrol Division 3 provides policing services to five communities within the City of Hamilton; Flamborough, Dundas, Ancaster, Binbrook/Glanbrook and Hamilton Mountain. There are no Ontario Provincial Police detachments within in City of Hamilton; the closest OPP detachment to the study area is located in the City of Cambridge (Ontario Provincial Police, 2019).

The City of Hamilton's Fire Department provides fire prevention/public education, fire communications/dispatch, firefighting and rescue operations, medical response with the Hamilton Paramedic Service, emergency planning/preparedness, and mechanical and fleet services for both Fire and Hamilton Paramedic Service. There are 30 fire stations within the City of Hamilton, with the closest fire station to the study area being Fire Station 28 located at 1801 Brock Road in Freelton (City of Hamilton, 2018).

Potential Impacts

The presence of temporary workers in the local communities during the six-month long 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.

During operation, the workforce will be relatively small (likely requiring only 100 hours per year, or an average of approximately 2 hours per week) and localized, and will put minimal additional demands on



local services and infrastructure. Some operation workers might already reside in the local area; however, some might need to come from outside communities and may use local community and emergency services.

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 construction contractor and Enbridge Gas 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 outlines 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.

Enbridge Gas will provide project information to local communities and service providers so that they are prepared for any possible demand on community services and infrastructure related to a temporary population increase. 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 Enbridge Gas 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 intersects mainly rural communities where roads currently have low levels of traffic and alternative 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, n.d.).

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 City of Hamilton 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 4-9).

Table 4-9: Health Indicators, City of Hamilton Health Unit and Ontario, 2015/2016

Indicators	City of Hamilton Health Unit (%)	Ontario (%)
Perceived health, very good or excellent	57.6	61.0
Perceived mental health, very good or excellent	70.0	71.1
Perceived life stress, most days quite a bit or extremely stressful	22.1	22.0

Source: Statistics Canada, 2019.

In 2015/2016 the population in the project area had perceptions of their health, mental health and life stress which were generally consistent with 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 20 recreational facilities in Hamilton providing many activities such as ice arenas, aquatic centres and various sports for all ages. There are over 100 parks, 11 conservation areas within HC regulated boundaries, eight parks within CH regulated boundaries and seven conservation areas and 12 parks within the GRCA regulated boundaries. The City of Hamilton owns and manages three 18-hole golf courses; Chedoke Golf Club – The Beddoe Course, Chedoke-Martin Golf Course and King's Forest Golf Course (City of Hamilton, n.d.).

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. During public consultation for the project, comments were raised regarding noise, dust, monetary compensation for loss of crops and trees, disruption to business, as well as enjoyment of property.

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 City of Hamilton (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. 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 with the production of agricultural 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 and access by landowners and farmers to their land.

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 spring, 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.

If laneways or driveways are affected as a result of pipeline construction, they will be left in place over the trench where requested by the landowner, for as long as possible and practical. Access to residential properties and businesses should be maintained at all times 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, Enbridge Gas will work with landowners to address specific concerns they may have regarding monetary compensation and their property, such as access, disruption to business and tile drainage repairs.

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. Vegetative buffers at watercourses and road crossings will be implemented and be compliant with applicable permits and regulations.

Additional consultation with residents and businesses along and adjacent to the proposed pipeline route will take place in advance of construction activity. Enbridge Gas 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, Enbridge Gas will undertake their standard tree replacement program. 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/highways, access roads/driveways, hydroelectric lines, and utilities. Existing conditions for roads and highways are outlined in Section 4.4.2.

The proposed pipeline route is located adjacent to residences in Antrim Glen Residential Community, Ponderosa Nature Resort and other residential properties on Westover Road, Middletown Road and Brock Road. There are 49 buildings within 50 m of the proposed route.

The proposed pipeline route intersects and runs parallel to existing overhead hydro and telecommunications utilities. The proposed pipeline route also traverses an overhead high-voltage hydroelectric transmission lines at two locations:

- On Highway 6, approximately 400 m north of Carlisle Road in Freelton, Ontario; and
- Near the existing Enbridge Kirkwall valve site and Trans Canada Compressor Station 1301, located on Valens Road in Cambridge, Ontario

The proposed pipeline route also parallels, and at one-point traverses, existing Enbridge Gas pipelines. The proposed pipeline traverses the existing Enbridge Gas pipelines approximately 400 m south of Concession 8 West and approximately 750 m west of Brock Road.

A variety of buried utilities such as telecommunication cables, low-voltage hydroelectric lines and watermains are located in 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 agricultural fields.

The proposed project will be constructed parallel and overlapping an existing Enbridge Gas easement, with some temporary lands required for construction purposes. Impacts to a community garden in the Antrim Glen Residential Community and to tennis courts within the Ponderosa Nature Resort will occur. Where temporary lands are required limited impacts to agricultural lands, 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.

Due to high traffic volumes the crossing of Highway 6 will be completed by way of trenchless installation method. 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).

Mitigation and Protective Measures

If laneways or driveways are affected as a result of pipeline construction, they will be left in place over the trench where requested by the landowner, for as long as possible and practical. Access to residential properties and businesses should be maintained at all times 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 communities 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 Infrastructure Ontario and HONI regarding easements to cross the existing overhead hydroelectric lines.

The contractor will be responsible for locating and exposing existing pipelines and utilities on lands that will be affected by trench excavation. 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 Highway 6 the Traffic Management Plan (Section 4.4.2) and additional traffic controls should be implemented. Enbridge Gas 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 will 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

A detailed mitigation plan will be developed once the crossing method and design have been determined.

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 mostly agricultural and rural. There are also areas of open space, residential, commercial and natural heritage. Agricultural operations have the potential to expel air emissions. Although the study area does not have a high population density, air emissions will be released through automobile use.

According to Environmental Noise Guideline (MOECC 2016), the majority of the landscape along the proposed pipeline route would be categorized as a Class 3 area, meaning “a rural area with an acoustical environment that is dominated by natural sounds having little or no road traffic, such as a small community; agricultural area; a rural recreational area such as a cottage or a resort area; or a wilderness area.”

The study area experiences a low traffic volume that represents a minimal source of noise for the majority of the proposed pipeline route, with increased traffic volume on Highway 6.

Other minor noise sources within the study area include occasional sounds due to anthropogenic agricultural 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.

See Section 4.2.1 for potential impacts due to blasting and hoe-ramming activities.

Mitigation and Protective Measures

During construction, motorized construction equipment should be equipped with appropriate mufflers and silencers as available. 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 so as 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 Contamination

Existing Conditions

A Contamination Overview Study (Appendix E) was completed for the project which considered the preferred pipeline route and activities within 250 m on either side to identify potential sources of contamination (PSOC). The overview included a search of public and private information databases for the investigated area by Environmental Risk Information Services (ERIS), and a limited site reconnaissance (i.e., a windshield-level survey which involved viewing the site and surrounding area from publicly accessible roadways) completed on January 4, 2019. PSOC were ranked as either low, moderate, or high depending on the distance of the potential source from the preferred route and the activity associated with the potential source.

Based on a review of the ERIS database report and the site reconnaissance, it was determined that 8 PSOC occur within 250 m of the proposed pipeline route. Of these, the potential for concern was moderate for one PSOC and low for seven PSOC. None if the identified PSOC were ranked as high.

A summary of the identified PSOC associated with the proposed pipeline route is provided in Table 4-10

Table 4-10: A summary of Potential Sources of Contamination (PSOC)

PSOC ID No.	Description of Potential Source	Location	Approximate Distance from the Site	Contaminant of Concern	Potential for Concern	Explanation of Potential for Concern
1	Enbridge Gas Kirkwall valve site	1374 Valens Road	Adjacent property to the west	Petroleum Hydrocarbons (PHCs), Polycyclic Aromatic Hydrocarbons (PAHs), and Volatile Organic Compounds (VOCs)	Low	Presence of metering equipment. No evidence of soil or groundwater contamination identified through Site observation and historical records review process.
2	Trans Canada Kirkwall Compressor Station	1376 Valens Road	Adjacent property to the west	PHCs, PAHs, and VOCs	Low	Presence of metering equipment. No evidence of soil or groundwater contamination identified through Site observation and historical records review process.
3	Imported fill material	Entire Site	On Site	PHCs, PAHs, VOCs, Metals and Inorganics	Moderate	It is expected that fill materials of unknown quality were imported onto the Site for the purposes of construction within the easement Therefore, the PSOC associated with imported fill along the Site is considered to be moderate.
4	Pad-mounted and pole-mounted transformers	Off Glenariff Drive and along various roadways	Within Study Area	PHCs and PCBs	Low	Pole-mounted transformers were identified along the roadway within the Study Area, as well as a pad-mounted transformer associated off Glenariff Drive with the residential communities off Concession 8 West. Given the low potential for these transformers to contain PCBs and/or transformer oil, they are considered to represent a PSOC with low potential concern.

Table 4-10: A summary of Potential Sources of Contamination (PSOC)

PSOC ID No.	Description of Potential Source	Location	Approximate Distance from the Site	Contaminant of Concern	Potential for Concern	Explanation of Potential for Concern
5	Scrap Cars, Debris, and Stockpiles	1454 Middletown Road	Approximately 75 m south of the Site	PHCs, PAHs, and VOCs	Low	Stockpiles of unknown origin/quality and several cars in varying states of disrepair were observed at this property, in addition to several piles of debris. The potential for migration of contaminants from these materials onto the Site represents a potential concern. This PSOC is considered to be low due to the distance of the property from the Site.
6	Historical Spills	Portions of Brock Road and Highway 6 within Study Area	On Site and within Study Area	PHCs, PAHs, and VOCs	Low	A few unplottable records existed for spills (≤100 L) of diesel, gasoline, and oil along Brock Road and Highway 6 between 1990 and 1997. These spills may have occurred within the Study Area. The PSOC associated with these spills is considered to be low due to the age and size of the spills.



Table 4-10: A summary of Potential Sources of Contamination (PSOC)

PSOC ID No.	Description of Potential Source	Location	Approximate Distance from the Site	Contaminant of Concern	Potential for Concern	Explanation of Potential for Concern
7	Verbinnen's Tree Nursery	1504 Brock Road	Adjacent property to the south	Pesticides and Herbicides	Low	During the site reconnaissance, a tree nursery was identified adjacent to the south of the Site. It is possible that bulk storage of pesticides and herbicides may be present given their likely use at the tree nursery to protect against disease and pests. Based on the nature of the activities at this property, the PSOC is considered to be low.
8	Hamilton valve site	43 Carlisle Road	Adjacent property to the southeast	PHCs, PAHs, and VOCs	Low	Presence of metering equipment. No evidence of soil or groundwater contamination identified through Site observation and historical records review process.

The windshield survey did not permit a detailed assessment of the presence of PSOCs at private properties; therefore, it is possible that above ground or underground fuel storage may exist on-site or at adjacent properties.

Potential Impacts

Construction activities, including excavation and associated trench dewatering, could expose contamination that may be present in soil or groundwater. This could result in increased mobility of existing contamination and/or increased human or ecological exposure to contaminants.

Mitigation and Protective Measures

Based on the findings, the following recommendations are provided:

- Should excess soil be generated at the Site during future construction activities, or if contaminated soils are suspected (e.g., if observed material contained anthropogenic substances, PHC odours/staining, and debris/waste), representative soil samples should be collected and submitted for chemical analysis to determine management options and appropriate handling and health and safety guidelines.
- Should excess soil be generated at the Site during construction activities, soils that do not meet the Standards listed in Table 1 of the MECP document Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act (April 15, 2011) may not be considered inert fill upon excavation, and off site management options for excess soils that cannot be reused within the Site must be considered.
- It is understood that salt-related parameters may not be considered to be contaminants in a road alignment, when de-icing salt has been used for winter road maintenance (O.Reg. 153/04 s.48 (3)); however, soil or water impacted by salt should be managed according to MECP guidance if it is to be removed from the RoW.
- Should excess water be generated at the Site during construction activities, water quality analyses should be conducted to determine appropriate management methods, such as done in support of a PTTW. This work should be done in coordination with a qualified person for environmental site assessment (QP_{ESA}) as defined by Ontario Regulation 153/04, to maintain data quality and provide an appropriate assessment of water quality. The QP_{ESA} should be aware of the PSOCs identified herein so as to select an appropriate list of analytes.
- Should evidence of soil or water impacts be identified during construction (e.g., staining, odours, petroleum hydrocarbon sheen) samples should be collected for laboratory analyses to confirm concentrations of potential contaminants so as to develop appropriate material management, and health and safety guidelines.
- Monitoring wells within the study area can provide a conduit from the ground surface, and should be abandoned in accordance with Reg. 903 if they are no longer in use.



- A Phase I ESA, and Phase II ESA (if recommended as part of the Phase I ESA) should be considered for any property that will be acquired by Enbridge Gas and a site-specific evaluation of PSOCs should be completed. If building demolition will be required, designated substance surveys should be completed for buildings or structures prior to demolition.

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

4.4.7 Waste Management

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 construction 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.

4.4.8 Land Use

Existing Conditions

The proposed pipeline route is located in the City of Hamilton. The City of Hamilton has two official plans. The Urban Hamilton Official Plan that applies to lands within the urban area of the city and the Rural Hamilton Official Plan that applies to the rural area of the city. The proposed pipeline is located within the rural area of the city. The Rural Hamilton Official Plan designates the route as agriculture, rural, open space and utility. According to Section 3.1.1 “the following uses shall be permitted in all land use designations as set out in the policies below:” b) Transportation facilities and existing electrical facilities

used directly for the generation and distribution or electric power, natural gas pipelines and new facilities and approved under the Environmental Assessment Act and other relevant statues shall be permitted in any land use designation located in Rural Hamilton provide they meet the conditions of the Plan."

Under the Official Plan's Energy and Environmental Design, Increased Energy Supply section 3.7.3 states "the City shall promote increasing the supply of energy and in particular, the supply of sustainable energy by: […] a) permitting energy generation facilities to meet existing and planned needs […] These facilities shall be permitted in all land use designations […] b) protecting existing and future utility corridors." (City of Hamilton, 2012)

The proposed pipeline includes Natural Heritage System – Core Areas. According to Section 2.3 Natural Heritage System – Core Areas are important components in terms of biodiversity, productivity, ecological and hydrological functions. 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). 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, natural gas 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 land is discussed in Section 4.2.5 (soils) and 4.2.6 (agricultural tile drainage). 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.

Mitigation and Protective Measures

Mitigation and protective measures for agricultural soils and drainage and for businesses are discussed in Sections 4.2.5, 4.2.6 and 4.4.1, respectively.

Consultation has been initiated, and will continue, with the City of Hamilton 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 the GRCA as per O.Reg 150/06, HCA as per O.Reg. 161/06 or 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.



4.4.9 Archaeological Resources

Existing Conditions

A Stage 1 Archaeological Assessment (AA) (Appendix F) has been conducted for the entire route evaluation study area. A copy of the completed Stage 1 AA report has been submitted to the MTCS for review and inclusion into the *Ontario Public Register of Archaeological Reports*.

Initial background research compiled information concerning potential archaeological resources within the study area. An examination of the *Ontario Archaeological Sites Database* has shown that there 14 registered archaeological sites within the study area and five registered archaeological sites within one kilometre of the study area. The City of Hamilton's municipal archaeological management plan (City of Hamilton 2016) was examined and illustrates the study area as a locale of archaeological potential.

Overall the Stage 1 AA determined that the entirety of the study area retains potential for the identification of Indigenous and Euro-Canadian archaeological resources.

Potential Impacts

The Stage 1 AA has determined that the majority of the study area retains potential for the identification of Indigenous and Euro-Canadian archaeological resources.

A map of archaeological potential is provided on Figure 14, Appendix C.

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.

4.4.10 Cultural Heritage Resources

Existing Conditions

A Cultural Heritage Assessment Report (CHAR) is in progress to identify heritage resources (both built heritage resources and cultural heritage landscapes) along the proposed pipeline route (Appendix G).

Through municipal and agency consultation, and a windshield survey conducted on January 30, 2019, a total of 26 cultural heritage resources (CHRs) have been identified within 50 m of the proposed pipeline routes (Figure 15, Appendix C). Of the 26 identified CHRs, 13 CHRs are situated within the CHAR Study Area. The CHAR Study Area refers to all properties through which the preferred pipeline route crosses plus a 50 m buffer surrounding Project components.

Potential Impacts

Impacts to cultural heritage resources are generally categorized as either direct (destruction or alteration) or indirect (shadows, isolation, obstruction, change in land use, and land disturbance). Along the proposed pipeline route, potential impacts to cultural heritage resources are limited to vibration damage to structural stability.

Mitigation and Protective Measures

In order to prevent negative impacts, the 13 CHR's identified within the CHAR Study Area should be isolated from project activities. It is recommended that site plan controls be put in place prior to construction to prevent potential impacts as a result of the project. The site plan control methods shall be determined in advance of construction by the proponent to indicate where project activities are restricted. These controls should be communicated to the construction contractor and should be indicated on all construction mapping and communicated to the construction team leads.

Identified heritage attributes of one CHR are situated within 50 m of the proposed pipeline route. The resource identified is:

- 750 Concession 8 West (CHR-11)

This resource is at risk for indirect impacts resulting from construction-related ground vibration. It is recommended that Enbridge consult with a qualified building conditions specialist or geotechnical engineer with previous experience working with heritage structures to identify appropriate vibration mitigation measures in advance of construction. It is also recommended that this consultation be expanded to include all structures within proximity to project construction. Mitigation measures for vibration may include developing an appropriate vibration setback distance, a vibration attenuation study, and/or a construction monitoring program.

Net Impacts

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



4.4.11 Indigenous Interests

Existing Conditions

There are no Indigenous communities located along the proposed pipeline route, however, the Ministry of Energy, Northern Development and Mines identified the potential for impacts to the following Indigenous communities:

- Mississaugas of the Credit;
- Six Nations of the Grand River; and
- Haudenosaunee Development Institute.

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. Potential permits and approvals required for the project (see Section 1.2.5) may trigger a duty to consult.

Mitigation and Protective Measures

Enbridge Gas has sought input from the identified Indigenous communities and will continue engaging with Indigenous communities as the project moves forward. Enbridge Gas will also continue to work with their respective Economic Development departments and Enbridge Gas's contractors to find opportunities for their participation in providing goods and services during construction. 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 4.4.9.

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 4-11 provides a summary of the recommended supplemental studies, mitigation and protective measures identified in Sections 4.2-4.4.

Table 4-11: Summary of Potential Impacts and Recommended Mitigation and Protective Measures

Environmental Feature(s)	Potential Impact(s)	Mitigation and Protective Measures
PHYSICAL FEATURES		
Bedrock Geology and Drift Thickness *Section 4.2.1*	Noise, vibration, fly rock damage and dust may impact wildlife, residences, water wells and businesses when blasting/hoe-ramming activities occur to remove bedrock.	Where hoe-ramming is undertaken the addition of water should be considered to reduce dust where appropriate. In locations where hoe-ramming is required in close proximity to residential homes or buildings the construction contractor should inspect foundations and other structures for integrity prior to and after hoe-ramming. Where blasting is required, blasting mats should be used to assist in controlling the blast. Immediately after blasting/hoe-ramming, any fly rock dispersed should be collected from the area surrounding the work site and stockpiled. If a significant quantity of bedrock has been removed, the material should be temporarily stockpiled and later transported to a local aggregate producer for reduction to crushed stone. Additionally, the material can be offered to interested landowners and businesses in the vicinity of the project. In locations where blasting is required in close proximity to residential homes or buildings, a blasting consultant should be retained to monitor potential blasting impacts. The monitoring program should include the inspection of foundations and other structures for integrity prior to and after blasting activity. The identification of homes and buildings to be monitored, in proximity to the blast, should be determined by the blasting consultant. Notices of blasting/hoe-ramming should be circulated to residents in the area of blasting/hoe-ramming locations. Monitoring of adjacent wells is recommended. Blasting procedures should be developed in conjunction with existing construction specifications, a licenced blasting contractor and a blasting design consultant in accordance to applicable regulations.
Surficial Geology and Physiography *Section 4.2.2*	Disturbance to the overburden along the proposed pipeline may cause surface soil erosion and watercourse sedimentation, particularly in areas of steep slopes during construction or post-construction. Trench slumping may occur.	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 clearing. When land is exposed, the exposure should be kept to the shortest practical period. Natural features should be preserved to the extent practical. Temporary

Table 4-11: Summary of Potential Impacts and Recommended Mitigation and Protective Measures

Environmental Feature(s)	Potential Impact(s)	Mitigation and Protective Measures
		vegetation and mulching should be used to protect areas as appropriate. Where required, natural vegetation should be reestablished 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 reviewed 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 trench from slumping, trench walls in susceptible soils should be sloped and should be monitored during wet conditions for the potential to slump. Trench boxes may be required depending on site specific conditions. At areas of the landscape with steep slopes site-specific mitigation and protective measures should be considered at the discretion of Enbridge Gas's on-site inspection team, including: placing erosion control measures at intervals along the slopes; restricting the movement of heavy machinery and construction personnel during construction on the slope; re-establishing existing contours and drainage upon completion of construction; re-establishing slopes as soon as practical, including at the conclusion of each stage of construction from the top of slope down, through hydromulching and hydroseeding with quick germinating seed mixture appropriate to surrounding vegetation; and monitoring of vegetation until established Slope stability should be reviewed at watercourse crossing locations. Watercourse banks should be seeded and stabilized immediately following crossing. 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 under O.Reg. 150/06 from GRCA, O.Reg. 161 from HCA or O.Reg. 162 from CH may contain conditions pertaining to ESC.

Table 4-11: Summary of Potential Impacts and Recommended Mitigation and Protective Measures

Environmental Feature(s)	Potential Impact(s)	Mitigation and Protective Measures
Hydrogeology *Section 4.2.3*	Hydrostatic Testing and Dewatering/Sand-pointing An uncontrolled discharge of water could cause downstream flooding, erosion, sedimentation, or contamination. Private Water Wells Depending on the proximity to wells, the depth of the well installation and the groundwater levels encountered during excavation, trench dewatering may impact water well quality or quantity at some of the overburden supply wells. Municipal Water Supply The proposed pipeline does not extend through any WHPAs or IPZs associated with any municipal groundwater supply system.	Refueling of equipment should be undertaken outside of areas mapped as highly vulnerable aquifer. If required, 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. 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 in the event that 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. Hydrostatic Testing and Dewatering/Sand-pointing For groundwater dewatering, the MECP allows registration under the EASR for construction dewatering projects where 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

Table 4-11: Summary of Potential Impacts and Recommended Mitigation and Protective Measures

Environmental Feature(s)	Potential Impact(s)	Mitigation and Protective Measures
		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 trench 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 preferred pipeline and a private well monitoring program may be recommended for residents who rely on overburden groundwater supply for domestic use. <u>Municipal Water Supply</u> There are no nearby municipal supply wells, and therefore additional mitigation measures are not required to protect groundwater drinking supply sources.
Extractive Resources: Aggregates and Petroleum Pools *Section 4.2.4*	No impacts anticipated.	N/A

Table 4-11: Summary of Potential Impacts and Recommended Mitigation and Protective Measures

Environmental Feature(s)	Potential Impact(s)	Mitigation and Protective Measures
Soil and Soil Capability *Section 4.2.5*	Surface stoniness following pipeline construction. The proposed pipeline route crosses agricultural land with a range of agricultural capability. 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. Trenching 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 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. Where equipment is moving from one agricultural field to another there is the potential for the spread of soil pests/diseases to previously unimpacted fields.	Picking of stones 10 cm and larger should be employed following soil replacement activities and subsoiling with an agricultural subsoiler. Repeated stone picking following sub-soiling, discing, chisel ploughing and cultivating should be undertaken <u>Excess Soil</u> It is noted that the MECP has proposed regulating the movement of excess soils in the province of Ontario. It is recommended that Enbridge Gas retain a qualified person for environmental site assessment who is knowledgeable in the current excess soils guidelines, as well as the proposed regulation, in order to make recommendations for the management of excess soils for this project. <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 Enbridge Gas's standard wet soils shutdown practice. Enbridge Gas'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. <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.

Table 4-11: Summary of Potential Impacts and Recommended Mitigation and Protective Measures

Environmental Feature(s)	Potential Impact(s)	Mitigation and Protective Measures
		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. Where the pipeline crosses woodlands or wetlands the organic and duff layer should be stripped where feasible, given local substrate conditions. Where stripping is undertaken in woodlands or wetlands, organic material 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 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. Soil Pests/Diseases In consultation with the landowner and an agrologist, Enbridge Gas will develop and implement a soil sampling plan on agricultural lands for potential pests and/or diseases that are known to the area. If the results indicate an issue or concern, in consultation with the landowner, Enbridge Gas will work with the agrologist, to develop a best practice protocol. Any imported topsoil used for rehabilitation will also have a composite sample analyzed for identified concerns before it is placed on the easement.

Table 4-11: Summary of Potential Impacts and Recommended Mitigation and Protective Measures

Environmental Feature(s)	Potential Impact(s)	Mitigation and Protective Measures
Agricultural Tile Drains *Section 4.2.6*	Construction activities, including trenching and the movement of heavy machinery, have the potential to crush and/or sever agricultural tile drains.	Enbridge Gas should undertake consultation with landowners of agricultural fields to confirm where systematic tile drainage is present. If tile drainage is present, Enbridge Gas should undertake standard mitigation during trenching, including: Develop site specific tile plans with an independent tile contractor Conduct pre-tiling, and install header tile to maintain tile system function Excavate the pipeline trench to a depth that allows clearance between the top of the proposed pipeline and the bottom of existing drainage systems Record and flag severed or crushed tile drains If a main drain, header drain, or large diameter drain is severed, maintain field drainage and prevent flooding of the work area and adjacent lands through temporary repairs Cap the downstream side of severed drains that cross the trench to prevent the entry of soil, debris and rodents, as required Repair damaged and severed drains following construction After repair and before backfilling, invite the landowner to inspect and approve the repair
Natural Hazards *Section 4.2.7*	A flooding event during construction could result in construction delays, soil erosion, sedimentation of a watercourse, trench slumping, and damage or loss of construction equipment and contamination of a watercourse as a result 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 under O.Reg. 150/06 from GRCA, O.Reg. 161/06 from HCA or O.Reg. 162/06 from CH.
BIOPHYSICAL FEATURES		
Aquatic Features *Section 4.3.1*	Contamination of surface water features due to accidental spills. <u>Dam and Pump Crossing</u> Construction of an open cut crossing has the potential to affect fish directly through impacts on water quality (erosion, sedimentation, and accidental spills),	Mitigation and protective measures for erosion and sediment control are outlined in Section 4.2.2. During construction, the primary concern to surface water quality is the potential for a contaminant spill. 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

Table 4-11: Summary of Potential Impacts and Recommended Mitigation and Protective Measures

Environmental Feature(s)	Potential Impact(s)	Mitigation and Protective Measures
	disruption/harassment (vibration and noise) and loss of habitat. Indirect impacts include restrictions to habitat use and fish passage. Long term impacts can include changes to habitat such as substrate, increased erosion potential, loss of in-stream cover and riparian shading.	groundwater quality in the event that 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. Temporary vehicle crossings and dam and pump pipeline crossings should be completed following the measures outlined in industry standards and the Enbridge Environmental Guidelines for Construction (Enbridge 2012) When working near aquatic features, the following mitigation measures are recommended: In-water work for warmwater habitats is typically permitted from July 1 to March 15 (no work from March 16 to June 30) (MNRF, 2013). In-water work for the Spencer Creek crossings is July 1 to September 15 (no work from September 16 to June 30) due to Redside Dace. Watercourses should not be obstructed in a way that impedes the free movement of water and fish. 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. Soil exposure should be reduced prior to commencing construction, and the period that soil remains exposed for grading should be limited. Exposed soils surrounding watercourses should be seeded immediately following construction. 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

Table 4-11: Summary of Potential Impacts and Recommended Mitigation and Protective Measures

Environmental Feature(s)	Potential Impact(s)	Mitigation and Protective Measures
		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. 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 >30 m from the watercourse. Any such material that inadvertently enters a watercourse should be removed in a manner satisfactory to the environmental inspector. In the unlikely event of a spill, spills containment and clean-up procedures should be implemented immediately. Enbridge will 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. Conditions of water crossing permit(s), if applicable, will be adhered to. Additional supplies should be maintained on-site, in a readily accessible location, for maintenance and contingency purposes. Prior to construction, adequate quantities of the materials listed below, or comparable substitutions, should be on site to control erosion and sediment deposition: Sediment control fencing Sediment control logs (i.e., SiltSoxx™) Straw bales Wooden stakes Sand bags Water energy dissipater Filter cloth Water pumps (including stand-by pumps and sufficient lengths of hose) Culvert

Table 4-11: Summary of Potential Impacts and Recommended Mitigation and Protective Measures

Environmental Feature(s)	Potential Impact(s)	Mitigation and Protective Measures
		Additional Measures: The following measures are applicable to trenched crossings: *Flow Diversion/Dewatering* If in-water works are required, the work area should be isolated from the remainder of the surface water feature. Downstream flows should be maintained using dam and pump or dam and flume techniques. When dewatering the work area, dewatering operations should be managed to prevent erosion and/or release of sediment laden or contaminated water to the waterbody (e.g. settling basin, filter bag, energy dispersion measures). An isolation/containment plan should be designed and implemented to isolate temporary in-water work zones and maintain flow around the work zone. Maintenance of downstream flow should avoid potential upstream flooding and desiccation of downstream aquatic habitat and organisms. To further reduce the potential for flooding during construction, the weather forecast should be monitored prior to the start of construction to ensure that in-water works occur during a dry period. *Fish Rescue Plan* Prior to dewatering the work zone, fish trapped in the construction area shall be collected and moved using capture, handling, and release techniques to reduce harm and stress. The intakes of pumping hoses should be equipped with an appropriate device to avoid entraining and impinging fish (see *Measures to Avoid Causing Harm to Fish and Fish Habitat* (2013) at the following DFO website http://www.dfo-mpo.gc.ca/pnw-ppe/measures-mesures/measures-mesures-eng.html). Fish rescue plans should be developed on a site-specific basis and implemented by qualified professionals with the appropriate permitting in place (i.e. MNRF Licence to Collect Fish for Scientific Purposes). *Site Restoration and Riparian Planting* Following construction, the bed and banks of the crossing locations should be restored to pre-construction conditions to the extent possible in accordance with environmental permits. Bank slopes should be restored to match existing grades; however, alterations may be made to maintain slope stability and limit future erosion. Exposed banks should be re-vegetated with native plants to provide riparian cover and aid in erosion and sediment control. Stream beds should be

Table 4-11: Summary of Potential Impacts and Recommended Mitigation and Protective Measures

Environmental Feature(s)	Potential Impact(s)	Mitigation and Protective Measures
		restored to maintain slopes and tie in with existing grades. Bed material should be replaced to match pre-construction conditions. *Permitting* The *Fisheries Act* prohibits causing serious harm to fish unless authorized by DFO. This applies to work being conducted in or near water bodies that support fish that are part of or that support a CRA fishery. Since November 25, 2013, proponents must take the responsibility to determine whether their projects meet the DFO requirements under the Self-Assessment process. If serious harm cannot be avoided, proponents should contact DFO for a formal review and/or approval under the *Fisheries Act*. Following finalization of plans, a Self-Assessment should be completed for all project activities that have the potential to cause serious harm to fish. If it is determined that serious harm is likely to occur because of project-related activities, a Request for Review should be completed and submitted to DFO to determine approvals requirements under the *Fisheries Act*. The pipeline route will be located within the regulated boundary of the GRCA, HCA and CH. Permits under Ontario Regulation 150/06, 161/06 and 162/06 respectively, will be required prior to construction activities in the regulated boundaries. If activities are required below the high-water line, then the DFO and MECP must be contacted to determine if SARA and ESA Permits are required.
Designated Natural Areas and Vegetation *Section 4.3.2*	Where there is natural vegetation, woodlands and wetlands 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: Field surveys will be conducted prior to construction to assess the presence or absence of wetlands. ELC and botanical surveys will be conducted prior to construction to assess the significance and boundaries of vegetation communities and to identify vascular plant species, including plant species of concern. The results of the surveys will be used to confirm mitigation and protective measures. Where the RoW abuts woodlands on one side, route pipeline to avoid woodlot area where possible. Determine municipal requirements or permits for tree removal prior to construction.

Table 4-11: Summary of Potential Impacts and Recommended Mitigation and Protective Measures

Environmental Feature(s)	Potential Impact(s)	Mitigation and Protective Measures
		Clearing should be minimized to the extent possible in sensitive areas such woodlots, along watercourses, along the side of 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 within the project footprint. Clearing should be done during dry soil conditions to the extent practical to limit disturbance to vegetation and terrain. A screening field program of wetlands and riparian areas should be undertaken prior to construction, to determine where precautionary measures (ex. 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. Enbridge Gas should consult with landowners and GRCA, HCA and CH to confirm replanting plans. Enbridge Gas should undertake their standard tree replacement program, which involves the replanting of twice the area of woodlot removed during construction, and the replacement of individual trees on a 1:1 basis. Tree replacement consists of species native to the area, and ideally the same species removed. Enbridge Gas encourages planting of replacement trees on the same property where the trees were removed, with the goal of enhancing a natural area and its associated wildlife habitat. If a landowner is not interested in planting trees on their property, Enbridge Gas will offer the trees to GRCA, HCA, CH or to a local community group. Enbridge Gas will maintain the trees for a period of 5 years, or until the trees reach a 'free to grow' status as defined by a height of 1 metre (m) and tree of adjacent brush competition. Seeding of the disturbed temporary work areas and permanent easement should be done with a native seed mix reviewed by GRCA, HCA or CH. Replaced soils will 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.

Table 4-11: Summary of Potential Impacts and Recommended Mitigation and Protective Measures

Environmental Feature(s)	Potential Impact(s)	Mitigation and Protective Measures
		Mitigation and protective measures are outlined in Section 4.4.5 for dust, Section 4.2.2 for erosion and Section 4.2.3 and 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: Field surveys will be undertaken before construction to assess the presence or absence of wildlife and wildlife habitat. 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, rare, special concern, and threatened species. Equipment and vehicles should yield the RoW to wildlife. Trench operations should be followed as closely as practical with backfill operations, to facilitate the movement of wildlife across the trench. Gaps in stockpiles should be created, in consultation with a biologist, to allow for the potential movement of wildlife across the RoW. 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 is encountered during construction, personnel are required to move away from the animal and wait for the animal to move off the construction site. Where practical, avoid construction in the vicinity of areas that may provide habitat for amphibians during the amphibian breeding season (March 1 – June 30). Amphibian habitat will be identified during field investigations. Areas of potential bat maternity roosting habitat will be identified during field investigations. Tree removal in identified areas should be limited to the extent possible and will avoid the active season for bats (May 1 to August 31). Mitigation recommendations for SAR bats will be prepared upon consultation with MECP. Work (soil excavation) within wetlands is recommended to occur outside of the winter months (i.e., not between November 1 and March 30) to avoid potential impacts to hibernating frogs and turtles. Silt fencing is recommended along the perimeter of the work zone to prevent encroachment into the wetland, exclude reptiles and amphibians, as well as prevent sedimentation.

Table 4-11: Summary of Potential Impacts and Recommended Mitigation and Protective Measures

Environmental Feature(s)	Potential Impact(s)	Mitigation and Protective Measures
		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. Habitat assessments and species occurrence surveys will be conducted for SAR. A report will be prepared to document results and recommend mitigation measures. If SAR are found along the proposed pipeline route Enbridge Gas will undertake consultation with the MECP regarding the potential need for a permit under the ESA and/or species-specific mitigation Mitigation and protective measures are outlined in Section 4.3.2 for vegetation removal and Section 4.2.3 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 compared to the labour supply. Three types of employment are considered: • Direct employment: labour that is hired directly for the project	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 Enbridge Gas will identify and implement various mechanisms to enhance project benefits. The potential effects of the project as a result of purchasing labour, goods and services is expected to be positive during construction and operation, so no mitigation will be required. However, Enbridge Gas has and will continue to work with local and Indigenous businesses to enhance their potential for successfully bidding on project contracts regarding the supply of goods and services, particularly for the operation phase. One initiative to help encourage further local and Indigenous content on the project is to post project purchasing requirements in advance, so that businesses can position themselves to effectively bid to supply goods and services needed for construction and operation. Increased

Table 4-11: Summary of Potential Impacts and Recommended Mitigation and Protective Measures

Environmental Feature(s)	Potential Impact(s)	Mitigation and Protective Measures
	• Indirect employment: labour hired by companies in order 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 Verbinnen's Nursery, Taylor Hills Equine Centre and Green Relief. Other potential adverse effects include impairment to the use and enjoyment of property and conflicts with farm machinery and other vehicular movement.	participation of local and Indigenous businesses will enhance positive local economic effects. With respect to potential adverse effects on agricultural and non-agricultural (commercial and industrial) businesses, Enbridge Gas will engage with land owners and the City of Hamilton 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
Community Services and Infrastructure	The presence of temporary workers in the local communities during the six-month	Project employees might require medical attention while staying in the area. The contractor and Enbridge Gas will have emergency response equipment and



Table 4-11: Summary of Potential Impacts and Recommended Mitigation and Protective Measures

Environmental Feature(s)	Potential Impact(s)	Mitigation and Protective Measures
Section 4.4.2	long 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. During operation, the workforce will be relatively small (likely requiring only 100 hours per year, or an average of approximately 2 hours per week) and localized, and will put minimal additional demands on local services 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 outlines 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. Enbridge Gas will provide project information to local communities and service providers so that they are prepared for any possible demand on community services and infrastructure related to a temporary population increase. 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 Enbridge Gas representative will be available to address questions and concerns during construction. Consultation has been initiated and will continue with municipal personnel.

Table 4-11: Summary of Potential Impacts and Recommended Mitigation and Protective Measures

Environmental Feature(s)	Potential Impact(s)	Mitigation and Protective Measures
	infrastructure. Some operation workers might already reside in the local area; however, some might need to come from outside communities and may use local community and emergency services.	
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. During public consultation for the project, comments were raised regarding noise, dust, monetary compensation for loss of crops and trees, disruption to business, as well as enjoyment of property. 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 City of Hamilton (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	Mitigation and protective measures for air quality and noise are outlined in Section 4.4.5. If laneways or driveways are affected as a result of pipeline construction, they will be left in place over the trench where requested by the landowner, for as long as feasible. Access to residential properties and businesses should be maintained at all times 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, Enbridge Gas will work with landowners to address specific concerns they may have regarding monetary compensation and their property, such as access, disruption to businesses and tile drainage repairs. 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. Vegetative buffers at watercourses and road crossings will be implemented and be compliant with applicable permits and regulations. Additional consultation with residents and businesses along and adjacent to the proposed pipeline route will take place in advance of construction activity. Enbridge Gas 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 4-11: Summary of Potential Impacts and Recommended Mitigation and Protective Measures

Environmental Feature(s)	Potential Impact(s)	Mitigation and Protective Measures
	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. 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 with the production of agricultural 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 and access by landowners and farmers to their land. 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 spring, summer and fall months, winter recreation activities will not be affected.	

Table 4-11: Summary of Potential Impacts and Recommended Mitigation and Protective Measures

Environmental Feature(s)	Potential Impact(s)	Mitigation and Protective Measures
Infrastructure *Section 4.4.4*	The proposed project will be constructed parallel and overlapping an existing Enbridge Gas easement, with some temporary lands required for construction purposes. Impacts to a community garden in the Antrim Glen Residential Community and to tennis courts within the Ponderosa Nature Resort will occur. Where temporary lands are required limited impacts to agricultural lands 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. Highway 6 crossing 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).	Mitigation and protective measures for roads are outlined in Section 4.4.2. Mitigation and protective measured for agricultural lands are outlined in Section 4.2.5. Arrangements will be made with the communities and landowners for replacement of features that are impacted by construction activities. Consultation is ongoing with Infrastructure Ontario and HONI regarding easements to cross the existing overhead hydroelectric lines. The contractor will be responsible for locating and exposing existing pipelines and utilities on lands that will be affected by trench excavation. 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. Standard construction mitigation measures will be implemented that include: • Safety fencing will be erected around bore pits • Wood decking will 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 A detailed mitigation plan will be developed once the crossing method and design have been determined.
Air Quality and Noise *Section 4.4.5*	Residential and business properties may experience noise, dust and equipment exhaust associated with construction activity. During operation, no substantial air or noise emissions are anticipated to occur. Potential impacts from blasting activities are outlined in Section 4.2.1	During construction, motorized construction equipment should be equipped with mufflers and silencers as available. Company and construction personnel should avoid idling of vehicles; vehicles or equipment should be turned off when not in use unless required for operation of the vehicle or equipment. 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 so as to reduce disturbance to residents and businesses. Where pipeline installation will take an extended time period to complete, such as watercourse and road crossings, an assessment

Table 4-11: Summary of Potential Impacts and Recommended Mitigation and Protective Measures

Environmental Feature(s)	Potential Impact(s)	Mitigation and Protective Measures
		should be undertaken to determine the suitability and effectiveness of temporary noise barriers adjacent to residential or business properties. 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. Mitigation and protective measures for blasting activities are outlined in Section 4.2.1.
Contamination *Section 4.4.6*	Presence of metering equipment and infrastructure relating to pipeline maintenance and operations at the Enbridge Gas Kirkwall valve site at1374 Valens Road, Cambridge, Ontario. Presence of metering equipment and infrastructure relating to pipeline maintenance and operations at the TransCanada Kirkwall Compressor Station at 1376 Valens Road, Cambridge, Ontario. Pad-mounted and pole-mounted transformers, Off Glenariff Drive and along various roadways Scrap Cars, Debris, and Stockpiles at 1454 Middletown Road, Millgrove, Ontario.	Should excess soil be generated at the Site during future construction activities, or if contaminated soils are suspected (e.g., if observed material contained anthropogenic substances, PHC odours/staining, and debris/waste), representative soil samples should be collected and submitted for chemical analysis to determine management options and appropriate handling and health and safety guidelines. Should excess soil be generated at the Site during construction activities, soils that do not meet the Standards listed in Table 1 of the Ministry of Environment, Conservation, and Parks (MECP) document Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act (April 15, 2011) may not be considered inert fill upon excavation, and off-site Management options for excess soils that cannot be reused within the Site must be considered. It is understood that salt-related parameters may not be considered to be contaminants in a road alignment, when de-icing salt has been used for winter road maintenance (O.Reg. 153/04 s.48 (3)); however, soil or water

Table 4-11: Summary of Potential Impacts and Recommended Mitigation and Protective Measures

Environmental Feature(s)	Potential Impact(s)	Mitigation and Protective Measures
	Historical diesel, gasoline and oil spills along Brock Road and Highway 6 within the Study Area Potential pesticide and herbicide use and storage Verbinnen's Tree Nursery at 1504 Brock Road, Dundas, Ontario. Presence of metering equipment and infrastructure relating to pipeline maintenance and operations at the Hamilton valve site at 43 Carlisle Road, Freelton, Ontario Imported fill material along the entire proposed route. The windshield survey did not permit a detailed assessment of the presence of PSOCs at private properties; therefore, it is possible that above ground or underground fuel storage may exist on-site or at adjacent residential, industrial, or commercial properties that were not observed from adjacent roadways.	impacted by salt should be managed according to MECP guidance if it is to be removed from the RoW. Should excess water be generated at the Site during construction activities, water quality analyses should be conducted to determine appropriate management methods, such as done in support or a PTTW. This work should be done in coordination with a qualified person for environmental site assessment (QP_{ESA}) as defined by Ontario Regulation 153/04, to maintain data quality and provide an appropriate assessment of water quality. The QP_{ESA} should be made aware of the PSOCs identified so as to select an appropriate list of analytes. Should evidence of soil or water impacts be identified during construction (e.g., staining, odours, petroleum hydrocarbon sheen) samples should be collected for laboratory analyses to confirm concentrations of potential contaminants so as to develop appropriate material management, and health and safety guidelines. A Phase I ESA, and Phase II ESA (if recommended as part of the Phase I ESA) should be considered for any property that will be acquired by Enbridge Gas and a site-specific evaluation of PSOCs should be completed. If building demolition will be required, designated substance surveys should be completed for buildings or structures prior to demolition.
Waste Management *Section 4.4.7*	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 construction 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.

Table 4-11: Summary of Potential Impacts and Recommended Mitigation and Protective Measures

Environmental Feature(s)	Potential Impact(s)	Mitigation and Protective Measures
Land Use *Section 4.4.8*	Natural gas 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 land is discussed in Section 4.2.5 (soils) and 4.2.6 (agricultural tile drainage). 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.	Mitigation and protective measures for agricultural soils, drainage and for businesses are discussed in Sections 4.2.5, 4.2.6 and 4.4.1, respectively. Consultation has been initiated, and will continue, with the City of Hamilton 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 the GRCA as per O.Reg 150/06, HCA as per O.Reg. 161/06 or CH as per O.Reg. 162/06.
Archaeological Resources *Section 4.4.9*	The Stage 1 AA has determined that the majority of the entirety of the study area retains potential for the identification of Indigenous and Euro-Canadian 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, as necessary, 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 3 and Stage 4 work will include engagement with the appropriate Indigenous community.
Cultural Heritage Resources *Section 4.4.10*	Along the proposed pipeline route, potential impacts to cultural heritage resources are limited to vibration damage to structural stability.	In order to prevent negative impacts, any potential cultural heritage resource within 50 m of the proposed pipeline route should be isolated from project activities. It is recommended that site plan controls be put in place prior to construction to prevent potential impacts as a result of the Project. The site plan control methods shall be determined in advance of construction by the proponent to indicate where project activities are restricted. These controls should be communicated to the construction contractor and should be indicated on all construction mapping and communicated to the construction team leads. As identified heritage attributes associated with one cultural heritage resource is situated within 50 m of the proposed pipeline route it is recommended that Enbridge Gas consult with a qualified building conditions specialist or geotechnical engineer with previous experience working with heritage structures

Table 4-11: Summary of Potential Impacts and Recommended Mitigation and Protective Measures

Environmental Feature(s)	Potential Impact(s)	Mitigation and Protective Measures
		to identify appropriate vibration mitigation measures in advance of construction. Mitigation measures for vibration may include developing an appropriate vibration setback distance, a vibration attenuation study, and/or a construction monitoring program.
Indigenous Interests *Section 4.4.11*	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 artefacts. 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.	Enbridge Gas has sought input into the project from the identified Indigenous communities and will continue engaging with Indigenous communities as the project moves forward. Enbridge Gas will also continue to work with their respective Economic Development departments and Enbridge Gas's contractors to find opportunities for their participation in providing goods and services during construction. 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 4.4.9.

5.0 CUMULATIVE EFFECTS ASSESSMENT

The recognition of cumulative effects assessment as a best practice is reflected in many regulatory and guidance documents. With regard to development of hydrocarbon pipelines in Ontario, the OEB Environmental Guidelines note that cumulative effects should be identified and discussed in the ER. The cumulative effects assessment refers to the potential effects associated with the project.

Building upon the intent of the OEB Environmental Guidelines, the OEB has specified that only those effects that are additive or interact with the 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. The cumulative effects assessment has been prepared with consideration of this direction from the OEB.

5.1 METHODOLOGY

The cumulative effects assessment describes the potential cumulative effects resulting from the interaction of residual effects of constructing and operating 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 have not been assessed in the cumulative effects assessment.

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 cumulative effects assessment. The 100 m boundary has been found, through previous experience with pipeline construction, to be appropriate for the most commonly encountered net effects.

Temporal

The temporal boundaries for the cumulative effects assessment 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 – 2019
2. Construction – 2021
3. Operation and Maintenance – 2021 to 2071*

**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: 2021 and 2026. The year 2021 was selected to represent the construction period, and the year 2026 was selected to represent the operation and maintenance period. Forecasting beyond 2026 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 for effects to interact with the identified effects of the proposed pipeline within the spatial and temporal study boundaries. The following resources were reviewed:

- Canadian Environmental Assessment Agency, Canadian Environmental Assessment Registry (CEA Agency, 2019)
- Government of Ontario, Environmental Assessment Projects by Category (Government of Ontario, 2019)
- Government of Ontario, Renewable Energy Approval Projects (2019)
- MTO, Southern Highways Program (2017-2021) (MTO, nd)
- City of Hamilton, Capital Construction Projects (2019)
- National Energy Board, Major Facilities Applications (NEB, 2019)

- OEB Applications Currently Before the Board (facilities applications only) (OEB, 2019)

Based on the review of publicly available resources, the project inclusion list in Table 5-1 included 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
*Milton Logistics Hub Project[1]	Milton, Ontario	Canadian National Railway Company	Currently undergoing Federal Environmental Assessment, Public Hearing June 2019.	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.
*Waterdown to Finch Project	Waterdown (rural Hamilton) to North York	Imperial Oil Limited	Submitted to the Ontario Energy Board on February 25, 2019.	Imperial Oil Limited is planning to replace approximately 63 km of the existing Sarnia Products Pipeline.	Potential for traffic management issues and congestion due to construction vehicles.
Westover to Copetown Temporary Transmission Line Project	Hamilton	Hydro One Networks Inc.	Class EA initiated. Work may begin as early as November 2019 to meet a target in-service date of May 2020.	Hydro One Networks Inc. is planning to install a temporary 115 kilovolt (kV) wood pole transmission line approximately 13 km in length. It will largely run parallel to an existing 500 kV line. It will be installed for approximately two years and is planned to be removed by Fall 2021.	Potential for 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 – Year 2021

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 1:1 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 will be contacted. If mortality occurs between concurrent projects for similar species, the Ministry will be able to note the occurrences and coordinate with Enbridge Gas 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 2026

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 Enbridge Gas will be completed in co-ordination with the Enbridge Gas Environmental Planning Team and will consider potential impacts on natural heritage and socio-economic environment. Appropriate mitigation measures will be developed and implemented based on the proposed maintenance work. Enbridge Gas 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. With this in mind, Enbridge Gas 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. Enbridge Gas should implement an orientation program for inspectors and contractor personnel to provide information regarding Enbridge Gas'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, trench slumping, and sedimentation of watercourses. 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 Enbridge Gas's on-site inspection team. Restored bank slopes 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 Crossings

Watercourse crossings have the potential to affect fish, fish habitat, and water quality. Enbridge Gas's on-site inspection team should oversee all watercourse crossings 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 and Wetlands

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 4.4.10.

6.1.7 Residents and Businesses

Construction activities will impact directly affected landowners and surrounding residents and businesses. During construction, a designated Enbridge Gas 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 Enbridge Gas representative.

Enbridge Gas'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. An Enbridge Gas 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, Enbridge Gas 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.

6.1.8 Municipal Roads

A pre-construction road condition assessment will be conducted to document road conditions. Following the completion of construction activities, a post-construction road condition assessment with be conducted to determine if there are any areas where construction impacts occurred. If construction impacts are found appropriate repairs will be completed.

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, Enbridge Gas and the pipeline 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 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 trench 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.



6.2.2 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, Enbridge 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. Spills should be immediately reported to Enbridge's on-site inspection team. 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.

6.2.3 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 MTCS 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).

In the event that 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, Enbridge Gas 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 and related facilities. 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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APPENDICES

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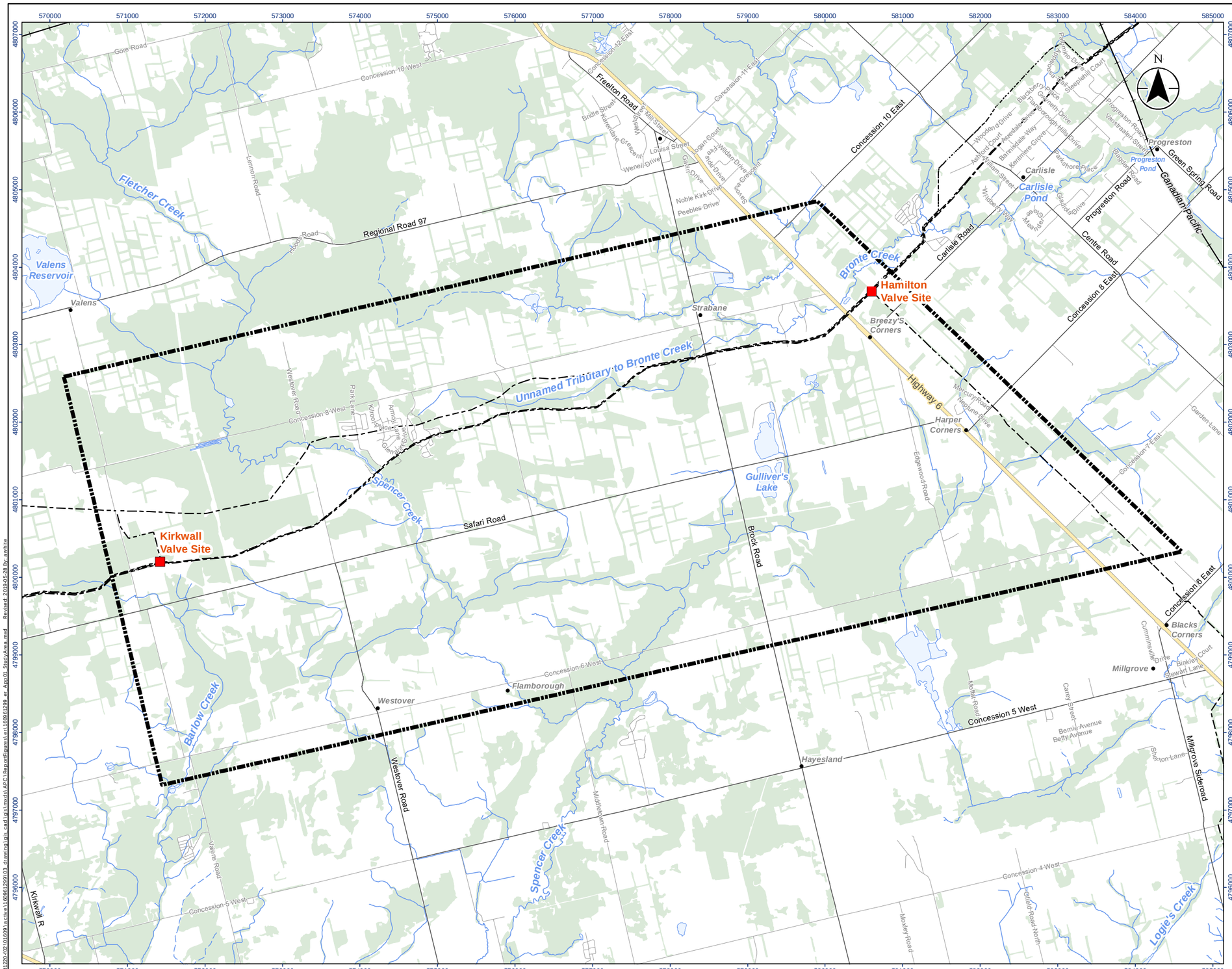
APPENDIX A:
ROUTE FIGURES





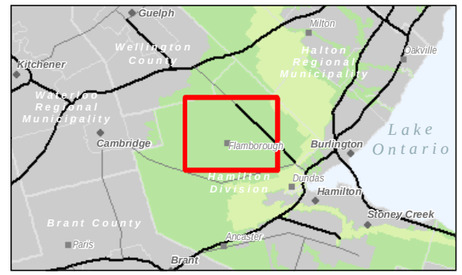
Stantec

Legend

- Study Area
- Enbridge Existing Station
- Enbridge Existing Pipeline
- Railway
- Expressway / Highway
- Major Road
- Minor Road
- Waterbody

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2019.



Project Location
City of Hamilton

160961299 REVA
Prepared by AW on 2019-05-28
Technical Review by ABC on YYYY-MM-DD

Client/Project
ENBRIDGE GAS INC.
KIRKWALL-HAMILTON PIPELINE PROJECT

Figure No.
1

Title
Study Area

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Stantec

Legend

- Study Area
- Route Alternative - A
- Route Deviation - A1
- Route Deviation - A2
- Route Alternative - B
- Enbridge Existing Station
- Enbridge Existing Pipeline
- Railway
- Expressway / Highway
- Major Road
- Minor Road
- Waterbody

0 1 2 km

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Notes

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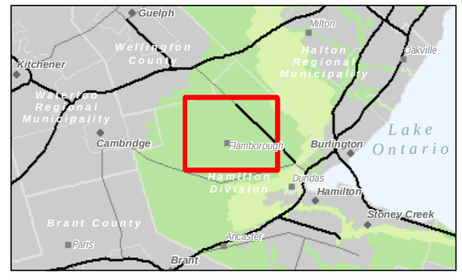

Project Location
City of Hamilton

160961299 REVA
Prepared by AW on 2019-05-28
Technical Review by ABC on YYYY-MM-DD

Client/Project
ENBRIDGE GAS INC.
KIRKWALL-HAMILTON PIPELINE PROJECT

Figure No.
2

Title
Route Alternatives

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Stantec

Legend

- Study Area
- Preliminary Preferred Route - A
- Route Deviation - A1
- Route Deviation - A2
- Route Alternative - B
- Enbridge Existing Station
- Enbridge Existing Pipeline
- Railway
- Expressway / Highway
- Major Road
- Minor Road
- Waterbody

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Notes

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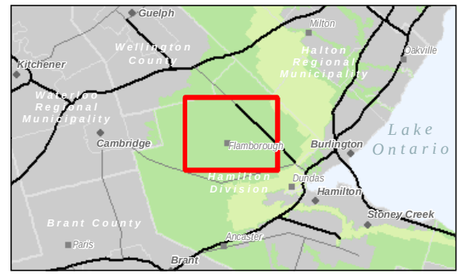

Project Location
City of Hamilton

160961299 REVA
Prepared by AW on 2019-05-28
Technical Review by ABC on YYYY-MM-DD

Client/Project
ENBRIDGE GAS INC.
KIRKWALL-HAMILTON PIPELINE PROJECT

Figure No.
3

Title
Preliminary Preferred Route

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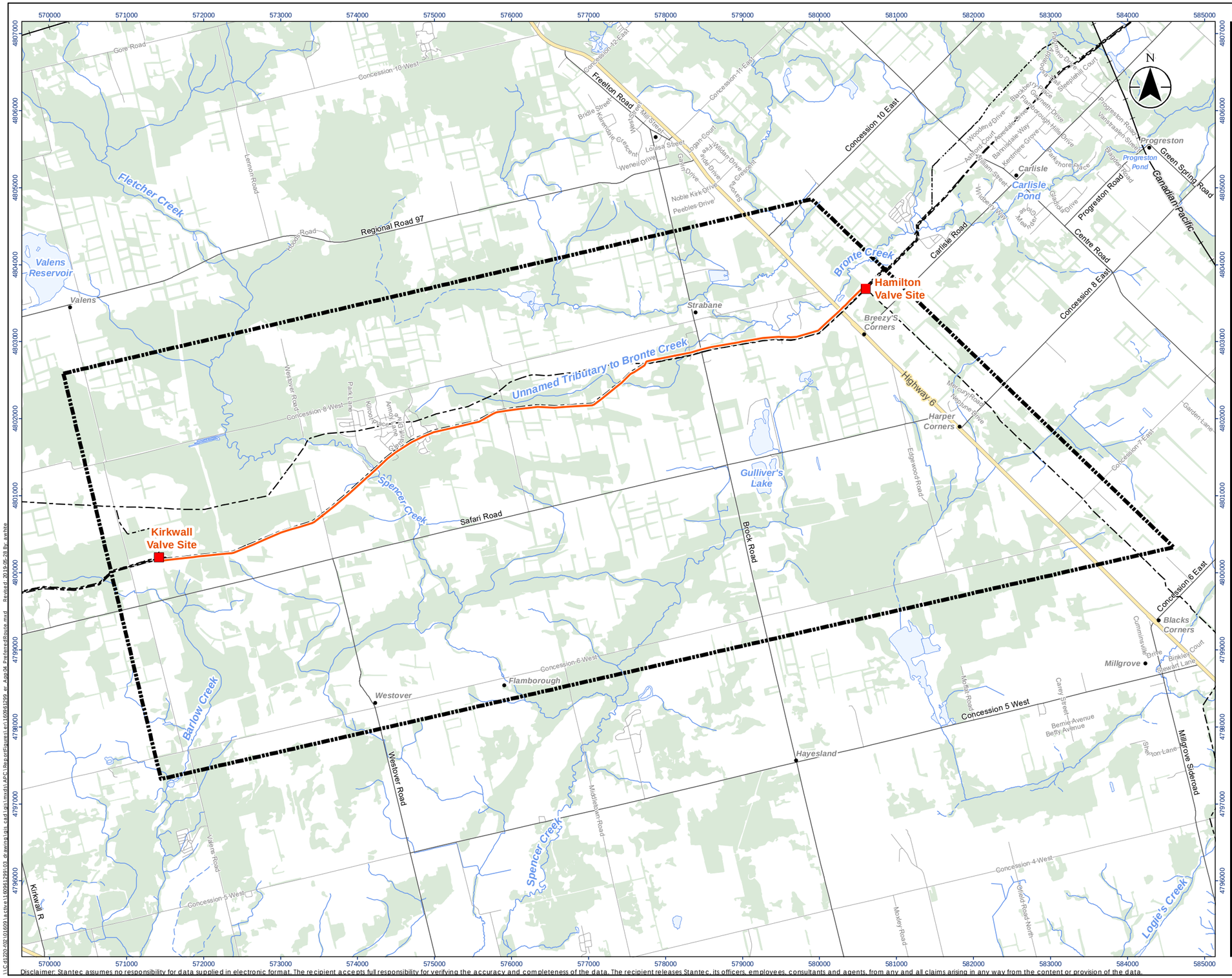

Stantec

Legend

- Study Area
- Preferred Route
- Enbridge Existing Station
- Enbridge Existing Pipeline
- Railway
- Expressway / Highway
- Major Road
- Minor Road
- Waterbody

0 1 2 km

1:50,000 (At original document size of 11x17)

Notes

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Project Location
City of Hamilton

160961299 REVA
Prepared by AW on 2019-05-28
Technical Review by ABC on YYYY-MM-DD

Client/Project
ENBRIDGE GAS INC.
KIRKWALL-HAMILTON PIPELINE PROJECT

Figure No.
4

Title
Preferred Route

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APPENDIX B:
CONSULTATION



APPENDIX B1:
PROJECT SUMMARY AND CONTACT LIST



Union Gas Limited – Proposed NPS 48 Kirkwall – Hamilton Pipeline Project Summary for the Ministry of Energy, Northern Development and Mines

1. Introduction

This Summary Report has been prepared to provide the Ministry of Energy, Northern Development and Mines ("ENDM") with an overview of the Kirkwall – Hamilton Pipeline Project ("Project"), to support the preparation of a contact list of indigenous communities that may have an interest in the Project.

1.1 Project Overview

To increase existing capacity and accommodate additional demand for natural gas, Union Gas Limited ("Union Gas") is proposing to construct a new NPS 48-inch diameter natural gas pipeline. The proposed pipeline is planned to be in service as early as Fall 2021 and will be located within the municipality of the City of Hamilton. The proposed pipeline will generally parallel three existing Union Gas pipelines between the existing Kirkwall valve site and the Hamilton gate station. The length of the pipeline will be determined by the final route chosen but will be approximately 10-14 km. The study area within which alternative routes will be developed and evaluated, and within which a preferred route will be identified is shown in Figure 1 (attached).

The following table provides the co-ordinates for the valve site and station.

Proposed Locations	Latitude	Longitude
Kirkwall Valve Site	**43.351282**	**-80.118709**
Hamilton Gate Station	**43.381753**	**-80.004919**

2. Regulatory Requirements and Approvals

Ontario Energy Board ("OEB") review and approval is required before this Project can proceed. As part of that application, an Environmental Review (ER) will be conducted in accordance with the OEB *Environmental Guidelines for the Location, Construction and Operation of Hydrocarbon Pipelines and Facilities in Ontario 7th Edition* (2016). The ER for this Project is anticipated to be completed and submitted to the OEB as early as summer 2019. Construction of the Project is planned to begin as early as spring/summer 2021 with an in-service date 6 months after construction start. Other permits and authorizations for the Project will be determined and may be necessary at the Federal, Provincial and Municipal levels.

3. Environmental Planning Process

The environmental planning process for the Project will be initiated in the fall of 2018 by Union Gas, with support provided throughout the process by consultant archaeologists, cultural heritage specialists,

and other environmental specialists. The following provides a general overview of the environmental planning process for the Project:

- **Complete an Environmental Report (ER)**
  - Describe the proposed work necessary for the Project;
  - Complete a route evaluation study
  - Describe the procedures that will be followed during construction of the facilities;
  - Identify potential environmental impacts and recommend measures to minimize those impacts; and
  - Describe the consultation opportunities.
- **Complete all necessary studies and assessments**
  - An Archaeological Assessment will be conducted by a licensed archaeologist in accordance with the Ministry of Tourism, Culture and Sport (MTCS) guidelines to identify known or potential archaeological resources within the Project area and will develop an appropriate mitigation plan if required.
  - A heritage specialist will review the running line for potential cultural heritage landscapes and built heritage resources and will develop an appropriate mitigation plan if required.
  - A qualified biologist will review the running line for potential species at risk and determine if any species will be impacted by construction activities and will develop an appropriate mitigation plan if required.
- **Obtain all necessary environmental permits and approvals**
  - Union Gas will work with all relevant governing agencies (i.e. the Ministry of the Environment, Conservation and Parks (MECP), the Ministry of Natural Resources and Forestry (MNRF), Grand River Conservation Authority (GRCA), Hamilton Conservation Authority (HCA), Conservation Halton (CH), Fisheries and Oceans Canada (DFO)) to obtain any permits and/or approvals should it be necessary.

4. Consultation

Consultation is an important part of the environmental planning process and may include discussions with the relevant federal and provincial agencies, the municipality, interested and potentially affected landowners, and interest groups, as well as First Nations and Metis Nations as identified by ENDM.

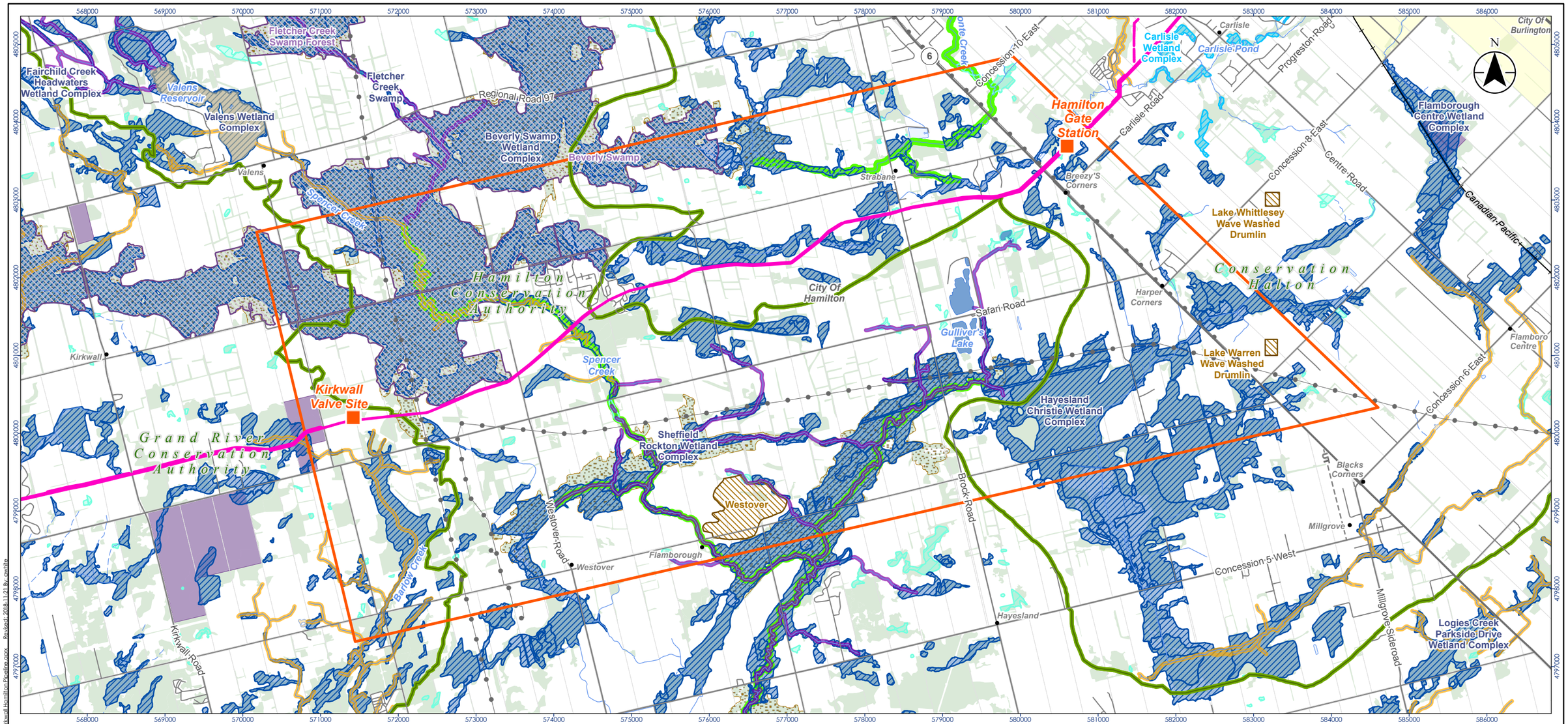
Union Gas will contact the municipality, MECP, MNRF, DFO, GRCA, HCA and CH to discuss and review the project. Union Gas will also contact landowners along the proposed route.

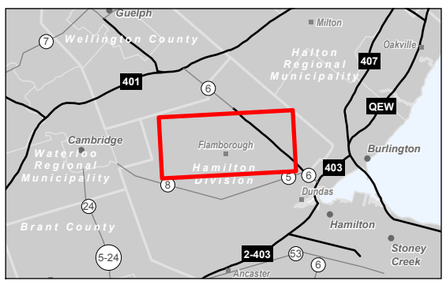
5. Project Activities

The pipeline will be installed using Union Gas's standard construction practices which include grading the site, digging the trench, installing the welded pipeline in the trench, testing the pipeline, and restoring the area to its original condition. The crossing methods used for watercourse crossings along the selected route will be determined during detailed design and will be based on site specific conditions and the results of geotechnical investigations.

6. Summary and Conclusion

The purpose of this report is to provide ENDM with preliminary information regarding the Project and acquire a list of Indigenous communities that may be interested in providing feedback during the Project planning process. Data collection and field studies will be undertaken to determine the potential effects of the Project during the construction and operation phases. Mitigation measures to manage these potential effects will be identified and will include proposed monitoring and contingency plans which will be implemented to ensure effects are minimized.





Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2018.

Legend

- General Study Area
- Existing Union Gas Station
- Existing Union Gas Pipeline
- Other Named Place
- Highway
- Major Road
- Minor Road
- Railway
- Hydro Line
- Unknown Transmission Line
- Watercourse (Intermittent)
- Watercourse (Permanent)
- Constructed Drain
- Conservation Area Administrative Boundary
- Crown Land Held/Acquired
- ANSI, Earth Science
- ANSI, Life Science
- Spawning Area
- Niagara Escarpment Plan Boundary
- Greenbelt Natural Heritage System
- Thermal Regime, Cold
- Thermal Regime, Warm
- Thermal Regime, Cold
- Thermal Regime, Warm
- Aquatic Species at Risk Distribution
- Wetland, Provincially Significant
- Wetland, Other Evaluated
- Wetland, Not evaluated per OWES
- Waterbody
- Lot
- Deer Wintering Area
- Niagara Escarpment Plan
- Greenbelt Natural Heritage System
- Wooded Area
- Municipal Boundary, Lower
- Municipal Boundary, Upper

0 1 2 km

1:50,000 (At original document size of 11x17)

Stantec

uniongas
An Enbridge Company

Project Location
City of Hamilton

160961229
Prepared by AMW on 2018-11-14
Technical Review by MC on 2018-11-14

Client/Project
UNION GAS LIMITED
KIRKWALL TO HAMILTON PIPELINE PROJECT

Figure No.
1

Title
Background Data Review

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W:\active\160961229\03_design\mxd_cad\gis\160961229 Kirkwall Hamilton Pipeline.aprx Revised: 2018-11-21 By: mvdale

Table B1.1: OPCC Members

First Name	Last Name	Title	Representing	Address	Town	Province	Postal Code	Phone	Email	Notes
Zora	Crnojacki		Ontario Energy Board	P.O Box 2319, 2300 Younge Street, 26th Floor	Toronto	ON	M4P 1E4	416-440-8104	zora.crnojacki@oeb.ca	
Linda	Pim		Ministry of Agriculture, Food and Rural Affairs	1 Stone Road West, 3rd Floor SE	Guelph	ON	N1G 4Y2	519-826-3380	Linda.Pim@ontario.ca	
Dan	Minkin	Heritage Planner	Ministry of Tourism, Culture & Sports	401 Bay Street	Toronto	ON	M7A 0A7	416-314-7147	dan.minkin@ontario.ca	Laura Hatcher removed - Dan Minkin added
Tony	Difabio		Ministry of Transportation	301 St. Paul Street, 2nd Floor	St. Catharines	ON	L2R 7R4	905-704-2656	tony.difabio@ontario.ca	
Kourosh	Manouchehri		Technical Standards and Safety Authority	345 Carlingview Drive	Toronto	ON	M9W 6N9	416-734-3539	kmanouchehri@tssa.org	
Sally	Renwick	Team Lead, Environmental Planning	Ministry of Natural Resources and Forestry	300 Water Street	Peterborough	ON	K9J 8M5	705-755-5195	sally.renwick@ontario.ca	
Ross	Lashbrok	Manager, Community Planning and Development	Ministry of Municipal Affairs and Housing, Western Municipal Services Office	777 Bay Street, 4th Floor, Suite 425	Toronto	ON	M5G 2E5	416-585-6063	ross.lashbrok@ontario.ca	
Shannon	McCabe	Senior Advisor, Indigenous Energy Policy Unit	Ministry of Energy	77 Grenville Street, 6th Floor	Toronto	ON	M7A 2C1	416-212-6704	shannon.mccabe@ontario.ca	
Natalie	Stacey	Regional Contact-West Central	Ministry of Environment, Conservation and Parks	119 King Street West,12th Floor	Hamilton	ON	L8P 4Y7	905-521-7639	natalie.stacey@ontario.ca	
Patrick	Grace		Infrastructure Ontario	1 Dundas Street West, Suite 2000	Toronto	ON	M5G 2L5		patrick.grace@infrastructureontario.ca	
Joseph	Vecchiolla		Ministry of Economic Development, Job Creation and Trade	777 Bay Street, 4th Floor, Suite 425	Toronto	ON	M5G 2E5	416-325-1561	joseph.vecchiolla@ontario.ca	No longer an OPCC member, no replacement as of April 16 2019

Table B1.2: Agencies

First Name	Last Name	Title	Representing	Address	Town	Province	Postal Code	Phone	Email	Notes
Karla	Barboza	Team Lead - Heritage (Acting)	Ministry of Tourism, Culture and Sports	401 Bay Street	Toronto	ON	M7A 0A7	416-314-7120	Karla.barboza@ontario.ca	
James	Hamilton	Manager, Heritage Program Unit	Ministry of Tourism, Culture and Sports	401 Bay Street	Toronto	ON	M7A 0A7	416-212-7505	james.hamilton@ontario.ca	
Shereen	Smithanik	Senior Policy Advisor, Indigenous Energy Policy	Ministry of Energy, Northern Development and Mines	77 Grenville Street, 6th Floor	Toronto	ON	M7A 2C1	416-326-0513	shereen.smithanik@ontario.ca	
Dawn	Palin Rokosh	Director, Planning and Implementation Branch	Ministry of Infrastructure	777 Bay Street, 4th Floor, Suite 425	Toronto	ON	M5G 2E5	416-325-7673	dawn.palin.rokosh@ontario.ca	
David	Cooper	Manager, Environmental and Land Use Policy & Stewardship	Ministry of Agriculture and Food, Ministry of Rural Affairs	1 Stone Road West, 3rd Floor SE	Guelph	ON	N1G 4Y2	519-826-3117	david.cooper@ontario.ca	
Michele	Doncaster	Policy Advisor, Land Use Policy & Stewardship	Ministry of Agriculture and Food, Ministry of Rural Affairs	1 Stone Road West, 3rd Floor SE	Guelph	ON	N1G 4Y2	519-826-4369	michele.doncaster@ontario.ca	
Drew	Crinklaw	Rural Planner, Land Use Policy & Stewardship	Ministry of Agriculture and Food, Ministry of Rural Affairs	667 Exeter Road	London	ON	N6E 1L3	519-873-4085	drew.crinlaw@ontario.ca	
Roman	Dorfman	Real Estate Coordinator	Hydro One Networks Inc.	185 Clegg Road	Markham	ON	L6G 1B7	905-946-6243	roman.dorfman@hydroone.com	
Beth	Brown	Supervisor of Resource Planning - Central	Grand River Conversation Authority	400 Clyde Road, PO Box 729	Cambridge	ON	N1R 5W6	519-621-2763 x 2307	bbrown@grandriver.ca	
Nathan	Garland	Resource Planner	Grand River Conversation Authority	400 Clyde Road	Cambridge	ON	N1R 5W6	519-621-2763 x 2237	ngarland@grandriver.ca	
Cassandra	Connolly	Regulations Officer	Conservation Halton	2596 Britannia Road West	Burlington	ON	L7P 0G3	905-336-1158 x 2301	cconnolly@hrca.on.ca	
Scott	Peck	Deputy Chief Administrative Officer/Director, Watershed Planning and Engineering	Hamilton Conservation Authority	838 Mineral Springs Road	Ancaster	ON	L9G 4X1	905-525-2181 x 130	scott.peck@conservationhamilton.ca	
Darren	Kenny	Watershed Officer	Hamilton Conservation Authority	838 Mineral Springs Road, PO Box 81067	Ancaster	ON	L9G 4X1	905-525-2181 x131	Darren.Kenny@conservationhamilton.ca	
Jason	Thorn	General Manager, Planning and Economic Development	City of Hamilton	71 Main Street West, 3rd Floor	Hamilton	ON	L8P 4T5	905-546-2424 x 4349	Jason.Thorne@hamilton.ca	
Cameron	Blaney	Corridor Management Officer, Enchroachments Niag/Ham/Halton	Ministry of Transportation	159 Sir William Hearst Avenue, 7th Floor, Building D	Downsview	ON	M3M 0B7	416-235-4387	cameron.blaney@ontario.ca	
Kaisha	Bruetsch	Senior Policy Advisor, Indigenous Affairs	Ministry of Energy, Northern Development and Mines	900 Bay Street, 4th Floor	Toronto	ON	M7A 1T7	416-327-9473	kaisha.bruetsch@ontario.ca	

Table B1.3: Indigenous Community

Title	First Name	Last Name	Position	cc	Indigenous community	Address	Town	Prov	PC	Phone	Email	Notes
Chief	Stacy	Laforme		Fawn Sault, Mississaugas of the Credit First Nation Megan Devries, Mississaugas of the Credit First Nation	Mississaugas of the Credit First Nation	2789 Mississauga Road R.R. #6	Hagersville	ON	N0A 1H0	905-768-1133	Barbara.Smoke@mncfn.ca	
	Fawn	Sault	Consultation Manager	Megan Devries, Mississaugas of the Credit First Nation Chief Stacy Laforme, Mississaugas of the Credit First Nation	Mississaugas of the Credit First Nation	2789 Mississauga Road R.R. #6	Hagersville	ON	N0A 1H0	905-768-4260	Fawn.Sault@mncfn.ca	
	Megan	Devries	Archaeological Coordinator	Chief Stacy Laforme, Mississaugas of the Credit First Nation Fawn Sault, Mississaugas of the Credit First Nation	Mississaugas of the Credit First Nation	2789 Mississauga Road R.R. #6	Hagersville	ON	N0A 1H0	905-768-4260	Megan.DeVries@mncfn.ca	
Chief	Ava	Hill		Joanne Thomas, Six Nations of the Grand River	Six Nations of the Grand River	1695 Chiefswood Road, PO Box 5000	Ohsweken	ON	N0A 1M0	519-445-4399	avahill@sixnations.ca	
	Joanne	Thomas	Consultation Supervisor	Chief Ava Hill, Six Nations of the Gand River	Six Nations of the Grand River	2496 Chiefswood Road, PO Box 500	Ohsweken	ON	N0A 1M0	519-753-0665	jthomas@sixnations.ca	
				Karl Hill, Haudenosaunee Development Institute	Haudenosaunee Development Institute (HDI)	16 Sunrise Court, Suite 407	Ohsweken	ON	N0A 1M0	519-445-4222	hdi2@bellnet.ca	Email from Todd on Feb 13 requesting all future information be sent to hdi2@bellnet.ca instead of hdi2@bellnet.ca
	Karl	Hill	Consultation Coordinator		Haudenosaunee Development Institute (HDI)	16 Sunrise Court, Suite 407	Ohsweken	ON	N0A 1M0	519-445-4222	karl.j.hill@gmail.com	

APPENDIX B2: NEWSPAPER NOTICES

Local

VIOLENCE
continued from // **A1**

25 additional police officers in 2019, which will mean increased police presence and increased safety in our community."

Police say most of this year's shootings have been "targeted." Here's a synopsis of each one:

- Jan. 2 — Barton Street East and Avondale Street: a gun was fired at the door of an apartment at 910 Barton St. E. Nobody was injured.
- Jan. 14 — Brunswick Street and Melvin Avenue: Police find bullet holes in an SUV and shell casings. There were no injuries.
- Jan. 30 — Mountain Brow Boulevard and Rendell Boulevard: Cece Luppino, son of a Hamilton mobster, is gunned down at his Mountain home.
- Feb. 3 — Leeming Street and Wright Avenue: Police were called after shots were fired, striking a window of a home. Nobody was injured.
- Feb. 5 — Roxborough Avenue and Beland Avenue North: A man is his 20s was taken to hospital with non-life-threatening injuries after he was shot just after midnight.
- Feb. 5 — Gage Avenue North and Cannon Street East: In the second shooting of the day, two men were taken to hospital with non-life-threatening injuries.
- Feb. 9 — Cutts Crescent and Pumpkin Pass: Bullets were fired into a Binbrook home on Saturday in what police called a "targeted" shooting. There were no injuries.
- Feb. 10 — Stone Church Road East and Upper Wellington Street: Police find a bullet hole in the side of a Mountain home at 9:30 a.m. The complainant said a loud bang was heard between 1 and 2 a.m. Nobody was hurt.

Diodati said it's too early to say whether any of the shootings are connected, or to discount the involvement of gangs. He noted the correlation between the drug trade and shootings in general.

"I think the biggest change in the market is the prevalence of fentanyl and other opiate-based drugs. We saw a similar spike with the advent of crack cocaine."



CATHIE COWARD THE HAMILTON SPECTATOR FILE PHOTO

Hamilton police respond to a shooting at Barton Street East and Balmoral Avenue on Feb. 5.



BARRY GRAY THE HAMILTON SPECTATOR FILE PHOTO

Police examine vehicle with windows shot out at Brunswick and Melvin Avenue on Jan. 14.

Fentanyl — a hospital painkiller that's available in bootleg form on the street — is a particularly powerful opiate fuelling an overdose epidemic in Hamilton and across North America.

"It's profitable for drug dealers. It all comes down to supply and demand," Diodati said.

In general, police say victims of Hamilton's shootings and witnesses alike have been uncooperative when it comes to providing information.

Diodati says he understands the "trepidation" in talking to police, noting fear of retribution or being a "rat," in street parlance.

The victims themselves can be involved in criminal activity, which can make them reluctant to speak with police, he added.

Cracking down on gun crime isn't just a police responsibility; it requires a coalescence of community services, Diodati emphasized.

"We need to be engaging our youth at a young age," he said, adding, "There is a socioeconomic piece that needs to be looked at."

Ruth Greenspan, executive director of the local John Howard Society, pointed to poverty, addiction and joblessness as underlying factors.

"People have no hope, no housing, and I think the gun violence is just a symptom of the problems going on in society."

The way to tackle gun crime is through preventive measures, such as improving access to jobs, education and housing, she said.

Greenspan also referenced a January 2018 McMaster University-led study that found half of the people in Canadian prisons experienced childhood abuse. "Sometimes there's just a lot of harm and a lot of hurt that needs to be healed."

The John Howard Society's Youth at Risk Development program has focused on preventing youth and gang violence. "It's a huge preventive program and I think that's key," Greenspan said.

But due to a lack of funding, its previous contingent of 15 staff has been cut to two. Funding for those two positions runs out in August.

Those who wish to contact police with information about shootings in Hamilton can call Det. Sgt. Jason Cattle at 905-546-3887.

Diodati also urges people to use Crime Stoppers, an option for anyone who wishes to remain anonymous. Call 1-800-222-8477 or visit www.crimestoppers hamilton.com.

tmoro@thespec.com
905-526-3264 | @TeviahMoro

Tories lose candidate as Ex-Ticat Marwan Hage drops out

KEVIN WERNER
Hamilton Community News

The Hamilton East-Stoney Creek federal Conservative riding association is looking for a new candidate to take on incumbent Liberal MP Bob Bratina in this fall's federal election.

Marwan Hage, the former Hamilton Tiger-Cats football player, father of two children and who is now operating a number of Tim Hortons franchises, has left the political field and won't be the Hamilton East-Stoney Creek federal candidate for the Conservative Party.

"I have realized I can't give this election campaign the full time and effort it needs," said the 37-year-old Hage.

He told the Conservative Party last month he was withdrawing his candidacy.

Hage said he still remains "100 per cent behind" Conservative party leader Andrew Scheer.

Hage, who was born in Lebanon, had a 10-year playing career with the Tiger-Cats before retiring. This was the first time he had entered politics.

Ken Audziss, candidate nominations chair, said the local riding association is working with the federal party to name a new candidate. He said further details will be available in March.

Meanwhile, the Hamilton East-Stoney Creek federal NDP has three candidates vying to become the flag-bearer to take on Bratina.

East Hamilton businessman Harpreet Gill, Juanita Maldonaldo, assistant to former Hamilton East-Stoney Creek NDP MP Wayne Marston, and labour lawyer and law professor Nick Milanovic will be seeking the NDP nomination March 3 at the Grand Olympia Banquet Centre starting at 2 p.m.

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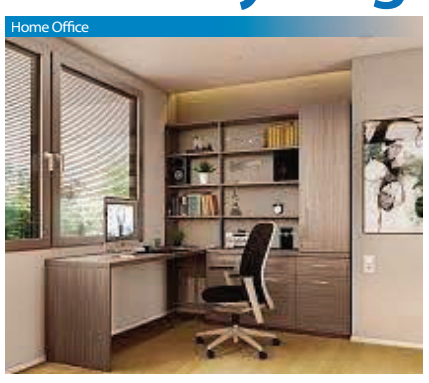

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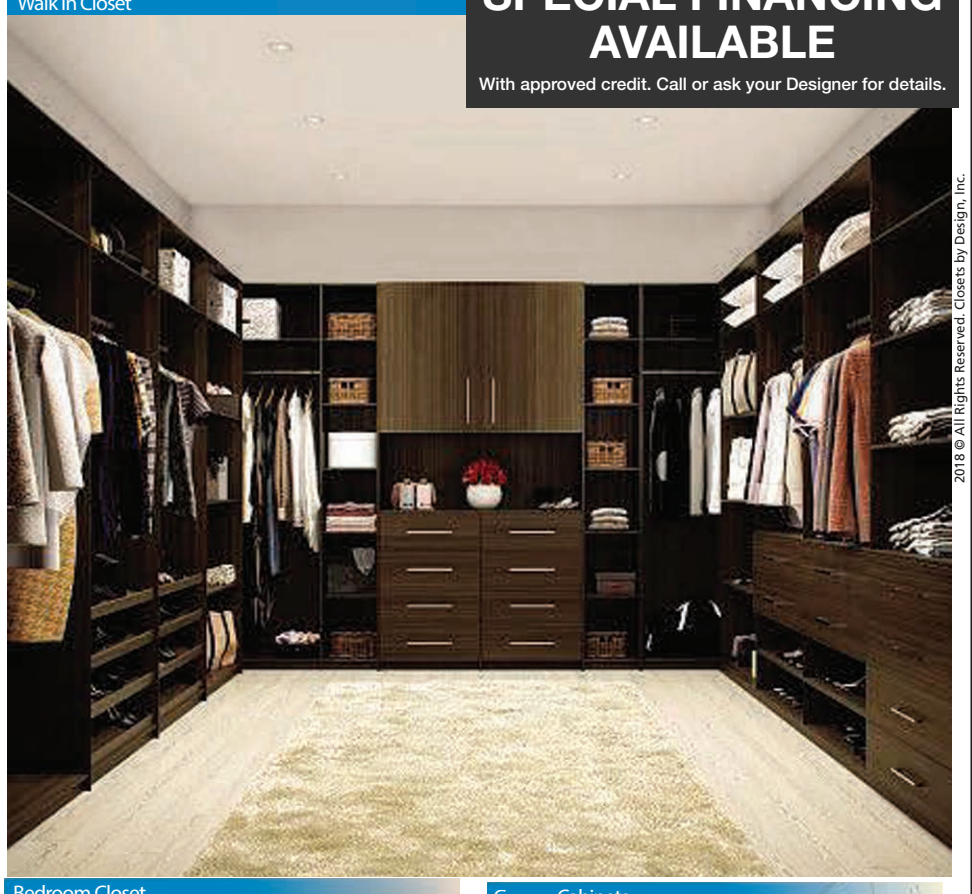
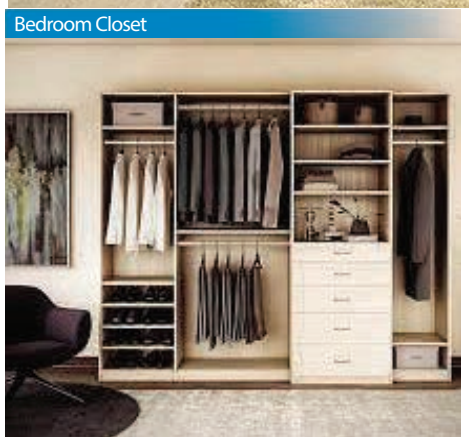


Bedroom Closet



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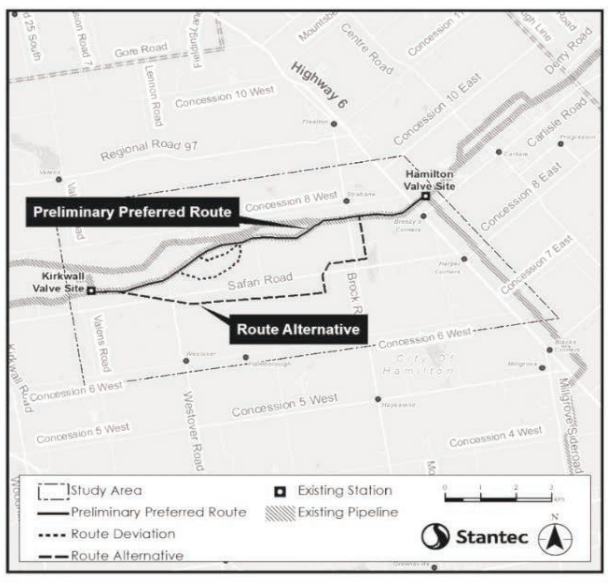
R0014955312

ENBRIDGE GAS INC. - NOTICE OF PROJECT COMMENCEMENT AND INFORMATION SESSION KIRKWALL-HAMILTON PIPELINE PROJECT

To increase existing capacity and accommodate additional demand for natural gas, Enbridge Gas Inc. is proposing to construct a new 48-inch diameter natural gas pipeline located within the City of Hamilton. (Note: As of Jan. 1, 2019, Union Gas and Enbridge Gas Distribution have amalgamated into one utility with the legal name Enbridge Gas Inc.)



The proposed project will be constructed between Enbridge Gas' existing Kirkwall valve site, located northeast of the intersection of Safari Road and Valens Road and Enbridge Gas' existing Hamilton valve site, located east of Highway 6 and north of Carlisle Road, generally paralleling three existing Enbridge Gas pipelines. The length of the proposed pipeline will be determined by the final route chosen after input from the community but will be approximately 10-14km. If approved, construction of the pipeline could begin as early as spring/summer 2021 and be complete by the end of 2021.

An integral part of this project is the completion of an environmental study of the construction and operation of the proposed pipeline and related facilities by an independent environmental consultant, Stantec Consulting Ltd. (Stantec). Stantec is hosting an Information Session to provide those interested in the project an opportunity to review the project in general, the alternative pipeline routes, the preliminary preferred pipeline route and provide input to the planning process. The Information Session will be conducted as a drop-in centre, with representatives from both Enbridge Gas and Stantec available to receive comments and answer questions.

The Information Session will be held at the following time and location:

Wednesday, Feb. 27, 2019
5 p.m. to 8 p.m.
Carlisle Arena
1496 Centre Road
Carlisle, ON L0R 1H2

If you cannot attend the Information Session but would like to learn more, please contact:

Michael Candido
Project Manager
Stantec Consulting Ltd.
Phone: 519-780-8139
Email:
Michael.Candido@Stantec.com

Enbridge Gas
Phone: 1-855-381-9138
Email: projects@uniongas.com
Or visit our project webpage:
www.uniongas.com/projects

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BUSINESS

OPEN BOOK TUTORING OPENS MINDS TO THE JOYS OF LEARNING

JULIA LOVETT
jlovett@flamborough
review.com

A fun and bright learning space has opened up in Waterdown, and it's all about getting back to basics.

Open Book Tutoring Centre aims to help children become the total reader they always could be by working to ensure they have the building blocks needed to succeed.


Angela Graham

"Teaching is what I've done for most of my working life. It's my passion; it's my joy," said facility owner Angela Graham. "I just love the challenge of educating young children."

Before moving to Waterdown a few of months ago, Graham owned and operated a Montessori school in Etobicoke for 17 years and was trained in Association Montessori Internationale (AMI) by Renilde Montessori, granddaughter of Montessori founder Maria Montessori.

The local centre currently caters to younger learners up to and including students in Grade 4. It provides after-school tutoring and is working on expanding its offering, including a full-day Montessori-based program, which is expected to start in September.

The lifelong educator said she has always taught young children and believes that is where a real difference can be made.

OPEN BOOK TUTORING CENTRE

LOCATION
5 Mill St. S.
HOURS
Monday to Friday from 1 to 7 p.m.
Saturday from 10 a.m. to 2 p.m.
The facility is closed Sundays.
CONTACT
Phone: 289-895-9049
Website: www.facebook.com/openbooktutoringcentre

"I'm just a firm believer that education is pivotal to everything," she said. "When they get what they need from the very beginning, they just go through life and it's a breeze."

Open Book Tutoring welcomes the community to its open house set for Saturday, Feb. 16, from 11 a.m. to 3 p.m. It will also host a parent information night on Feb. 21 at 7:30 p.m.

ENBRIDGE GAS INC. - NOTICE OF PROJECT COMMENCEMENT AND INFORMATION SESSION
KIRKWALL-HAMILTON PIPELINE PROJECT

To increase existing capacity and accommodate additional demand for natural gas, Enbridge Gas Inc. is proposing to construct a new 48-inch diameter natural gas pipeline located within the City of Hamilton. (Note: As of Jan. 1, 2019, Union Gas and Enbridge Gas Distribution have amalgamated into one utility with the legal name Enbridge Gas Inc.)

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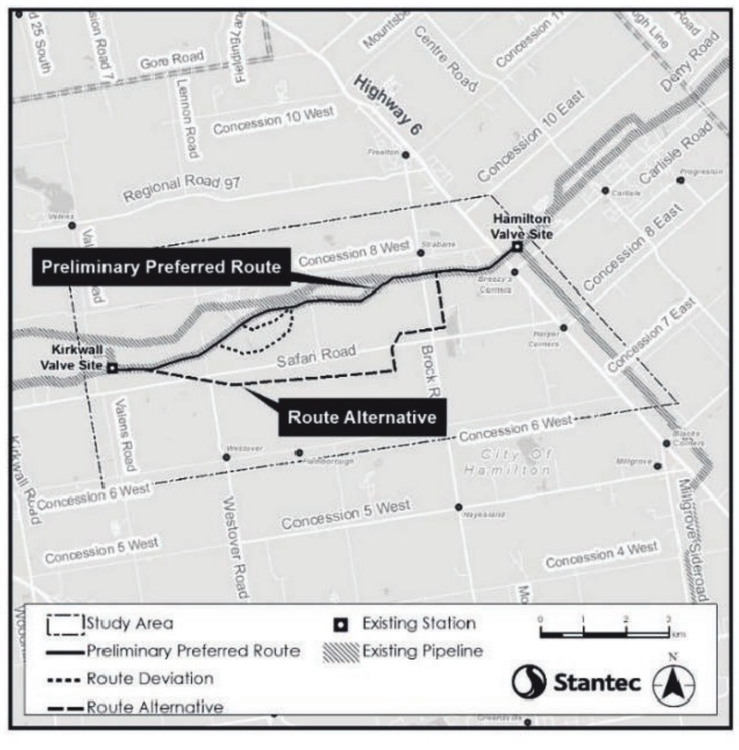
An integral part of this project is the completion of an environmental study of the construction and operation of the proposed pipeline and related facilities by an independent environmental consultant, Stantec Consulting Ltd. (Stantec). Stantec is hosting an Information Session to provide those interested in the project an opportunity to review the project in general, the alternative pipeline routes, the preliminary preferred pipeline route and provide input to the planning process. The Information Session will be conducted as a drop-in centre, with representatives from both Enbridge Gas and Stantec available to receive comments and answer questions.



The Information Session will be held at the following time and location:

Wednesday, Feb. 27, 2019
5 p.m. to 8 p.m.
Carlisle Arena
1496 Centre Road
Carlisle, ON L0R 1H2

If you cannot attend the Information Session but would like to learn more, please contact:

Michael Candido
Project Manager
Stantec Consulting Ltd.
Phone: 519-780-8139
Email:Michael.Candido@Stantec.com

Enbridge Gas
Phone: 1-855-381-9138
Email: projects@uniongas.com
Or visit our project webpage:
www.uniongas.com/projects

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419 Concession Street, Hamilton
905-388-4949
BINBROOK
2668 Binbrook Road, Unit 203, Binbrook
905-692-4949
BRANTFORD
29 Darling Street, Brantford*
519-445-4502
*LEGAL ADVICE BY APPOINTMENT ONLY.
R0014983221

Local

Residents forced out by mystery odour

NICOLE O'REILLY
The Hamilton Spectator

Residents on Mary Street were forced from their homes after an investigation into a gas smell in the neighbourhood.

About 60 homes were evacuated on Mary Street Monday morning over the smell that the Hamilton Fire Department said was coming from the sewer system.

Residents were forced to stay out of their homes until about 2 p.m. while the sewers were flushed and houses checked.

Crews were originally dispatched just before 10 a.m. to 238 Mary St. for an odour investigation, Hamilton Fire Deputy Chief John Verbeek said.

On-scene firefighters noticed a petroleum-based smell at this home and several neighbouring addresses. The call was upgraded to a HAZMAT (hazardous materials) response, drawing addition resources and monitoring equipment to the scene, Verbeek said.

All properties between Cannon and Barton streets were evacuated. Then crews narrowed down the smell as coming from the sewer system.

Hamilton Fire remained on scene until the investigation was complete.



GARY YOKOYAMA THE HAMILTON SPECTATOR

On Mary Street, firefighters went door-to-door, asking residents to leave while they investigated a mystery sewer smell.

noreilly@thespec.com
905-526-3199 | @NicoleatTheSpec

City now waits for plans to change paramedics

Amalgamation of emergency services 'not quite set in stone as it appeared to be'

Hamilton Community News

Hamilton officials are taking a more optimistic approach to the provincial government's recent announcement it will merge paramedic services across Ontario.

Paul Johnson, general manager of community and emergency services, said Ontario is prepared to talk with various stakeholders, including municipalities, about its plans.

"This announcement is not quite set in stone as it appeared to be," said Johnson. "They are still in the process of determining if this makes sense to do across the province. The short answer is they will do more consultation."

Paramedic Services Chief Michael Sanderson said the provincial government is already creating a format to "engage" in discussions with communities and other groups. Last week the Association of Municipalities of Ontario revealed the province in its 2019 budget is proposing to integrate Ontario's 59 emergency health service operators — 52 emergency medical services and six First Nations — and 22 provincial dispatch communication centres into 10 units. The province provides 100 per cent funding to the services.

Hayley Chazan, spokesperson for Christine Elliot, Minister of Health said "it is too early to discuss outcomes" but confirmed discussions with stakeholders will begin "shortly."

But Mario Posteraro, president of OPSEU, Local 256, said union officials have yet to hear from the provincial government to discuss any merger plans.

"What they say and what they do are two separate issues with this government," said Posteraro. "Trust is non-existent and paramedics are nervous about what the end game plan is and how it will impact patients and taxpayers and themselves."

Mayor Fred Eisenberger said he is "hopeful" the province's plans will be revamped through further discussions with stakeholder groups. He said the idea to regionalize paramedic services "flies in the face" of Hamilton's continuing request to have local control for dispatch services.

"It's critically important we have a voice at the table," said Eisenberger. "I hope the province listens carefully."

ENBRIDGE GAS INC.
NOTICE OF SECOND INFORMATION SESSION
KIRKWALL-HAMILTON PIPELINE PROJECT

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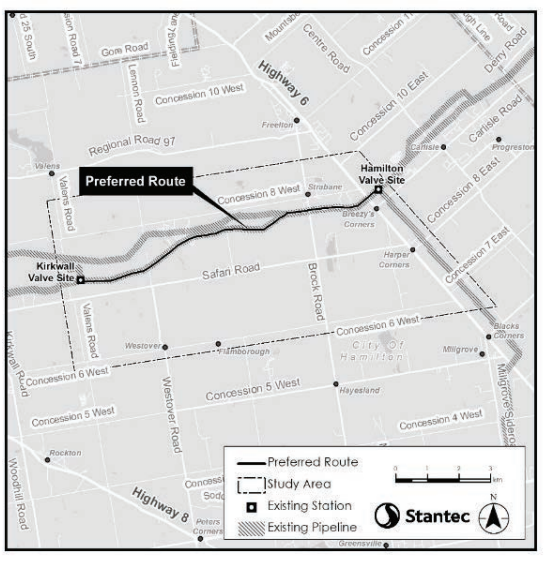

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The Information Session will be held at the following time and location:

Thursday May 9, 2019
5 p.m. to 8 p.m.
Valens Community Centre
1818 Valens Road
Flamborough, ON N0B 2J0

If you cannot attend the Information Session but would like to learn more, please contact:

Michael Candido
Project Manager
Stantec Consulting Ltd.
Phone: 519-780-8139
Email:
michael.candido@stantec.com

Enbridge Gas
Phone: 1-855-381-9138
Email:
projects@uniongas.com
Or visit our project webpage:
www.uniongas.com/projects/Kirkwall-Hamilton

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WATERDOWN'S BEAUPRE PURSUES NCAA VOLLEYBALL DREAM



GERRY GRAHAM photo

Waterdown's Aimee Beaupre celebrates after signing with Youngstown State. The St. Mary Catholic Secondary School student received a scholarship with the Ohio university, where she'll play volleyball with the NCAA Division I Penguins.

LARRY MOKO

Aimee Beaupre of St. Mary Catholic Secondary School has fulfilled other people's DREAMS and now she's preparing to pursue her own dream.

Beaupre, a Waterdown resident, has signed a volleyball scholarship offer from Ohio's Youngstown State University. The NCAA Division 1 Penguins are part of the Horizon League.

"My biggest goal is to play Division 1," Beaupre said during the recent signing ceremony at St. Mary that was attended by many of her teammates, coaches and family members. "Then, we'll see where it goes from there."

An outstanding middle player on the volleyball court, Beaupre committed to the Youngstown-based school recently after returning from a service trip to the Dominican Republic. She was in that country over the March break with a group of Grade 12 students from St. Mary to participate in the annual DREAMS program (Dominican Republic Education and Medical Support).

Since 2000, more than 600 St. Mary students have raised funds and travelled to impoverished mountain communities in the Dominican Republic to build homes and schools.

"I had the honour and privilege to travel with Aimee and be her teacher-chaperone on our most recent DREAMS trip," St. Mary senior girls volleyball coach Chiara Salvatore said. "Seeing Aimee in yet another environment, outside of the classroom and off the volleyball court, I was able to witness the sincerity that she has in helping others. I also saw what happiness and joy it brought to Aimee herself."

Beaupre, whose parents are Sandra and Jan, played four years of volleyball in the Hamilton-Wentworth Catholic league. And during that period she achieved great success. The Crusaders captured city championships in her Grade 9, 10 and 11 years. Even with a young squad this season, St. Mary reached the league final against the ACMT Jaguars.

The two-time Hamilton-Wentworth Catholic Athletic Association (HWCA) all-star helped St. Mary qualify for three overall Ontario Federation of School Athletic Associations (OFSAA) appearances. Team medal wins at

See LOCAL, page 20

ENBRIDGE GAS INC. - NOTICE OF SECOND INFORMATION SESSION KIRKWALL-HAMILTON PIPELINE PROJECT

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Project Manager
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Email:
michael.candido@stantec.com

Enbridge Gas
Phone: 1-855-381-9138
Email:
projects@uniongas.com
Or visit our project webpage:
www.uniongas.com/projects/Kirkwall-Hamilton

APPENDIX B3: LETTERS

Stantec Consulting Ltd.
1-70 Southgate Drive, Guelph ON N1G 4P5

February 12, 2019
File: 160961299

«First_Name» «Last_Name», «Title»
«Representing»
«Address»
«Town», «Province» «Postal_Code»
«Email_»

SENT VIA EMAIL

Dear «First_Name» «Last_Name»,

Reference: Enbridge Gas Inc. Pipeline Project – Notice of Commencement and Information Session: Kirkwall-Hamilton Pipeline Project

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An Environmental Report, summarizing the results of the environmental study, will accompany Enbridge Gas' application to the OEB, whose review and approval is required before the proposed project can proceed. The Environmental Report for the proposed project is anticipated to be completed and submitted to the OEB as early as summer of 2019 as part of the overall project application.

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Additional project information is available at: uniongas.com/projects

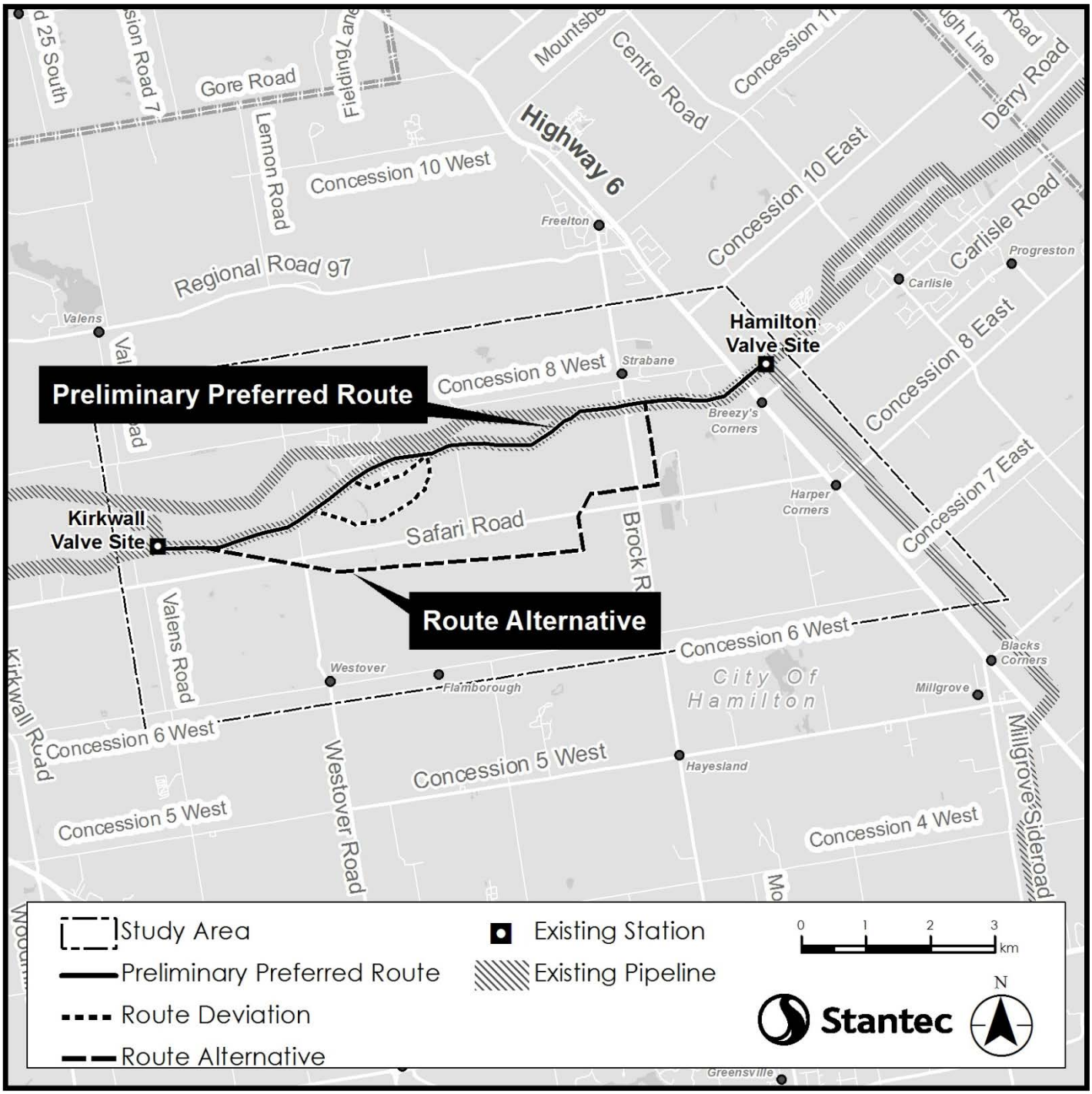
Regards,

Stantec Consulting Ltd.

Michael Candido
Project Manager
Assessment and Permitting
Stantec Consulting
1-70 Southgate Drive
Guelph, ON N1G 4P5
519-780-8139
Michael.Candido@stantec.com

Attachment: Map of Alternate Routes

c. Tony Vadlja, Enbridge Gas Inc. Operating as Union Gas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Route Alternative
Hamilton Valve Site
Kirkwall Valve Site
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Regional Road 97
Concession 10 West
Concession 10 East
Concession 8 West
Concession 8 East
Concession 7 East
Concession 6 West
Concession 5 West
Concession 4 West
Safari Road
Centre Road
Derry Road
Carlisle Road
Lennon Road
Valens Road
Kirkwall Road
Westover Road
Millgrove Sideroad
Brock R
Freelton
Strabane
Breezy's Corners
Harper Corners
Carlisle
Progreston
Valens
Westover
Flamborough
City Of Hamilton
Millgrove
Blacks Corners
Hayesland
Greensville
Study Area
Existing Station
Preliminary Preferred Route
Existing Pipeline
Route Deviation
Route Alternative
0 1 2 3 km
N
Stantec

February 12, 2019

<<Recipient's Address>>

Attention: <<Title>><<First_Name>><<Last_Name>>

Dear <<First_Name>><<Last Name>>,

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Wednesday, Feb. 27, 2019
5 p.m. to 8 p.m.
Carlisle Arena
1496 Centre Road
Carlisle, ON L0R 1H2

«Community» is invited to attend the Information Session and provide comments regarding the proposed project. Specifically, Stantec is seeking information about any adverse impacts that the proposed project may have on constitutionally protected aboriginal or treaty rights and any measures for mitigating those adverse impacts. Stantec is also seeking background environmental and socio- economic information that may be useful in compiling an inventory.

If you cannot attend the Information Session but would like to learn more about the project, please contact the undersigned.

Additional project information is available at: uniongas.com/projects

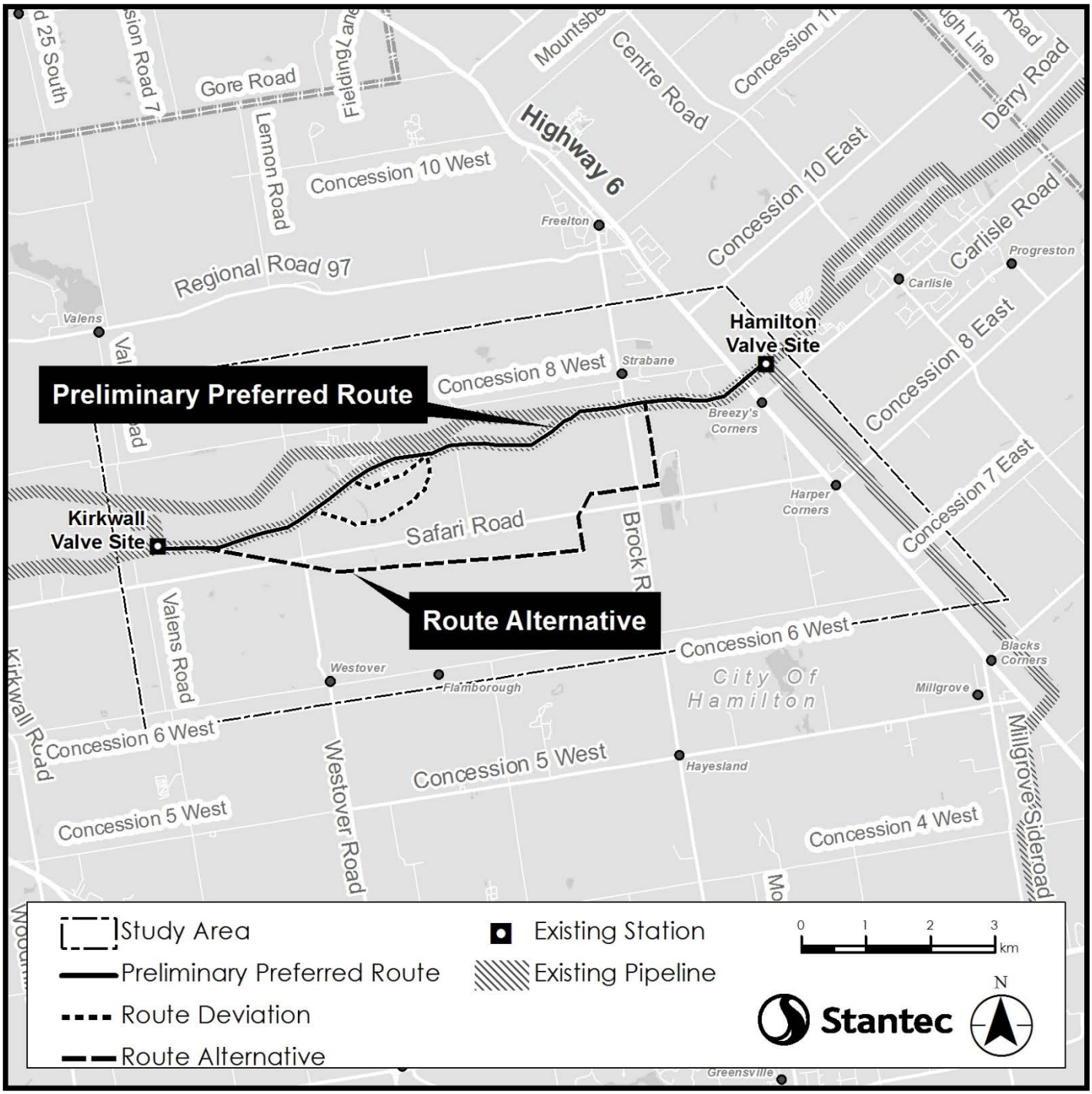
Miigwech,

Ken McCorkle

Ken McCorkle
Manager, Indigenous Affairs Enbridge Gas Inc.
50 Keil Drive North Chatham, ON N7M 5M1
Phone: 519-436-4600 ext. 5002243
Email: kmccorkle@uniongas.com

Attachment: Map of Alternative Routes

c. Michael Candido, Stantec Consulting Ltd.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Concession 5 West
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Centre Road
Derry Road
Carlisle Road
Lennon Road
Valens Road
Kirkwall Road
Westover Road
Millgrove Sideroad
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Hayesland
Greensville
Study Area
Existing Station
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Existing Pipeline
Route Deviation
Route Alternative
0 1 2 3 km
N
Stantec

Stantec Consulting Ltd.
1-70 Southgate Drive, Guelph ON N1G 4P5

February 13, 2019
File: 160961299

Dear Resident,

Reference: Enbridge Gas Inc. Pipeline Project – Notice of Commencement and Information Session
Kirkwall-Hamilton Pipeline Project

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You are receiving this letter because the preliminary preferred or alternate pipeline route is located on or in proximity to your property.

As an integral part of this project, Enbridge Gas has hired Stantec Consulting Ltd. to undertake an environmental study of the construction and operation of the proposed pipeline and related facilities. 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 (2016)*. The environmental study process includes consultation and engagement with landowners, municipalities, agencies, Indigenous communities, and other interested parties through notices, mailouts, meetings, and Information Sessions.

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Wednesday, Feb. 27, 2019
5 p.m. to 8 p.m.
Carlisle Arena
1496 Centre Road
Carlisle, ON L0R 1H2

If you cannot attend the Information Session but would like to learn more about the project, please contact the undersigned.

Please feel free to share this letter with your neighbours. If you are a landowner, it would also be appreciated if this letter could be shared with your tenants.

Additional project information is available at: uniongas.com/projects.

Regards,

Stantec Consulting Ltd.



Michael Candido CAN-CISEC
Project Manager
Assessment and Permitting
Stantec Consulting
1-70 Southgate Drive
Guelph, ON N1G 4P5
519-79-8139
Michael.Candido@stantec.com

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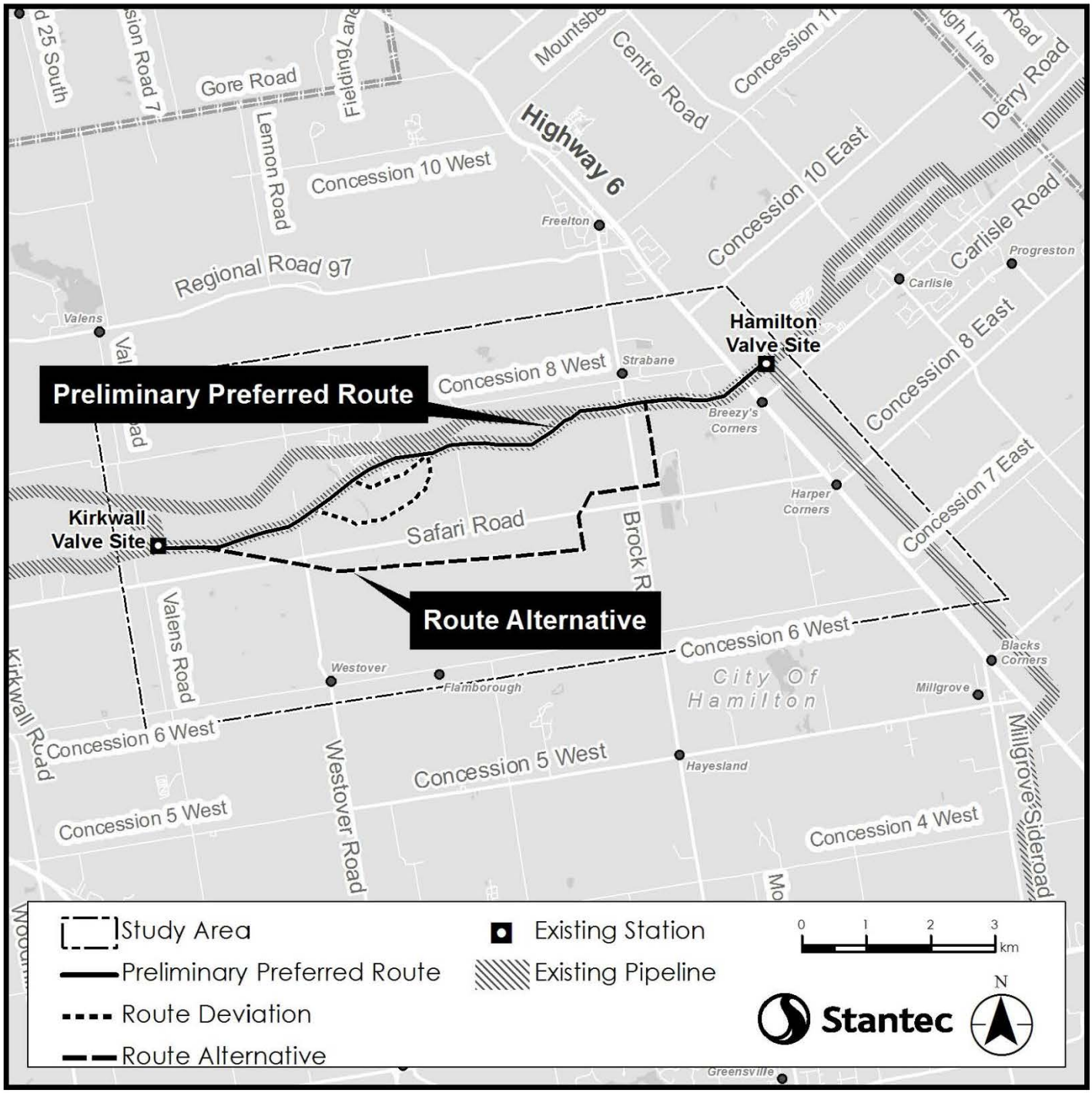
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Highway 6
Centre Road
Derry Road
Carlisle Road
Lennon Road
Valens Road
Westover Road
Kirkwall Road
Safari Road
Millgrove Sideroad
Freelton
Strabane
Breezy's Corners
Harper Corners
Carlisle
Progreston
Valens
Westover
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Existing Pipeline
0 1 2 3 km
N
Stantec

Stantec Consulting Ltd.
1-70 Southgate Drive, Guelph ON N1G 4P5

February 12, 2019
File: 160961299

«First_Name» «Last_Name», «Title»
«Representing»
«Address»
«Town», «Province» «Postal_Code»
«Email_»

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Additional project information is available at: uniongas.com/projects

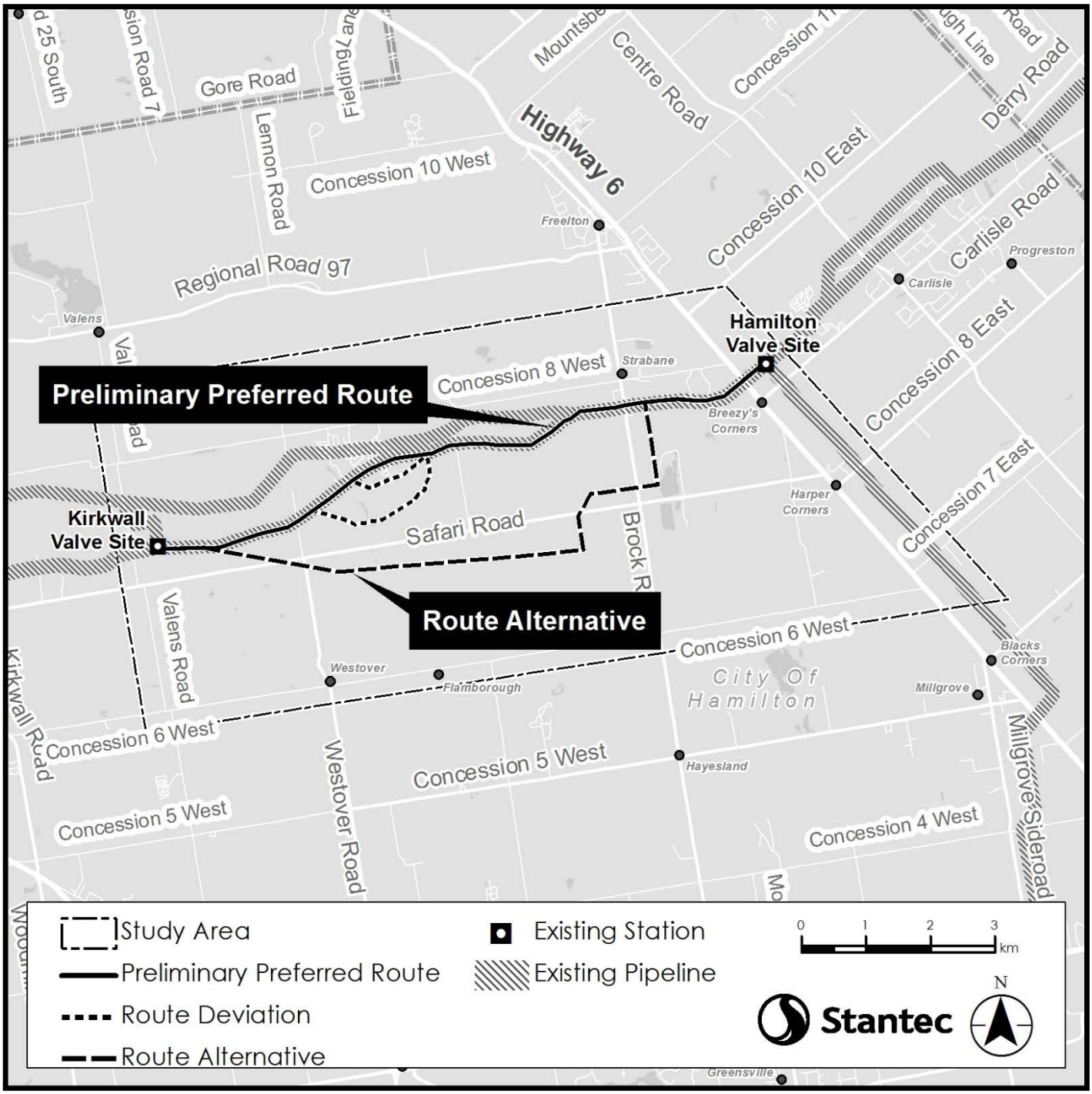
Regards,

Stantec Consulting Ltd.

Michael Candido
Project Manager
Assessment and Permitting
Stantec Consulting
1-70 Southgate Drive
Guelph, ON N1G 4P5
519-780-8139
Michael.Candido@stantec.com

Attachment: Map of Alternate Routes

c. Tony Vadlja, Enbridge Gas Inc. Operating as Union Gas


Preliminary Preferred Route
Route Alternative
Hamilton Valve Site
Kirkwall Valve Site
Highway 6
Gore Road
Regional Road 97
Concession 10 West
Concession 10 East
Concession 8 West
Concession 8 East
Concession 7 East
Concession 6 West
Concession 5 West
Concession 4 West
Safari Road
Centre Road
Derry Road
Carlisle Road
Lennon Road
Valens Road
Kirkwall Road
Westover Road
Millgrove Sideroad
Brock R
Freelton
Strabane
Breezy's Corners
Harper Corners
Carlisle
Progreston
Valens
Westover
Flamborough
City Of Hamilton
Millgrove
Blacks Corners
Hayesland
Greensville
Study Area
Existing Station
Preliminary Preferred Route
Existing Pipeline
Route Deviation
Route Alternative
0 1 2 3 km
N
Stantec

Stantec Consulting Ltd.
1-70 Southgate Drive, Guelph ON N1G 4P5

April 18, 2019
File: 160961299

«First_Name» «Last_Name», «Title»
«Representing»
«Address»
«Town», «Province» «Postal_Code»
«Email_»

Dear «First_Name» «Last_Name»,

Reference: Enbridge Gas Pipeline Project – Notice of Second Information Session: Kirkwall-Hamilton Pipeline Project

To increase existing capacity and accommodate additional demand for natural gas, Enbridge Gas is proposing to construct a new 48-inch diameter natural gas pipeline located within the City of Hamilton.

Please note: As of Jan. 1, 2019, Union Gas and Enbridge Gas Distribution have amalgamated into one utility with the legal name Enbridge Gas Inc.

The proposed pipeline will be constructed between Enbridge Gas' existing Kirkwall valve site, located northeast of the intersection of Safari Road and Valens Road and Enbridge Gas' existing Hamilton valve site, located east of Highway 6 and north of Carlisle Road. The Preliminary Preferred Route and Alternate Route were presented during an Information Session held on February 27th, 2019. Feedback on the routes was taken into consideration during the route evaluation process. The evaluation resulted in the selection of the Preferred Route, which will parallel three existing Enbridge Gas pipelines and will be 10 km in length. If approved, construction of the pipeline could begin as early as spring/summer 2021 and be complete by the end of 2021.

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An Environmental Report, summarizing the results of the environmental study, will accompany Enbridge Gas' application to the OEB, whose review and approval is required before the proposed project can proceed. The Environmental Report for the proposed project is anticipated to be completed and submitted to the OEB as early as the summer of 2019 as part of the overall project application.

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As a stakeholder with authority or a potential interest in developments in the project location you are invited to provide comments regarding the proposed pipeline. Specifically, Stantec is seeking information that may affect construction and operation of the proposed pipeline, including: background environmental and socio-economic information, planning principles or guidelines which fall under your authority and other proposed developments known in the area to assess potential cumulative effects.

The Information Session is planned to seek feedback on the proposed project in general and on the Preferred Route. The Information Session will be conducted as a drop-in, and representatives from both Enbridge Gas and Stantec Consulting Ltd. will be available to answer questions.

The Information Session will be held on:

Thursday, May 9, 2019
5 p.m. to 8 p.m.
Valens Community Centre
1818 Valens Road
Flamborough, ON N0B 2J0

If you cannot attend the Information Session but would like to learn more about the project, please contact the undersigned.

Additional project information is available at: uniongas.com/Kirkwall-Hamilton

Regards,

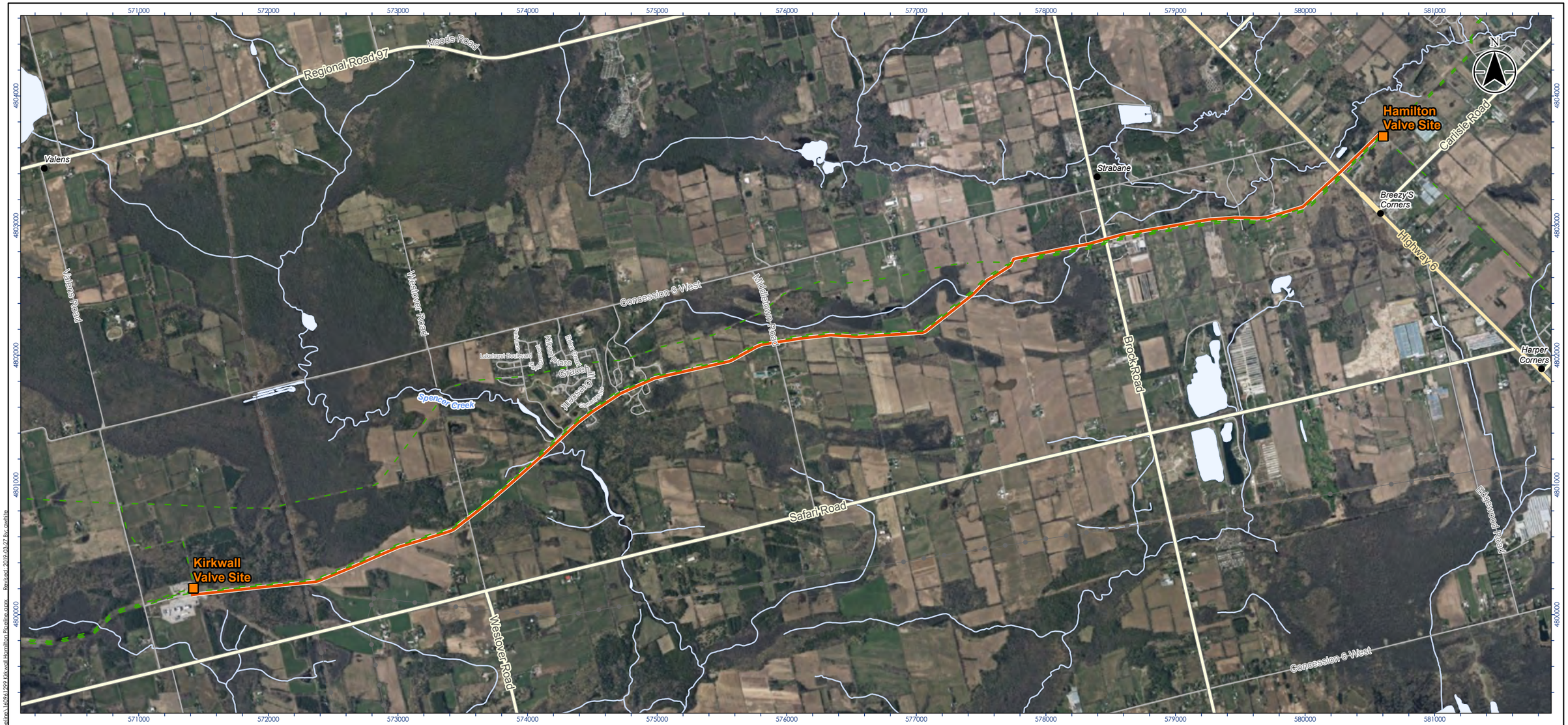
Stantec Consulting Ltd.

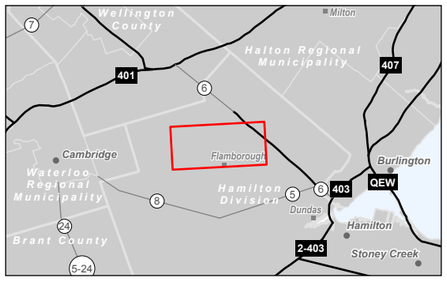


Michael Candido
Project Manager
Assessment and Permitting
Stantec Consulting
1-70 Southgate Drive
Guelph, ON N1G 4P5
519-780-8139
michael.candido@stantec.com

Attachment: Map of Preferred Route

c. Ryan Park, Enbridge Gas





Legend

- Preferred Route
- Existing Enbridge Station
- Existing Pipeline
- Highway
- Major Road
- Minor Road
- Hydro Line
- Watercourse
- Waterbody

0 0.5 1 km

1:30,000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
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Stantec

Project Location
City of Hamilton

160961229

Client/Project
ENBRIDGE GAS INC.
KIRKWALL TO HAMILTON PIPELINE PROJECT

Figure No.
1

Title
Preferred Route

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April 18, 2019

«Indigenous_communityAgency»
«Address»
«Town» «Prov» «PC»
«Email_»

Attention: «Title» «First_Name» «Last_Name», «Position»

Dear «Title» «First_Name» «Last_Name»,

Reference: Enbridge Gas Pipeline Project – Notice of Second Information Session: Kirkwall-Hamilton Pipeline Project

To increase existing capacity and accommodate additional demand for natural gas, Enbridge Gas is proposing to construct a new 48-inch diameter natural gas pipeline located within the City of Hamilton.

The proposed pipeline will be constructed between Enbridge Gas' existing Kirkwall valve site, located northeast of the intersection of Safari Road and Valens Road and Enbridge Gas' existing Hamilton valve site, located east of Highway 6 and north of Carlisle Road. The Preliminary Preferred Route and Alternate Route were presented during an Information Session held on February 27th, 2019. Feedback on the routes was taken into consideration during the route evaluation process. The evaluation resulted in the selection of the Preferred Route, which will parallel three existing Enbridge Gas pipelines and will be 10 km in length. If approved, construction of the pipeline could begin as early as spring/summer 2021 and be complete by the end of 2021.

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An Environmental Report, summarizing the results of the environmental study, will accompany Enbridge Gas' application to the OEB. The Environmental Report for the proposed project is anticipated to be completed and submitted to the OEB as early as the summer of 2019 as part of the overall project application.

The Information Session is planned to seek feedback on the proposed project in general and on the Preferred Route. The Information Session will be conducted as a drop-in, and representatives from both Enbridge Gas and Stantec Consulting Ltd. will be available to answer questions.

The Information Session will be held on:

Thursday, May 9, 2019
5 p.m. to 8 p.m.
Valens Community Centre
1818 Valens Road
Flamborough, ON N0B 2J0

«Indigenous_communityAgency» is invited to attend the Information Session and provide comments on the proposed project. Specifically, Stantec is seeking information about any adverse impacts that the proposed project may have on constitutionally protected Indigenous or treaty rights and any measures for mitigating those adverse impacts. Stantec is also seeking background environmental and socio-economic information that may be useful in compiling an inventory.

If you cannot attend the Information Session but would like to learn more about the project, please contact the undersigned.

Additional project information is available at: uniongas.com/Kirkwall-Hamilton

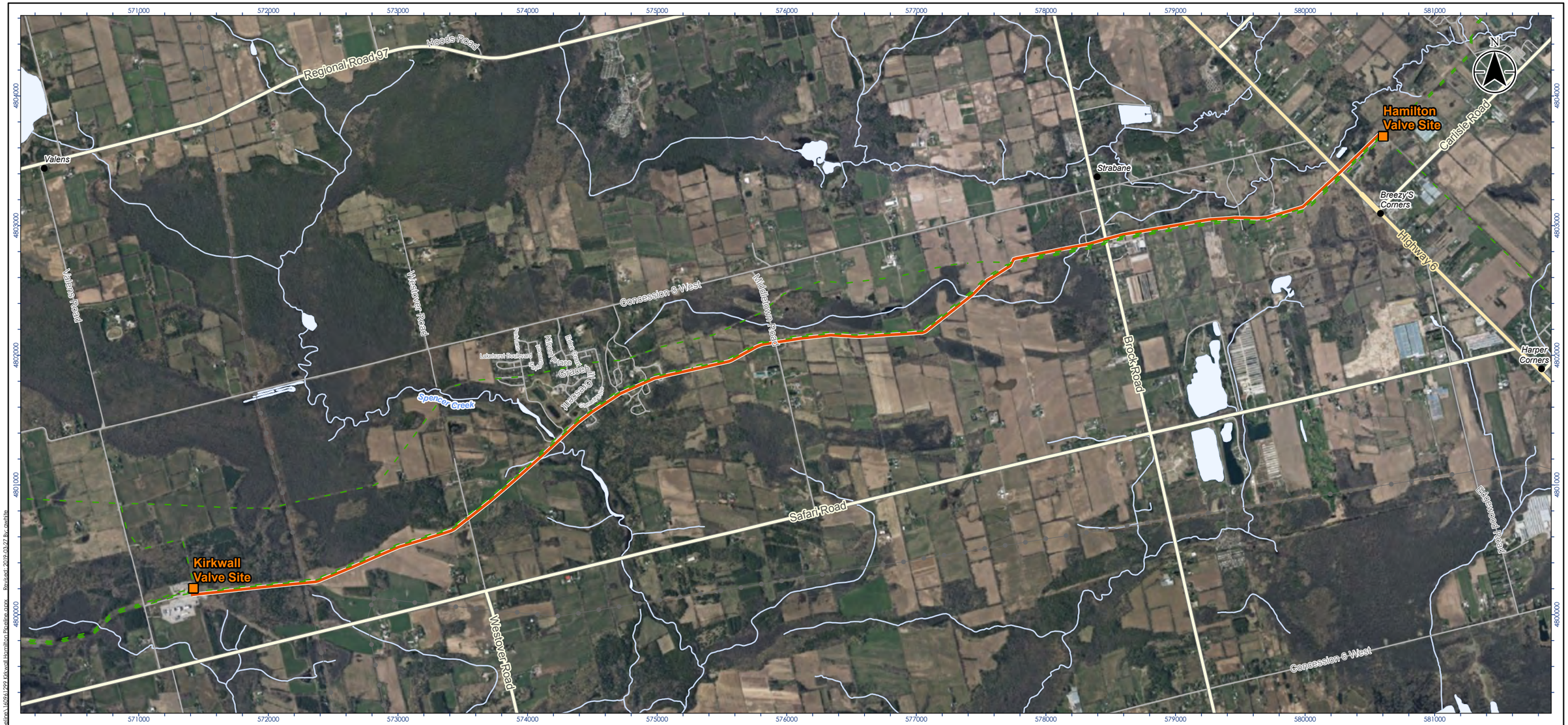
Miigwech,

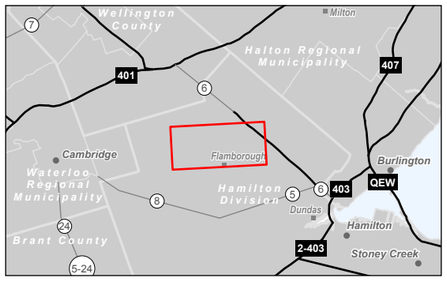
Ken McCorkle

Ken McCorkle
Manager, Indigenous Affairs Enbridge Gas
50 Keil Drive North Chatham, ON N7M 5M1
Phone: 519-436-4600 ext. 5002243
Email: kmccorkle@uniongas.com

Attachment: Map of Preferred Route

c. Michael Candido, Stantec Consulting Ltd.
«cc»





Legend

- Preferred Route
- Existing Enbridge Station
- Existing Pipeline
- Highway
- Major Road
- Minor Road
- Hydro Line
- Watercourse
- Waterbody

0 0.5 1 km

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Notes

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Stantec

Project Location
City of Hamilton

160961229

Client/Project
ENBRIDGE GAS INC.
KIRKWALL TO HAMILTON PIPELINE PROJECT

Figure No.
1

Title
Preferred Route

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Stantec Consulting Ltd.
1-70 Southgate Drive, Guelph ON N1G 4P5

April 17, 2019
File: 160961299

«Name1»
«Name2»
«Address1»
«Address2_RR»
«City», «Prov» «PostalCode»

Dear «Name1» and «Name2»,

Reference: Enbridge Gas Pipeline Project – Notice of Second Information Session Kirkwall-Hamilton Pipeline Project

To increase existing capacity and accommodate additional demand for natural gas, Enbridge Gas is proposing to construct a new 48-inch diameter natural gas pipeline located within the City of Hamilton.

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You are receiving this letter as the Preferred Route is located on or adjacent to your property.

As an integral part of this project, Enbridge Gas has hired Stantec Consulting Ltd. to undertake an environmental study of the construction and operation of the proposed pipeline and related facilities. 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 (2016)*. The environmental study process includes consultation and engagement with landowners, municipalities, agencies, Indigenous communities, and other interested parties through notices, mailouts, meetings, and Information Sessions.

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The Information Session is planned to seek feedback on the project in general and on the Preferred Route. The Information Session will be conducted as a drop-in, and representatives from both Enbridge Gas and Stantec Consulting Ltd. will be available to answer questions.

The Information Session will be held on:

Thursday, May 9, 2019
5 p.m. to 8 p.m.
Valens Community Centre
1818 Valens Road
Flamborough, ON N0B 2J0

If you cannot attend the Information Session but would like to learn more about the project, please contact the undersigned.

Please feel free to share this letter with your neighbours. If you are a landowner, it would also be appreciated if this letter could be shared with your tenants.

Additional project information is available at: uniongas.com/Kirkwall-Hamilton

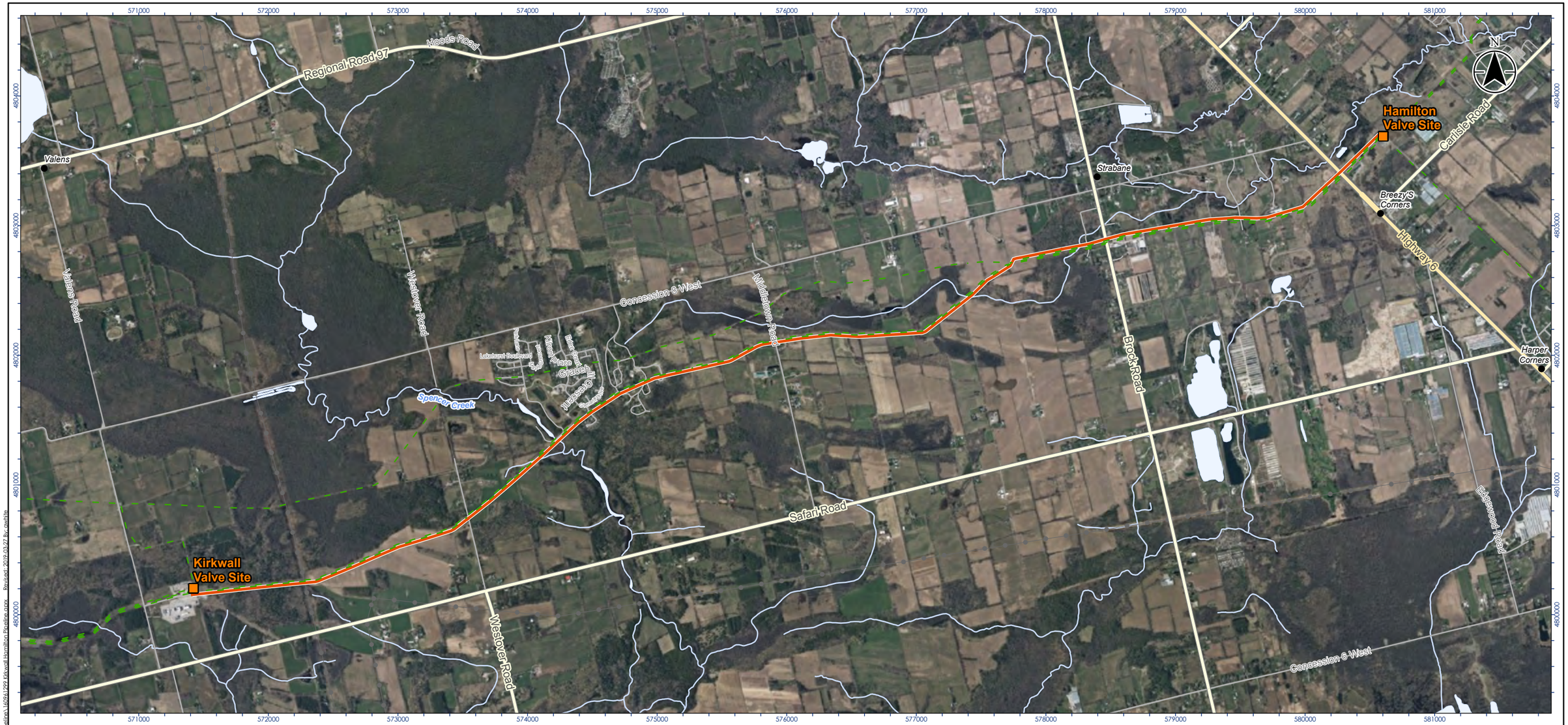
Regards,

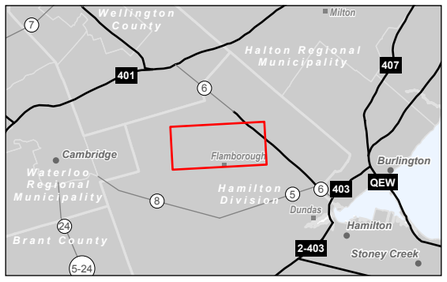
Stantec Consulting Ltd.

Michael Candido
Project Manager
Assessment and Permitting
Stantec Consulting
1-70 Southgate Drive
Guelph, ON N1G 4P5
519-780-8139
michael.candido@stantec.com

Attachment: Map of Preferred Route

c. Ryan Park, Enbridge Gas





Legend

- Preferred Route
- Existing Enbridge Station
- Existing Pipeline
- Highway
- Major Road
- Minor Road
- Hydro Line
- Watercourse
- Waterbody

0 0.5 1 km

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Notes

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Stantec

Project Location
City of Hamilton

160961229

Client/Project
ENBRIDGE GAS INC.
KIRKWALL TO HAMILTON PIPELINE PROJECT

Figure No.
1

Title
Preferred Route

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Stantec Consulting Ltd.
1-70 Southgate Drive, Guelph ON N1G 4P5

April 17, 2019
File: 160961299

«Name1»
«Name2»
«Address1»
«Address2_RR»
«City» «Prov» «PostalCode»

Dear «Name1» and «Name2»,

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You are receiving this letter as a previously identified Alternate Route or Route Deviation was located on your property. However, please be advised that the Preferred Route is NOT located on your property.

As an integral part of this project, Enbridge Gas has hired Stantec Consulting Ltd. to undertake an environmental study of the construction and operation of the proposed pipeline and related facilities. 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 (2016)*. The environmental study process includes consultation and engagement with landowners, municipalities, agencies, Indigenous communities, and other interested parties through notices, mailouts, meetings, and Information Sessions.

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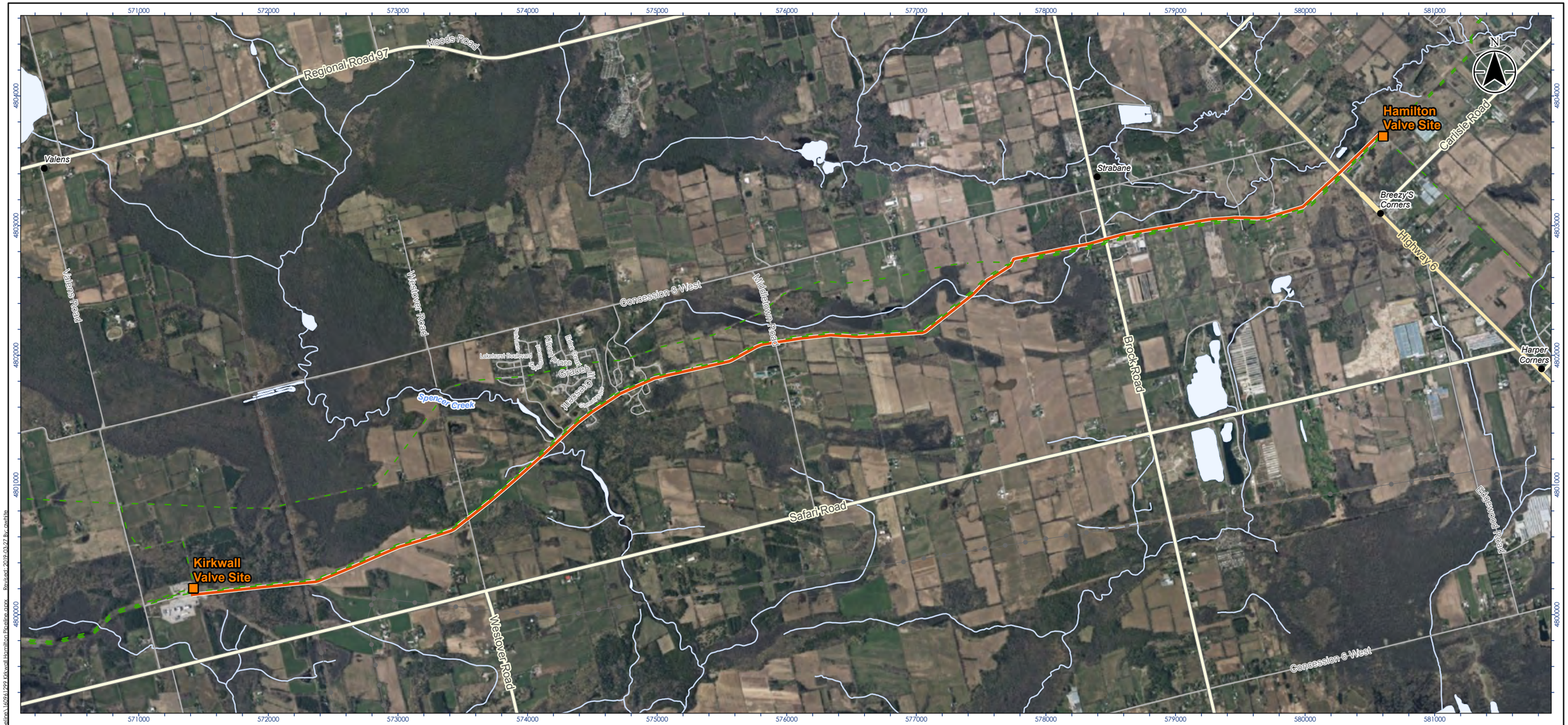
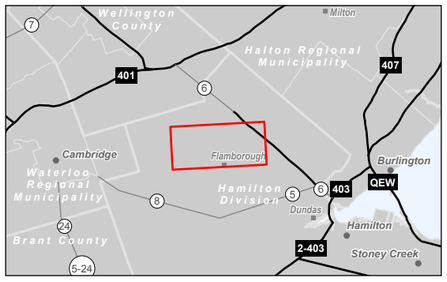
Michael Candido
Project Manager
Assessment and Permitting
Stantec Consulting
1-70 Southgate Drive
Guelph, ON N1G 4P5
519-780-8139
michael.candido@stantec.com

Attachment: Map of Preferred Route

c. Ryan Park, Enbridge Gas





Legend

- Preferred Route
- Existing Enbridge Station
- Existing Pipeline
- Highway
- Major Road
- Minor Road
- Hydro Line
- Watercourse
- Waterbody

0 0.5 1 km

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Notes

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Stantec

Project Location
City of Hamilton

160961229

Client/Project
ENBRIDGE GAS INC.
KIRKWALL TO HAMILTON PIPELINE PROJECT

Figure No.
1

Title
Preferred Route

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Stantec Consulting Ltd.
1-70 Southgate Drive, Guelph ON N1G 4P5

April 18, 2019
File: 160961299

«First_Name» «Last_Name», «Title»
«Representing»
«Address»
«Town», «Province» «Postal_Code»
«Email_»

Dear «First_Name» «Last_Name»,

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Additional project information is available at: uniongas.com/Kirkwall-Hamilton

Regards,

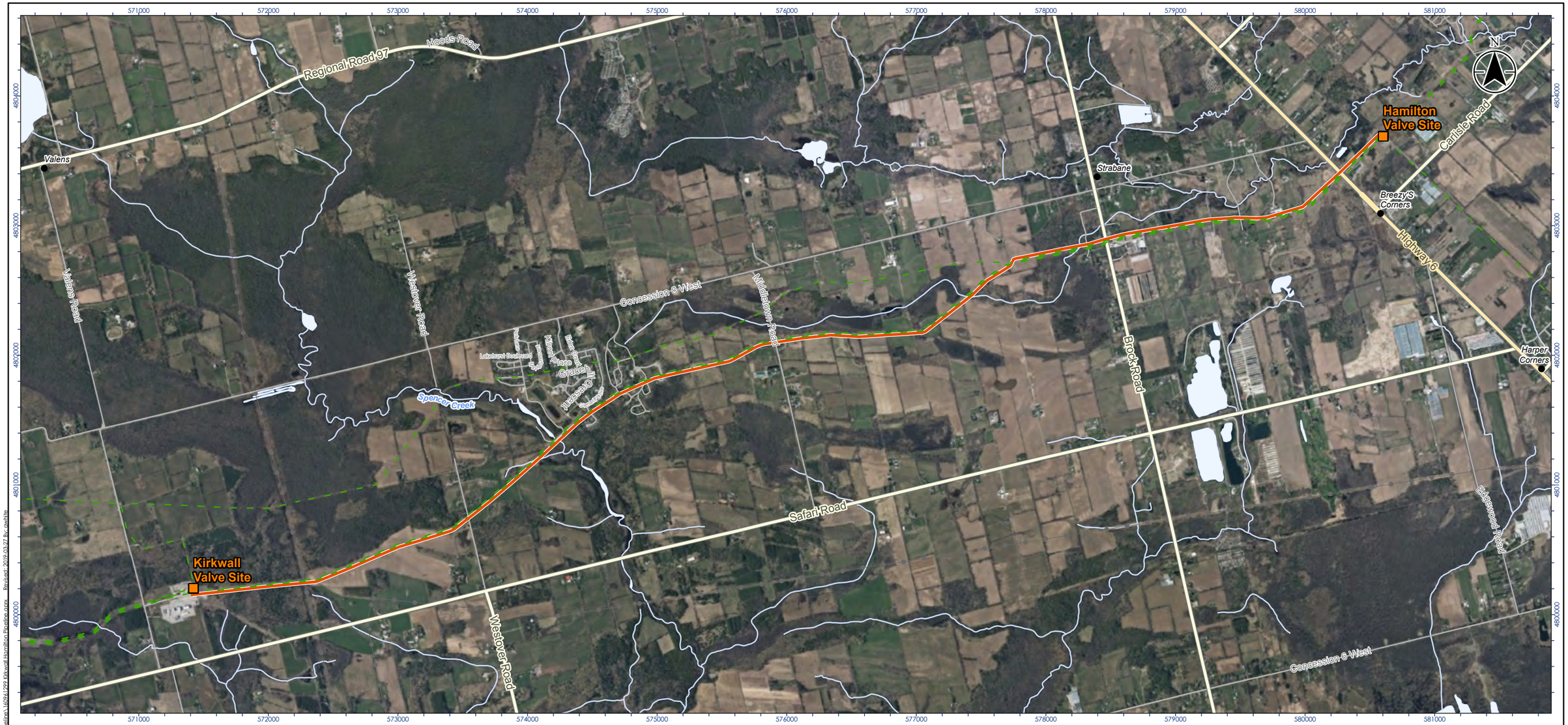
Stantec Consulting Ltd.

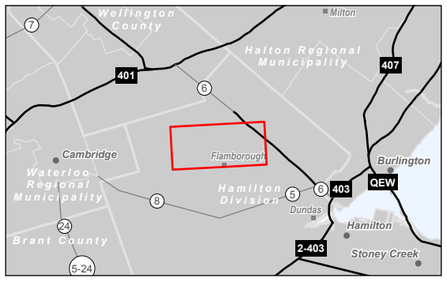


Michael Candido
Project Manager
Assessment and Permitting
Stantec Consulting
1-70 Southgate Drive
Guelph, ON N1G 4P5
519-780-8139
michael.candido@stantec.com

Attachment: Map of Preferred Route

c. Ryan Park, Enbridge Gas





Legend

- Preferred Route
- Existing Enbridge Station
- Existing Pipeline
- Highway
- Major Road
- Minor Road
- Hydro Line
- Watercourse
- Waterbody

0 0.5 1 km

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Notes

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Stantec

Project Location
City of Hamilton

160961229

Client/Project
ENBRIDGE GAS INC.
KIRKWALL TO HAMILTON PIPELINE PROJECT

Figure No.
1

Title
Preferred Route

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APPENDIX B4: DISPLAY BOARDS, NEWSLETTER AND EXIT QUESTIONNAIRE

Kirkwall-Hamilton Pipeline Project Information Session



Welcome

Please view the display boards, speak to members of Stantec Consulting Ltd. (Stantec) and/or Enbridge Gas Inc. (Enbridge Gas), and complete a questionnaire providing your feedback.

Sign up at the front desk to have your attendance recorded as part of the environmental study and to receive future project updates. (Note: As of Jan. 1, 2019, Union Gas and Enbridge Gas Distribution have amalgamated into one utility with the legal name Enbridge Gas Inc.)

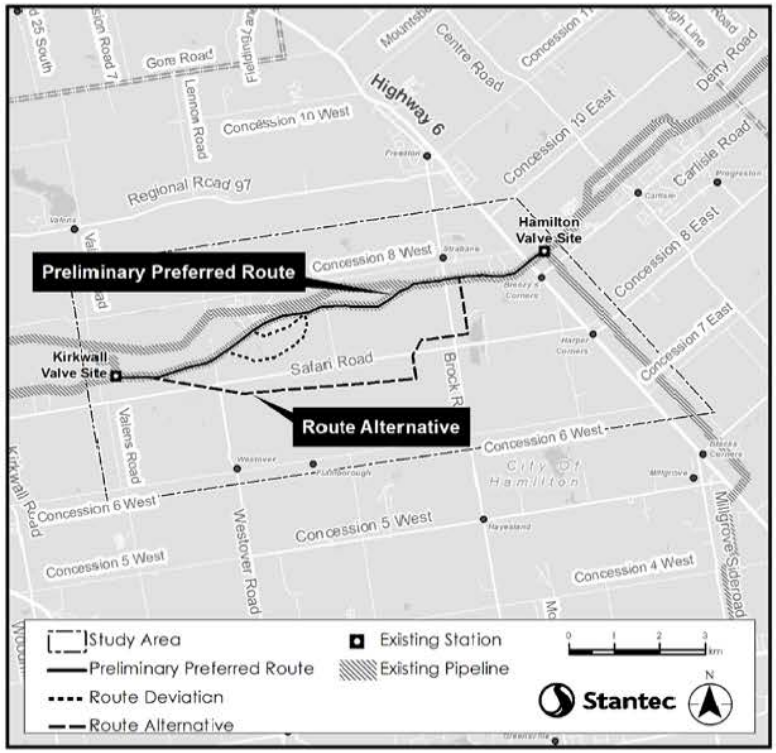
Our commitment

Enbridge Gas is committed to involving community members in this proposed project. We are dedicated to providing you with up-to-date information in an open, honest and respectful manner and will carefully consider your input.

Enbridge Gas provides safe and reliable delivery of natural gas to more than 3.5 million residential, commercial, and industrial customers across Ontario. Enbridge Gas is committed to environmental stewardship and conducts all of its operations in an environmentally responsible manner.

Kirkwall-Hamilton Pipeline Project
Information Session





Project overview

The proposed pipeline will be constructed between the existing Enbridge Gas Kirkwall valve site, located northeast of the intersection of Safari Road and Valens Road and the existing Enbridge Gas Hamilton valve site, located east of Highway 6 and north of Carlisle Road, generally paralleling three existing Enbridge Gas pipelines. The length of the proposed pipeline will be determined by the final route chosen after input from the community but will be approximately 10 – 14 km and will be 48 inches in diameter.

If approved by the Ontario Energy Board (OEB), construction of the proposed pipeline is planned to begin as early as spring/summer 2021 and be in service by the end of 2021.

Kirkwall-Hamilton Pipeline Project Information Session



Why is Enbridge Gas undertaking this project?

Enbridge Gas is undertaking the proposed project to increase existing capacity and accommodate additional demand for natural gas along its main natural gas transmission system, the Dawn Parkway System.

Kirkwall-Hamilton Pipeline Project Information Session



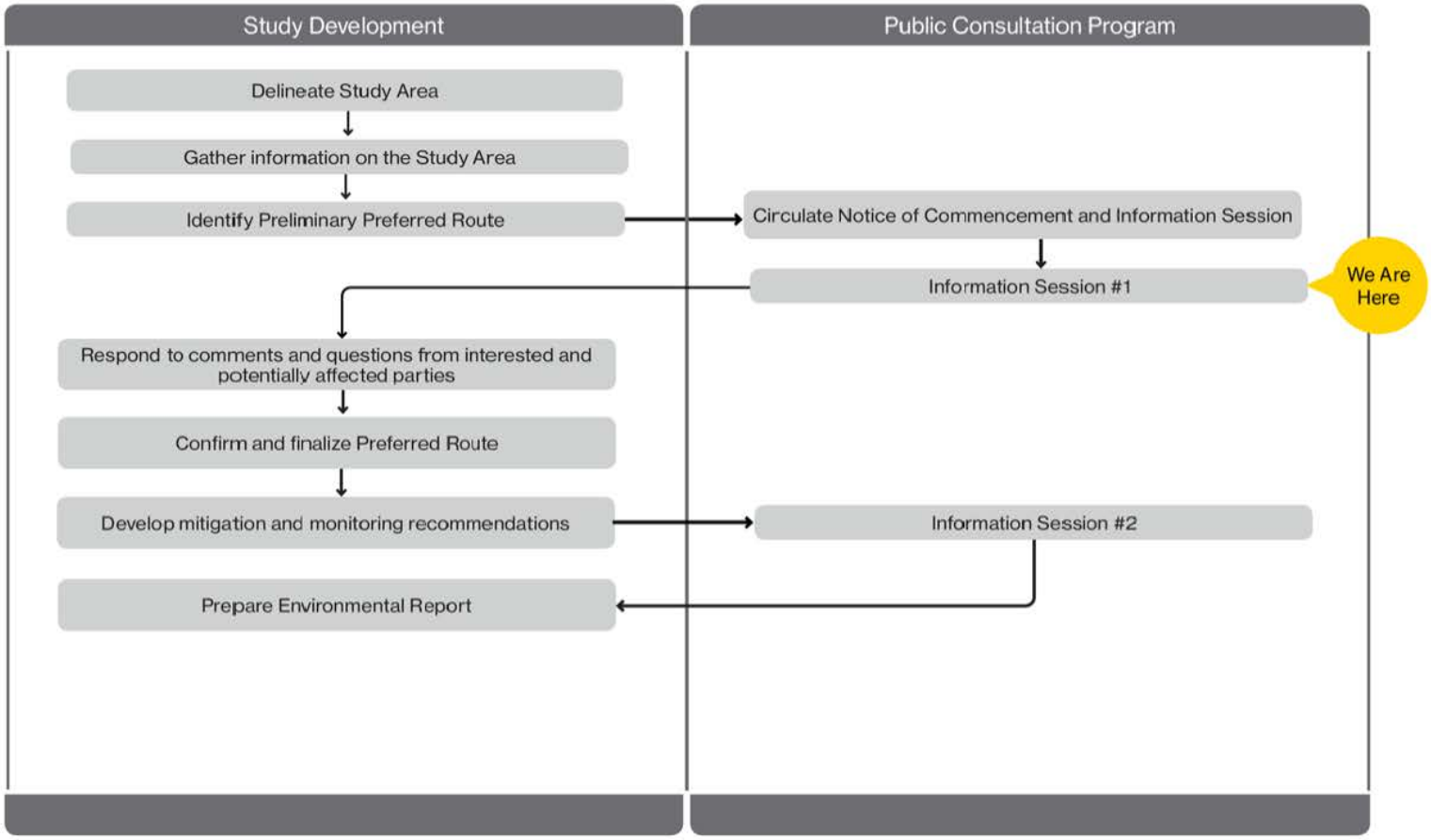
Environmental study process

The environmental study and subsequent Environmental Report for the project will be completed as per the Ontario Energy Board's (OEB) "Environmental Guidelines for the Location, Construction and Operation of Hydrocarbon Pipelines and Facilities in Ontario (2016)."

The study will:

- Undertake consultation to understand the views of interested and potentially affected parties.
- Consult with Indigenous Communities to understand interests and potential impacts.
- Be conducted during the earliest phase of the project.
- Identify potential impacts of the project.
- Develop environmental mitigation and protective measures to avoid or minimize potential impacts.
- Develop an appropriate environmental inspection, monitoring and follow-up program.

Kirkwall-Hamilton Pipeline Project
Information Session



Kirkwall-Hamilton Pipeline Project Information Session



Ontario Energy Board (OEB) review and approval process

The OEB is a body that regulates the natural gas industry in Ontario, in the public interest.

Enbridge Gas plans to submit an application for this project to the OEB. This application will include comprehensive information on the project including:

- The need for the project.
- Facility alternatives.
- Project costs and economics.
- Pipeline design and construction.
- Environmental mitigation measures.
- Land requirements.
- Consultation with Indigenous Communities.
- Consultation with various stakeholders including landowners and government agencies.

The OEB will then hold a public hearing to review the project.

If after this review the OEB determines that the project is in the public interest it will approve construction of the project.

Additional information about the OEB process can be found on the project newsletter and at:
www.ontarioenergyboard.ca

Submit Application → Public Hearing → Approval → Construction

Kirkwall-Hamilton Pipeline Project
Information Session

ENBRIDGE



Route evaluation methodology

The Preferred Route will be selected through a five-step process:

Step 1

Develop Routing Parameters

a. Establish a study area.
b. Establish routing objectives.
   i. Follow a reasonably direct path between start and end points.
   ii. Avoid sensitive environmental and socio-economic features.
   iii. Use existing linear features.
   iv. Follow existing lot and property lines.
c. Create an inventory of environmental and socio-economic features.

Step 2

Identify Alternative Routes in the Study Area

Identify reasonable and feasible routes within the study area in consideration of the routing objectives and environmental and socio-economic opportunities and constraints.

Step 3

Route Evaluation

An evaluation of the Alternative Routes will be conducted based on:

a. A quantitative comparative evaluation of impacts to environmental and socio-economic features.
b. A qualitative comparative evaluation.

Once complete, a Preliminary Preferred Route will be determined.

Step 4

Input on the Preliminary Preferred Route

Gather input on the Preliminary Preferred Route.

We Are Here

Step 5

Confirmation of the Preferred Route

A Preferred Route will be confirmed following consultation with landowners and other affected parties. The location of the Preferred Route may be refined as the project moves forward based on pre-construction field investigations, landowner requests and/or engineering and construction considerations.

Stantec

Kirkwall-Hamilton Pipeline Project
Information Session



Route evaluation methodology

In the study area, a variety of pipeline routing constraints are present: natural heritage features, slope, topography, and socio-economic features and landscapes. After creating a Geographic Information System (GIS) database of opportunities and constraints, a GIS routing exercise was undertaken that examined all mapped routing constraints and opportunities to generate alternative routes. A field reconnaissance was undertaken in 2016 to review whether any of the existing Enbridge Gas pipeline easements could be paralleled.

As a result, two alternative routes were identified (Route A and Route B). The routes follow existing linear infrastructure where available and avoid, to the extent possible, existing environmental and socio-economic features.

Kirkwall-Hamilton Pipeline Project
Information Session



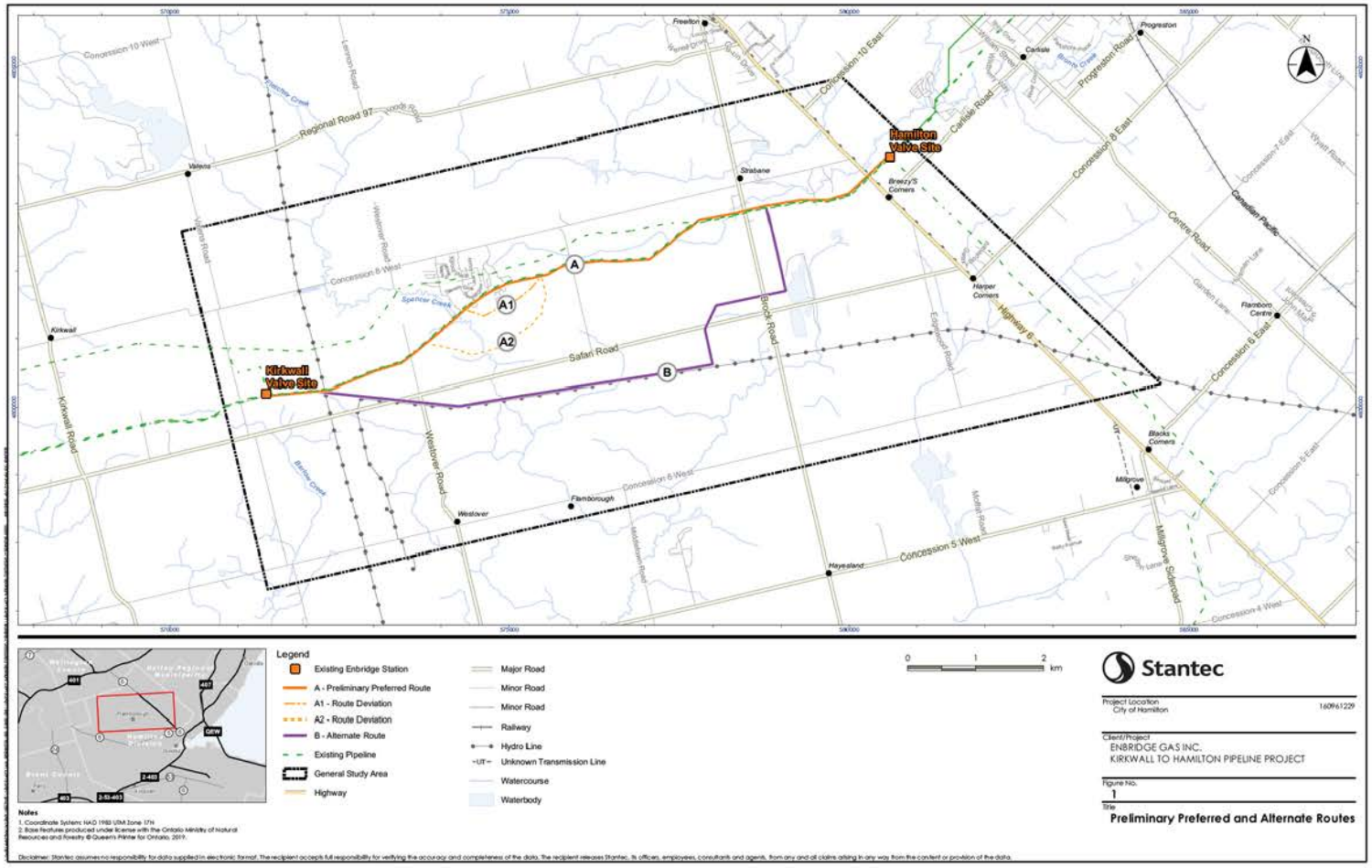
Preliminary preferred route

A quantitative comparative evaluation identified that Routes A and B were both environmentally acceptable, however Route A was preferred for operational efficiencies due to the ability to locate the proposed pipeline parallel and overlapping an existing Enbridge Gas pipeline easement.

For Route A, an existing Enbridge Gas pipeline easement travels through the communities of Antrim Glen and the Ponderosa Nature Resort. To minimize impacts to these communities two route deviations have been identified (Route A1 and Route A2) which will be further evaluated based on landowner input, field investigations, and engineering and construction considerations.

Kirkwall-Hamilton Pipeline Project
Information Session

Preliminary preferred route



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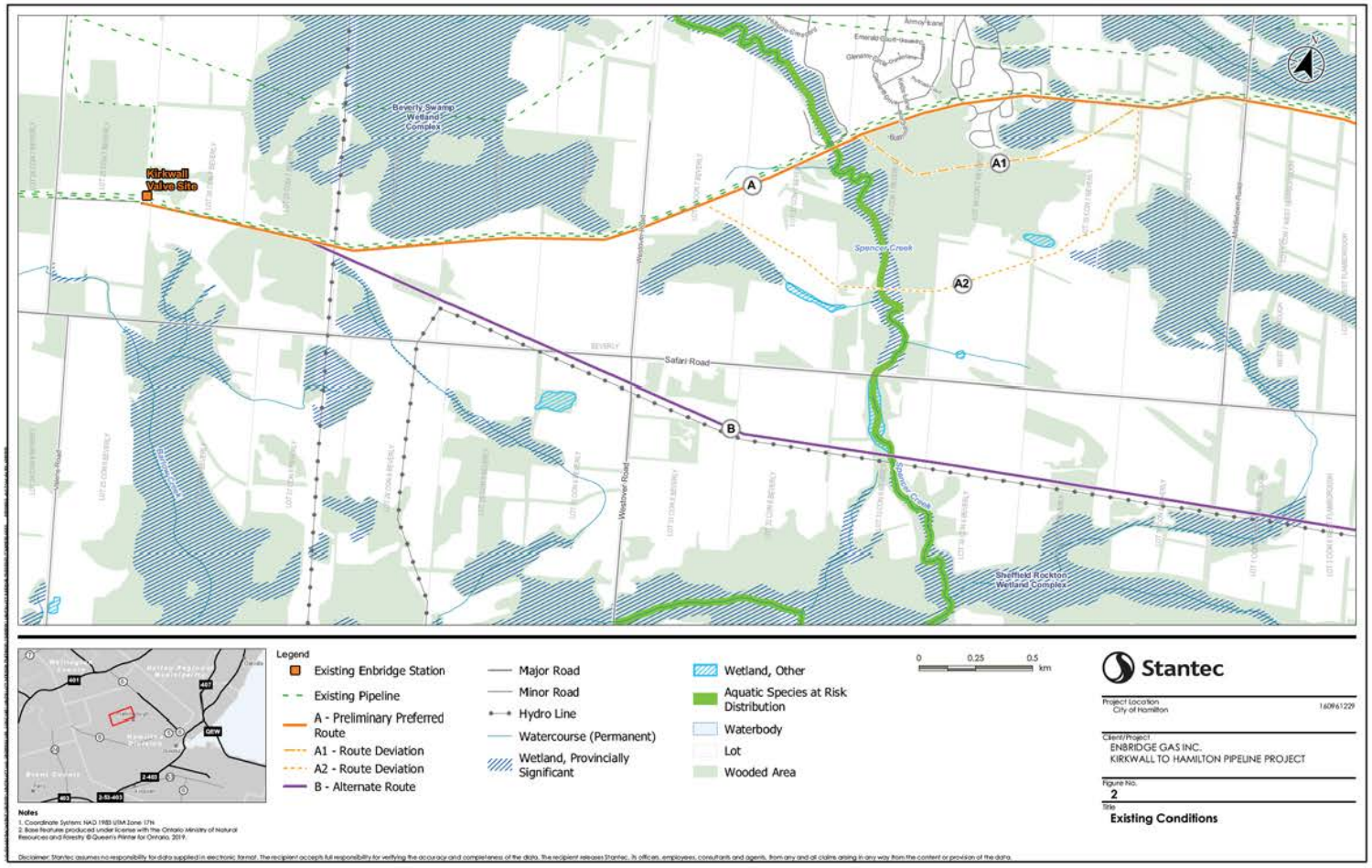
Kirkwall-Hamilton Pipeline Project
Information Session

Existing features



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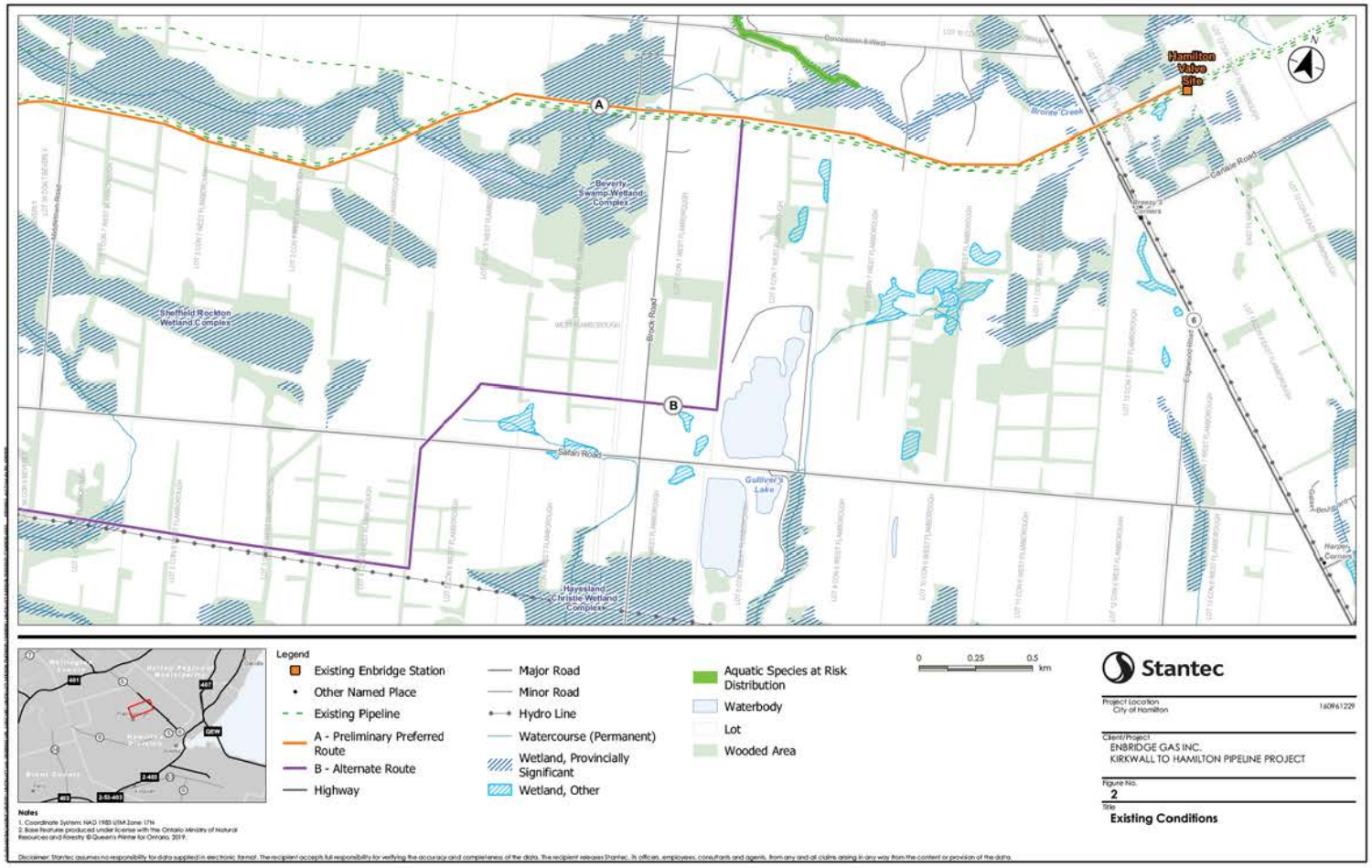
Information Session

Existing features



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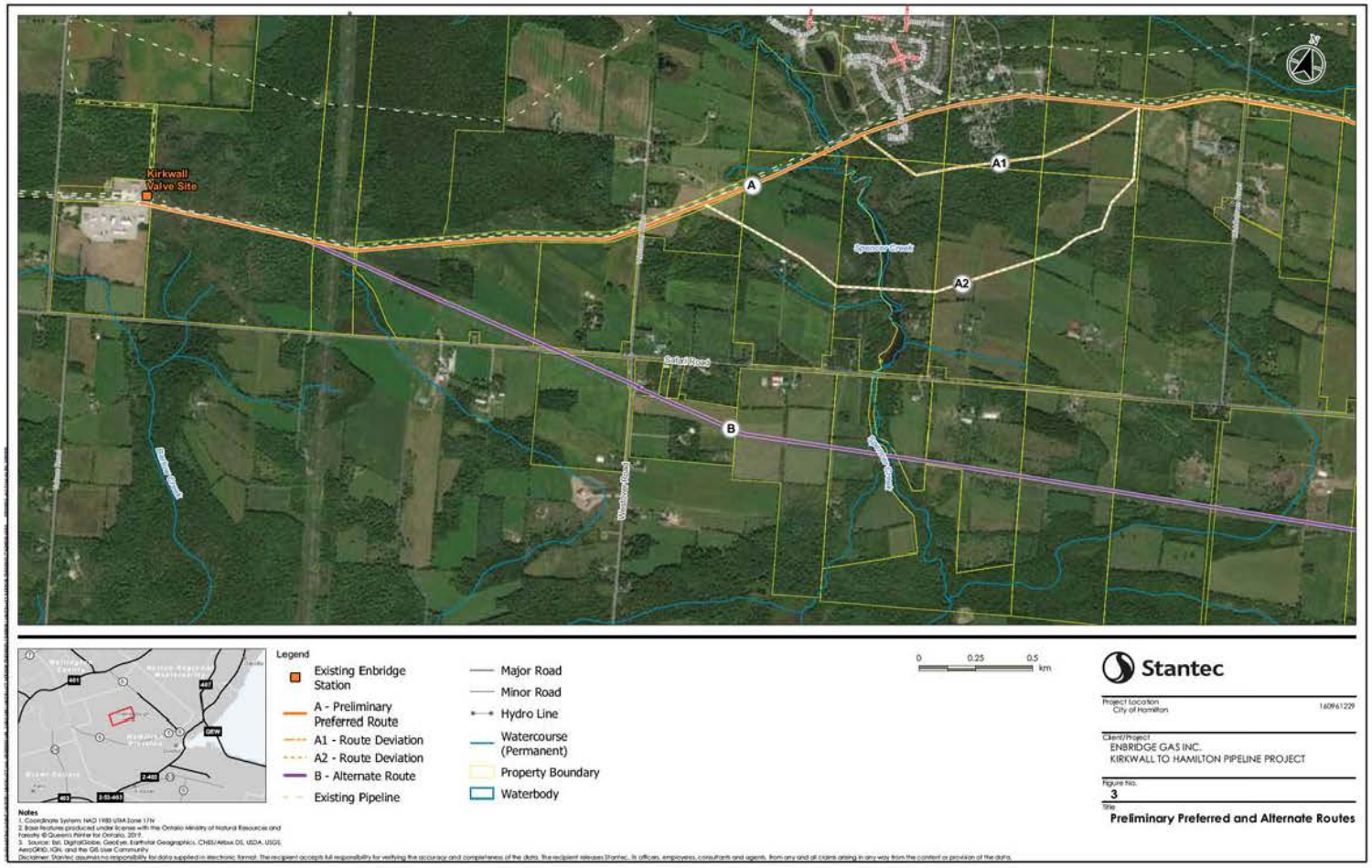
Kirkwall-Hamilton Pipeline Project
Information Session

Preliminary preferred route



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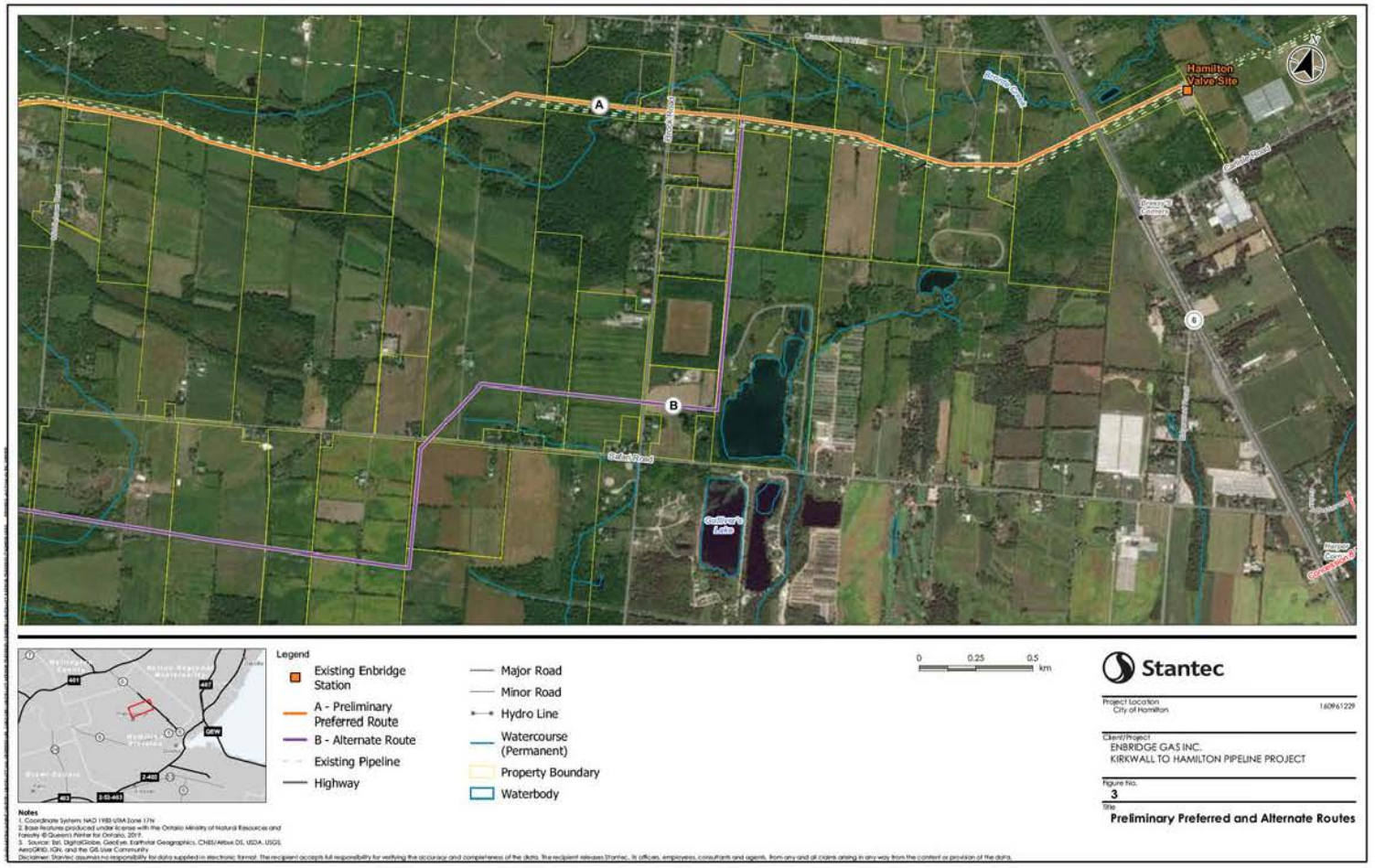
Kirkwall-Hamilton Pipeline Project
Information Session

Preliminary preferred route



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Kirkwall-Hamilton Pipeline Project
Information Session



Access and land requirements

Once a preferred route is selected, an Enbridge Gas Land Agent will begin discussions with landowners for the appropriate land rights necessary to construct the pipeline. Enbridge Gas is committed to working with all directly affected landowners in anticipation of acquiring early access agreements in order to gather essential information, including but not limited to, land survey data, environmental, archaeological and property site features, along with negotiating the necessary land rights. These land rights will consist of permanent easements and/or temporary land rights. The temporary land rights are only required during project construction activities.

Enbridge Gas will ensure that a Land Agent is available to each landowner during all pipeline construction activities. The Land Agent will keep all landowners informed of the progress of the project and assist with any concerns that may arise as a result of the construction activities.

Kirkwall-Hamilton Pipeline Project Information Session



Agricultural soils

Enbridge Gas has established and tested measures to preserve the integrity of agricultural soils throughout the construction phase:

- A third-party soils specialist will determine topsoil depth prior to stripping and supervise activities so the proper depth of topsoil is removed and replaced.
- Topsoil will be stripped from the right-of-way and other work areas and stockpiled along the right-of-way. A separation will be maintained between topsoil and subsoil.
- Enbridge Gas will implement a wet soil shutdown protocol on agricultural lands to minimize soil structure damage.
- The subsoil on the stripped portion of the right-of-way will be chisel ploughed or sub-soiled during cleanup activities to alleviate compaction.
- Any agricultural drainage systems impacted by construction will be repaired.
- Enbridge Gas will develop and implement a sampling program on agricultural easements along the pipeline route for potential pests and/or diseases that are known to the area, where appropriate.
- The entire outside boundaries of the work space necessary for construction of the project will be staked at regular intervals.
- A post-construction cover crop program will be available to landowners.

Kirkwall-Hamilton Pipeline Project
Information Session



Maintaining agricultural drainage systems

- Landowners will be contacted prior to construction to confirm the location and type of existing drains. Any future drainage plans will also be discussed with the landowner.
- Field tile will be temporarily re-routed during pre-construction activities where required to ensure proper drainage during construction.
- Damaged and severed drains will be repaired following construction. After repair and prior to backfilling, landowners will be invited to inspect and approve the repair. Any on-going field tile issues resulting from pipeline construction will be addressed by Enbridge Gas as required.

Kirkwall-Hamilton Pipeline Project Information Session



Socio-economic features

The project will be constructed through private business areas, agricultural and residential land, along with land owned by Hydro One and Hamilton Region Conservation Authority. Land use designations consist of a variety of uses, including agricultural, rural residential and commercial.

Potential effects

- Temporary increases in noise, dust and air emissions.
- Increased construction traffic volumes.
- Temporary impairment of the use and enjoyment of property.
- Vegetation clearing along the pipeline easement.

Example mitigation measures

- Provide access across the construction area.
- Restrict construction to daylight hours, and adhere to applicable noise by-laws.
- Develop and implement a Traffic Control Plan.
- Place fencing at appropriate locations for safety.
- Implement a water well monitoring program.
- Making contact information for a designated Enbridge Gas representative available prior to and throughout construction.
- Dust control measures.
- Re-vegetation of cleared areas (seeding/planting).

Kirkwall-Hamilton Pipeline Project Information Session



Aquatic resources

Enbridge Gas understands the importance of protecting wildlife during construction and therefore will implement recognized mitigation measures to minimize possible environmental effects.

Potential effects

- Disruption and alteration to aquatic species and habitat and/or nuisance effects.
- Increased erosion, sedimentation, and turbidity resulting from removal of vegetation.

Example mitigation measures

- Conduct surveys of waterbodies.
- Obtain all agency permits and approvals.
- Limit in-channel construction, where possible, and conform to fish timing window guidelines.
- For in-channel construction, protect aquatic species and manage sedimentation and turbidity.
- Restore and seed areas to establish habitat and reduce erosion.
- Replant riparian vegetation.

Kirkwall-Hamilton Pipeline Project
Information Session



Cultural heritage resources

During the course of construction, cultural heritage features such as archaeological finds, buildings, fences and landscapes may be encountered. Detailed field surveys will be conducted by independent, third-party archaeologists and cultural heritage professionals.

Potential effects

- Damage or destruction of archaeological, paleontological or historical resources.

Example mitigation measures

- Archaeological assessment of the construction right-of-way, with review and comment from the Ministry of Tourism, Culture and Sport (MTCS).
- Cultural heritage assessment (for built heritage features and cultural heritage landscapes) of the construction right-of-way, with review and comment from MTCS.
- Reporting of any previously unknown archaeological, paleontological or historical resources uncovered, or suspected of being uncovered, during excavation.

Kirkwall-Hamilton Pipeline Project Information Session



Terrestrial resources

During the course of construction, natural heritage features such as wildlife habitat and vegetated/wooded areas will need to be crossed.

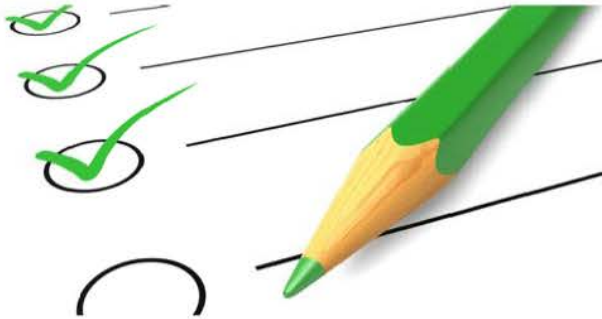
Potential effects

- Damage or removal of vegetation and wildlife habitat adjacent to the construction area.
- Disturbance and/or mortality to local wildlife.

Example mitigation measures

- Conduct surveys (including Species at Risk surveys) in advance of construction to determine opportunities for wildlife habitat to exist.
- Clearly mark the construction area to avoid accidental damage.
- Restore and seed areas to establish habitat and reduce erosion.
- Secure any necessary permits, and follow any conditions of approval.

Kirkwall-Hamilton Pipeline Project Information Session

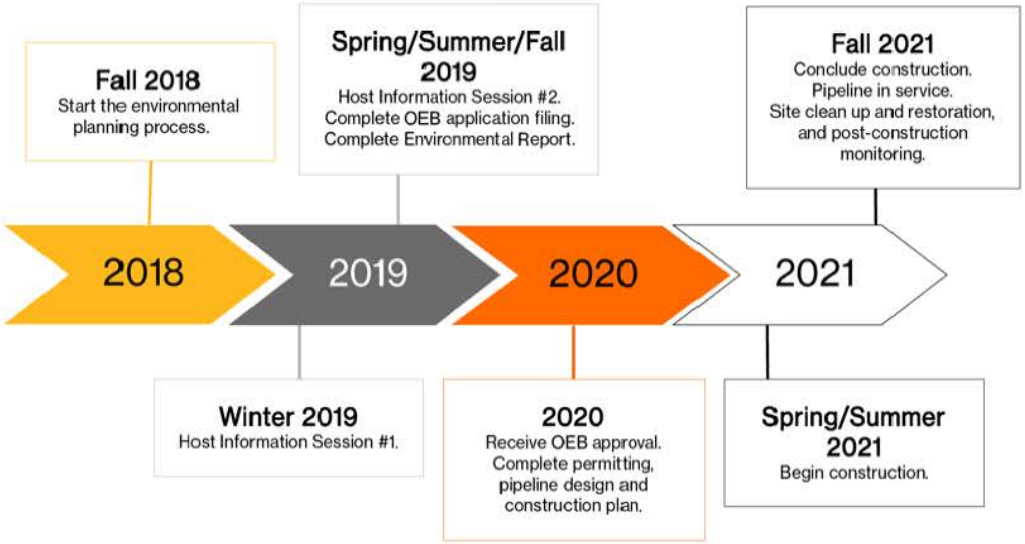


Next steps

Serving hundreds of communities in Ontario, we consider ourselves strong community partners who believe in and are committed to public consultation.

During the planning stages for this Project we have consulted and will continue to consult with local landowners, Indigenous Communities, government agencies and other interested parties that could be impacted by the Project.

After this Information Session, we intend to pursue the following schedule of activities:



Kirkwall-Hamilton Pipeline Project
Information Session

Thank you!

On behalf of the Project Team, thank you for attending this Information Session. We appreciate your involvement in the consultation process, and we would like to hear from you.

Please fill out the exit questionnaire. If you have any further comments or questions, please contact:

Michael Candido, Project Manager
Stantec Consulting Ltd.
Phone: 519-780-8139
Email: michael.candido@stantec.com

Enbridge Gas
Phone: 1-855-381-9138
Email: Projects@uniongas.com

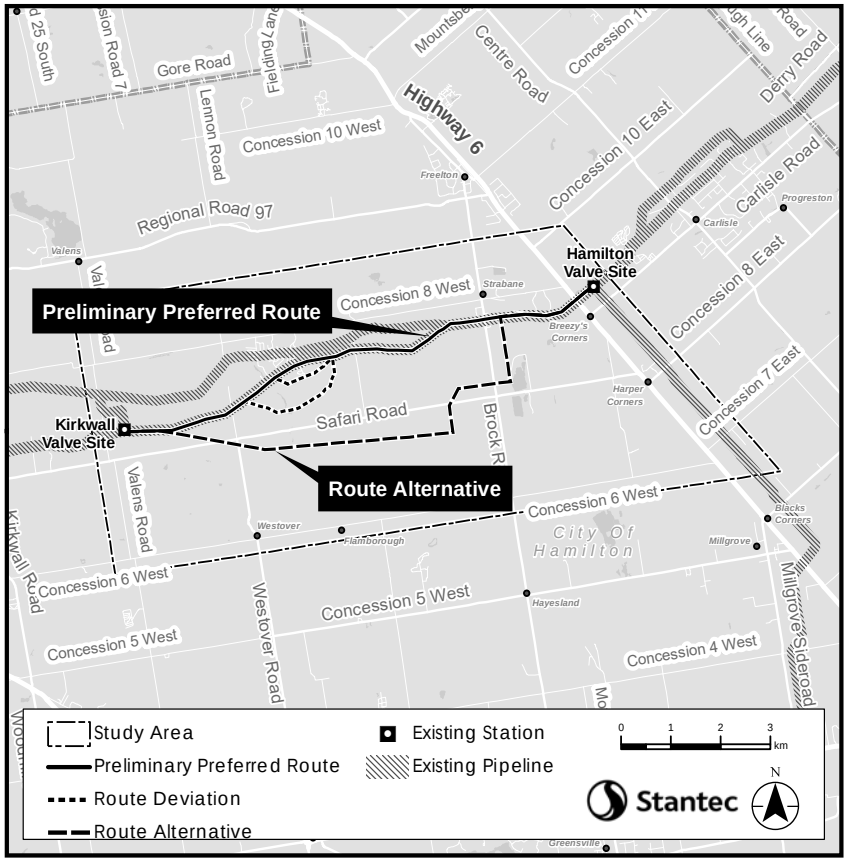
Or visit our project webpage: uniongas.com/Kirkwall-Hamilton

FEBRUARY 2019

Enbridge Gas Inc.
Kirkwall - Hamilton Pipeline Project:
Information Newsletter

Project Overview

The proposed project will be constructed between Enbridge Gas' existing Kirkwall valve site, located northeast of the intersection of Safari Road and Valens Road and Enbridge Gas' existing Hamilton valve site, located east of Highway 6 and north of Carlisle Road, generally paralleling three existing Enbridge Gas pipelines. The length of the proposed pipeline will be determined by the final route chosen after input from the community but will be approximately 10 – 14 km and will be 48 inches in diameter. If approved, construction of the pipeline could begin as early as spring/ summer 2021 and be complete by the end of 2021.



Why is Enbridge Gas undertaking this Project?

Enbridge Gas is undertaking the proposed project to increase existing capacity and accommodate additional demand for natural gas along its main natural gas transmission system, the Dawn Parkway System.

Note: As of Jan. 1, 2019, Union Gas and Enbridge Gas Distribution have amalgamated into one utility with the legal name Enbridge Gas Inc.

Ontario Energy Board Review and Approval Process

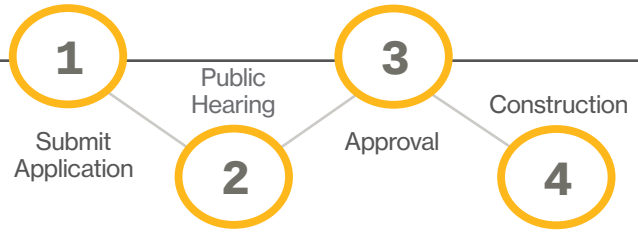
The Ontario Energy Board (OEB) is the body that regulates the natural gas industry in Ontario, in the public's interest. The OEB's approval is required before this pipeline can be constructed.

Enbridge Gas plans to submit an application for this project to the OEB, whose review and approval is needed before this project can proceed. This application will include comprehensive information on the project including: the need for the project, facility alternatives, project costs and economics, pipeline design and construction, environmental mitigation measures, land requirements, and consultation with Indigenous Communities.

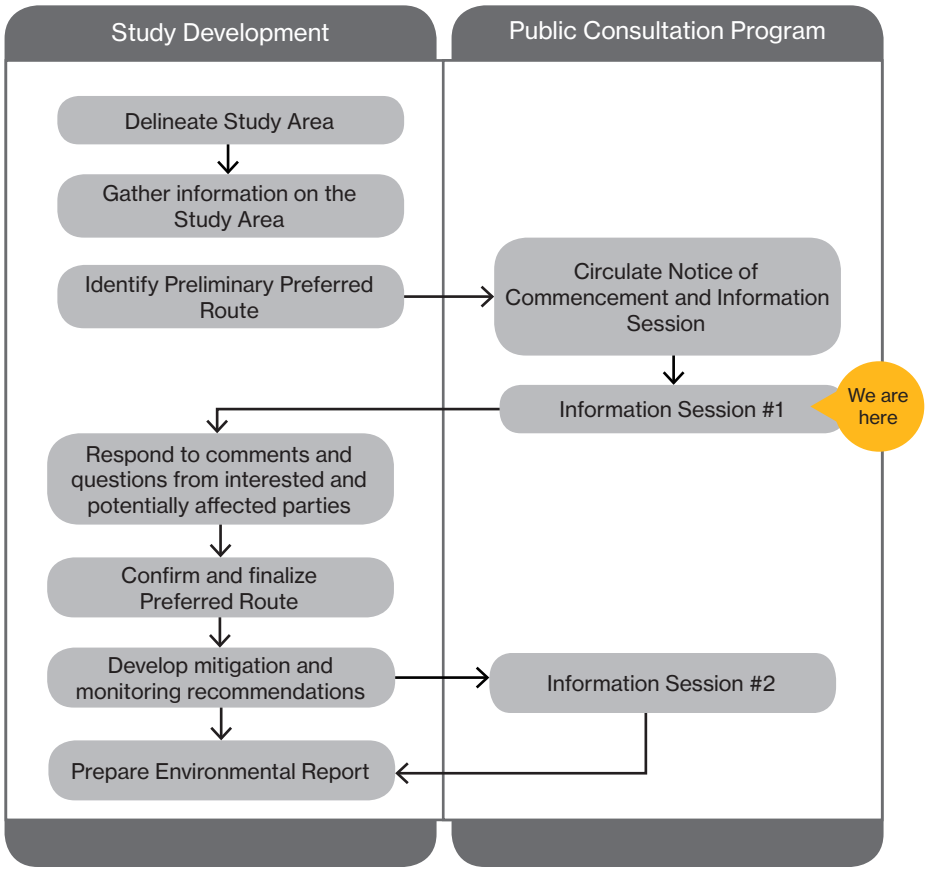
The OEB will then hold a public hearing to review the project. This will include notices in local newspapers, letters to directly affected landowners, the opportunity for the general public and landowners to submit questions regarding the project, a formal hearing, and a written decision regarding the project.

If after this review the OEB determines that the project is in the public's interest it will approve construction of the project. The OEB normally attaches conditions to the approval which Enbridge Gas will comply with during the construction and restoration process.

Additional information about the OEB process and information about how to participate in the OEB hearing process can be found at: www.ontarioenergyboard.ca



Environmental Study Process



Thank You!

On behalf of the Project Team, thank you for your interest in this project. We appreciate your involvement.

If you have any comments or questions please contact:

Michael Candido
Project Manager
Stantec Consulting Ltd.
Phone: (519) 780-8139
Email: michael.candido@stantec.com

Or visit our project webpage: uniongas.com/Kirkwall-Hamilton



Kirkwall-Hamilton Pipeline Project
Information Session Questionnaire – February 27, 2019

Please read the newsletter and look over the displays, and then take a few moments to answer the following questions. Your comments are appreciated. If you require any assistance or clarification while completing the questionnaire please speak with a Stantec or Enbridge Gas representative.

Completed questionnaires can be dropped off at the front table. If you would like additional time to consider your comments, pre-paid envelopes are available at the front table. We request your comments by **March 15, 2019**.

1. **What is your interest in this project?**

   ☐ Directly affected landowner
   ☐ Surrounding landowner
   ☐ Interested citizen
   ☐ Member of interest group
   ☐ Government official
   ☐ Other: _____

2. **Please indicate if the project will have any impacts to you, your property or your business that you would like addressed** (i.e., access, noise, dust, traffic, etc.).

3. **Please identify any features along the Preliminary Preferred Route that you feel are important to consider during the environmental study.**

4. **Do you have any questions or comments about this project that you would like to bring to our attention?**

5. **Did the content provided at this Information Session meet your needs?**

6. **How did you hear about this Information Session? Check all that apply:**

- ☐ Newspaper Advertisement
- ☐ Project Notification Letter
- ☐ Social Media Post(s)
- ☐ Word of Mouth

Thank you for completing this questionnaire. If you have a question about the project that has not been addressed or for which you would like more information, please provide us with your full contact information so that we can respond to you.

Please Print Clearly

Name: _____

Address: _____

Email: _____

Phone: (_____)_____

Information will be collected and used in accordance with the Freedom of Information and Protection of Privacy Act. This information will be used to assist Enbridge Gas in meeting applicable approval requirements. This material will be maintained on file for use during the study and may be included in project documentation. Unless indicated otherwise, personal information and all comments will become part of the public record and may be publicly released as part of project documentation.

Kirkwall-Hamilton Pipeline Project Information Session



Welcome

Please view the display boards, speak to members of Stantec Consulting Ltd. (Stantec) and/or Enbridge Gas Inc. (Enbridge Gas), and complete a questionnaire providing your feedback.

Sign up at the front desk to have your attendance recorded as part of the environmental study and to receive future project updates. (Note: As of Jan. 1, 2019, Union Gas and Enbridge Gas Distribution have amalgamated into one utility with the legal name Enbridge Gas Inc.)

Our commitment

Enbridge Gas is committed to involving community members in this proposed project. We are dedicated to providing you with up-to-date information in an open, honest and respectful manner and will carefully consider your input.

Enbridge Gas provides safe and reliable delivery of natural gas to more than 3.7 million residential, commercial, and industrial customers across Ontario. Enbridge Gas is committed to environmental stewardship and conducts all of its operations in an environmentally responsible manner.

Kirkwall-Hamilton Pipeline Project Information Session





Project overview

The proposed pipeline will be constructed between Enbridge Gas' existing Kirkwall valve site, located northeast of the intersection of Safari Road and Valens Road and Enbridge Gas' existing Hamilton valve site, located east of Highway 6 and north of Carlisle Road. The proposed pipeline will parallel three existing Enbridge Gas pipelines, will be 10 km in length and 48 inches in diameter.

If approved, construction of the pipeline could begin as early as spring/summer 2021 and be complete by the end of 2021.

Stantec

Kirkwall-Hamilton Pipeline Project Information Session



Why is Enbridge Gas undertaking this project?

Enbridge Gas is undertaking the proposed project to increase existing capacity and accommodate additional demand for natural gas along its main natural gas transmission system, the Dawn Parkway System.

Kirkwall-Hamilton Pipeline Project Information Session



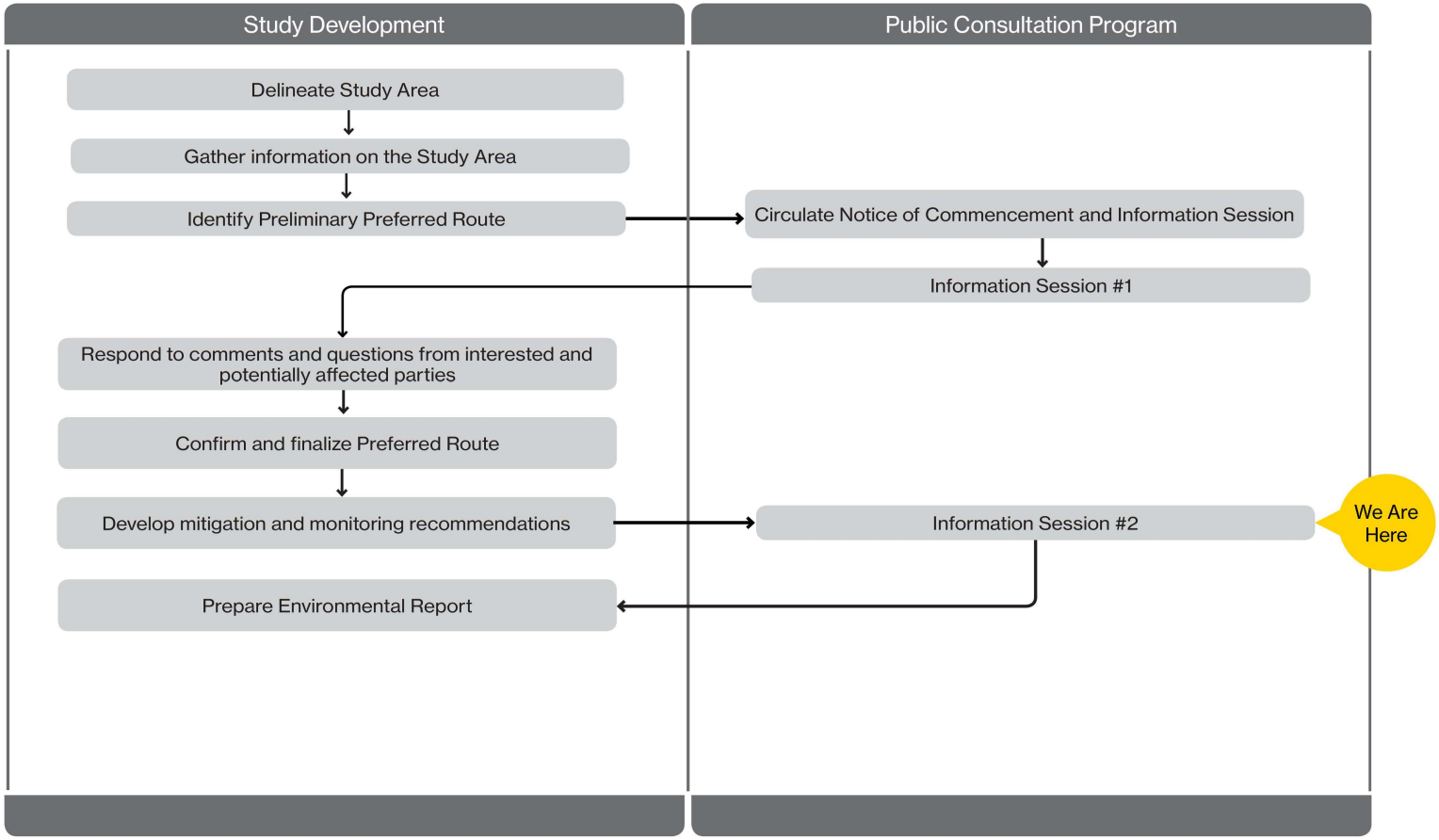
Environmental study process

The environmental study and subsequent Environmental Report for the project will be completed as per the Ontario Energy Board's (OEB) "Environmental Guidelines for the Location, Construction and Operation of Hydrocarbon Pipelines and Facilities in Ontario (2016)."

The study will:

- Undertake consultation to understand the views of interested and potentially affected parties.
- Consult with Indigenous Communities to understand interests and potential impacts.
- Be conducted during the earliest phase of the project.
- Identify potential impacts of the project.
- Develop environmental mitigation and protective measures to avoid or minimize potential impacts.
- Develop an appropriate environmental inspection, monitoring and follow-up program.

Kirkwall-Hamilton Pipeline Project
Information Session



Kirkwall-Hamilton Pipeline Project Information Session



Ontario Energy Board (OEB) review and approval process

The OEB is a body that regulates the natural gas industry in Ontario, in the public interest.

Enbridge Gas plans to submit an application for this project to the OEB. This application will include comprehensive information on the project including:

- The need for the project.
- Facility alternatives.
- Project costs and economics.
- Pipeline design and construction.
- Environmental mitigation measures.
- Land requirements.
- Consultation with Indigenous Communities.
- Consultation with various stakeholders including landowners and government agencies.

The OEB will then hold a public hearing to review the project.

If after this review the OEB determines that the project is in the public interest it will approve construction of the project.

Additional information about the OEB process can be found on the project newsletter and at:
www.ontarioenergyboard.ca

Submit Application → Public Hearing → Approval → Construction

Kirkwall-Hamilton Pipeline Project
Information Session

ENBRIDGE



Route evaluation methodology

The Preferred Route will be selected through a five-step process:

Step 1

Develop Routing Parameters

a. Establish a study area.
b. Establish routing objectives.
   i. Follow a reasonably direct path between start and end points.
   ii. Avoid sensitive environmental and socio-economic features.
   iii. Use existing linear features.
   iv. Follow existing lot and property lines.
c. Create an inventory of environmental and socio-economic features.

Step 2

Identify Alternative Routes in the Study Area

Identify reasonable and feasible routes within the study area in consideration of the routing objectives and environmental and socio-economic opportunities and constraints.

Step 3

Route Evaluation

An evaluation of the Alternative Routes will be conducted based on:

a. A quantitative comparative evaluation of impacts to environmental and socio-economic features.
b. A qualitative comparative evaluation.

Once complete, a Preliminary Preferred Route will be determined.

Step 4

Input on the Preliminary Preferred Route

Gather input on the Preliminary Preferred Route.

Step 5

Confirmation of the Preferred Route

A Preferred Route will be confirmed following consultation with landowners and other affected parties. The location of the Preferred Route may be refined as the project moves forward based on pre-construction field investigations, landowner requests and/or engineering and construction considerations.

We Are Here

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Kirkwall-Hamilton Pipeline Project
Information Session



Route evaluation methodology

In the study area, a variety of pipeline routing constraints are present: natural heritage features, slope, topography, and socio-economic features and landscapes. After creating a Geographic Information System (GIS) database of opportunities and constraints, a GIS routing exercise was undertaken that examined all mapped routing constraints and opportunities to generate alternative routes. A field reconnaissance was undertaken to review whether any of the existing Enbridge Gas pipeline easements could be paralleled, and to identify potential route alternatives.

Routing follows existing linear infrastructure where available and avoids, to the extent possible, existing environmental and socio-economic features.

Kirkwall-Hamilton Pipeline Project
Information Session



Preferred route

The first Information Session presented a Preliminary Preferred Route that included two route deviations and an Alternate Route. Further quantitative and qualitative evaluation resulted in the selection of a Preferred Route.

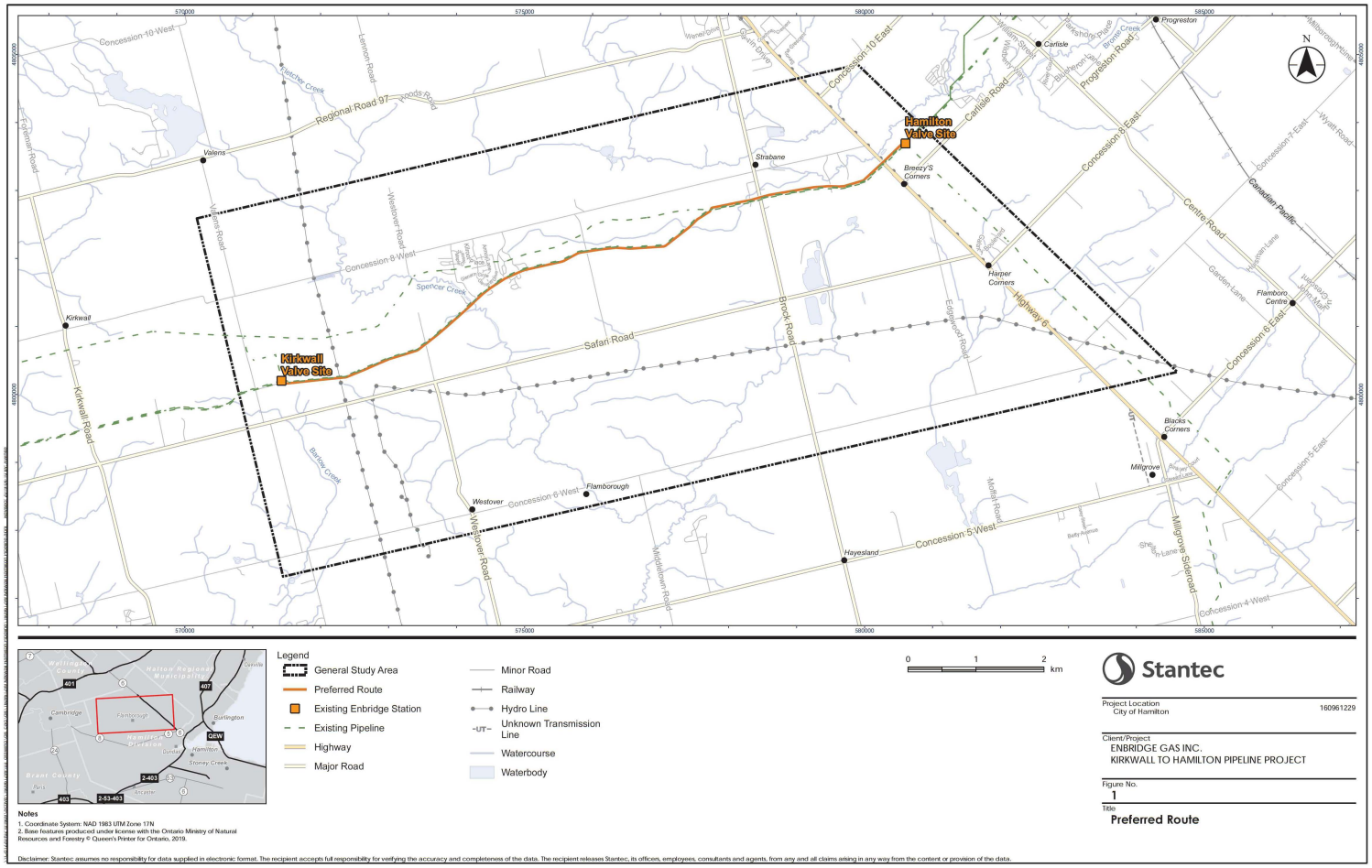
The Preferred Route was selected based on:

- Operational efficiencies due to the ability to locate the proposed pipeline parallel and overlapping an existing Enbridge Gas pipeline easement.
- A review of comments received to date from interested and potentially affected parties.
- The experience of the Project Team in routing linear infrastructure.

Enbridge Gas will undertake detailed design to determine the exact location of the pipeline, permanent easement and temporary land use requirements. Detailed design will be influenced by supplemental studies (including environmental studies) and site-specific requests from landowners and agencies.

Kirkwall-Hamilton Pipeline Project
Information Session

Preferred route



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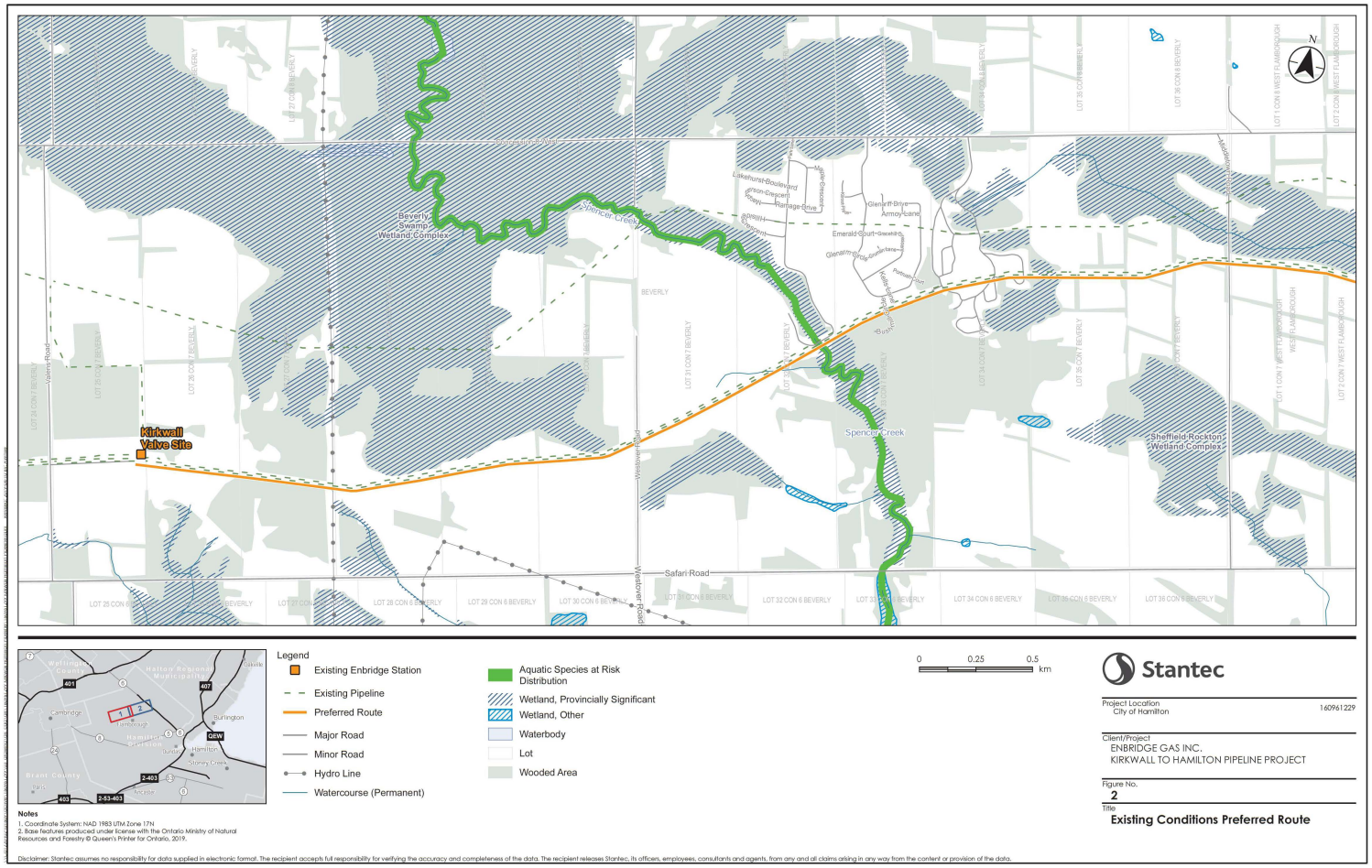
Kirkwall-Hamilton Pipeline Project
Information Session

Existing features



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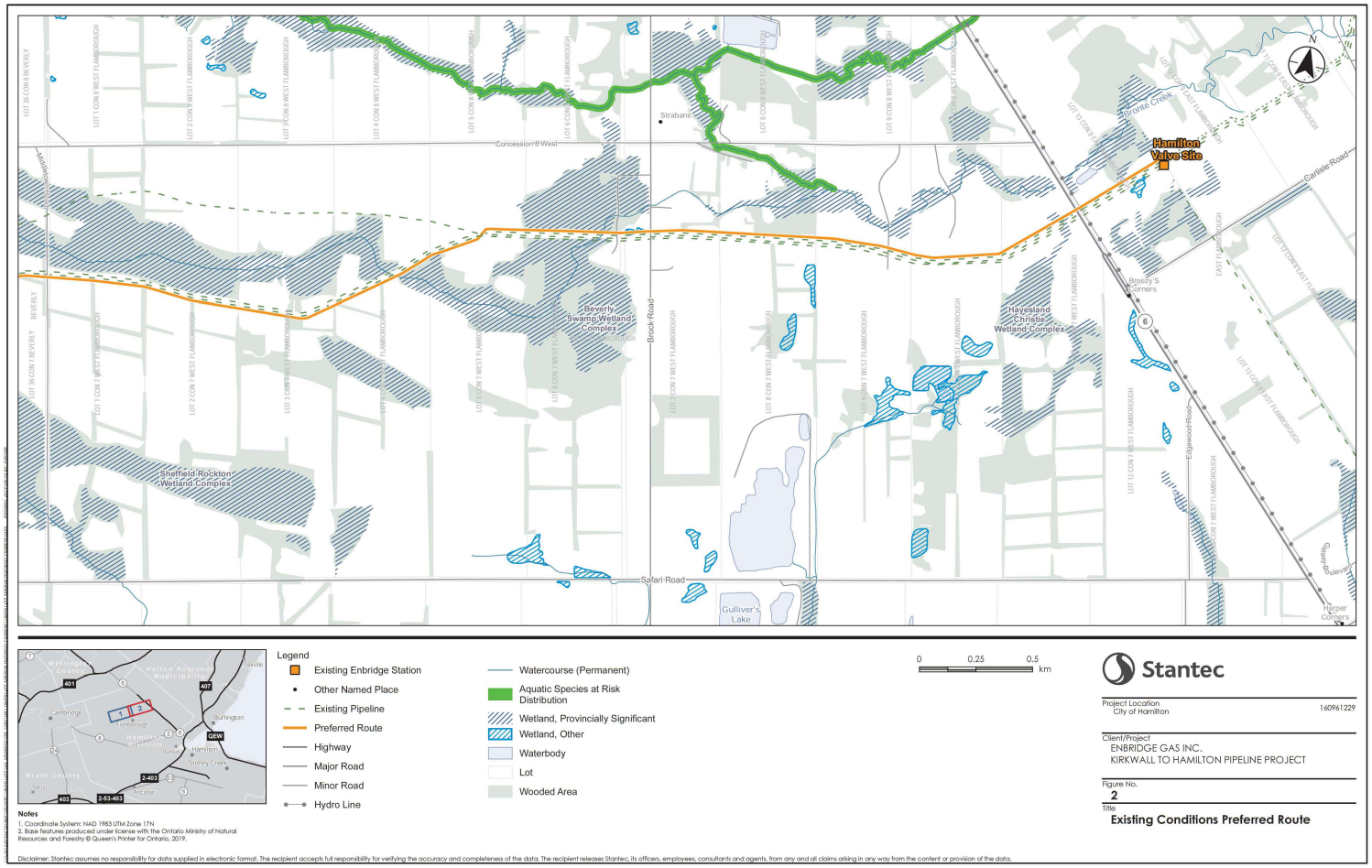
Kirkwall-Hamilton Pipeline Project
Information Session

Existing features



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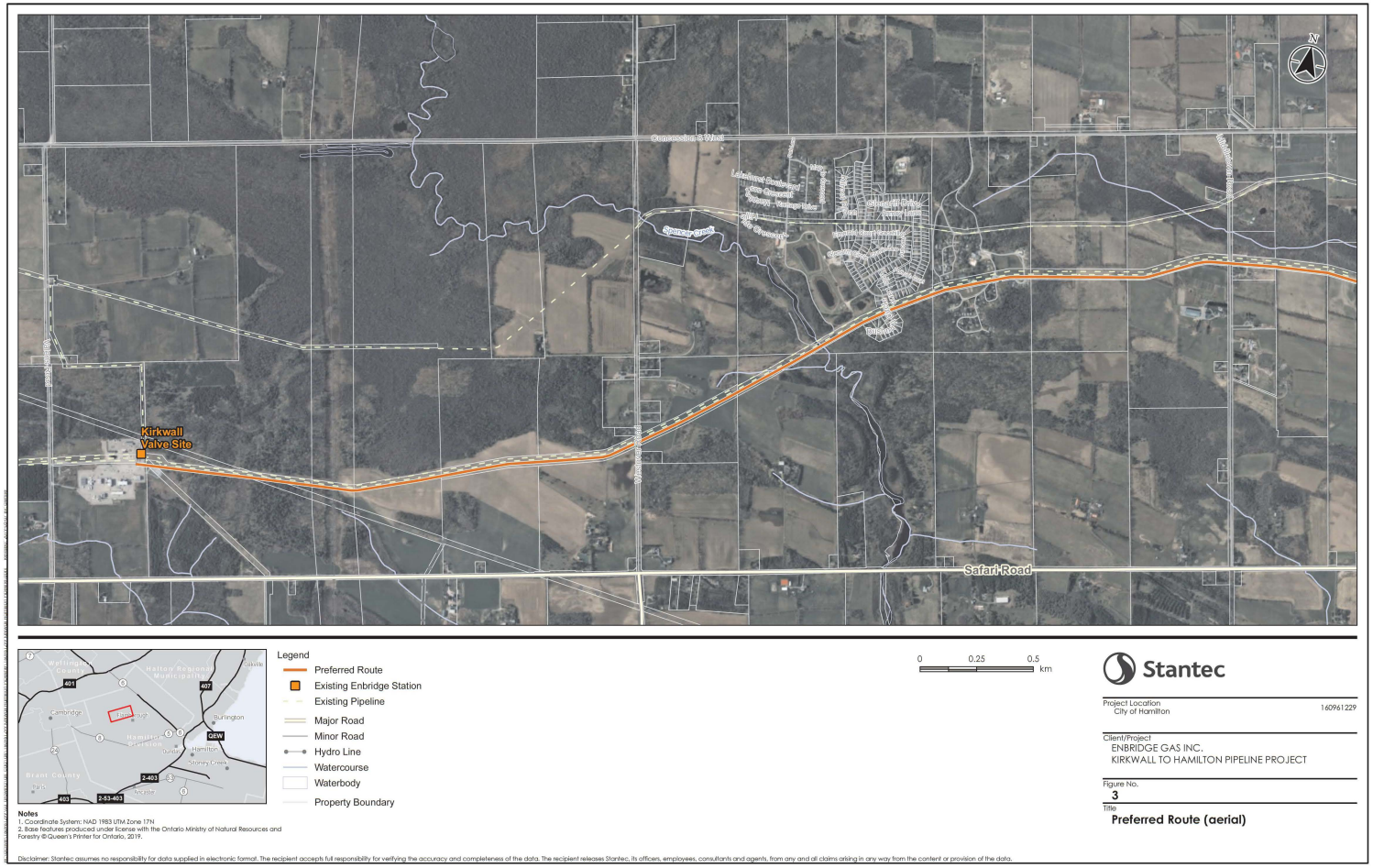
Kirkwall-Hamilton Pipeline Project
Information Session

Preferred route



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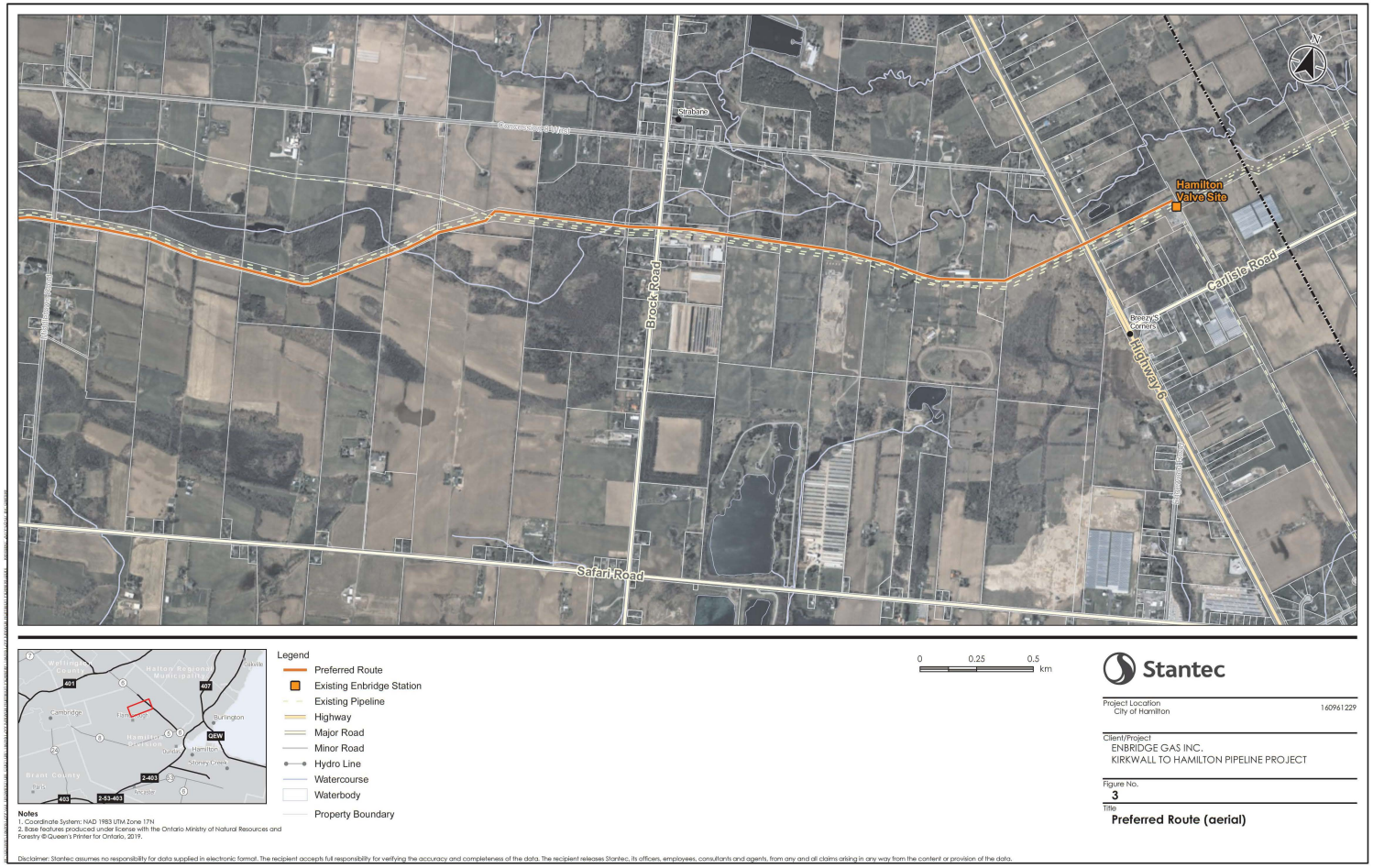
Kirkwall-Hamilton Pipeline Project
Information Session

Preferred route



Stantec

Kirkwall-Hamilton Pipeline Project
Information Session



Access and land requirements

An Enbridge Gas Representive shall begin discussions with landowners along the preferred route following this Information Session for the appropriate land rights necessary to construct the pipeline. Enbridge Gas is committed to working with all directly affected landowners in anticipation of acquiring early access agreements in order to gather essential information, including but not limited to, land survey data, environmental, archaeological and property site features, along with negotiating the necessary land rights. These land rights will consist of permanent easements and/or temporary land rights. The temporary land rights are only required during project construction activities.

Enbridge Gas will ensure that a Land Relations Agent (LRA) is available to each landowner during all pipeline construction activities. The Land Agent will keep all landowners informed of the progress of the project and assist with any concerns that may arise as a result of the construction activities.

Kirkwall-Hamilton Pipeline Project Information Session



Agricultural soils

Enbridge Gas has established and tested measures to preserve the integrity of agricultural soils throughout the construction phase:

- A third-party soils specialist will determine topsoil depth prior to stripping and supervise activities so the proper depth of topsoil is removed and replaced.
- Topsoil will be stripped from the right-of-way and other work areas and stockpiled along the right-of-way. A separation will be maintained between topsoil and subsoil.
- Enbridge Gas will implement a wet soil shutdown protocol on agricultural lands to minimize soil structure damage.
- The subsoil on the stripped portion of the right-of-way will be chisel ploughed or sub-soiled during cleanup activities to alleviate compaction.
- Any agricultural drainage systems impacted by construction will be repaired.
- Enbridge Gas will develop and implement a sampling program on agricultural easements along the pipeline route for potential pests and/or diseases that are known to the area, where appropriate.
- The entire outside boundaries of the work space necessary for construction of the project will be staked at regular intervals.
- A post-construction cover crop program will be available to landowners.

Kirkwall-Hamilton Pipeline Project
Information Session



Maintaining agricultural drainage systems

- Landowners will be contacted prior to construction to confirm the location and type of existing drains. Any future drainage plans will also be discussed with the landowner.
- Field tile will be temporarily re-routed during pre-construction activities where required to ensure proper drainage during construction.
- Damaged and severed drains will be repaired following construction. After repair and prior to backfilling, landowners will be invited to inspect and approve the repair. Any on-going field tile issues resulting from pipeline construction will be addressed by Enbridge Gas as required.

Kirkwall-Hamilton Pipeline Project Information Session

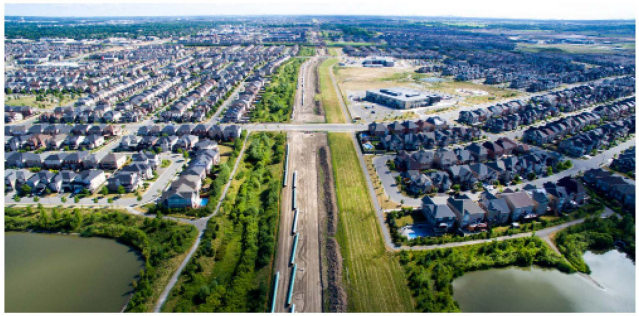


Socio-economic features

The project will be constructed through private business areas, agricultural and residential land, along with land owned by Hydro One and Hamilton Conservation Authority. Land use designations consist of a variety of uses, including agricultural, rural residential and commercial.

Enbridge Gas has extensive experience working in the City of Hamilton on major construction projects, most recently with its Brantford-Kirkwall (2015) and Hamilton-Milton (2016) projects. This project will be constructed to the same standards of care for the local community, working to minimize and mitigate construction impacts.

Kirkwall-Hamilton Pipeline Project Information Session



Socio-economic features

Potential effects

- Temporary increases in noise, dust and air emissions.
- Increased construction traffic volumes.
- Temporary impairment of the use and enjoyment of property.
- Vegetation clearing along the pipeline easement.

Example mitigation measures

- Provide access across the construction area.
- Restrict construction to daylight hours, and adhere to applicable by-laws.
- Develop and implement a Traffic Control Plan.
- Place fencing at appropriate locations for safety.
- Implement a water well monitoring program.
- Making contact information for a designated Enbridge Gas representative available prior to and throughout construction.
- Dust control measures.
- Re-vegetation of cleared areas (seeding/planting).
- Maintain access to properties and work with landowners during temporary access disruptions.
- Regular community updates via newsletter mail-out during construction, and dedicated project web-page with information available prior to and during construction.
- Timing of construction to limit disturbance with consideration for communities and businesses.

Kirkwall-Hamilton Pipeline Project Information Session



Aquatic resources

Enbridge Gas understands the importance of protecting wildlife during construction and therefore will implement recognized mitigation measures to minimize possible environmental effects.

The pipeline crosses 4 known watercourses.

Potential effects

- Disruption and alteration to aquatic species and habitat and/or nuisance effects.
- Increased erosion, sedimentation, and turbidity resulting from removal of vegetation.

Example mitigation measures

- Conduct surveys of waterbodies.
- Obtain all agency permits and approvals.
- Limit in-channel construction, where possible, and conform to fish timing window guidelines.
- For in-channel construction, protect aquatic species and manage sedimentation and turbidity.
- Restore and seed areas to establish habitat and reduce erosion.
- Replant riparian vegetation.

Kirkwall-Hamilton Pipeline Project Information Session



Cultural heritage resources

During the course of construction, cultural heritage features such as archaeological finds, buildings, fences and landscapes may be encountered. Detailed field surveys will be conducted by independent, third-party archaeologists and cultural heritage professionals.

Potential effects

- Damage or destruction of archaeological, paleontological or historical resources.

Example mitigation measures

- Archaeological assessment of the construction right-of-way, with review and comment from the Ministry of Tourism, Culture and Sport (MTCS).
- Cultural heritage assessment (for built heritage features and cultural heritage landscapes) of the construction right-of-way, with review and comment from the MTCS.
- Reporting of any previously unknown archaeological, paleontological or historical resources uncovered, or suspected of being uncovered, during excavation.

Kirkwall-Hamilton Pipeline Project Information Session



Terrestrial resources

During the course of construction, natural heritage features such as wildlife habitat and vegetated/wooded areas will need to be crossed.

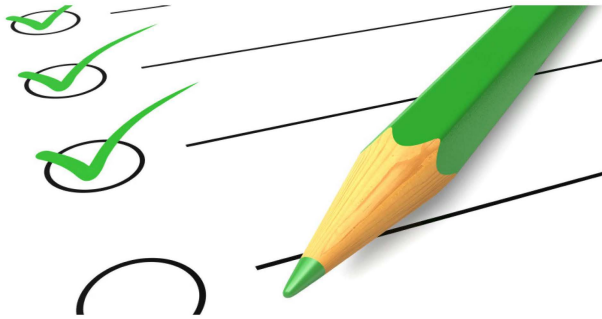
Potential effects

- Damage or removal of vegetation and wildlife habitat adjacent to the construction area.
- Disturbance and/or mortality to local wildlife.

Example mitigation measures

- Conduct surveys (including Species at Risk surveys) in advance of construction to determine opportunities for wildlife habitat to exist.
- Clearly mark the construction area to avoid accidental damage.
- Restore and seed areas to establish habitat and reduce erosion.
- Secure any necessary permits, and follow any conditions of approval.

Kirkwall-Hamilton Pipeline Project Information Session

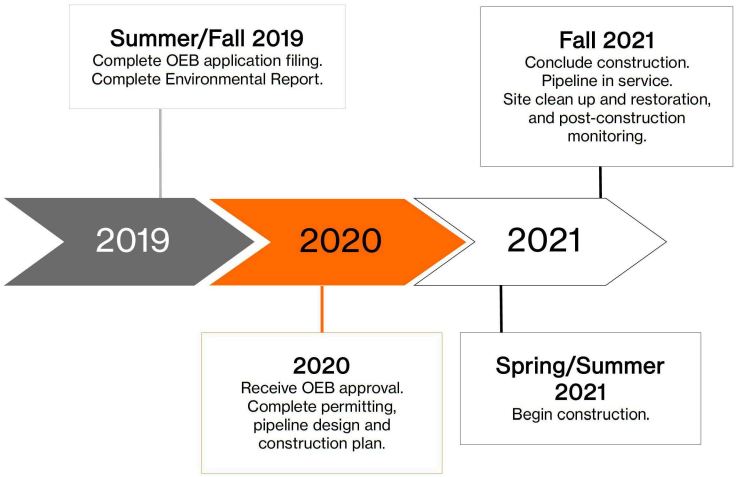


Next steps

Serving hundreds of communities in Ontario, we consider ourselves strong community partners who believe in and are committed to public consultation.

During the planning stages for this Project we have consulted and will continue to consult with local landowners, Indigenous Communities, government agencies and other interested parties that could be impacted by the Project.

After this Information Session, we intend to pursue the following schedule of activities:



Thank you!

On behalf of the Project Team, thank you for attending this Information Session. We appreciate your involvement in the consultation process, and we would like to hear from you.

Please fill out the exit questionnaire. If you have any further comments or questions, please contact:

Michael Candido, Project Manager
Stantec Consulting Ltd.
Phone: 519-780-8139
Email: michael.candido@stantec.com

Enbridge Gas
Phone: 1-855-381-9138
Email: Projects@uniongas.com

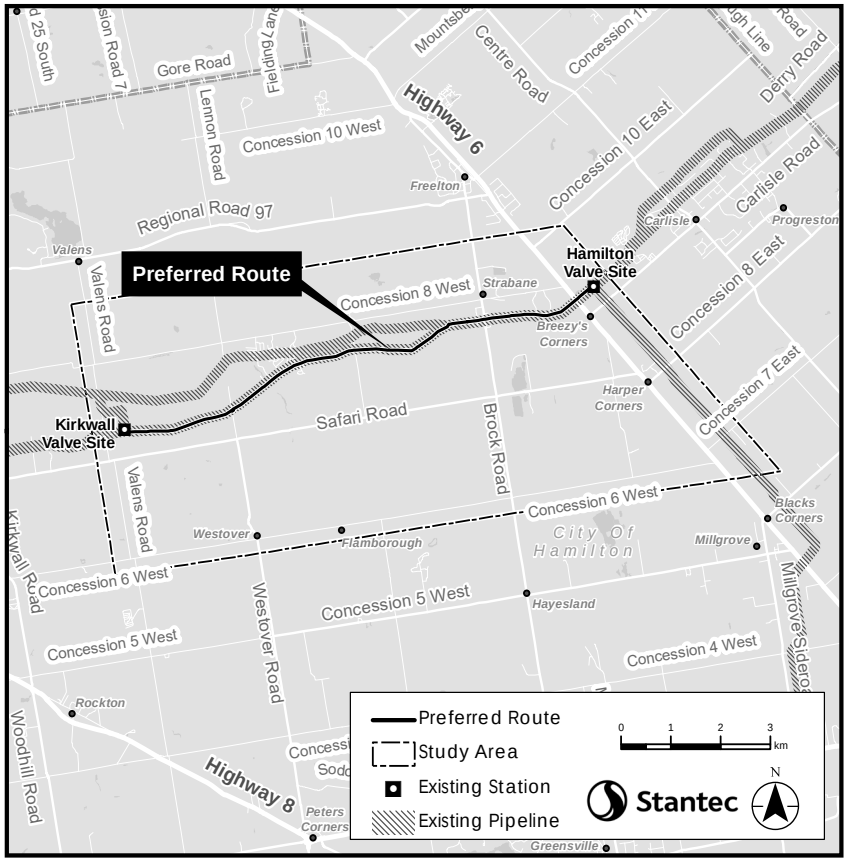
Or visit our project webpage: uniongas.com/Kirkwall-Hamilton

MAY 2019

Enbridge Gas Inc.
Kirkwall - Hamilton Pipeline Project
Information Newsletter

Project Overview

The proposed project will be constructed between Enbridge Gas' existing Kirkwall valve site, located northeast of the intersection of Safari Road and Valens Road and Enbridge Gas' existing Hamilton valve site, located east of Highway 6 and north of Carlisle Road. The preferred route will parallel three existing Enbridge Gas pipelines. The length of the proposed pipeline will be approximately 10 km and will be 48 inches in diameter. If approved, construction of the pipeline could begin as early as spring/summer 2021 and be complete by the end of 2021.



Why is Enbridge Gas undertaking this Project?

Enbridge Gas is undertaking the proposed project to increase existing capacity and accommodate additional demand for natural gas along its main natural gas transmission system, the Dawn Parkway System.

Note: As of Jan. 1, 2019, Union Gas and Enbridge Gas Distribution have amalgamated into one utility with the legal name Enbridge Gas Inc.

Ontario Energy Board Review and Approval Process

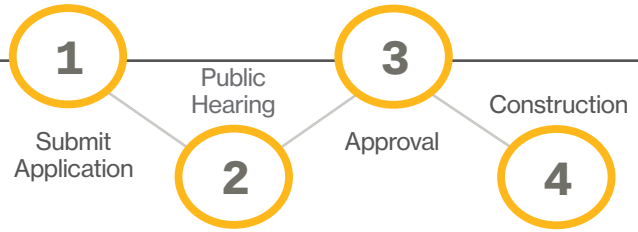
The Ontario Energy Board (OEB) is the body that regulates the natural gas industry in Ontario, in the public's interest. The OEB's approval is required before this pipeline can be constructed.

Enbridge Gas plans to submit an application for this project to the OEB, whose review and approval is needed before this project can proceed. This application will include comprehensive information on the project including: the need for the project, facility alternatives, project costs and economics, pipeline design and construction, environmental mitigation measures, land requirements, and consultation with Indigenous Communities.

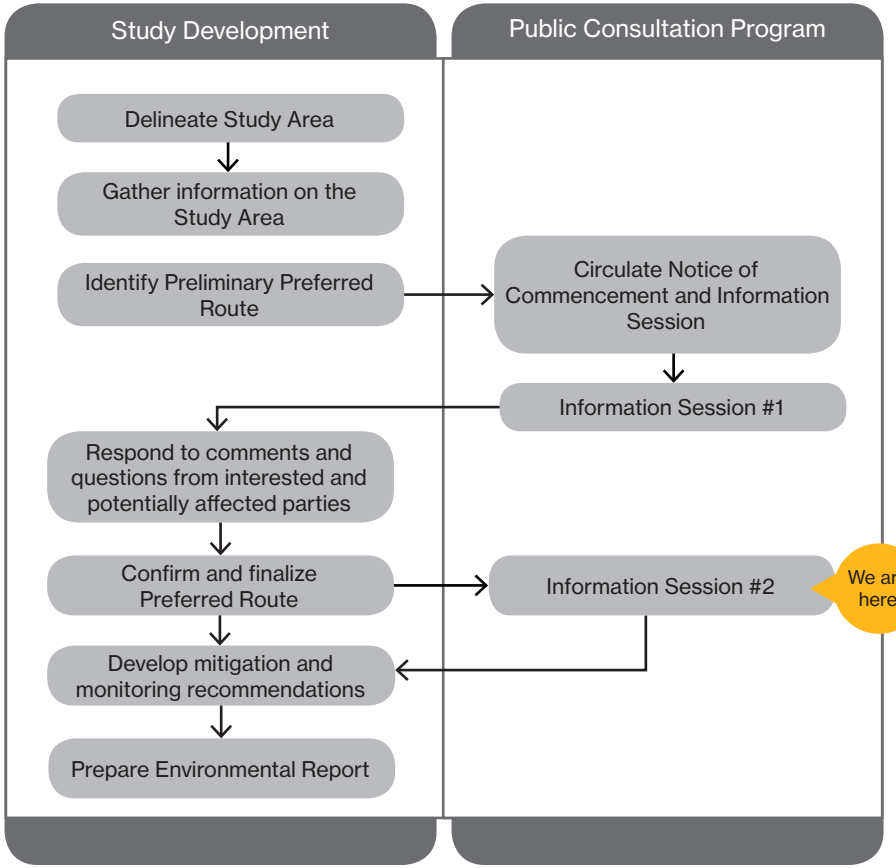
The OEB will then hold a public hearing to review the project. This will include notices in local newspapers, letters to directly affected landowners, the opportunity for the general public and landowners to submit questions regarding the project, a formal hearing, and a written decision regarding the project.

If after this review the OEB determines that the project is in the public's interest it will approve construction of the project. The OEB normally attaches conditions to the approval which Enbridge Gas will comply with during the construction and restoration process.

Additional information about the OEB process and information about how to participate in the OEB hearing process can be found at: www.ontarioenergyboard.ca



Environmental Study Process



Thank You!

On behalf of the Project Team, thank you for your interest in this project. We appreciate your involvement.

If you have any comments or questions please contact:

Michael Candido
Project Manager
Stantec Consulting Ltd.
Phone: (519) 780-8139
Email: michael.candido@stantec.com

Or visit our project webpage: uniongas.com/Kirkwall-Hamilton



Kirkwall-Hamilton Pipeline Project
Information Session Questionnaire – May 9, 2019

Please read the newsletter and look over the displays, and then take a few moments to answer the following questions. Your comments are appreciated. If you require any assistance or clarification while completing the questionnaire please speak with a Stantec or Enbridge Gas representative.

Completed questionnaires can be dropped off at the front table. If you would like additional time to consider your comments, pre-paid envelopes are available at the front table. We request your comments by **May 24, 2019**.

1. **What is your interest in this project?**

   ☐ Directly affected landowner
   ☐ Surrounding landowner
   ☐ Interested citizen
   ☐ Member of interest group
   ☐ Government official
   ☐ Other: _____

2. **Please indicate if the project will have any impacts to you, your property or your business that you would like addressed** (i.e., access, noise, dust, traffic, etc.).

3. **Please identify any features along the Preferred Route that you feel are important to consider during the environmental study.**

4. **Do you have any questions or comments about this project that you would like to bring to our attention?**

5. **Did the content provided at this Information Session meet your needs?**

6. **How did you hear about this Information Session? Check all that apply:**

- ☐ Newspaper Advertisement
- ☐ Project Notification Letter
- ☐ Social Media Post(s)
- ☐ Word of Mouth

Thank you for completing this questionnaire. If you have a question about the project that has not been addressed or for which you would like more information, please provide us with your full contact information so that we can respond to you.

Please Print Clearly

Name: _____

Address: _____

Email: _____

Phone: (_____)_____

Information will be collected and used in accordance with the Freedom of Information and Protection of Privacy Act. This information will be used to assist Enbridge Gas in meeting applicable approval requirements. This material will be maintained on file for use during the study and may be included in project documentation. Unless indicated otherwise, personal information and all comments will become part of the public record and may be publicly released as part of project documentation.

APPENDIX B5:
PROJECT CORRESPONDENCE

Kirkwall-Hamilton Pipeline Project
Correspondence Tracking
Government and Agencies

Comment Number	Stakeholder Group	Stakeholder Representative Name	Method of Communication	Date of Communication	Summary of Comment	Date of Response	Summary of Response
See Appendix B1 and B3	All agencies on contact list		Email	February 12, 2019	Notice of Commencement and Information Session.	N/A	N/A
1	Grand River Conservation Authority (GRCA)	Beth Brown	Email	February 12, 2019	Forwarded the Notice of Commencement and Information Session to Nathan Garland, the planner that covers Hamilton.	February 12 and 13, 2019	Stantec thanked GRCA for the updated contact information.
2	City of Hamilton	Jason Thorne	Email	February 12, 2019	Asking for confirmation on who else at the City of Hamilton the Notice of Commencement and Information Session was sent to and how the public would be notified.	February 13, 2019	Enbridge's District Manager, is conducting the outreach to city staff/council. A message was left with the Mayor's office on Monday. The District Manager has also been attempting to reach the City Manager's office to have a conversation about the project. A letter will be going to Council today. Stantec noted a letter was mailed to all landowners along the pipeline routes on Monday. Letters are being hand delivered today to the residents of Beverly Hills Estates, Antrim Glen and Ponderosa Nature Resort (private communities in proximity to the routes). A Notice of Commencement and Information Session will run in the Hamilton Spectator today and the Flamborough Review tomorrow. A webpage has also been launched www.uniongas.com/Kirkwall-Hamilton
3	Ministry of Transportation (MTO)	Cameron Blaney	Email	February 15, 2019	Indicated he will be point of contact for the project and the project will need an encroachment permit for the Highway 6 section.	February 15, 2019	Stantec thanked MTO for updated contact infomation and noted the project is in the early planning stages and contact will be made once things progress.
4	Conservation Halton (CH)	Cassandra Connolly	Email	February 15, 2019	Unable to attend the February 27, 2019 Information Session. Confirmed a portion of the project will be occurring across lands regulated by CH and a permit will be required. CH would also be involved in the review and comment on the environmental report.	N/A	N/A
5	Hamilton Conservation Authority (HCA)	Darren Kenny	Email	February 22, 2019	In addition to being a landowner of property on and immediately adjacent to the existing and proposed pipeline alignment, the HCA regulates lands within the alignment under Ontario Regulation 161/06 (HCA's Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses) made under the Conservation Authorities Act, R.S.O. 1990. Written permission will be required from our office for the portions of the new pipeline installation within our regulated area. Enbridge has our regulated area and property mapping available in-house, but you can also access our regulated area mapping from our website at http://conservationhamilton.ca/regulated-areas-map-tool/. Our watershed jurisdiction runs from just east of the Valens Rd valve station to the Beverly Estates/Antrim Glen Park.Requested to be kept updated on the project and consulted for natural heritage and regulatory approval process input as the project develops.	February 25, 2019	Stantec thanked HCA for the information and will keep HCA updated on the project.
6	Grand River Conservation Authority	Nathan Garland	Email	March 18, 2019	Requested the GRCA remains notified of any information pertaining to the EA as it becomes available. Noted that the study area contains natural hazard and natural heritage features including wetland, watercourse, floodplain, slope valley hazards and regulated allowances to these features and are regulated under Ontario Regulation 150/06. Any development may require a Development, Interference with Wetlands and Alterations to Shorelines and Watercourses permit. Advised only a portion of the study area is within GRCA watershed and recommended contacting HCA and CH.		Acknowledged.
See Appendix B1 and B3	All agencies on contact list		Email	April 18, 2019	Notice of Second Information Session	N/A	N/A
7	Hydro One Networks Inc.	Roman Dorfman	Email	May 5, 2019	Tthe proposed pipeline project will effect Hydro One (HONI) distribution line facilities as well as 2 separate transmission line ROW. Attached documents on processes for submitting proposals for review.	May 6, 2019	Stantec thanked HONI for the information and will be in contact in the future.

Kirkwall-Hamilton Pipeline Project
Correspondence Tracking
Indigenous Communities

Comment Number	Community	Community Representative Name	Method of Communication	Date of Communication	Summary of Comment	Date Response Provided	Summary of Response
See Appendix B1	All communities on contact list		Email	February 12, 2019	Notice of Commencement and Information Session	N/A	N/A
1	Haudenosaunee Development Institute (HDI)	Todd Williams	Email	February 13, 2019	Provided updated email address to send future project information to	February 13, 2019	Stantec thanked him for the updated information and will update contact list.
See Appendix B1 and B3	All communities on contact list		Email	April 18, 2019	Notice of Second Information Session	N/A	N/A
2	Haudenosaunee Development Institute (HDI)	Karl Hill	Email	May 3, 2019	The HDI has been legislated by the Haudenosaunee Chiefs Confederacy Council (HCCC) to handle all development issues in Haudenosaunee Treaty Territory. HDI is interested in participating in any archaeological and environmental field work for the project. Enbridge has had initial meeting with HDI/HCCC regarding the project.	May 6, 2019	Stantec requested HDI follow up with Enbridge Gas' Senior Indigenous Affairs Advisor regarding archaeological and environmental field work.

Kirkwall-Hamilton Pipeline Project
Correspondence Tracking
Public, Landowners and Businesses

Comment Number	Stakeholder Group	Method of Communication	Date of Correspondence	Summary of Comment	Date Response Provided	Summary of Response
See Appendix B3	Landowners	Mailout	February 11, 2019	Notice of Commencement and Information Session.	N/A	N/A
See Appendix B3	Residents of Beverly Hills Estates Community, Antrim Glen Community and Ponderosa Nature Resort	Hand delivery	February 13, 2019	Notice of Commencement and Information Session.	N/A	N/A
N/A	Landowner	Phone call	Feburary 19, 2019	Will natural gas distribution to house be available as a result of construction of new pipeline. When will construction start.	February 19, 2019	Stantec responded that Enbridge will be able to answer distribution question at the upcoming Information Session. If the project is approved construction is planned to begin in spring 2021.
1	Member of the public	Email	February 23, 2019	Timing of the start and finish of construction. What other commodity is currently buried in this same property. What other additional safety concerns will this natural gas pipeline present. Re:step down station, what is the unit cost advantage to the consumer of natural gas vs. propane.	February 26, 2019	Stantec responded that if approved, construction of the proposed project could begin in spring/summer 2021 and be completed by the end of 2021. The 3 existing pipelines are carrying natural gas. There will be representatives from Enbridge at the Information Session that can speak to questions regarding safety and cost advantage of natural gas vs. propane. If they cannot attend the Information Session Stantec can gather information on those questions.
2	Resident in nearby community	Email	February 23, 2019	Lives in Antrim Glen community. Currently out of the country, will not be able to attend Feburary 27, 2019 Information Session and requested project details	February 25, 2019	Stantec emailed a letter and map with details regarding the project and noted the display boards from the Information Session would be made available on the project website during the first week of March 2019.
N/A	Landowner	Phone call	Feburary 27, 2019	Spencer Creek expands a lot at crossing location along Route Deviation A2. Wildlife corridor along Alternate Route B through their property. There is a delta on Spencer Creek at the crossing location along Alternate Route B. Offered project team access to property to look at Spencer Creek and flora and fauna.	February 27,2019	Stantec thanked them for the information and documented concerns.
N/A	Landowner	Phone call	February 27,2019	Existing pipeline easement crosses property and they agree with the Preliminray Preferred Route. Route Deviations A1 and A2 look devistating to the environment. Landscape along Route Deviation A2 is very hilly (drumlin). Spencer Creek gets very wide in the spring at the crossing location along Route Deviation A2. Issue with scale and detail of project map provided in letter and on the project website.	February 27,2019	Stantec thanked them for the information about the landscape and Spencer Creek and documented concerns. Encouraged them to attend the Information Session to learn more about the project and inform the project team about property features.

Kirkwall-Hamilton Pipeline Project
Correspondence Tracking
Public, Landowners and Businesses

Comment Number	Stakeholder Group	Method of Communication	Date of Correspondence	Summary of Comment	Date Response Provided	Summary of Response
N/A	Landowner	Phone call	February 28,2019	Route Deviation A2 is very close to their house. Conservation Authority has a vested interest in the property due to due to Spencer Creek drainage. Significant woodlots on property. Archaeological areas on property. Did not receive a Notice of Commencement and Information Session letter.	February 28,2019	Stantec thanked them for the information about property features and documented concerns. Will update the project contact list and add contact information if not already on the list.
N/A	Landowner	Phone call	March 4, 2019	Does not agree with Route Deviations A1 and A2 from an environmental perspective. Would like to meet with Enbridge and Stantec to discuss features on their property with respect to Route Deviation A2.	March 4, 2019	Stantec and Enbridge to discuss potential meeting dates and times and will follow up to set up a meeting. Meeting set for March 15, 2019.
N/A	Resident in nearby community	Phone call	March 5, 2019	Will construction affect road access from Concession Road 8 West to Beverly Hills Community.	March 7, 2019	Stantec responded that based on location of residence, access during construction will not be affected.
N/A	Landowner	Phone call	March 6, 2019	Concerned about affects of Route Deviations A1 and A2 on Christmas Tree farm business, the environment and loss of property enjoyment. Did not receive a Notice of Commencement and Information Session letter.	March 6, 2019	Stantec thanked them for the information and documented concerns. Will update the project contact list and add contact information if not already on the list.
N/A	Landowner	Meeting at Stantec Guelph office	March 13, 2019	Concerned about affects of Route Deviations A1 and A2 on Christmas Tree farm business on property. No herbicides or pesticides are used on the trees. Property has seven fields where Christmas trees are grown. A1 runs through four fields and A2 runs through three fields. Property has other unique features (woodlands, Spencer Creek, ponds, archaeology, walking trails, paddocks). Concerned about loss of property enjoyment. Did not receive a Notice of Commencement and Information Session letter.	March 13, 2019	Stantec thanked them for the information and documented concerns. Confirmed they are on the project contact list however address was incorrect. Address was updated.
N/A	Landowner	Phone call	March 14, 2019	Concerned about Alternate Route B affecting hay production, flora and fauna, artisian springs and livestock. Preference to Preliminary Preferrred Route A. Would like to remain on contact list.	March 14, 2019	Stantec thanked them for the information and documented concerns.
N/A	Landowner	Meeting at landowners residence with Stantec and Enbridge	March 15, 2019	Issues with timing of Information Session notification, scale of map included with notification and location of first Information Session.Would like questionnaire and display boards posted to the project website prior to the second Information Session. With the project in development for over 2 years believes landowners should have been notified sooner. Prefer the Preliminary Preferred Route from an environmental and socio-economic perspective. Route Deviations A1 and A2 are longer in length and would be problematic from an evironmental (Spencer Creek crossing, drumlins, slope, wetlands) and socio-economic perspective (residences, archaeological). Issues with helicopter survey and no ground reconnaissance being completed on the Route Deviations. Provided additional information on the property and associated features.	March 15, 2019	Explained the notification process and will take comments into consideration for second Information Session notification materials. Detailed the general process of how a project is built (geographic need, internal Enbridge project selection process, etc.). Explained the level of detail for data collection during the planning stage regarding environmental/socio economic features (data collected using available data bases) for route selection. As this progresses additional information is received from landowners/stakeholders. Preferred Route is selected and more detailed data is collected on the preferred route. The OEB approvals process was also discussed.

Kirkwall-Hamilton Pipeline Project
Correspondence Tracking
Public, Landowners and Businesses

Comment Number	Stakeholder Group	Method of Communication	Date of Correspondence	Summary of Comment	Date Response Provided	Summary of Response
N/A	Landowner	Phone call	March 28, 2019	Was unable to attend the February 27, 2019 Information Session. Concerned about the affect Alternate Route B would have on a high voltage, underground powerline that runs from the road to his house. Spencer Creek on his property is under Conservation Authority ownership. Asked how the pipeline would cross Spencer Creek. Landowners along Alternate Route B are hiring a lawyer.	March 28, 2019	Stantec thanked them for infomration and documented concerns. Explained the two potential creek crossing methods of open cut crossing and horizontal directional drilling and a crossing method has not been chosen. Based on feedback form the public, Preliminary Preferred Route is preferred by most. Another Information Session will be held in early May.
See Appendix B3	Landowners	Mailout	April 17, 2019	Notice of Second Information Session.	N/A	N/A
See Appendix B3	Residents of Beverly Hills Estates Community, Antrim Glen Community and Ponderosa Nature Resort	Hand delivery	April 22, 2019	Notice of Second Information Session. **Letters were given Ponderosa Nature Resort management to distibute to residents.*	N/A	N/A
N/A	Landowner	Phone call	April 26, 2019	Concerned about access to fields for horses to graze and to harvest hay during construction. Films are shot on property and noted potential loss of income. Noted large size of trench during 1991 construction. Questions regarding timing of construction and compensation. Unable to attend May 9, 2019 Information Session.	April 26, 209	Stantec responded that Enbridge will work with landowner regarding field access during construction. Construction would begin in spring 2021 if the project is approved. Stantec passed along contact information and concerns of landowner to Enbridge regarding compensation.
N/A	Landowner	Phone call	April 26, 2019	Landowner observed paint markings on fields. Was not upset but was curious why they were not contacted prior to survey work.	April 26, 209	Stantec passed along contact information and concerns to Enbridge.
See Appendix B5 for questionnaires received from the first and second Information Sessions.						

From:	Nathan Garland
To:	Candido, Mike; Beth Brown
Subject:	RE: Enbridge Gas Inc. Notice of Commencement and Information Session: Kirkwall-Hamilton Pipeline Project
Date:	Friday, February 15, 2019 9:12:29 AM

Nathan Garland
Resource Planner
Grand River Conservation Authority
400 Clyde Road, Cambridge, ON N1R 5W6

ngarland@grandriver.ca
Direct Line: 519.621.2763 x 2237
Office: 1.866.900.4722
Fax: 519.621.4945

Nathan Garland
519.621.2763 x 2237

From: Candido, Mike [mailto:michael.candido@stantec.com]
Sent: Wednesday, February 13, 2019 9:16 AM
To: Beth Brown
Cc: Nathan Garland
Subject: RE: Enbridge Gas Inc. Notice of Commencement and Information Session: Kirkwall-Hamilton Pipeline Project

Good morning. As a follow up, Beth I will remove you from the contact list.

Nathan I will add you to the list for all future notifications. Can you please send me your contact information and title. Thank you.

Mike

Michael Candido -CAN-CISEC
Project Manager - Assessment and Permitting

Direct: 519 780-8139
Mobile: 519 829-8159
Fax: 519 836-2493
michael.candido@stantec.com

Stantec
1-70 Southgate Drive
Guelph ON N1G 4P5

The content of this email is the confidential property of Stantec and should not be copied, modified, retransmitted, or used for any purpose except with Stantec's written authorization. If you are not the intended recipient, please delete all copies and notify us immediately.

From: Candido, Mike
Sent: Tuesday, February 12, 2019 5:31 PM

To: 'Beth Brown' <bbrown@grandriver.ca>
Cc: Nathan Garland <ngarland@grandriver.ca>
Subject: RE: Enbridge Gas Inc. Notice of Commencement and Information Session: Kirkwall-Hamilton Pipeline Project

Thanks Beth.

Mike

From: Beth Brown <bbrown@grandriver.ca>
Sent: Tuesday, February 12, 2019 4:44 PM
To: Candido, Mike <michael.candido@stantec.com>
Cc: Nathan Garland <ngarland@grandriver.ca>
Subject: RE: Enbridge Gas Inc. Notice of Commencement and Information Session: Kirkwall-Hamilton Pipeline Project

Hello – I have forwarded your message to Nathan Garland, our Planner that covers Hamilton.

Sincerely,
Beth Brown
Supervisor of Resource Planning - Central
Grand River Conservation Authority
P.O. Box 729 (mailing address)
400 Clyde Road, Cambridge, Ontario N1R 5W6
Phone: (519) 621-2763 ext. 2307
Toll Free: 1-866-900-4722
Fax: (519) 621-4945
Website: www.grandriver.ca

From: Candido, Mike [mailto:michael.candido@stantec.com]
Sent: Tuesday, February 12, 2019 4:20 PM
To: Beth Brown
Subject: Enbridge Gas Inc. Notice of Commencement and Information Session: Kirkwall-Hamilton Pipeline Project

Hello. Please find attached the Notice of Commencement and Information Session for the Kirkwall-Hamilton Pipeline Project.

Regards,

Michael Candido -CAN-CISEC
Project Manager - Assessment and Permitting

Direct: 519 780-8139
Mobile: 519 829-8159
Fax: 519 836-2493
michael.candido@stantec.com

Stantec
1-70 Southgate Drive
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From: Candido, Mike
To: "Thorne, Jason"
Subject: RE: Enbridge Gas Inc. Notice of Commencement and Information Session: Kirkwall-Hamilton Pipeline Project
Date: Wednesday, February 13, 2019 9:56:00 AM
Attachments: image001.jpg

Good morning Jason. Enbridge's District Manager, Mark Egbedeyi-Emmanuel, is conducting the outreach to city staff/council. A message was left with the Mayor's office on Monday. Mark has also been attempting to reach the City Manager's office to have a conversation about the project. A letter will be going to Council today.

A letter was mailed to all landowners along the pipeline routes on Monday. Letters are being hand delivered today to the residents of Beverly Hills Estates, Antrim Glen and Ponderosa Nature Resort (private communities in proximity to the routes).

A notice of commencement and information session will run in the Hamilton Spectator today and the Flamborough Review tomorrow. A webpage has also been launched www.uniongas.com/Kirkwall-Hamilton

Please let me know if you have any additional questions.

Mike

Michael Candido -CAN-CISEC
Project Manager - Assessment and Permitting

Direct: 519 780-8139
Mobile: 519 829-8159
Fax: 519 836-2493
michael.candido@stantec.com

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1-70 Southgate Drive
Guelph ON N1G 4P5

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From: Thorne, Jason <Jason.Thorne@hamilton.ca>
Sent: Wednesday, February 13, 2019 8:50 AM
To: Candido, Mike <michael.candido@stantec.com>
Subject: RE: Enbridge Gas Inc. Notice of Commencement and Information Session: Kirkwall-Hamilton Pipeline Project

Michael, it appears I was the only recipient of this letter. Can you confirm who else at the City of Hamilton you have sent this notification to, and how you will be notifying the public?

From: Candido, Mike [mailto:michael.candido@stantec.com]

Sent: February-12-19 4:19 PM
To: Thorne, Jason
Subject: Enbridge Gas Inc. Notice of Commencement and Information Session: Kirkwall-Hamilton Pipeline Project

Hello. Please find attached the Notice of Commencement and Information Session for the Kirkwall-Hamilton Pipeline Project.

Regards,

Michael Candido -CAN-CISEC
Project Manager - Assessment and Permitting

Direct: 519 780-8139
Mobile: 519 829-8159
Fax: 519 836-2493
michael.candido@stantec.com

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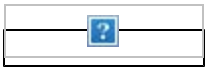
1-70 Southgate Drive
Guelph ON N1G 4P5



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From:	Blaney, Cameron (MTO)
To:	Candido, Mike
Subject:	RE: Enbridge Gas Inc. Notice of Commencement and Information Session: Kirkwall-Hamilton Pipeline Project
Date:	Friday, February 15, 2019 12:09:24 PM
Attachments:	image002.jpg image003.jpg

For this project yes you can remove Tony from the contact list, I can help you going forward.

Cameron Blaney l Corridor Management Officer l Enchroachments Niag/Ham/Halt
Central Region l 159 Sir William Hearst Avenue l Ministry of Transportation
7th Floor, Building D l Downsview, Ontario l M3M 0B7
416-235-4387
Cameron.Blaney@ontario.ca

From: Candido, Mike [mailto:michael.candido@stantec.com]
Sent: February 14, 2019 2:17 PM
To: Blaney, Cameron (MTO) <Cameron.Blaney@ontario.ca>
Subject: RE: Enbridge Gas Inc. Notice of Commencement and Information Session: Kirkwall-Hamilton Pipeline Project

Hi Cameron. I will add you to the contact list. Can you please confirm if Tony Di Fabio should be removed from future project notifications. The project is in the early planning stages and I will reach out to you once things progress. Thanks.

Mike

Michael Candido -CAN-CISEC
Project Manager - Assessment and Permitting

Direct: 519 780-8139
Mobile: 519 829-8159
Fax: 519 836-2493
michael.candido@stantec.com

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From: Blaney, Cameron (MTO) <Cameron.Blaney@ontario.ca>
Sent: Wednesday, February 13, 2019 4:30 PM
To: Candido, Mike <michael.candido@stantec.com>
Subject: RE: Enbridge Gas Inc. Notice of Commencement and Information Session: Kirkwall-Hamilton

Pipeline Project

Hello Michael,

I received info that you are going to start investigating a 48” pipeline project that is proposed to cross near Hwy 6 and Carlisle Rd as a part of the Kirkwall-Hamilton Pipeline Project. I am working as the Encroachment Permit Officer in the MTO Corridor Management Office and will be your point of contact for the Ministry.

This work will need an encroachment permit and I can help to get the ball rolling to obtain that permit. Let me know if you need any info or have any questions regarding the Hwy 6 section of your project.

Cameron Blaney l Corridor Management Officer l Enchroachments Niag/Ham/Halt
Central Region l 159 Sir William Hearst Avenue l Ministry of Transportation
7th Floor, Building D l Downsview, Ontario l M3M 0B7
416-235-4387
Cameron.Blaney@ontario.ca

From: Della Mora, Dan (MTO)
Sent: February 13, 2019 10:54 AM
To: Blaney, Cameron (MTO) <Cameron.Blaney@ontario.ca>
Subject: FW: Enbridge Gas Inc. Notice of Commencement and Information Session: Kirkwall-Hamilton Pipeline Project

Hi Cameron,

Please take the lead on this one.

Thanks,
Dan

From: Di Fabio, Tony (MTO)
Sent: February 13, 2019 8:15 AM
To: Hewitt, Tom (MTO) <Tom.Hewitt@ontario.ca>; Della Mora, Dan (MTO) <Dan.DellaMora@ontario.ca>
Subject: FW: Enbridge Gas Inc. Notice of Commencement and Information Session: Kirkwall-Hamilton Pipeline Project

FYI

Tony Di Fabio
Team Lead
Highway Corridor Management Section, Head Office
Ministry of Transportation

Tel. (905) 704-2656

email HMCS logo

From: Candido, Mike [mailto:michael.candido@stantec.com]
Sent: February-12-19 4:34 PM
To: Di Fabio, Tony (MTO) <Tony.DiFabio@ontario.ca>
Subject: Enbridge Gas Inc. Notice of Commencement and Information Session: Kirkwall-Hamilton Pipeline Project

Hello. Please find attached the Notice of Commencement and Information Session for the Kirkwall-Hamilton Pipeline Project.

Regards,

Michael Candido -CAN-CISEC
Project Manager - Assessment and Permitting

Direct: 519 780-8139
Mobile: 519 829-8159
Fax: 519 836-2493
michael.candido@stantec.com

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From:	Cassandra Connolly
To:	Candido, Mike
Subject:	RE: Enbridge Gas Inc. Notice of Commencement and Information Session: Kirkwall-Hamilton Pipeline Project
Date:	Friday, February 15, 2019 10:44:20 AM

Hi Michael,

Thank you for providing me with the Notice of Commencement and Information Session for the Kirkwall-Hamilton Pipeline Project. While I will not be in attendance for the upcoming Information Session, based on the Route Map provided I can confirm that a portion of the project will be occurring across lands regulated by Conservation Halton and will require a Permit(s) to be issued by our Authority. Conservation Halton would also be involved in the review and comment on the environmental study to be completed.

I look forward to working with you on this project.

Regards,

Cassandra Connolly
Regulations Officer

Conservation Halton
2596 Britannia Road, Burlington, ON L7P 0G3
905-336-1158 ext. 2301 | cconnolly@hrca.on.ca

From: Candido, Mike <michael.candido@stantec.com>
Sent: February 12, 2019 4:19 PM
To: Cassandra Connolly <cconnolly@hrca.on.ca>
Subject: Enbridge Gas Inc. Notice of Commencement and Information Session: Kirkwall-Hamilton Pipeline Project

Hello. Please find attached the Notice of Commencement and Information Session for the Kirkwall-Hamilton Pipeline Project.

Regards,

Michael Candido -CAN-CISEC
Project Manager - Assessment and Permitting

Direct: 519 780-8139
Mobile: 519 829-8159
Fax: 519 836-2493
michael.candido@stantec.com

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From:	Candido, Mike
To:	"Kenny, Darren"
Cc:	Hall, Matthew - HCA
Subject:	RE: Notice of Commencement for Kirkwall to Hamilton Pipeline Project
Date:	Monday, February 25, 2019 9:26:00 AM

Good morning Darren. Thanks for the information. I will be sure to keep you updated on the project as things develop. Thank you.

Mike

Michael Candido -CAN-CISEC
Project Manager - Assessment and Permitting

Direct: 519 780-8139
Mobile: 519 829-8159
Fax: 519 836-2493
michael.candido@stantec.com

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From: Kenny, Darren <Darren.Kenny@conservationhamilton.ca>
Sent: Friday, February 22, 2019 11:13 AM
To: Candido, Mike <michael.candido@stantec.com>
Cc: Hall, Matthew - HCA <MatthewJames.Hall@conservationhamilton.ca>
Subject: Notice of Commencement for Kirkwall to Hamilton Pipeline Project

Mr. Candido,

Our office has recently received the notice for this project.

Please be advised that in addition to being a landowner of property on and immediately adjacent to the existing and proposed pipeline alignment, the Hamilton Conservation Authority (HCA) regulates lands within the alignment under *Ontario Regulation 161/06 (HCA's Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses)* made under the *Conservation Authorities Act, R.S.O. 1990.* Written permission will be required from our office for the portions of the new pipeline installation within our regulated area. Enbridge has our regulated area and property mapping available in-house, but you can also access our regulated area mapping from our website at http://conservationhamilton.ca/regulated-areas-map-tool/. Our watershed jurisdiction runs from just east of the Valens Rd valve station to the Beverly Estates/Antrim Glen

Park.

We request that we be kept updated on the project and consulted for natural heritage and regulatory approval process input as the project develops. I would be the main HCA contact for the project going forward.

Thank you

Darren Kenny, B.Sc. (Hons.), CAN-CISEC
Watershed Officer, Badge # 113
Hamilton Conservation Authority
P.O. Box 81067, 838 Mineral Springs Road
Ancaster, Ontario L9G 4X1
Tel - 905-525-2181, ext. 131
darren.kenny@conservationhamilton.ca
Website - www.conservationhamilton.ca

Hamilton Conservation Authority
A Healthy Watershed for Everyone

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From: Jenn Simons
To: Candido, Mike
Subject: Kirkwall-Hamilton Pipeline Project
Date: Monday, March 18, 2019 2:16:03 PM
Attachments: Kirkwall-Hamilton Pipeline Project- scanned comments.pdf

---

Good afternoon,

Please find attached a scanned copy of GRCA comments for the file noted above. A hard copy will follow by regular mail.

Kind regards,

Jenn Simons
Resource Planning Technician
Grand River Conservation Authority
400 Clyde Road
Cambridge, ON N1R5W6
P: (519) 621-2763 x2236
F: (519) 621-4844
www.grandriver.ca

400 Clyde Road, P.O. Box 729 Cambridge, ON N1R 5W6

Phone: 519.621.2761 **Toll free:** 866.900.4722 **Fax:** 519.621.4844 **Online:** www.grandriver.ca

March 18, 2019

Cathy Plosz
Natural Heritage Planner,
Planning and Economic Development Department
City of Hamilton
71 Main St. West, 5th Floor,
Hamilton, ON L8P 4Y5

Mr. Michael Candido
Project Engineer
Stantec Consulting
1-70 Southgate Drive
Guelph ON, N1G 4P5

Dear Ms. Plosz and Mr. Candido

Re: City of Hamilton – Enbridge Gas Inc. Kirkwall-Hamilton Pipeline Project Environmental Assessment
Notice of Commencement and Information Session

Thank-you for circulating our office the Notice of Study Commencement and Information Session for Enbridge Gas Inc. Kirkwall-Hamilton Pipeline Project (EA). We request that our office remains notified of any information pertaining to the EA as it becomes available.

The study area contains natural hazard and natural heritage features including wetland, watercourses, floodplain, slope valley hazards and the regulated allowances to these features.

These features and their allowances are regulated under Ontario Regulation 150/06. Any future development within the regulated areas may require the issuance of a Development, Interference with Wetlands and Alterations to Shorelines and Watercourses permit from GRCA. A copy of our resource mapping is attached for your reference.

Please be advised that only a portion of the study area is within the GRCA watershed and recommend contacting Hamilton Conservation Authority and Halton Conservation Authority.

Should you have any further questions or comments, please contact me ext. 2237.

Yours truly,

Nathan Garland
Resource Planner
Grand River Conservation Authority
NG/js

Member of Conservation Ontario, representing Ontario's 36 Conservation Authorities ■ The Grand – A Canadian Heritage River

From:	Candido, Mike
To:	"Roman.Dorfman@HydroOne.com"
Cc:	Daniel.King-Costa@HydroOne.com
Subject:	RE: Kirkwall-Hamilton Pipeline Project
Date:	Monday, May 6, 2019 2:19:00 PM

Thanks for the information Roman. I will be in touch in the near future.

Mike

Michael Candido -CAN-CISEC
Project Manager - Assessment and Permitting

Direct: 519 780-8139
Mobile: 519 829-8159
Fax: 519 836-2493
michael.candido@stantec.com

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From: Roman.Dorfman@HydroOne.com <Roman.Dorfman@HydroOne.com>
Sent: Monday, May 6, 2019 8:55 AM
To: Candido, Mike <michael.candido@stantec.com>
Cc: Daniel.King-Costa@HydroOne.com
Subject: Kirkwall-Hamilton Pipeline Project

Michael, based on the attached submission received by our office in April (attached), the proposed pipeline project will effect Hydro One (HONI) distribution line facilities as well as 2 separate transmission line ROW as follows:

- HONI easement ROW - see process for submitting proposals for review
- Provincially owned HONI ROW (Bill 58 lands) - see process for submitting proposals for review

Please forward all requirements c/o me or Daniel King Cost (cc'd) and please note that paper copies of drawings are not required

Thank you

Roman Dorfman
Real Estate Services Supervisor,
Facilities and Real Estate Services

Hydro One Networks Inc.

185 Clegg Road
Markham, ON | L6G 1B7

Tel: 905.946.6243
Cell: 416.433.8777
Fax: 905.946.6242
Email: roman.dorfman@hydroone.com

www.HydroOne.com

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From:	Candido, Mike
To:	"Todd Williams"
Cc:	HDI; HDI Tracy; Ken
Subject:	RE: Enbridge Gas Inc. Notice of Commencement and Information Session: Kirkwall-Hamilton Pipeline Project
Date:	Wednesday, February 13, 2019 10:35:00 AM

Thanks Todd. I will update my contact list.

From: Todd Williams <williams.todde@gmail.com>
Sent: Wednesday, February 13, 2019 10:29 AM
To: Candido, Mike <michael.candido@stantec.com>
Cc: HDI <hdi2@bellnet.ca>; HDI Tracy <traceyghdi@gmail.com>; Ken <kmccorkle@uniongas.com>
Subject: Re: Enbridge Gas Inc. Notice of Commencement and Information Session: Kirkwall-Hamilton Pipeline Project

Good morning Mike,

Thanks for the notice on the upcoming Enbridge Gas project,

Please direct future project information directly to HDI: hdi2@bellnet.ca

Thanks,

Todd E. Williams, P.Eng
Monitoring Program Coordinator
Haudenosaunee Development Institute (HDI)
Haudenosaunee Confederacy Chiefs Council (HCCC)
Six Nations of the Grand River Territory
O: 519-445-4222
M: 519-761-1794
https://www.haudenosauneeconfederacy.com/

On Tue, Feb 12, 2019 at 4:05 PM Candido, Mike <michael.candido@stantec.com> wrote:

> Hello. Please find attached the Notice of Commencement and Information Session for the Kirkwall-Hamilton Pipeline Project.
>
> Regards,
>
> **Michael Candido** -CAN-CISEC
> Project Manager - Assessment and Permitting
>
> Direct: 519 780-8139
> Mobile: 519 829-8159
> Fax: 519 836-2493
> michael.candido@stantec.com
>
> Stantec
> 1-70 Southgate Drive
> Guelph ON N1G 4P5

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From: Candido, Mike
To: Karl Hill
Cc: Todd Williams; Ken McCorkle; Ryan Park
Subject: RE: Enbridge Gas Pipeline Project - Notice of Second Information Session - Kirkwall Hamilton Pipeline Project
Date: Monday, May 6, 2019 9:20:00 AM

Good morning Karl. Can you please follow up with Ken McCorkle (cc'd) from Enbridge Gas regarding archaeology and environmental fieldwork. Thank you.

Mike

Michael Candido -CAN-CISEC
Project Manager - Assessment and Permitting

Direct: 519 780-8139
Mobile: 519 829-8159
Fax: 519 836-2493
michael.candido@stantec.com

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From: Karl Hill <karl.j.hill@gmail.com>
Sent: Friday, May 3, 2019 1:45 PM
To: Candido, Mike <michael.candido@stantec.com>
Cc: Todd Williams <williams.todde@gmail.com>
Subject: Re: Enbridge Gas Pipeline Project - Notice of Second Information Session - Kirkwall Hamilton Pipeline Project

Good afternoon Mike,

The Haudenosaunee Development Institute (HDI) has been legislated by the Haudenosaunee Chiefs Confederacy Council (HCCC) to handle all development issues in Haudenosaunee Treaty Territory. HDI is interested in participating in any Archaeological field work, as well as any Environmental Field work for the project.
Enbridge Gas Inc. has had initial meeting with HDI/HCCC regarding Kirkwall Hamilton Pipeline project.

Best Regards,

Karl Hill
HDI Environmental
Office: 519-445-4222

Cell: 226-922-1823

On Thu, Apr 18, 2019 at 4:15 PM Candido, Mike <michael.candido@stantec.com> wrote:

> Hello. Please find attached the Notice of Second Information Session - Kirkwall Hamilton Pipeline Project.
>
> Regards,
>
> **Michael Candido** -CAN-CISEC
> Project Manager - Assessment and Permitting
>
> Direct: 519 780-8139
> Mobile: 519 829-8159
> Fax: 519 836-2493
> michael.candido@stantec.com
>
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> 
>
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From: Candido, Mike
To:
Subject: RE: Potential installation of a Natural Gas Line
Date: Tuesday, February 26, 2019 9:31:00 AM

Hello and thank you for your questions.

A. If approved, construction of the proposed project could begin in spring/summer 2021 and be completed by the end of 2021.
B. The 3 existing pipelines are carrying natural gas.

Will you be attending the information session on February 27? There will be representatives at the information session that you can speak to regarding questions C and D. If you cannot attend please let me know and I will gather information on those questions. Thank you.

Mike

Michael Candido -CAN-CISEC
Project Manager - Assessment and Permitting

Direct: 519 780-8139
Mobile: 519 829-8159
Fax: 519 836-2493
michael.candido@stantec.com

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From:
Sent: Saturday, February 23, 2019 10:09 PM
To: Candido, Mike <michael.candido@stantec.com>
Subject: Potential installation of a Natural Gas Line

Thank you for the opportunity to pose the following questions
A) Timing for the start and finish of the project
B) What other commodity is currently buried in this same property
C) What other additional safety concern will this Natural Gas pipeline present
D) RE: step down station, what is the unit cost advantage to the consumer of Natural Gas V.s Propane

Thank you;

From:
To: Candido, Mike
Subject: Re: Gas pipeline through Antrum Glen
Date: Monday, February 25, 2019 10:22:24 AM

Thank you for your response

Sent from iPhone

> On Feb 25, 2019, at 14:42, Candido, Mike <michael.candido@stantec.com> wrote:
>
> Hello Please find attached a letter and map with details regarding the proposed project that was send to residents in proximity to the proposed pipeline routes. The information from the public meeting should be available on the project website during the first week of March. https://www.uniongas.com/Kirkwall-Hamilton
>
> Please let me know if you have any additional questions. My contact information can be found below. Thank you.
>
> Mike
>
>
> Michael Candido -CAN-CISEC
> Project Manager - Assessment and Permitting
>
> Direct: 519 780-8139
> Mobile: 519 829-8159
> Fax: 519 836-2493
> michael.candido@stantec.com
>
> Stantec
> 1-70 Southgate Drive
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>
>
>
>
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>
>
>
> -----Original Message-----
> From:
> Sent: Saturday, February 23, 2019 10:58 AM
> To: Candido, Mike <michael.candido@stantec.com>
> Subject: Gas pipeline through Antrum Glen
>
> Mr Candido
> Sir;
> We are at present out of the country and have just heard of the pipeline. Are you able to give me some details of the proposal? I will not be back for the meeting on February 27.
> Thank you
>
>
> Sent from iPhone

> <let_NoCIS_landowners-generic_20190213_fin.pdf>

Stantec

Kirkwall-Hamilton Pipeline Project
Information Session Questionnaire – February 27, 2019

Please read the newsletter and look over the displays, and then take a few moments to answer the following questions. Your comments are appreciated. If you require any assistance or clarification while completing the questionnaire please speak with a Stantec or Enbridge Gas representative.

Completed questionnaires can be dropped off at the front table. If you would like additional time to consider your comments, pre-paid envelopes are available at the front table. We request your comments by **March 15, 2019**.

1. **What is your interest in this project?**

   ☐ Directly affected landowner
   ☑ Surrounding landowner
   ☐ Interested citizen
   ☐ Member of interest group
   ☐ Government official
   ☐ Other: _____

2. **Please indicate if the project will have any impacts to you, your property or your business that you would like addressed** (i.e., access, noise, dust, traffic, etc.).

   Access to Bushmill Circle
   in Construction Phase

3. **Please identify any features along the Preliminary Preferred Route that you feel are important to consider during the environmental study.**

4. **Do you have any questions or comments about this project that you would like to bring to our attention?**

5. **Did the content provided at this Information Session meet your needs?**

Yes

6. **How did you hear about this Information Session? Check all that apply:**

- [ ] Newspaper Advertisement
- [x] Project Notification Letter
- [ ] Social Media Post(s)
- [ ] Word of Mouth

Thank you for completing this questionnaire. If you have a question about the project that has not been addressed or for which you would like more information, please provide us with your full contact information so that we can respond to you.

Please Print Clearly

Name:

Address:

Email:

Phone:

Information will be collected and used in accordance with the Freedom of Information and Protection of Privacy Act. This information will be used to assist Enbridge Gas in meeting applicable approval requirements. This material will be maintained on file for use during the study and may be included in project documentation. Unless indicated otherwise, personal information and all comments will become part of the public record and may be publicly released as part of project documentation.

Notification and Meeting

Some questions of concern regarding the process.

Why was the project not communicated to affected landowners until a week before the meeting date? My neighbor did not get a notification.

Why was the meeting in Carlisle. The landowners affected live west of Highway six. Valens, Westover, Millgrove, and Beverly Hills all have community halls.

The weather on the day of the meeting was very poor. My most immediate neighbors could not get out of their driveways. Was a second meeting considered?

Why was the route map showing the alternate route loops 1A and 1B not clearly defined in the mailing?

Why wasn't the "Session Questionaire" not mailed with the notification for those who couldn't attend. We had to photo copy ours so the neighbors knew.

Why were the "Storyboards" not posted on the website before the meeting so we could read them in advance and ask more pertinent questions?

Most importantly, since the project has been in the works for 2+ years, and conceivably could directly affect the houses and lives of a number of long term residents, why were we not informed earlier.

Route A The "Preliminary Preferred Route"

Already two pipelines are in the ground on the existing easement (1968,1991).

All technical data on the terrain, depth to bedrock., bedrock topology and characteristics, wetland areas, areas that may need blasting is already known and on file.

Sensitive environmental areas, and woodlots adjacent to the easement are documented.

The important crossing of the Spencer Creek has already been done twice . All data on the difficulties and environmental mitigation measures are known at the crossing point.

The pipeline follows the most direct path possible and avoids geographic features. It is the lowest topographic route.

The easement predates the existence of Antrim Glen. Those who purchased would have been notified of the existing easement.

The historical route was initially selected so that it travelled at the rear of rural farm property lines, away from existing houses and barns.

No substantial new environmental degradation will be necessary. The easement goes through previously disturbed areas.

Route Deviations A1 and A2

These deviations were established as a result of a helicopter survey done 2 years ago. No ground reconnaissance has been undertaken. According to your documents, their stated goal was to minimize the impacts on Antrim Glen and the Ponderosa Nature Resort.

The existing easement predated the construction of Antrim Glen. Ponderosa is supposed to be a "seasonal park".

Since the easement goes through both of these properties, they are fully aware that there may be future work on the pipeline.

A1 or A2 would represent a new route with many more challenges

---

The "Route Evaluation Methodology" has a 5 step process according to your "Story Boards". Step 5 is the "Confirmation of the Route" which is to be done in early May. At that point the route is established. We are now at step 4 "Input of the Preliminary Preferred Route".
However, Step 3 states that "An evaluation of the Alternate Routes will be based on:

a) A **quantitative** comparative evaluation of impacts to environmental and socio-economic features.
b) A qualitative comparison evaluation.

Once complete, a preliminary preferred route will be determined."
Where are these studies?

With either route, new easements will have to be negotiated.

A2 is much longer and extremely problematic from both an environmental and socio-economic point of view.

The route goes through an area of the Butler property that required extensive blasting in 1990-91.

It crosses the southern slope of one of the best examples of a glacial drumlin in Ontario. This has an ANSI designation and would likely obliterate the well preserved Lake Whittlesey wave cut terrace, now so well preserved.

It passes directly behind our residence, an historic Flamborough farm house and barn.

By necessity it would traverse the steeper Stoss slope to the Spencer Creek.
It would cross the Spencer Creek where it is very wide and has extensive wetland, probably the worst place possible to make minimum ecological damage.

It would pass very close to two residences,one on the west and one on the east side of the creek.

It would then have to cross a smaller drumlin to the east.

The amount of environmental and topographic degradation would be very substantial. The social impact would be devastating.

Many indigenous artifacts have been found along the banks of the Spencer Creek in this area. An extensive ossuary was found on lot 34. The area was the site of 'Tinawatawa', a Neutral Iroquois settlement. Artifacts and skeletons were found in digs as recent as 1968, and are part of the Dwyer collection at the ROM. This would necessitate special investigation.

There are other alternate routes , avoiding topographic, environmental, cultural and historical issues.

Stantec

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1. **What is your interest in this project?**

   ☑ Directly affected landowner
   ☐ Surrounding landowner
   ☐ Interested citizen
   ☐ Member of interest group
   ☐ Government official
   ☐ Other: _____

2. **Please indicate if the project will have any impacts to you, your property or your business that you would like addressed** (i.e., access, noise, dust, traffic, etc.).

   - Crossing Spencer Creek
   - Fault problem 100 M from pipeline crossing 1999 or 50 = 2 M depth rock
   - Wildlife Corridor
   - Drumlins
   - Conservation Land

3. **Please identify any features along the Preliminary Preferred Route that you feel are important to consider during the environmental study.**

   Present line has already changed the environment why make another disturbance

4. **Do you have any questions or comments about this project that you would like to bring to our attention?**

   Use the pipeline route
   Increase wall thickness
   Reduce impacts on Spencer Creek
   Stay on right of way
   Our concern is not as a NIMBY but why do more disturbing of the environment by changing the course of the pipeline

5. **Did the content provided at this Information Session meet your needs?**

Well done

6. **How did you hear about this Information Session? Check all that apply:**

- [x] Newspaper Advertisement
- [x] Project Notification Letter
- [ ] Social Media Post(s)
- [ ] Word of Mouth

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   DUST & DIRT FROM BLASTING AND DIGGING

3. **Please identify any features along the Preliminary Preferred Route that you feel are important to consider during the environmental study.**

   IF AT ALL WE COULD GET A REDUCTION STATION SO WE COULD GET NATURAL GAS SERVICE. THERE ARE ABOUT 500 HOMES IN THIS AREA

4. **Do you have any questions or comments about this project that you would like to bring to our attention?**

5. **Did the content provided at this Information Session meet your needs?**

6. **How did you hear about this Information Session? Check all that apply:**

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2. **Please indicate if the project will have any impacts to you, your property or your business That you would like addressed (i.e. access, noise, dust, traffic, etc.)**

The project, if either the A1 or the A2 deviations were selected, would have a definite detrimental impact resulting in the immediate loss of our revenue to a point where we would no longer qualify for a "farm classification" which in turn would result in a fourfold increase in our property tax. We operate a Christmas tree growth business. We grow spruce, pine and fir trees without the use of herbicides or any other chemicals. One of the major reasons for our customers returning year after year is because of the natural conservation type of setting of our Christmas tree farm. Both route deviations, but especially A2 would go through some of our main fields and destroy all trees there. Also one of the paddocks, used to collect and burn roots, branches and other farm residue is in the very area identified as part of the A2 route.**(SEE ATTACHED LETTER)**
In addition all of the noted nuisances such as noise, dust, traffic etc. will disturb the farm's tranquility.

3. **Please identify any features along the Preliminary Preferred Route that you feel are important to consider during the environmental study.**

It bears to be kept in mind that any suggested deviation of the identified preferred A route will encounter serious soil condition difficulties, as the area is extremely rocky.
The only possible farming activity in this area is the growing of certain tree species, as there is very little topsoil for other activities. It takes 10 to 15 years of growth before our Christmas trees are ready to be harvested.

4. **Do you have any questions or comments about this project that you would like to bring to our attention?**

Please refer to the attached letter which explains in more detail the impact to us, our farm and our customers if either the A1 or the A2 route deviations were chosen instead of the preferred route A. It is our opinion that the identified preferred A Route is the route that appears the most economical and ecologically appropriate one. It has a definite advantage in that it is a route already used for three pipelines, and therefore least damaging to the environment.
We would appreciate to have an opportunity to meet with you at our farm for a site visit and to discuss any additional matters related to the Kirkwall-Hamilton Pipeline Project.

5. Did the content provided at this information session meet your needs?

Both Mr. Michael Candido as well as Mr. Brian Lenny we were informed of our inabilty to attend the information session on Wednesday February 27th, due to the sheet of ice having formed on our driveway making it impossible to negotiate its incline.

---

6. **How did you hear about this Information Session? Check all that apply:**

- [ ] Newspaper Advertisement
- [ ] Project Notification Letter
- [ ] Social Media Post(s)
- [x] Word of Mouth

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MEMORANDUM
Date: March 10, 2019
To.: Michael Candido, Project Manager, Stantec Consulting Ltd
Brian Lenny, Enbridge Gas
Gord Costie, Director Conservation Area Services, Hamilton Conservation Authority
From:

Re: Kirkwall – Hamilton Pipeline Project

Dear Mr. Candido,

This is further to our recent telephone call concerning the above noted project and the possible implications it might have on our Christmas Tree Farm, home, business, property and life.

This matter is of extreme importance to us. We were taken aback, in fact stunned, that we had not been informed or consulted and had to be told by one of our neighbours from the south side of Safari Road, via an urgent phone call informing us of the proposed development in our back yard and on our property. We were immediately in touch with Mr Brian Lenny as well as with you and appreciated your response.

The proposed deviations A1 and A2 are intrusive to our living and our life style and will immensely impact our tranquil life, the very reason we bought this property, which had natural boundaries as such provides us with safety and privacy which we deeply value.

Our property apart from the agricultural and conservation designation of some of its parts, is zoned for a health care practice affording me to carry out my practice from the comfort of my home in this safe and tranquil setting. There is a single access to our property and that is from Safari Road which is a great safety feature and which sold us this home and farm.

Any intrusion will adversely impact the value of our property and our daily life.

Our land is very rocky. From past personal experience when Antrim Glenn was blasting rocks to build basements which we learnt much later was the reason why we would experience and hear from time to time an unexplained bomb like explosion that caused the house to shake and extreme vibration forcing us to run outside. The visible adverse impact on the structure of our home took time to show up. We know that sand blasting the rocks to create brand new pathways will adversely impact the structure of our home and existing structure as vibrations in due time will cause the home to settle, in turn causing further expensive repairs, besides impacting our peace of mind.

Please note we live, work and run a farm
We are a working Christmas Tree Farm with 7 fields of Christmas trees of various species and sizes grown without the use of herbicides or pesticides in a natural conservation type of setting for our customers to select and cut during the Christmas season.
There are 3 fields immediately behind the barn and paddocks with a pathway going through the tall trees by the Spencer creek leading to 4 more fields of trees close to the back of the property where the farm adjoins the Antrim Glen Property.

Spencer Creek runs literally throughout the length of our property. We have been very diligent in ensuring that even though operating a Christmas tree farm without the use of herbicides is an ongoing challenge as it exclusively requires manual labour to maintain it. Our love of the land and commitment to the environment has kept us ecologically conscious and committed to do our best to maintain a green environment that honours the ecology of the area entrusted to us.

We have been very conscious of maintaining our farm free of the use of herbicides to avoid any leaching of harmful chemicals into Spencer Creek. We have worked in close concert with the conservation authority to keep intact the natural foliage, wild life and integrity of the land and water flowing through this property. We are watershed stewards.

2019 is our 25th season operating this farm. The previous owners had also run it as a Christmas tree farm at least since 1983. We are dependent on the income we earn from the sale of the trees; it affords us the opportunity to stay in this pristine calm natural setting.

It is also economically important for us to continue to maintain the tree farm and earn enough income on an ongoing basis to retain our "farm designation". As a grower it takes 10 to 15 years and a lot of help from Nature to grow a Christmas tree before it can be harvested. We sell Christmas trees ranging from 5 to 30 feet in size of various species such as traditional Scots pine, White pine, Balsam fir and White spruce.

If we are unable to qualify on an ongoing basis as a farm we not only lose an important source of revenue we depend upon, but there are additional consequences for us, the mere thought of which is creating stress, especially when we have done our best to be responsible citizens. For example, our yearly property taxes will go up by 75 % on an ongoing basis and for years to come if there is any disruption. **It can adversely impact value and the future sale of our property.**

Given what we see in particular in deviation A1 and A2 any tampering of the land would interfere with our operation as a tree farm, traversing some of our main growth sections. It could put our ability to continue to operate our business at peril and adversely impact our living at many levels for years to come!

As a working farm and in particular a Christmas Tree farm without the use of chemicals there is an ongoing need for cleanup of harmful, dead and excessive brush and disposing of dead trees, stumps etc. We have to use an open area for burning with ready access to water and where we can safely adhere to issues such as prevailing winds, etc. Deviation A2 from what we can determine will actually run right through the area where we normally carry out this activity. Additionaly it would subject us to almost all the factors you have listed, access, noise, dust, traffic etc. It would also destroy our privacy, adversely impact our driveway and our paths to access our tree fields not to speak of vibrations affecting the home we live in.

Given the options you have suggested the preferred Route A makes the best sense as it already has the existing pipelines. We look forward to meet with you at your office or at our farm for a site visit, which may also be an opportunity to share any additional information.

Thank you.

Stantec

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1. **What is your interest in this project?**

   ☒ Directly affected landowner
   ☐ Surrounding landowner
   ☐ Interested citizen
   ☐ Member of interest group
   ☐ Government official
   ☐ Other: _____

2. **Please indicate if the project will have any impacts to you, your property or your business that you would like addressed** (i.e., access, noise, dust, traffic, etc.).

   Yes, the project would have direct impact on our property on the Southern diversion.

3. **Please identify any features along the Preliminary Preferred Route that you feel are important to consider during the environmental study.**

   The forest south of the Preferred Route would be an environmental mistake.

4. **Do you have any questions or comments about this project that you would like to bring to our attention?**

   Please stick to the original preferred Route. You have the right of way already - why change it?

5. **Did the content provided at this Information Session meet your needs?**

Yes, it was what I expected. Lots of info. Lots of help with suggestions.

6. **How did you hear about this Information Session? Check all that apply:**

- [x] Newspaper Advertisement
- [x] Project Notification Letter
- [ ] Social Media Post(s)
- [ ] Word of Mouth

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   ☐ Member of interest group
   ☐ Government official
   ☐ Other: _____

2. **Please indicate if the project will have any impacts to you, your property or your business that you would like addressed** (i.e., access, noise, dust, traffic, etc.).

3. **Please identify any features along the Preliminary Preferred Route that you feel are important to consider during the environmental study.**

   Seems less disruptive to environment to build along the existing route rather than disrupt new land

4. **Do you have any questions or comments about this project that you would like to bring to our attention?**

   Best to build along the existing pipelines: Route "A" makes a lot more sense.

5. **Did the content provided at this Information Session meet your needs?**

6. **How did you hear about this Information Session? Check all that apply:**

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1. **What is your interest in this project?**

   - ☒ Directly affected landowner
   - ☐ Surrounding landowner
   - ☐ Interested citizen
   - ☐ Member of interest group
   - ☐ Government official
   - ☐ Other: _____

2. **Please indicate if the project will have any impacts to you, your property or your business that you would like addressed** (i.e., access, noise, dust, traffic, etc.).

   PREFERRED ROUTE A, A1, OR B WOULD HAVE LITTLE TO NO IMPACT
   ALTERNATE A2 WOULD DESTROY MATURE TREES, EXISTNG LANDSCAPING & BEDS
   IT WOULD CUT ACROSS MY DRIVEWAY CAUSING A PROBLEM WITH ACCESS TO MY HOME. I HAVE A CONCERN WITH CREWS ACCESSING THE PROPERTY AND THE IMPACT TO THE GROUNDS AND DRIVEWAY. THERE ARE 100 RED OAK SEEDLINGS IN THE POTENTIAL PATH ALONG WITH 50 PAPER BIRCH

3. **Please identify any features along the Preliminary Preferred Route that you feel are important to consider during the environmental study.**

   *A2 TRIBUTARY/DRAINAGE STREAM TO SPENCER CREEK
   NO CONCERNS RE: PRELIMINARY PREFERRED ROUTE A

4. **Do you have any questions or comments about this project that you would like to bring to our attention?**

   A2 IS AN AREA OF SIGNIFICANT ARCHEOLOGICAL INTEREST
   SPENCER CREEK IS QUITE WIDE AT POINT OF CROSSING
   SPENCER CREEK IN THE AREA OF A2 HAS SIGNIFICANT WILDLIFE INCLUDING FISH & AQUATIC LIFE AND IS A MIGRATORY PATH FOR BIRDS

5. **Did the content provided at this Information Session meet your needs?**

SOME

6. **How did you hear about this Information Session? Check all that apply:**

- [x] Newspaper Advertisement
- [x] Project Notification Letter
- [ ] Social Media Post(s)
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2. **Please indicate if the project will have any impacts to you, your property or your business that you would like addressed** (i.e., access, noise, dust, traffic, etc.).

   Not in its current format.

3. **Please identify any features along the Preliminary Preferred Route that you feel are important to consider during the environmental study.**

   Going with the preferred route means the least environmental impact.

4. **Do you have any questions or comments about this project that you would like to bring to our attention?**

   None at this time, but we strongly support the preferred route.

5. **Did the content provided at this Information Session meet your needs?**

Yes.

6. **How did you hear about this Information Session? Check all that apply:**

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Please Print Clearly

Name: Owner of nearby acreage

Address: _____

Email: _____

Phone: (_____) _____

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   ☐ Member of interest group
   ☐ Government official
   ☐ Other: _____

2. **Please indicate if the project will have any impacts to you, your property or your business that you would like addressed** (i.e., access, noise, dust, traffic, etc.).

   We keep a commercial apiary + queen breeding operation on our farm. We would need to be informed well ahead if the project is going to go ahead. We would need to access the back of our property at all times.

3. **Please identify any features along the Preliminary Preferred Route that you feel are important to consider during the environmental study.**

4. **Do you have any questions or comments about this project that you would like to bring to our attention?**

5. **Did the content provided at this Information Session meet your needs?**

yes.

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Answers supplied in accompanying document.

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Response from:

Answers to Questions:

1. Interest in this project:
    - Directly Affected Landowner
2. Impacts to our property and business:
    a. We will lose several of our production areas during the installation and we will need to establish alternate sites for growing for that time. Alternate production growing sites will need to be built in 2020 in preparation for growing on them in 2021.
    b. Our pond and well are directly in line of the pipeline. These are our two main water sources for irrigating most of the plants we grow. There will need to be a plan that will ensure we have access to water and ability to distribute it to our plants. Efforts implement this plan may need to begin in 2020.
    c. This well is a strong and valuable water supply for us. It will need it to be protected from any damage or water flow disruption.
    d. Vehicle access and nursery production workflow will be disrupted by the activities of the pipeline project. Means of managing this will need to be considered.
    e. The activities of the project will affect the storm water run off system at the nursery. Without appropriate direction, storm runoff water may bring damage to our other growing areas.
    f. have 4 children currently under the age of 8 living at their residence
    g. We want to be sure that there are appropriate safety measures taken to protect them from areas and equipment that are dangerous.

    This is by no means an exhaustive list. The mentioned concerns are what first comes to mind. We will need to examine the implications more thoroughly when the time is appropriate.
    It would be best to meet with a Stantec or Enbridge Gas representative as soon as possible to start discussions.

3. Environmental Considerations:
    - We don't have any suggestions of environmental considerations at this point.
4. Questions or comments about the project:
    - When will the decision be made on which route is chosen?
5. Information session comments:

- Yes, the information session was helpful. It is understandable that much still has to be figured out. The information was a good start.

6. How did we hear about the information session:
    - Project notification letter received by
7. Contact information:

Stantec

Kirkwall-Hamilton Pipeline Project
Information Session Questionnaire – February 27, 2019

Please read the newsletter and look over the displays, and then take a few moments to answer the following questions. Your comments are appreciated. If you require any assistance or clarification while completing the questionnaire please speak with a Stantec or Enbridge Gas representative.

Completed questionnaires can be dropped off at the front table. If you would like additional time to consider your comments, pre-paid envelopes are available at the front table. We request your comments by **March 15, 2019**.

1. **What is your interest in this project?**

   - [x] Directly affected landowner
   - [ ] Surrounding landowner
   - [ ] Interested citizen
   - [ ] Member of interest group
   - [ ] Government official
   - [ ] Other: _____

2. **Please indicate if the project will have any impacts to you, your property or your business that you would like addressed** (i.e., access, noise, dust, traffic, etc.).

   MY PROPERTY HAS THE PIPELINE RUNNING @ THE BACK OF MY PROPERTY WE ARE CONCERNED ABOUT DAMAGE TO OUR HOME NOISE DUST & ACCESS TO OUR PROPERTY & DAMAGE TO THE SURROUNDING AREAS

3. **Please identify any features along the Preliminary Preferred Route that you feel are important to consider during the environmental study.**

   KEEPING NATURAL HABITATS SAFE ,

4. **Do you have any questions or comments about this project that you would like to bring to our attention?**

   WHEN UPGRADING A NETWORK OF GASLINES IT WOULD BENIFIT THE LOCAL COMMUNITIES IF STEP-DOWN STATIONS COULD BE INSTALLED SO THAT THEY MAY BENIFIT BY BEING ABLE TO USE GAS THAT IS RUNNING THROUGH THERE COMMUNITIES .

5. **Did the content provided at this Information Session meet your needs?**

YES

6. **How did you hear about this Information Session? Check all that apply:**

- ☐ Newspaper Advertisement
- ☒ Project Notification Letter
- ☐ Social Media Post(s)
- ☐ Word of Mouth

Thank you for completing this questionnaire. If you have a question about the project that has not been addressed or for which you would like more information, please provide us with your full contact information so that we can respond to you.

Please Print Clearly

Name: _____

Address: _____

Email: _____

Phone: (_____

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To ;- Emily Hartwig, Bsc., EP(f)

Environmental Consultant

Stantec Consulting Ltd.

1-70 Southgate Drive

Guelph

Canada

Ontario

04-03-19

N1G 4P5

Dear Emily,

We are writing about the proposed new gas pipeline that is to be installed between the Kirkwall valve site and to the Hamilton valve site located at Highway 6 north of Carlisle Road. We live in the Antrim Glen community that has three gas-lines already going through the community, the proposed new one to go alongside one of the existing ones.

We have no problem with new gas-lines as expanding the infrastructure is necessary for all businesses to grow, our concern is that although the gas lines go through our community we have no access to it as there are no step down stations close to us. In all expanded services it is far easier to install things as new equipment is being installed rather than trying to add after it is completed.

Antrim Glen has 289 properties, Beverly Hills 168 properties and the Ponderosa has approximately 100 properties making over 550 properties that would benefit from being able to access natural gas. The cost of the new pipe-line must be in the hundreds of million dollars to install and the cost of a step down station and piping to the communities would be negligible with the cost of it recoverable with the selling of the natural gas to these communities in a short period of time.

Government bodies are always asking for companies to expand to provide better infrastructure for local communities and profit is very necessary for this to happen but it is also necessary for everyone to feel it is a win win situation for everyone concerned. Natural gas is far cheaper to heat homes and water than either Propane or oil and is also a lot cleaner and environmentally a better proposition. Having to endure an upset for approximately six months when the pipe-line is installed would be a lot easier to accept if the local communities felt that they would be getting something in return.

We will be sending a copy of this letter to the Chairman of our Homeowners Association. We would welcome any replies that would assist everyone in coming to a satisfactory conclusion for all parties.

Yours Faithfully

Stantec

Kirkwall-Hamilton Pipeline Project
Information Session Questionnaire – February 27, 2019

Please read the newsletter and look over the displays, and then take a few moments to answer the following questions. Your comments are appreciated. If you require any assistance or clarification while completing the questionnaire please speak with a Stantec or Enbridge Gas representative.

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1. **What is your interest in this project?**

   ☑ Directly affected landowner
   ☐ Surrounding landowner
   ☐ Interested citizen
   ☐ Member of interest group
   ☐ Government official
   ☐ Other: _____

2. **Please indicate if the project will have any impacts to you, your property or your business that you would like addressed** (i.e., access, noise, dust, traffic, etc.).

   Presumably you will access the project from our property

3. **Please identify any features along the Preliminary Preferred Route that you feel are important to consider during the environmental study.**

4. **Do you have any questions or comments about this project that you would like to bring to our attention?**

   What are you doing with those big maps?
   I would take an extra one when you are done with it.

5. **Did the content provided at this Information Session meet your needs?**

Reasonable
the ... e display was good
- I am curious about the long term impact on capillary transport of moisture in the soil above the pipeline compared to the surrounding area

6. **How did you hear about this Information Session? Check all that apply:**

- ☐ Newspaper Advertisement
- ☒ Project Notification Letter
- ☐ Social Media Post(s)
- ☐ Word of Mouth

Thank you for completing this questionnaire. If you have a question about the project that has not been addressed or for which you would like more information, please provide us with your full contact information so that we can respond to you.

Please Print Clearly

Name: [redacted]

Address:

Phone: (_____

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Kirkwall-Hamilton Pipeline Project
Information Session Questionnaire – May 9, 2019

Please read the newsletter and look over the displays, and then take a few moments to answer the following questions. Your comments are appreciated. If you require any assistance or clarification while completing the questionnaire please speak with a Stantec or Enbridge Gas representative.

Completed questionnaires can be dropped off at the front table. If you would like additional time to consider your comments, pre-paid envelopes are available at the front table. We request your comments by **May 24, 2019**.

1. **What is your interest in this project?**

   ☐ Directly affected landowner
   ☐ Surrounding landowner
   ☑ Interested citizen
   ☐ Member of interest group
   ☐ Government official
   ☐ Other: _____

2. **Please indicate if the project will have any impacts to you, your property or your business that you would like addressed** (i.e., access, noise, dust, traffic, etc.).

   None

3. **Please identify any features along the Preferred Route that you feel are important to consider during the environmental study.**

4. **Do you have any questions or comments about this project that you would like to bring to our attention?**

   restoration after project is completed is most important

5. **Did the content provided at this Information Session meet your needs?**

Yes

6. **How did you hear about this Information Session? Check all that apply:**

- [x] Newspaper Advertisement
- [ ] Project Notification Letter
- [ ] Social Media Post(s)
- [x] Word of Mouth

Thank you for completing this questionnaire. If you have a question about the project that has not been addressed or for which you would like more information, please provide us with your full contact information so that we can respond to you.

Please Print Clearly

Name: _____

Address: _____

Email: _____

Phone: (_____)_____

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Stantec

Kirkwall-Hamilton Pipeline Project
Information Session Questionnaire – May 9, 2019

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Completed questionnaires can be dropped off at the front table. If you would like additional time to consider your comments, pre-paid envelopes are available at the front table. We request your comments by **May 24, 2019**.

1. **What is your interest in this project?**

   ☐ Directly affected landowner
   ☐ Surrounding landowner
   ☒ Interested citizen
   ☐ Member of interest group
   ☐ Government official
   ☐ Other: _____

2. **Please indicate if the project will have any impacts to you, your property or your business that you would like addressed** (i.e., access, noise, dust, traffic, etc.).

   Risk to my local watershed

3. **Please identify any features along the Preferred Route that you feel are important to consider during the environmental study.**

   Waterways

4. **Do you have any questions or comments about this project that you would like to bring to our attention?**

   I feel that this project should have independant risk assessment on behalf of taxpayers given the embodied risk of the fuel, industry, and changing policy.

5. **Did the content provided at this Information Session meet your needs?**

I believe that the information provided adequate. Friendly and helpful staff

6. **How did you hear about this Information Session? Check all that apply:**

- ☐ Newspaper Advertisement
- ☐ Project Notification Letter
- ☐ Social Media Post(s)
- ☒ Word of Mouth

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Please Print Clearly

Name: _____

Address: _____

Email: _____

Phone: (_____)_____

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Stantec

Kirkwall-Hamilton Pipeline Project
Information Session Questionnaire – May 9, 2019

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1. **What is your interest in this project?**

   ☐ Directly affected landowner
   ☐ Surrounding landowner
   ☑ Interested citizen
   ☐ Member of interest group
   ☐ Government official
   ☐ Other: _____

2. **Please indicate if the project will have any impacts to you, your property or your business that you would like addressed** (i.e., access, noise, dust, traffic, etc.).

   None.

3. **Please identify any features along the Preferred Route that you feel are important to consider during the environmental study.**

   everything you are addressing

4. **Do you have any questions or comments about this project that you would like to bring to our attention?**

   I didn't know about the first inf. session
   Thank you sooo much for this one May 9/2019.
   ☺ nice to be included.
   Please let me know if anything changes
   & comes to my house ☺.

5. **Did the content provided at this Information Session meet your needs?**

yes.

6. **How did you hear about this Information Session? Check all that apply:**

- [x] Newspaper Advertisement
- [ ] Project Notification Letter
- [ ] Social Media Post(s)
- [ ] Word of Mouth

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Please Print Clearly

Name: _____

Address: _____

Email: _____

Phone: (_____

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Kirkwall-Hamilton Pipeline Project
Information Session Questionnaire – May 9, 2019

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Completed questionnaires can be dropped off at the front table. If you would like additional time to consider your comments, pre-paid envelopes are available at the front table. We request your comments by **May 24, 2019**.

1. **What is your interest in this project?**

   ☐ Directly affected landowner
   ☑ Surrounding landowner
   ☑ Interested citizen
   ☐ Member of interest group
   ☐ Government official
   ☐ Other: Immediate Neighbour

2. **Please indicate if the project will have any impacts to you, your property or your business that you would like addressed** (i.e., access, noise, dust, traffic, etc.).

   See Attached letters

3. **Please identify any features along the Preferred Route that you feel are important to consider during the environmental study.**

   Blasting & its Impact on our property. See Attached letters

4. **Do you have any questions or comments about this project that you would like to bring to our attention?**

   See Attached letters

5. **Did the content provided at this Information Session meet your needs?**

See the attached letters

6. **How did you hear about this Information Session? Check all that apply:**

- [x] Newspaper Advertisement
- [x] Project Notification Letter
- [ ] Social Media Post(s)
- [ ] Word of Mouth

Thank you for completing this questionnaire. If you have a question about the project that has not been addressed or for which you would like more information, please provide us with your full contact information so that we can respond to you.

Please Print Clearly
Name:
Address:

Email:

Phone:

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We appreciated once again the opportunity to meet with Michael Candido of StanTec, and also to personally connect with Brian Lenny, the representative of Enbridge with whom we had corresponded and spoken to via phone at the meeting held at the Valens Community Centre on Thursday May 12, 2019. We shared with them as we had previously shared that we fully understand that progress has to continue but must be managed with the least impact on the environment and neighbouring land as it has negative consequences at many levels and often very expensive ones to the owners of properties that are impacted adversely.

We have appreciated Michael Candido taking time to hear our concern regarding the variations which would have had a grave negative impact on us, our life, our business, the land, our property and our home in every sense of the manner with whom we personally met on March 12, 2019. The mere thought of it had created undue emotional stress which by all standards of common consideration was unacceptable and would have been cruel and also impacted adversely the value of our property. It is a great relief that those options are off the table.

It is understood whenever there is construction in the neighbourhood there is increased dust and noise. Our area is very rocky and even widening the pipelines will require the blasting of the rocks that can impact negatively on the buildings on the property that may not be close but are impacted being on similar grid! Our concern was shared with both Brian and Michael.

Michael made notes of the following concerns we expressed based of our previous experience when there was blasting occurring at the Antrim Glen to make basements etc, something we were told would not be happening when we bought the property in early 1995. There were going to be homes built for seniors and sold on a 90 year lease basis but without basements was our understanding from the open house. We were neither consulted about the changes to the plans nor given any notice of the impending dates of blasting of the rocks even though our property backs to the Antrim Glenn Property. We were simply left to deal with its negative impact as we witnessed its gradual impact on our home and the creek. The Spencer creek runs the entire length of our property on the west side.

It is our understanding that now as part of the process to install the planned 48" pipeline extension there will be a need for blasting through the rocks that are part of the area, adjoining our property. We have shared with Michael Candido and Brian Lenny our personal experience and its negative impact on our home when blasting took place at Antrim Glen in order to build basements in the later additions to the community. At that time the blasting took place, usually mid afternoon for a short period of time, the noise was penetrating and felt as if bombs had fallen in the area. We were, as well as our immediate neighbours were impacted.

As a direct result of this activity our home which had been built in 1981/82 and had already settled, settled again about one year after the blasting had taken place with the ceilings separating from the walls, and in one location the floor separating from the wall. The resulting repairs to rectify these matters ran into a few thousand dollars.

We have requested that representatives of Enbridge make a site visit to our home before any blasting related to the installation of the new pipeline extension takes place, and then it is followed up with a site visit approximately one year or later to determine whether any negative impact on our home has taken place as a result.

REFLECTIONS ON PAST EXPERIENCE

From experience we know that any construction close to where one lives creates excessive dust and at times, depending upon the type of construction and activity, there is varying level of noise. It increasingly demands more work to keep a home clean. Apart from the noise what concerns us most is the possibility of vibrations due to construction and any blasting that may impact adversely one's living structure that is both stressful and costly.

We bought our farm and home in early 1995. At that time we were told the Antrim Glenn properties would not be having any basements. Years later a number of times when by chance we happened to be home in the afternoon a noise as if a bomb was being discharged would shake the house and extreme vibration was felt all over forcing us out of the home to see what had happened but nothing was visible when we went out to check if a plane had fallen on our roof. This disturbance was repeated on several days around 3-4 PM, when generally we and the neighbours would be at work.

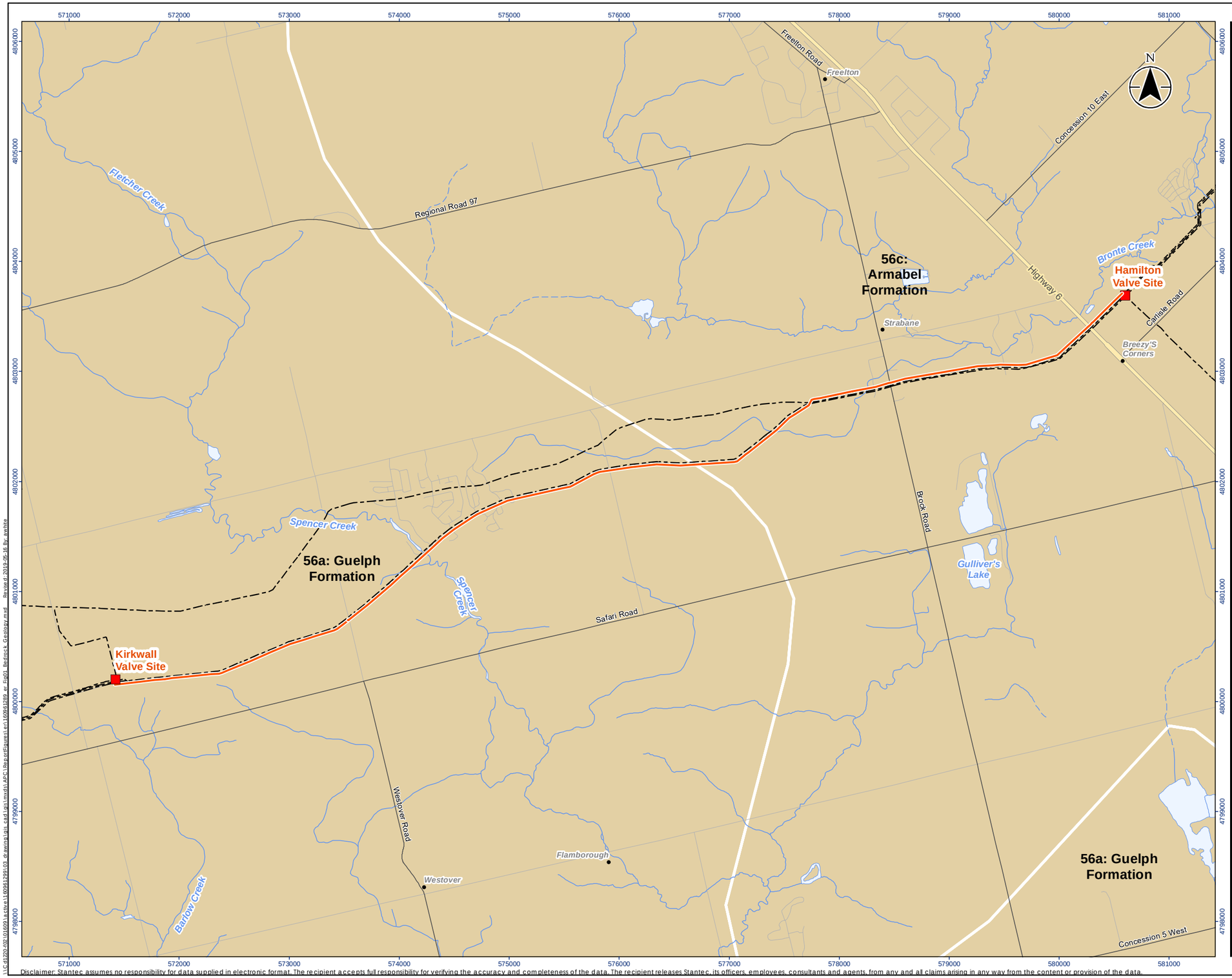
On inquiry we discovered that at Antrim Glen rocks was being blasted in order to built basements and a water reservoir. Eventually this action resulted in visible damage to our home, a solid construction built in 1982. It had remained in excellent shape, but after we had lived here for a few years began to show cracks and settlement. We had to have repairs done to correct the unusual settlement and had the entire house repainted.

After being here for a few years we also began to notice changes in the Spencer creek for the worse. On inquiry we learnt that Antrim Glenn waste was being discharged in the Spencer creek after treatment. We were told that the water disposed off was good enough to drink, however the changes to the water spoke a different story.

It is sad to say farm work is literally a 24/7 day affair with little tangible rewards and requires hard work dedication and then farmers pray that Nature is kind. Sometime it feels that as a culture we have very little regard for our citizens working the land!

APPENDIX C:
EXISTING CONDITIONS FIGURES





Stantec

Legend

- Enbridge Existing Station
- Preferred Route
- Enbridge Existing Pipeline

Bedrock Geology

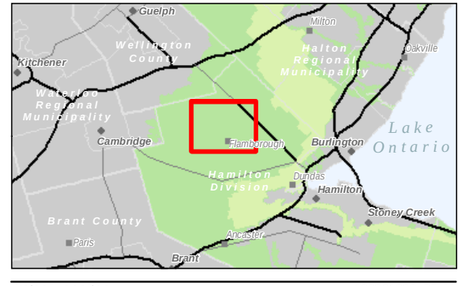
- 56a: Guelph Fm. (also present in the Upper Silurian)
- 56c: Amabel Fm.
- Watercourse (Intermittent)
- Watercourse (Permanent)
- Waterbody

0 1 2 km

1:35,000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2019.
3. Bedrock geology data source: Ontario Geological Survey 2011. 1:250 000 scale bedrock geology of Ontario; Ontario Geological Survey, Miscellaneous Release-Data 126-Revision 1. ISBN 978-1-4435-5704-7 (CD) ISBN 978-1-4435-5705-4



Project Location
City of Hamilton

160961299 REVA
Prepared by AW on 2019-05-16
Technical Review by ST on 2019-05-06

Client/Project
ENBRIDGE GAS INC.
KIRKWALL-HAMILTON PIPELINE PROJECT

Figure No.
1

Title
Bedrock Geology

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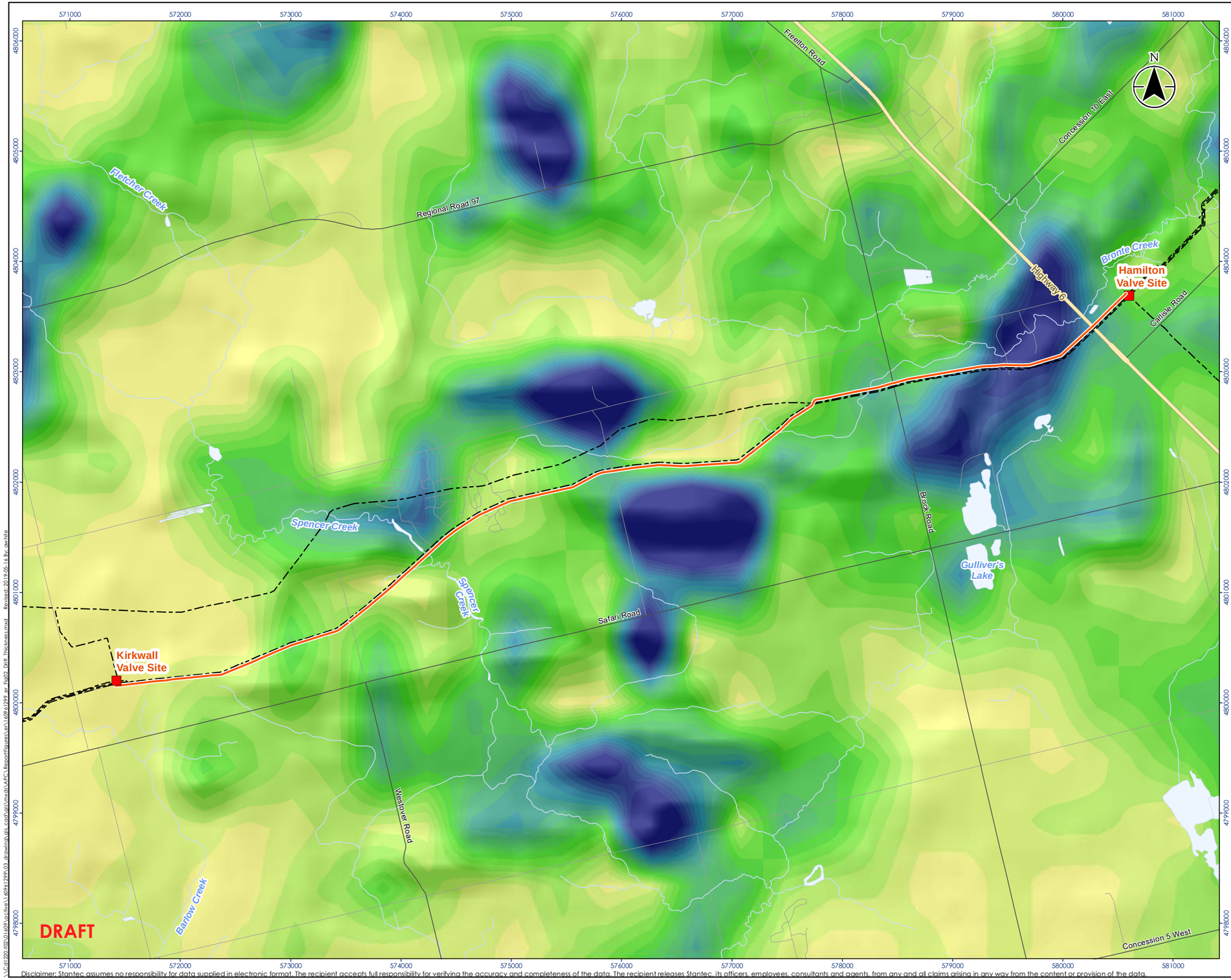

Stantec

Legend

- Preferred Route
- Enbridge Existing Station
- Enbridge Existing Pipeline
- Expressway / Highway
- Major Road
- Minor Road
- Watercourse
- Waterbody

Drift Thickness

(m)

- High : 35
- Low : 0

0 1 2 km

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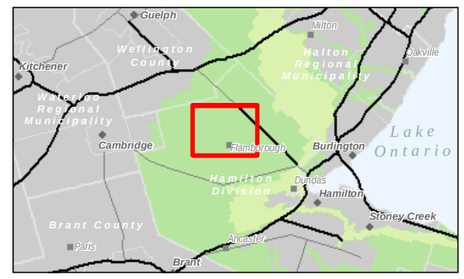
Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2019.
3. Drift thickness data source: Gao, C., Shirota, J., Kelly, R.I., Brunton, F.R. and van Haaften, S. 2006. Bedrock topography and overburden thickness mapping, Southern Ontario; Ontario Geological Survey, Miscellaneous Release—Data 207.



Project Location
City of Hamilton

160961299 REVA
Prepared by AW on 2019-05-16
Technical Review by ABC on YYYY-MM-DD

Client/Project
ENBRIDGE GAS INC.
KIRKWALL-HAMILTON PIPELINE PROJECT

Figure No.
2

Title
Drift Thickness

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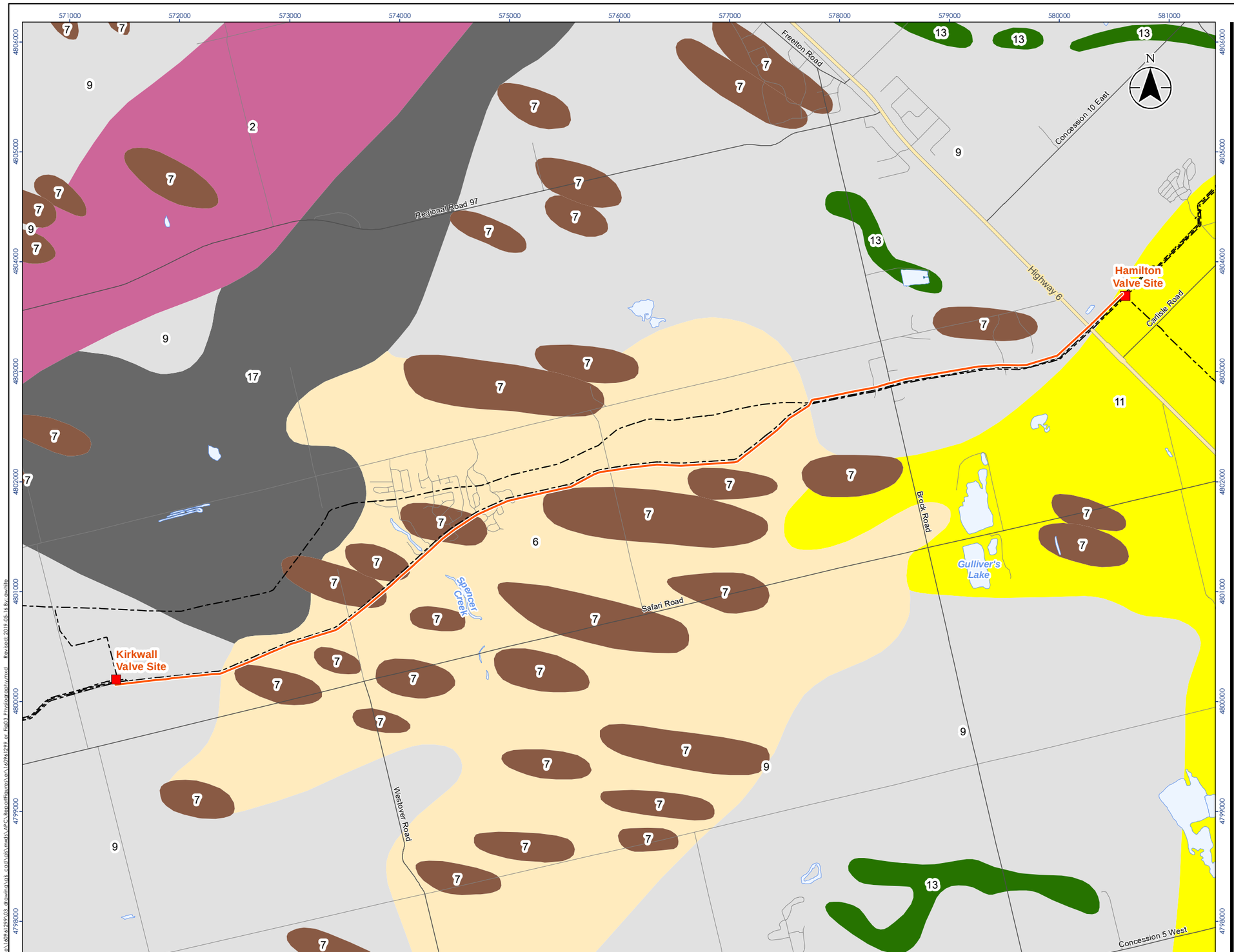


Stantec

Legend

- Preferred Route
- Enbridge Existing Station
- Enbridge Existing Pipeline
- Expressway / Highway
- Major Road
- Minor Road
- Waterbody

Physiography

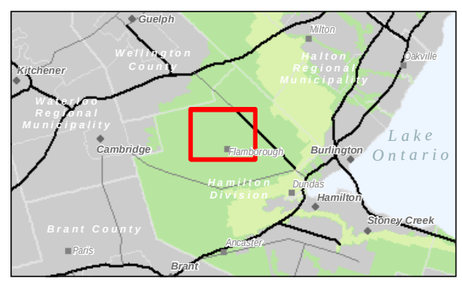
- 2: Till Moraines
- 6: Till Plains (Drumlinized)
- 7: Drumlins
- 9: Limestone Plains
- 11: Sand Plains
- 13: Eskers
- 17: Peat And Muck

0 1 2 km

1:35,000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2019.
3. Physiography data source: Chapman, L.J. and Putnam, D.F. 2007. Physiography of southern Ontario; Ontario Geological Survey, Miscellaneous Release—Data 228.



Project Location
City of Hamilton

160961299 REVA
Prepared by AW on 2019-05-16
Technical Review by ABC on YYYY-MM-DD

Client/Project
ENBRIDGE GAS INC.
KIRKWALL-HAMILTON PIPELINE PROJECT

Figure No.
3

Title
Physiography

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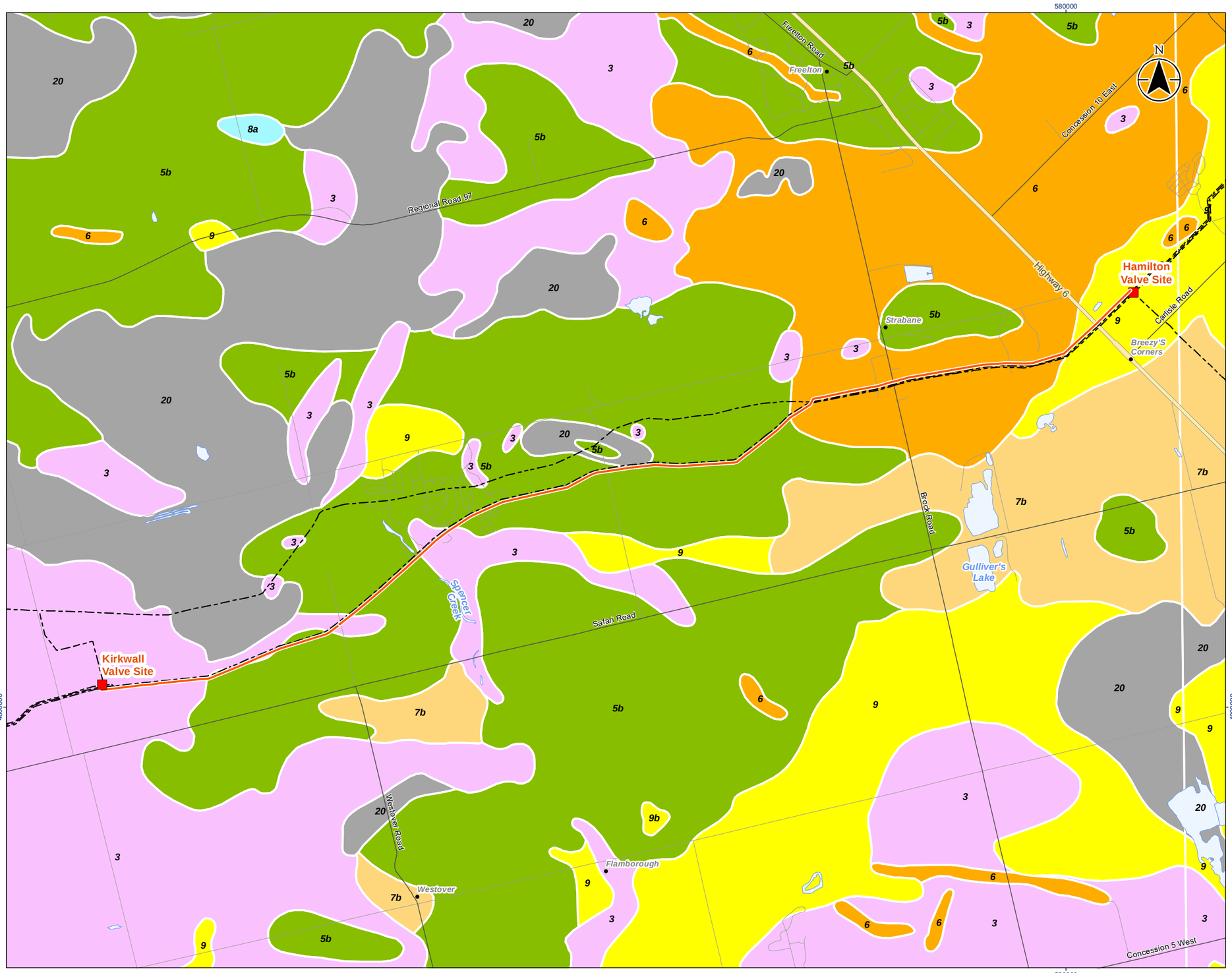


Stantec

Legend

- Preferred Route
- Enbridge Existing Station
- Enbridge Existing Pipeline
- Expressway / Highway
- Major Road
- Minor Road
- Waterbody

Surficial Geology

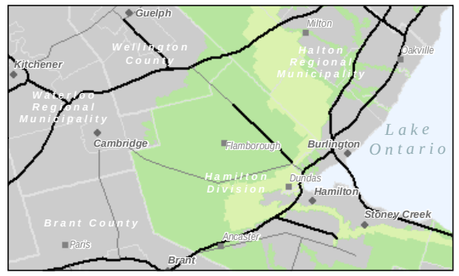
- 3: Paleozoic bedrock
- 5b: Stone-poor, carbonate-derived silty to sandy till
- 6: Ice-contact stratified deposits
- 7b: Glaciofluvial deposits (Gravelly deposits)
- 8a: Fine-textured glaciolacustrine deposits (Massive-well laminated)
- 9: Coarse-textured glaciolacustrine deposits
- 9b: Coarse-textured glaciolacustrine deposits (Littoral-foreshore deposits)
- 20: Organic deposits

0 1 2 km

1:35,000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2019.
3. Surficial geology data source: Ontario Geological Survey 2010. Surficial geology of Southern Ontario; Ontario Geological Survey, Miscellaneous Release--Data 128-REV ISBN 978-1-4435-2483-4.



Project Location
City of Hamilton

160961299 REVA
Prepared by AW on 2019-05-16
Technical Review by ABC on YYYY-MM-DD

Client/Project
ENBRIDGE GAS INC.
KIRKWALL-HAMILTON PIPELINE PROJECT

Figure No.
4

Title
Surficial Geology

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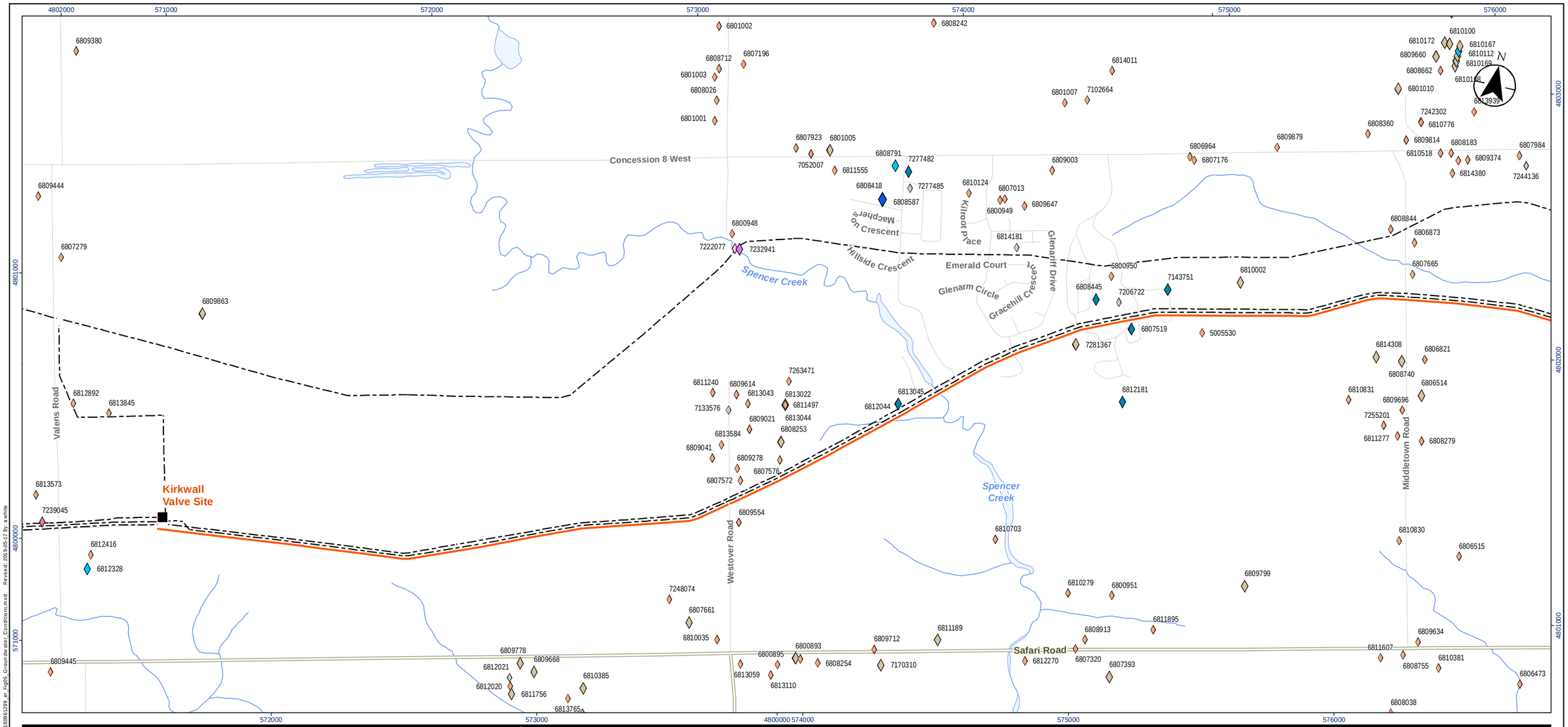

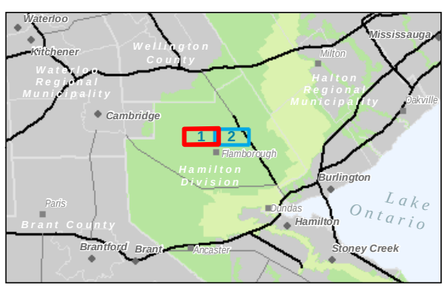

Legend

- Enbridge Existing Station
- Preferred Route
- Enbridge Existing Pipeline
- Domestic
- No Data
- Livestock
- Commerical
- Monitoring
- Public
- Monitoring and Test Hole
- Test Hole
- Municipal
- Major Road
- Minor Road
- Watercourse (Permanent)
- Waterbody

0 250 500 metres

1:15,000 (At original document size of 11x17)

Notes

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Stantec

Project Location
City of Hamilton

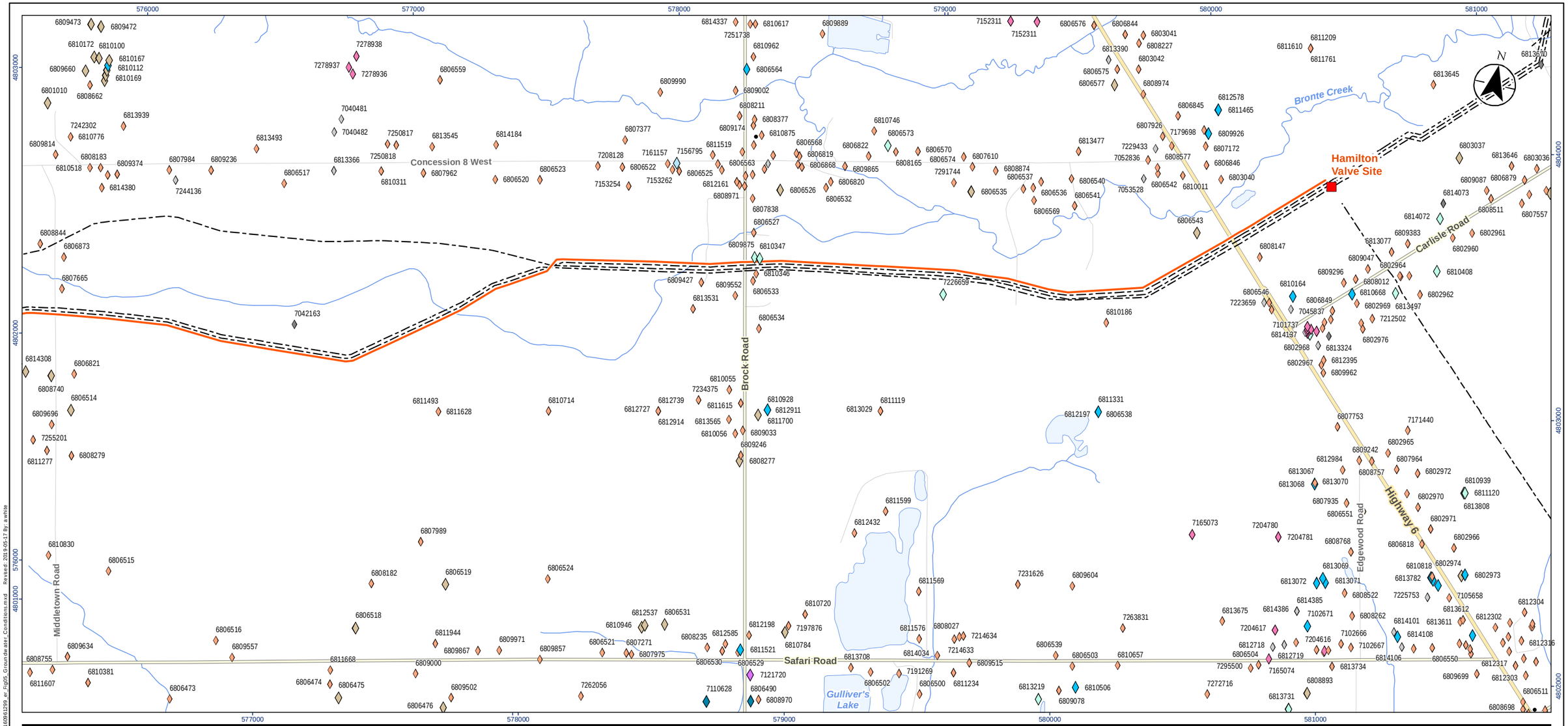
160961299 REVA
Prepared by AW on 2019-05-17
Technical Review by ABC on yyyy-mm-dd

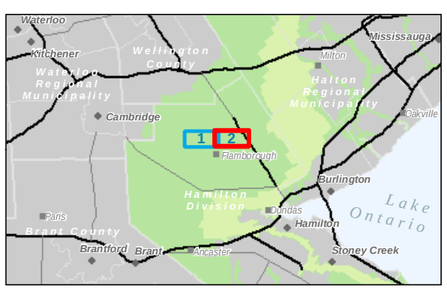
Client/Project
ENBRIDGE GAS INC.
KIRKWALL-HAMILTON PIPELINE PROJECT

Figure No.
5

Title
Groundwater Conditions

LC:d1220:r02:01699:active:160961299:03_drawing:gis_cad:gis:mxds:APC:ReportFigures:er:160961299_er_Fig05_Groundwater_Conditions.mxd Revised: 2019-05-17 By: awhite





Legend

- Enbridge Existing Station
- Preferred Route
- Enbridge Existing Pipeline
- Domestic
- No Data
- Livestock
- Commerical
- Monitoring
- Not Used
- Public
- Irrigation
- Test Hole
- Cooling And A/C
- Other Named Place
- Expressway / Highway
- Major Road
- Minor Road
- Watercourse (Intermittent)
- Watercourse (Permanent)
- Waterbody

0 250 500 metres

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Notes

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Stantec

Project Location
City of Hamilton

160961299 REVA
Prepared by AW on 2019-05-17
Technical Review by ABC on yyyy-mm-dd

Client/Project
ENBRIDGE GAS INC.
KIRKWALL-HAMILTON PIPELINE PROJECT

Figure No.
5

Title
Groundwater Conditions

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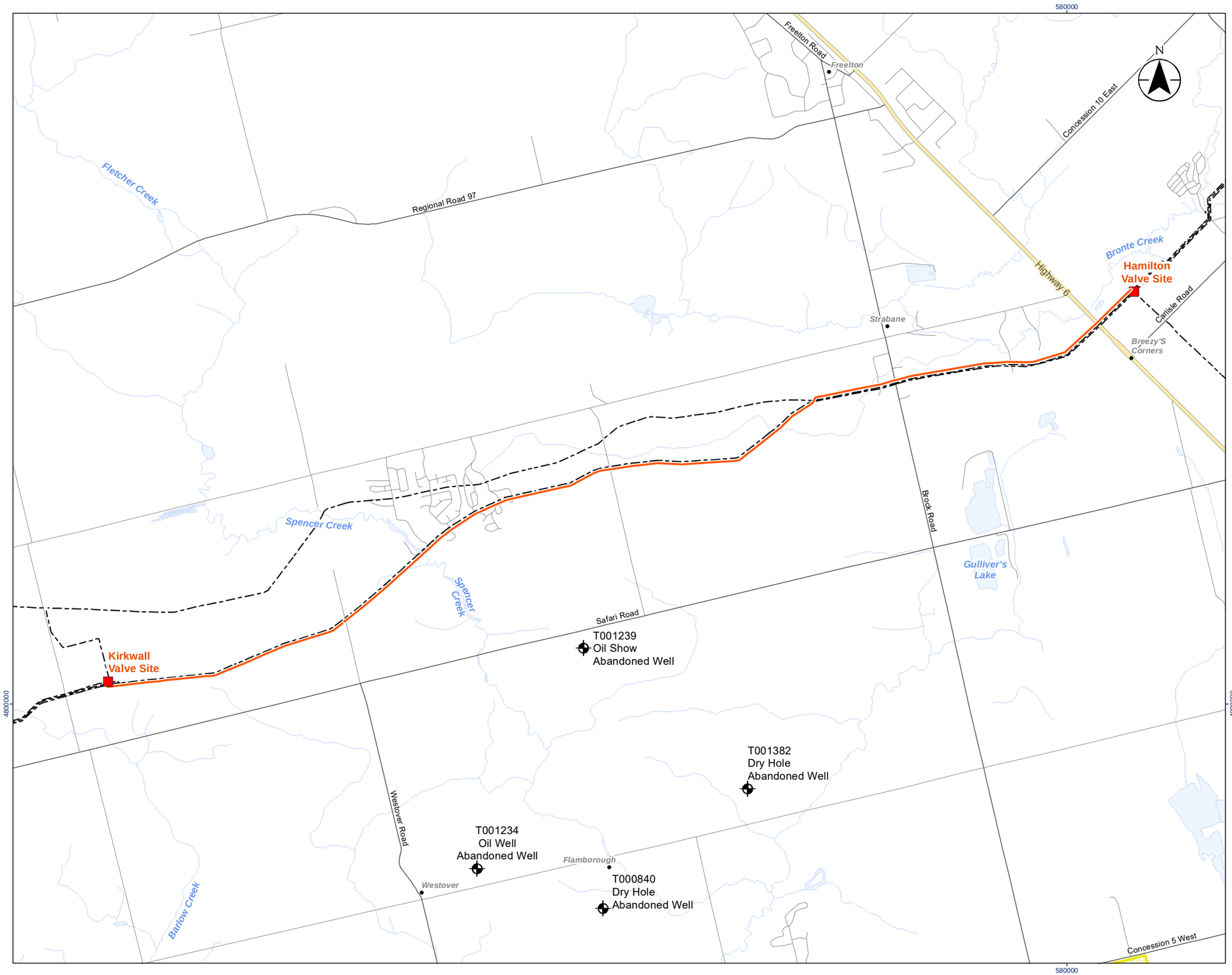

Stantec

Legend

- Petroleum Well
- Aggregate Site - Active
- Expressway / Highway
- Major Road
- Minor Road
- Watercourse
- Waterbody

0 1 2 km

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Notes

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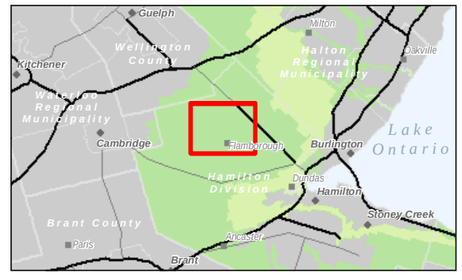

Project Location
City of Hamilton

160961299 REVA
Prepared by AW on 2019-05-17
Technical Review by ABC on 2019-MM-DD

Client/Project
ENBRIDGE GAS INC.
KIRKWALL-HAMILTON PIPELINE PROJECT

Figure No.
6

Title
Aggregate and Petroleum Resources

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Legend Text

- BRT. BRANT SILT LOAM - SHALLOW PHASE
- BUF. BURFORD LOAM
- CWO. COLWOOD SILT LOAM
- DUF. DUMFRIES LOAM
- DUF. DUMFRIES LOAM - ROCKY PHASE
- DYK. DONNYBROOK GRAVELLY LOAM
- FMB. FLAMBORO SANDY LOAM
- FMB. FLAMBORO SANDY LOAM - SHALLOW PHASE
- FRM. FARMINGTON LOAM
- GMY. GRIMSBY SANDY LOAM
- GMY. GRIMSBY SANDY LOAM - SHALLOW PHASE
- GUP. GUELPH LOAM
- GUP. GUELPH LOAM - SHALLOW PHASE
- KIL. KILLEAN LOAM
- LIY. LILY LOAM
- LOD. LONDON LOAM
- LOD. LONDON LOAM - SHALLOW PHASE
- PLL. PARKHILL LOAM
- PLL. PARKHILL LOAM - SHALLOW PHASE
- SRI. SPRINGVALE SANDY LOAM
- TLD. TOLEDO SILT LOAM - SHALLOW PHASE
- TUC. TUSCOLA SILT LOAM - SHALLOW PHASE
- VLD. VINELAND SANDY LOAM
- VLD. VINELAND SANDY LOAM - SHALLOW PHASE
- ZBU. BUILT UP AREA
- ZMK. MUCK
- ZST. STREAM COURSE

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Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
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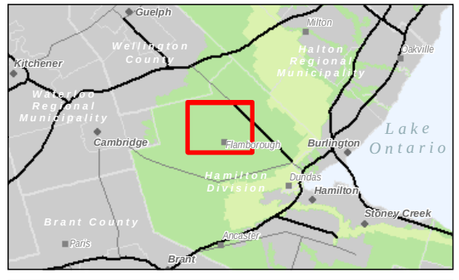

Project Location
City of Hamilton

160961299 REVA
Prepared by AW on 2019-05-27
Technical Review by ABC on 2019-MM-DD

Client/Project
ENBRIDGE GAS INC.
KIRKWALL-HAMILTON PIPELINE PROJECT

Figure No.
7

Title
Soil Types

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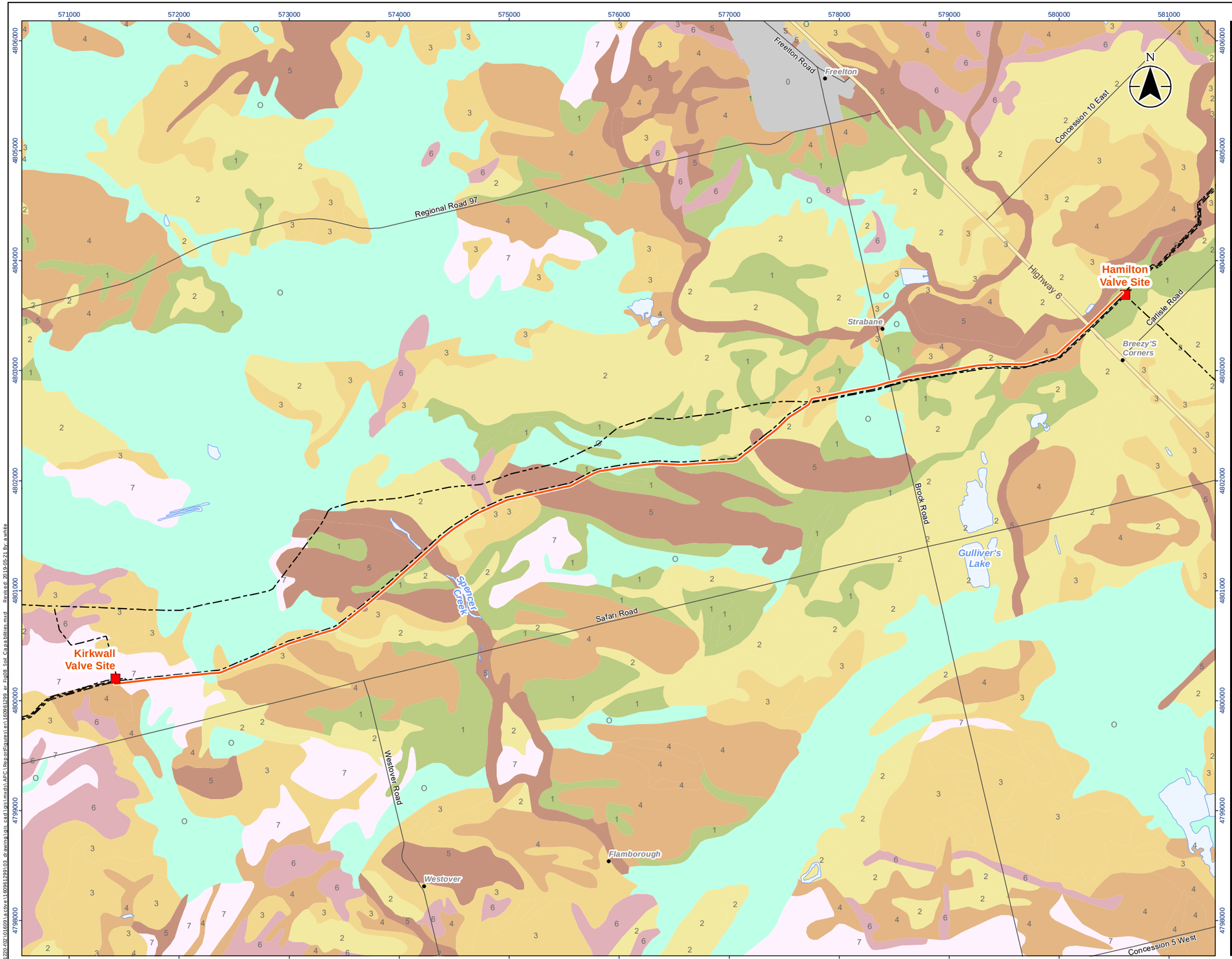

Stantec

Legend

- Enbridge Existing Station
- Preferred Route
- Enbridge Existing Pipeline
- Waterbody

Soil Capability Classification of Agriculture

- 1: Soils in this class have no significant limitations in use for crops
- 2: Soils in this class have moderate limitations that restrict the range of crops or require moderate conservation practices
- 3: Soils in this class have moderately severe limitations that restrict the range of crops or require special conservation practices
- 4: Soils in this class have severe limitations that restrict the range of crops or require special conservation practices
- 5: Soils in this class gave very severe limitations that restrict their capability in producing perennial forage crops, and improvement practices are feasible
- 6: Soils in this class are capable only of producing perennial forage crops, and improvement practices are not feasible
- 7: Soils in this class have no capacity for arable culture or permanent pasture
- Organic Soils (not placed in capability classes)
- CLI Unavailable

0 1 2 km

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Notes

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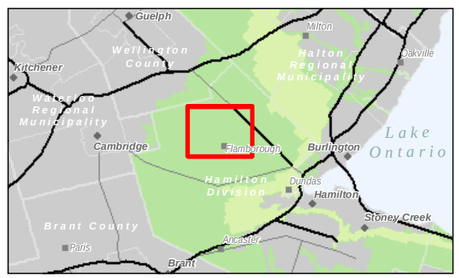

Project Location
City of Hamilton

160961299 REVA
Prepared by AW on 2019-05-21
Technical Review by ABC on 2019-MM-DD

Client/Project
ENBRIDGE GAS INC.
KIRKWALL-HAMILTON PIPELINE PROJECT

Figure No.
8

Title
Soil Capability

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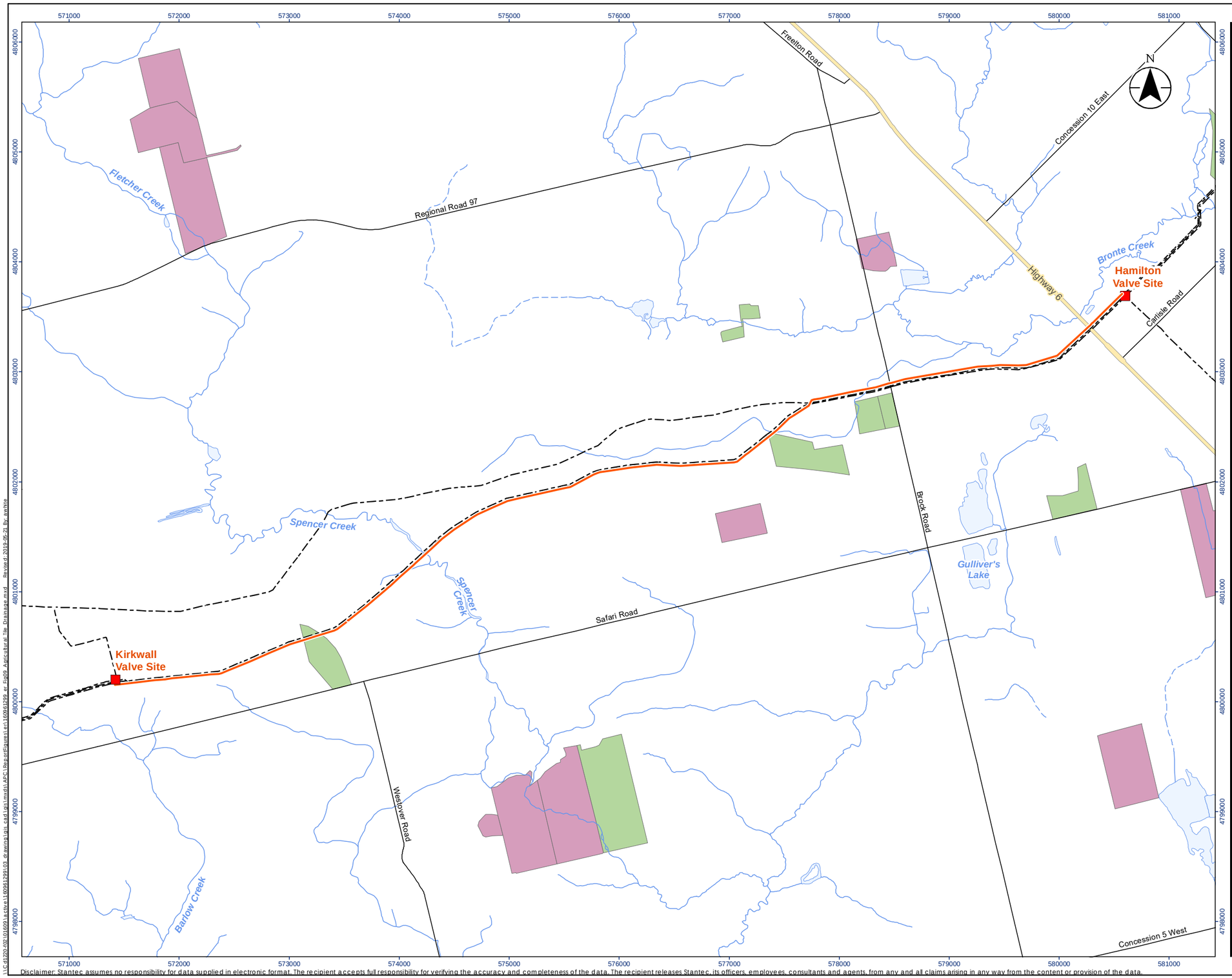

Stantec

Legend

- Railway
- Expressway / Highway
- Major Road
- Minor Road
- Watercourse (Intermittent)
- Watercourse (Permanent)
- Waterbody

Tile System Type

- Random
- Systematic

0 1 2 km

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Notes

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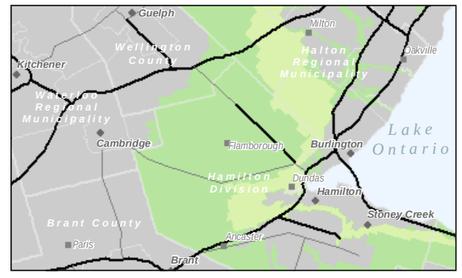

Project Location
City of Hamilton

160961299 REVA
Prepared by AW on 2019-05-21
Technical Review by ABC on 2019-MM-DD

Client/Project
ENBRIDGE GAS INC.
KIRKWALL-HAMILTON PIPELINE PROJECT

Figure No.
9

Title
Known Agricultural Tile Drainage

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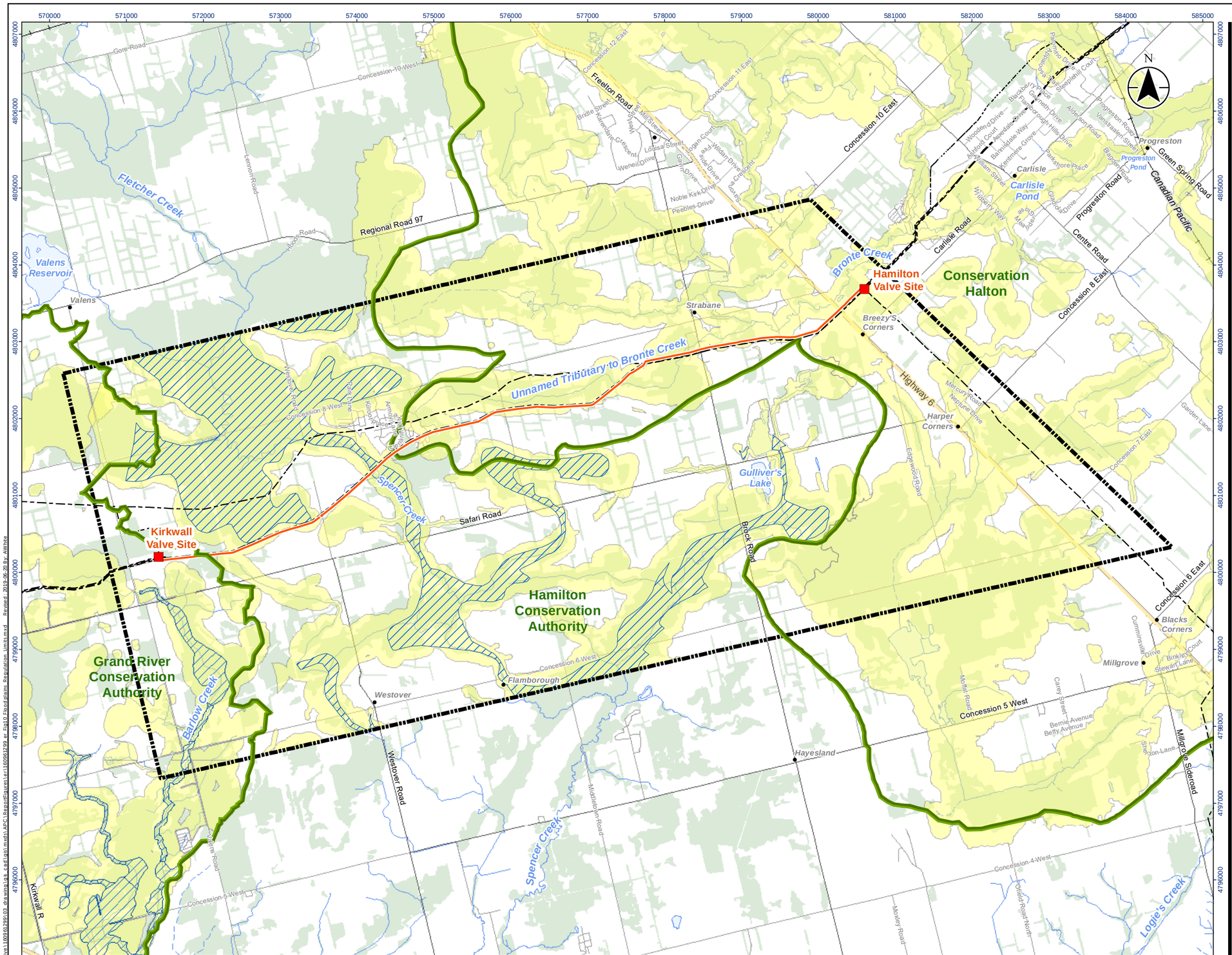

Stantec

Legend

- Study Area
- Preferred Route
- Enbridge Existing Station
- Enbridge Existing Pipeline
- Railway
- Expressway / Highway
- Major Road
- Minor Road
- Waterbody
- Regulated Area
- Floodplain

1:50,000 (At original document size of 11x17)

Notes

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Technical Review by ABC on YYYY-MM-DD

Client/Project
ENBRIDGE GAS INC.
KIRKWALL-HAMILTON PIPELINE PROJECT

Figure No.
10

Title
Floodplains and Regulation Limits

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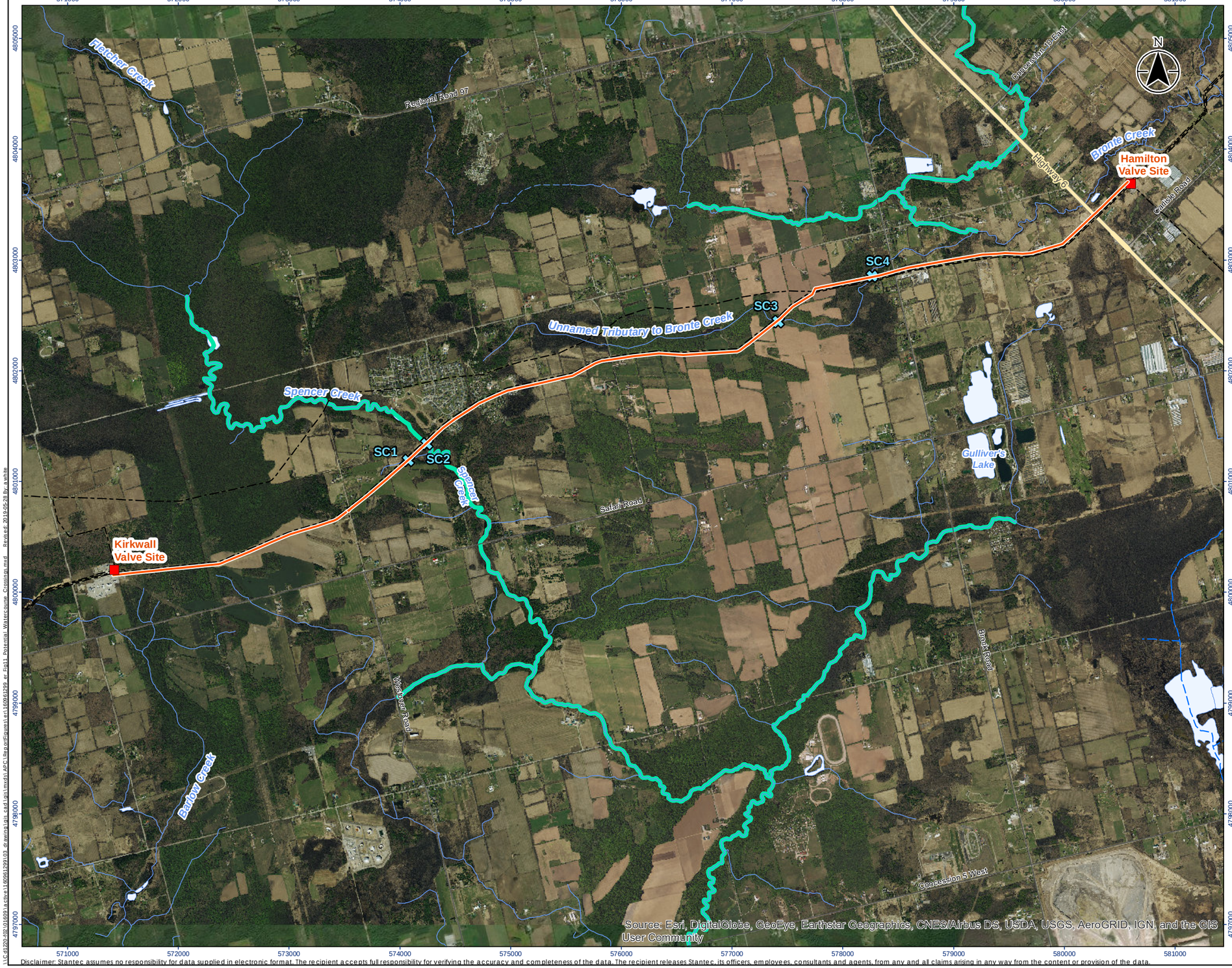

Stantec

N

Legend

- Watercourse Crossing
- Watercourse (Intermittent)
- Watercourse (Permanent)
- DFO Aquatic Species at Risk - Fish
- Waterbody

DFO Drain Class

- E

0 500 1,000 m

1:35,000 (At original document size of 11x17)

Notes

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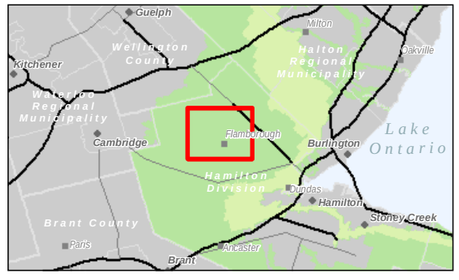

Project Location
City of Hamilton

160961299 REVA
Prepared by AW on 2019-05-28
Technical Review by ABC on 2019-mm-dd

Client/Project
ENBRIDGE GAS INC.
KIRKWALL-HAMILTON PIPELINE PROJECT

Figure No.
11

Title
Potential Watercourse Crossings

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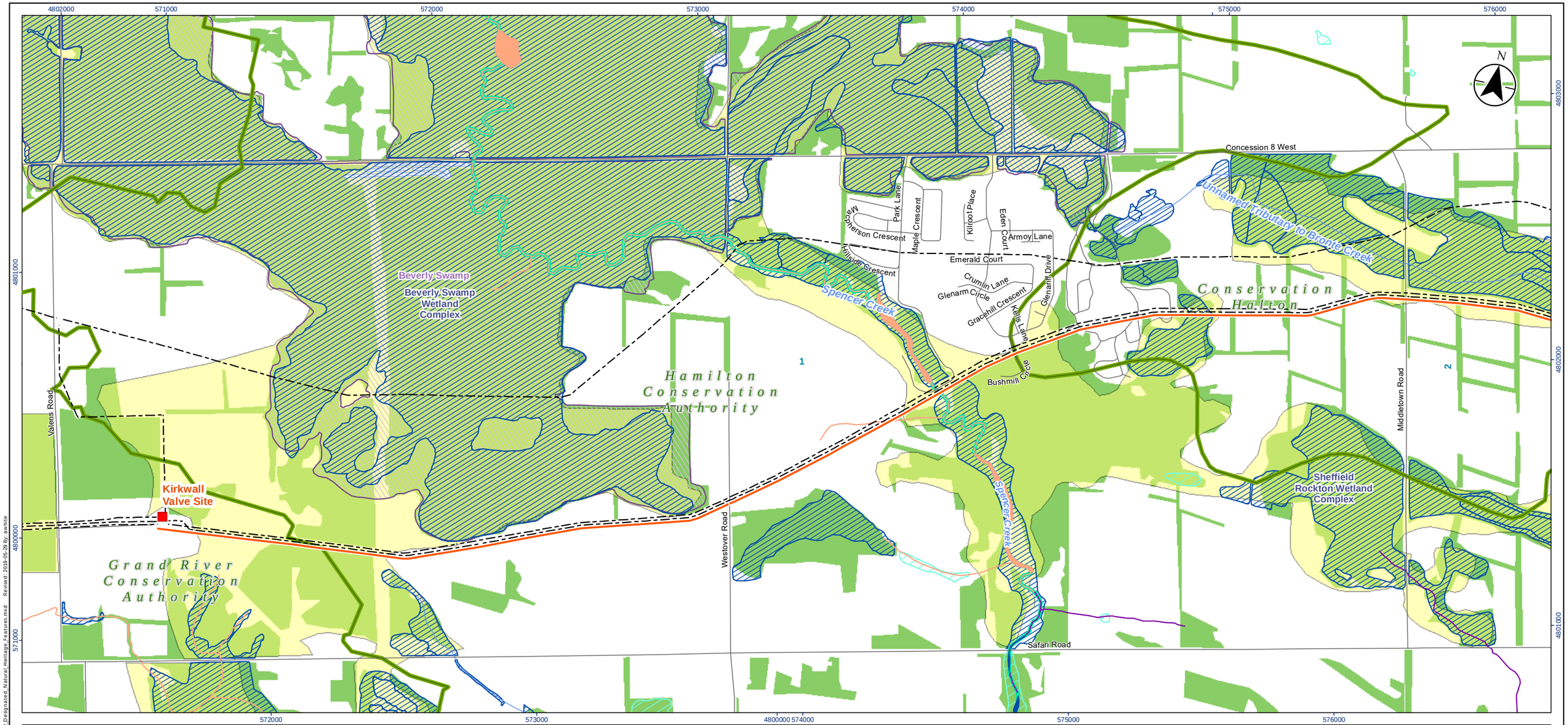



Legend

- Thermal Regime, Cold
- Thermal Regime, Warm
- Watercourse (Permanent)
- ANSI, Life Science
- Conservation Area Administrative Boundary
- City of Hamilton Environmentally Sensitive Areas
- DFO Aquatic Species at Risk - Fish
- Waterbody
- Wetland, Provincially Significant
- Wetland, Not evaluated per OWES
- Wooded Area

0 250 500 metres

1:15,000 (At original document size of 11x17)

Notes

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Project Location
City of Hamilton

160961299 REVA
Prepared by AW on 2019-05-29
Technical Review by ABC on yyyy-mm-dd

Client/Project
ENBRIDGE GAS INC.
KIRKWALL-HAMILTON PIPELINE PROJECT

Figure No.
12

Title
Designated Natural Heritage Features

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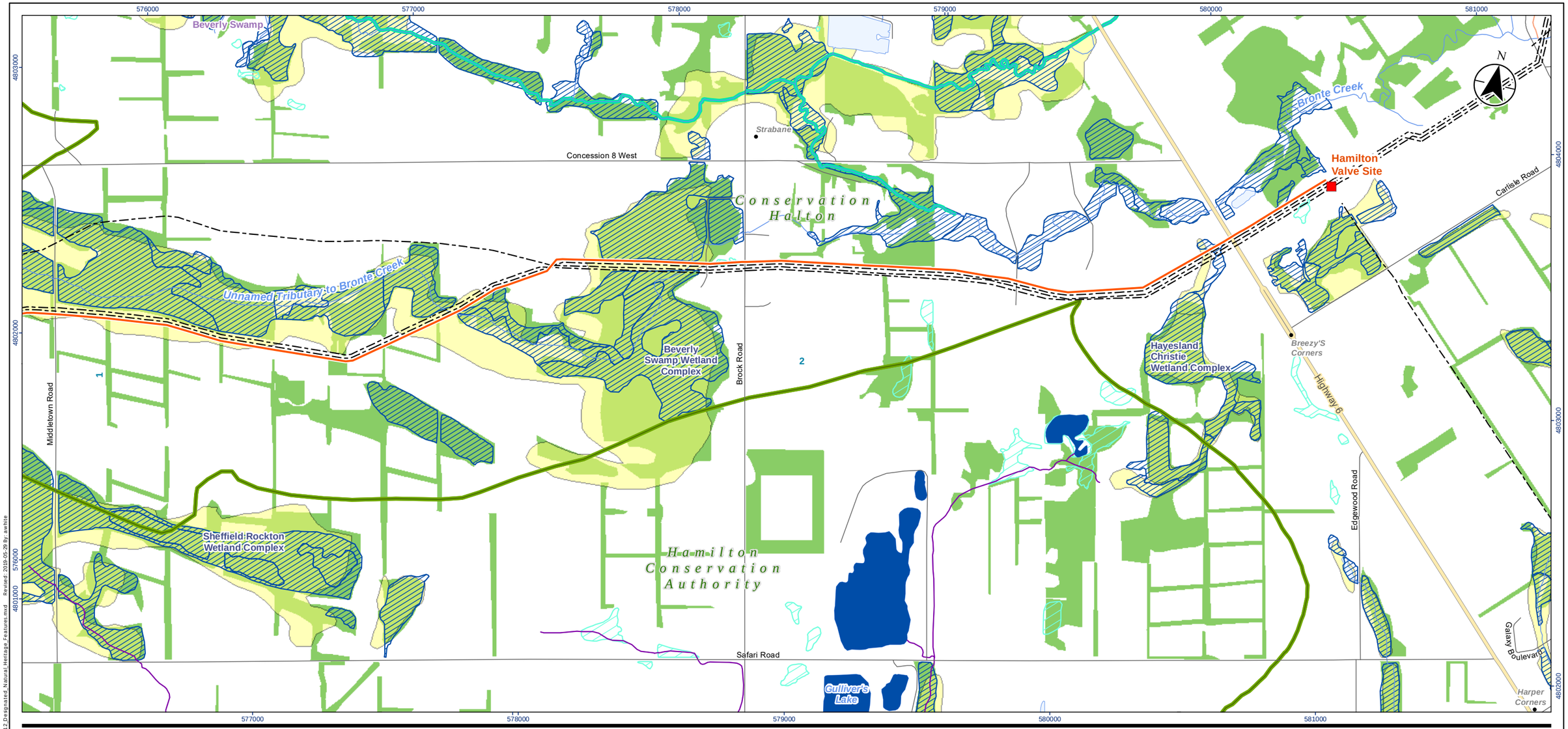



Legend

- Thermal Regime, Cold
- Thermal Regime, Warm
- Watercourse (Intermittent)
- Watercourse (Permanent)
- ANSI, Life Science
- Conservation Area Administrative Boundary
- City of Hamilton Environmentally Sensitive Areas
- DFO Aquatic Species at Risk - Fish
- Waterbody
- Wetland, Provincially Significant
- Wetland, Not evaluated per OWES
- Wooded Area

0 250 500 metres

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Notes

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Project Location
City of Hamilton

160961299 REVA
Prepared by AW on 2019-05-29
Technical Review by ABC on yyyy-mm-dd

Client/Project
ENBRIDGE GAS INC.
KIRKWALL-HAMILTON PIPELINE PROJECT

Figure No.
12

Title
Designated Natural Heritage Features

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Legend

- Enbridge Existing Station
- Preferred Route
- Enbridge Existing Pipeline
- Hydro Line
- Major Road
- Minor Road
- Watercourse
- Municipal Boundary, Lower
- Waterbody
- Community Centre
- Stormwater Management Pond
- Other Linear Feature
- Industrial
- Residential Complex

0 250 500 metres

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Notes

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Project Location
City of Hamilton

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Technical Review by ABC on yyyy-mm-dd
Independent Review by ABC on yyyy-mm-dd

Client/Project
ENBRIDGE GAS INC.
KIRKWALL-HAMILTON PIPELINE PROJECT

Figure No.
13.1

Title
Infrastructure and Socio-Economic Features

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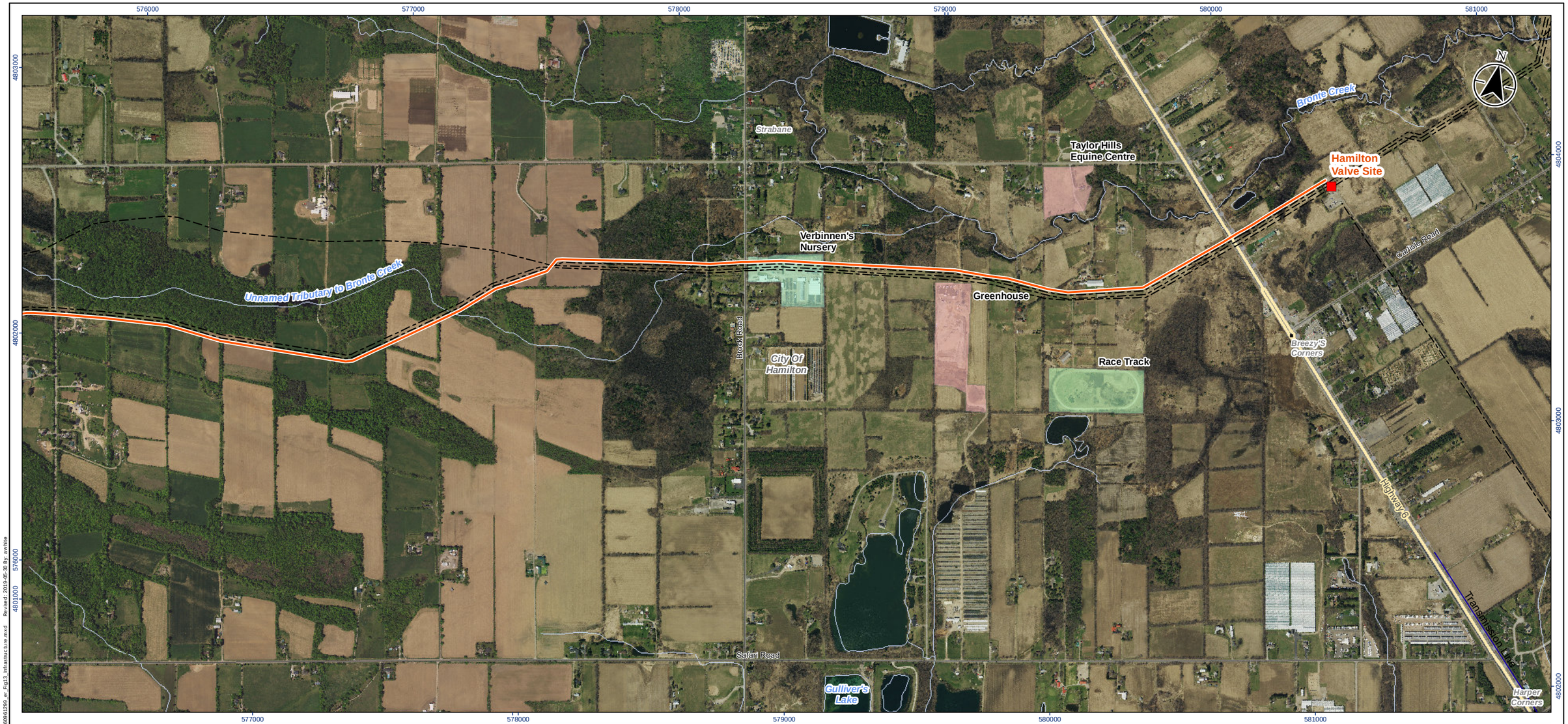



Legend

- Enbridge Existing Station
- Preferred Route
- Enbridge Existing Pipeline
- Hydro Line
- Expressway / Highway
- Major Road
- Minor Road
- Watercourse
- Municipal Boundary, Lower
- Waterbody
- Other Linear Feature
- Greenhouses/Nursery
- Race Track
- Speciality Farm

0 250 500 metres

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Notes

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Stantec

Project Location
City of Hamilton

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Prepared by AW on 2019-05-30
Technical Review by ABC on yyyy-mm-dd
Independent Review by ABC on yyyy-mm-dd

Client/Project
ENBRIDGE GAS INC.
KIRKWALL-HAMILTON PIPELINE PROJECT

Figure No.
13.2

Title
Infrastructure and Socio-Economic Features

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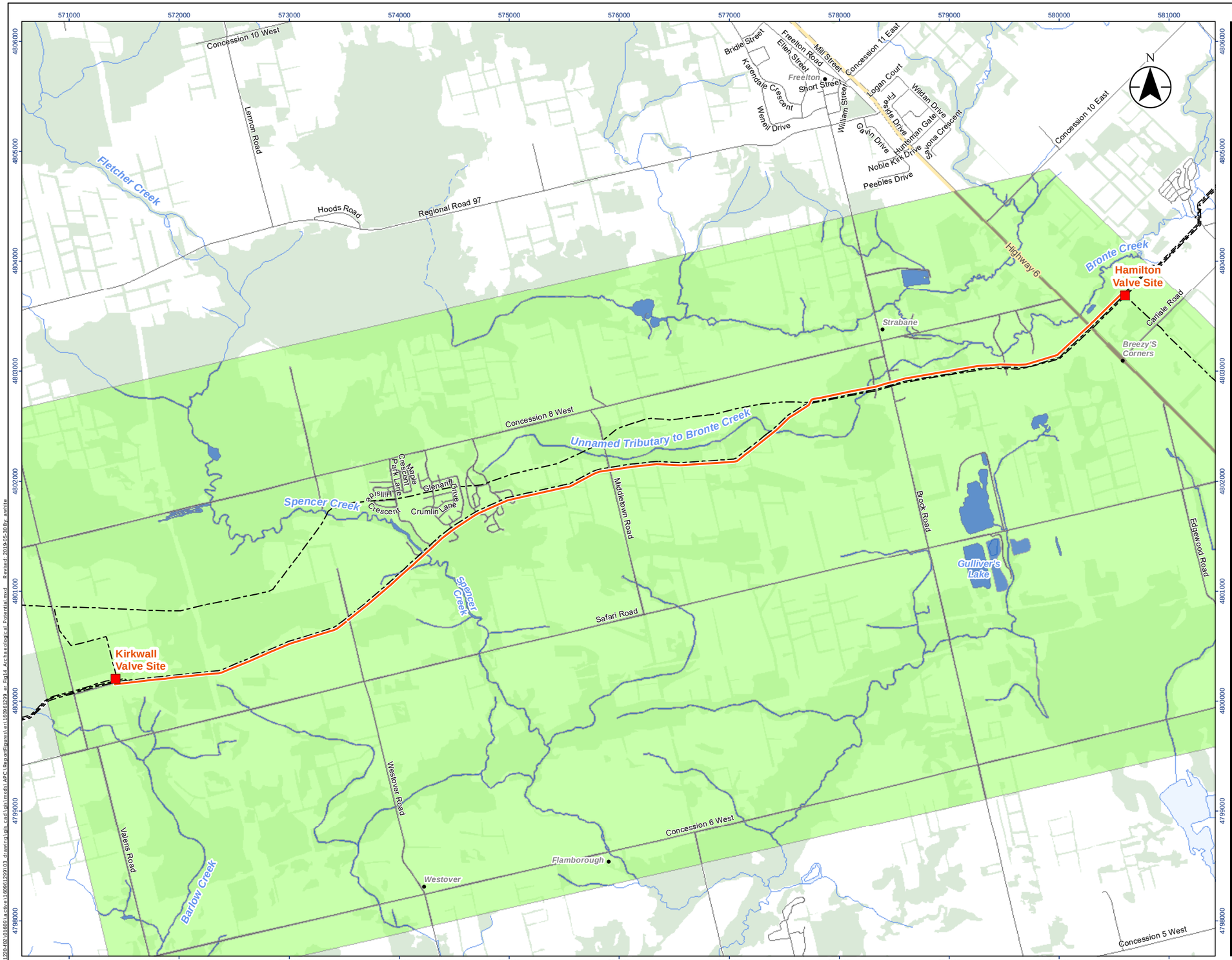

Stantec

Legend

Potential_Type

- Retains Archaeological Potential; Stage 2 Assessment Required
- Municipal/Provincial Road ROW, May Retain Archaeological Potential; Stage 2 Assessment Required to Confirm Disturbance
- Low and Permanently Wet Areas, Low to No Archaeological Potential; Stage 2 Assessment Required to Confirm Presence
- Watercourse (Intermittent)
- Watercourse (Permanent)
- Waterbody
- Wooded Area

0 500 1,000 m

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Notes

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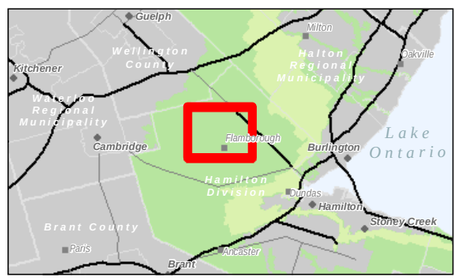
3. Knonw Archaeological Sites from MTCS as of March 1, 2019.



Project Location
County of Essex and the Municipality Of Chatham-Kent

160961299 REVA
Prepared by AW on 2019-05-30
Technical Review by ST on 2019-05-06

Client/Project
ENBRIDGE GAS INC.
KIRKWALL-HAMILTON PIPELINE PROJECT

Figure No.
14

Title
Archaeological Potential

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Notes

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Legend

- Identified Heritage Resource
- Inventoried Heritage Property
- Enbridge Existing Station
- Preferred Route
- Enbridge Existing Pipeline
- Hydro Line
- Major Road
- Minor Road
- Watercourse
- Municipal Boundary, Lower
- Waterbody

0 250 500 metres

1:15,000 (At original document size of 11x17)

Stantec

Project Location
City of Hamilton

160961299 REVA
Prepared by AW on 2019-05-28
Technical Review by ABC on yyyy-mm-dd
Independent Review by ABC on yyyy-mm-dd

Client/Project
ENBRIDGE GAS INC.
KIRKWALL-HAMILTON PIPELINE PROJECT

Figure No.
15.1

Title
Cultural Heritage Features

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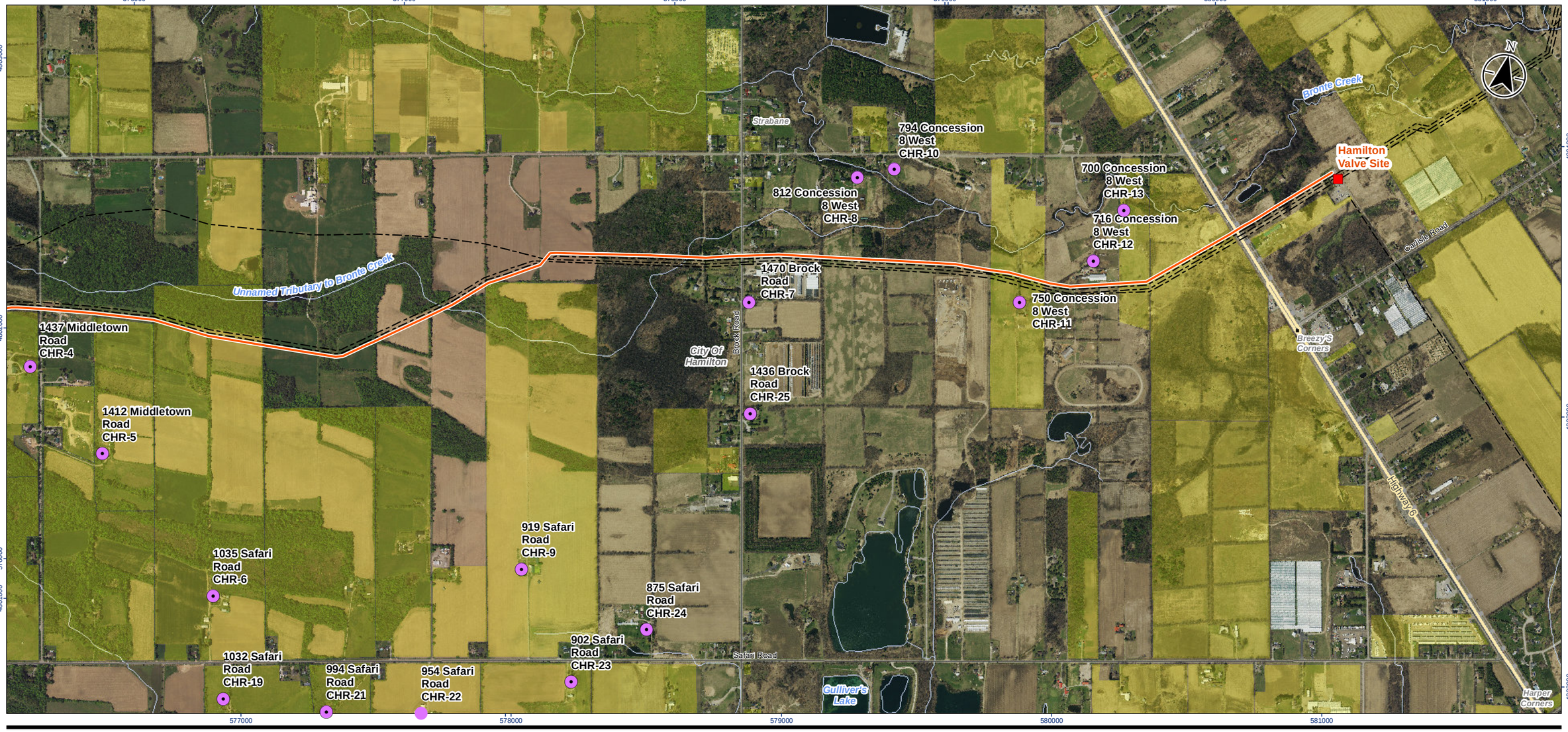



Legend

- Identified Heritage Resource
- Inventoried Heritage Property
- Enbridge Existing Station
- Preferred Route
- Enbridge Existing Pipeline
- Hydro Line
- Expressway / Highway
- Major Road
- Minor Road
- Watercourse
- Municipal Boundary, Lower
- Waterbody

0 250 500 metres

1:15,000 (At original document size of 11x17)

Notes

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Project Location
City of Hamilton

160961299 REVA
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Independent Review by ABC on yyyy-mm-dd

Client/Project
ENBRIDGE GAS INC.
KIRKWALL-HAMILTON PIPELINE PROJECT

Figure No.
15.2

Title
Cultural Heritage Features

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Legend

- Preferred Route
- Enbridge Existing Station
- Enbridge Existing Pipeline
- Expressway / Highway
- Major Road
- Minor Road
- Watercourse (Permanent)
- Watercourse (Intermittent)
- Waterbody

Slope

- 0 - 5 degrees
- 6 - 10 degrees
- 10 - 80 degrees

1:35,000 (At original document size of 11x17)

Notes

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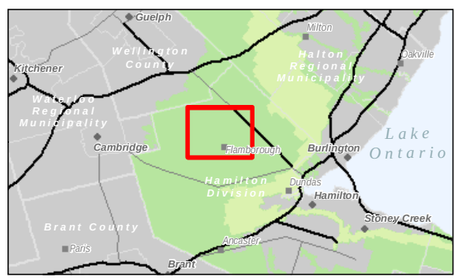

Project Location
City of Hamilton

160961299 REVA
Prepared by AW on 2019-05-27
Technical Review by ABC on 2019-MM-DD

Client/Project
ENBRIDGE GAS INC.
KIRKWALL-HAMILTON PIPELINE PROJECT

Figure No.
16

Title
Slope

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APPENDIX D:
TERRESTRIAL HABITAT



Appendix D-1 Wildlife Habitat Assessment in Proximity to Proposed Pipeline Route (Ecoregion 6E)

Wildlife Habitat Type	Criteria	Methods	Habitat Assessment
SEASONAL CONCENTRATION AREAS			
Waterfowl Stopover and Staging Area (Terrestrial and Aquatic)	Field with evidence of annual spring flooding from meltwater or runoff; aquatic habitats such as ponds, marshes, lakes, bays, and watercourses used during migration, including large marshy wetlands.	ELC surveys, wildlife habitat assessments, and air photo interpretation will be used to assess features in proximity to the proposed pipeline route that may support waterfowl stopover and staging areas.	Ponds present in proximity to the proposed pipeline route and spring flooding may occur at Westover Road based on spring aerial photography. Habitat assessment to be completed during 2020 field investigations.
Shorebird Migratory Stopover Area	Beaches and un-vegetated shorelines of lakes, rivers, and wetlands.	ELC surveys and air photo interpretation will be used to assess features in proximity to the proposed pipeline route that may support migratory shorebirds.	Natural unvegetated shoreline habitat is absent in proximity to the proposed pipeline route.
Raptor Wintering Area	Combination of fields and woodland (>20 ha).	ELC surveys and air photo interpretation will be used to assess features in proximity to the proposed pipeline route that may support wintering raptors.	Suitable upland habitat (>15 ha, pasture) may occur west of Middletown Road adjacent to forested areas. Assessment of upland habitat suitability to be completed during 2019-2020 field investigations.
Bat Hibernacula	Hibernacula may be found in caves, mine shafts, underground foundations and karsts.	ELC surveys, wildlife habitat assessments, and air photo interpretation will be used to assess features in proximity to the proposed pipeline route that may support bat hibernacula.	Crevices, caves or abandoned mines are absent in proximity to the proposed pipeline route.
Bat Maternity Colonies	Maternity colonies considered significant wildlife habitat are found in forested ecosites.	ELC surveys, wildlife habitat assessments, and air photo interpretation will be used to assess features in proximity to the proposed pipeline route that may support bat maternity colonies.	Forest habitat is present in proximity to the proposed pipeline route. which may support bat maternity colonies.
Turtle Wintering Areas	Over-wintering sites are permanent water bodies, large wetlands, and bogs or fens with adequate dissolved oxygen. Water has to be deep enough not to freeze and have soft mud substrate.	ELC surveys, wildlife habitat assessments and air photo interpretation will be used to assess features in proximity to the proposed pipeline route that may support areas of permanent standing water but not deep enough to freeze.	Wetlands and waterbodies present in proximity to the proposed pipeline route. Habitat assessment to be completed during 2019-2020 field investigations.

Appendix D-1 Wildlife Habitat Assessment in Proximity to Proposed Pipeline Route (Ecoregion 6E)

Wildlife Habitat Type	Criteria	Methods	Habitat Assessment
Reptile Hibernaculum	Rock piles or slopes, stone fences, crumbling foundations	ELC surveys and wildlife habitat assessments will be used to document features in proximity to the proposed pipeline route that may support snake hibernacula.	To be determined during 2019 field investigations.
Colonial-Nesting Bird Breeding Habitat (Bank and Cliff)	Eroding banks, sandy hills, steep slopes, rock faces or piles	ELC surveys, wildlife habitat assessments, and air photo interpretation will be used to assess features in proximity to the proposed pipeline route that may support colonial bird breeding habitat.	To be determined during 2019-2020 field investigations.
Colonial-Nesting Bird Breeding Habitat (Tree/Shrubs)	Dead trees in large marshes and lakes, flooded timber, and shrubs, with nests of colonially nesting heron species.	ELC surveys and wildlife habitat assessments will be used to assess features in proximity to the proposed pipeline route that may support colonial bird breeding habitat (Trees/Shrubs).	LIO identified the presence of mixed wader nesting colonies. To be confirmed during 2019-2020 field investigations.
Colonial-Nesting Bird Breeding Habitat (Ground)	Rock islands and peninsulas in a lake or large river.	ELC surveys and air photo interpretation will be used to assess features in proximity to the proposed pipeline route that may support colonial bird breeding habitat (Ground).	LIO identified the presence of colonial waterbird nesting area. To be confirmed during 2019-2020 field investigations.
Migratory Butterfly Stopover Areas	Meadows and forests that are a minimum of 10 ha and are located within 5km of Lake Ontario.	GIS analysis was used to measure distance from the Lake Ontario shoreline.	Not located within 5 km of Lake Ontario.
Landbird Migratory Stopover Areas	Woodlands of a minimum size located within 5 km of Lake Ontario.	GIS analysis was used to measure distance from the Lake Ontario shoreline.	Not located within 5 km of Lake Ontario.
Deer Winter Congregation Areas	Deer winter congregation’s areas are mapped by MNRF and species use surveys are not required.	The LIO database and MNRF consultation were used to identify deer winter congregation areas.	Large deer wintering area associated with the Beverly Swamp and adjacent woodlands identified within proximity to the proposed pipeline route.
RARE VEGETATION COMMUNITIES			

Appendix D-1 Wildlife Habitat Assessment in Proximity to Proposed Pipeline Route (Ecoregion 6E)

Wildlife Habitat Type	Criteria	Methods	Habitat Assessment
Sand Barren, Alvar, Cliffs and Talus Slopes	Sand barren, Alvar, Cliff and Talus ELC Community Classes, and other areas of exposed bed rock and patchy soil development, near vertical exposed bedrock and slopes of rock rubble.	ELC surveys and air photo interpretation were used to assess vegetation communities in proximity to the proposed pipeline route.	To be determined during 2019-2020 field investigations.
Old-growth Forest	Relatively undisturbed, structurally complex; dominant trees > 100 years' old.	ELC surveys and air photo interpretation were used to assess vegetation communities in proximity to the proposed pipeline route.	To be determined during 2019-2020 field investigations.
Tallgrass Prairie and Savannah	Open canopy habitats (tree cover < 60%) dominated by prairie species.	ELC surveys and air photo interpretation were used to assess vegetation communities in proximity to the proposed pipeline route.	To be determined during 2019-2020 field investigations.
Other Rare Vegetation Communities	Provincially Rare S1, S2 and S3 vegetation communities listed by the NHIC.	ELC surveys and air photo interpretation will be used to assess vegetation communities in proximity to the proposed pipeline route.	To be determined during 2019-2020 field investigations.
SPECIALIZED HABITAT FOR WILDLIFE			
Waterfowl Nesting Area	Upland habitats adjacent to wetlands (within 120m).	ELC surveys, wildlife habitat assessment, and air photo interpretation will be used to assess features in proximity to the proposed pipeline route that may support nesting waterfowl.	To be determined during 2019-2020 field investigations.
Bald Eagle and Osprey nesting, Foraging, and Perching Habitat	Treed communities adjacent to rivers, lakes, ponds, and other wetlands with stick nests of Bald Eagle or Osprey.	ELC surveys, air photo interpretation and wildlife habitat assessment will be used to assess features in proximity to the proposed pipeline route that may support nesting, foraging and perching habitat for large raptors.	To be determined during 2019-2020 field investigations.
Woodland Raptor Nesting Habitat	Forested ELC communities >30 ha with 10 ha of interior habitat.	ELC surveys, wildlife habitat assessment, and GIS analysis were used to assess features in proximity to the proposed pipeline route that may support nesting habitat for woodland raptors.	Suitable forests (i.e., >10 ha of interior habitat) present within proximity to the proposed pipeline route. .

Appendix D-1 Wildlife Habitat Assessment in Proximity to Proposed Pipeline Route (Ecoregion 6E)

Wildlife Habitat Type	Criteria	Methods	Habitat Assessment
Turtle Nesting Areas	Exposed soil, including sand and gravel in open sunny areas near wetlands.	ELC surveys, wildlife habitat assessment and air photo interpretation will be used to assess features in proximity to the proposed pipeline route that may support turtle nesting areas.	To be determined during 2019-2020 field investigations.
Seeps and Springs	Any forested area with groundwater at surface within the headwaters of a stream or river system	Surveys and air photo interpretation will be used to assess areas/features of groundwater upwelling, including seeps and springs.	To be determined during 2019-2020 field investigations.
Amphibian Breeding Habitat (Woodland and Wetland)	Treed uplands with vernal pools, and wetland ecosites	ELC surveys will be used to assess features in proximity to the proposed pipeline route that may support woodland breeding amphibians.	To be determined during 2019-2020 field investigations.
Woodland Area-sensitive Bird Breeding Habitat	Large mature forest stands, woodlots >30ha and >200m from the forest edge.	ELC surveys, air photo interpretation, and GIS analysis were used to determine whether woodlots that occurred in proximity to the proposed pipeline route that were >30 ha with interior habitat present (>200 m from edge).	Suitable forests (i.e., >30 ha with interior habitat) present in proximity to the proposed pipeline route.
HABITAT FOR SPECIES OF CONSERVATION CONCERN			
Marsh Bird Breeding Habitat	Wetlands with shallow water and emergent aquatic vegetation.	ELC surveys and air photo interpretation were used to identify marshes with shallow water and emergent vegetation in proximity to the proposed pipeline route that may support marsh breeding birds.	To be determined during 2019-2020 field investigations.
Open Country Bird Breeding Habitat	Large grasslands and fields (>30ha).	ELC surveys, air photo interpretation, and GIS analysis were used to identify grassland communities in proximity to the proposed pipeline route that may support area-sensitive breeding birds.	To be determined during 2019-2020 field investigations.
Shrub/Early Successional Bird Breeding Habitat	Large shrub and thicket habitats (>10ha).	ELC surveys, air photo interpretation and GIS analysis were used to identify large communities that may support shrub/early successional breeding birds.	To be determined during 2019-2020 field investigations.

Appendix D-1 Wildlife Habitat Assessment in Proximity to Proposed Pipeline Route (Ecoregion 6E)

Wildlife Habitat Type	Criteria	Methods	Habitat Assessment
Terrestrial Crayfish	Wet meadows and edges of shallow marshes.	ELC surveys were used to identify shallow marsh and meadow marsh communities that occurred in proximity to the proposed pipeline route; searches for crayfish chimneys will be conducted during wildlife habitat assessments.	To be determined during 2019-2020 field investigations.
SPECIES OF CONSERVATION CONCERN			
Candidate habitat for Species of Conservation Concern to be assessed during 2019-2020 field investigations			
ANIMAL MOVEMENT CORRIDORS			
Amphibian Movement Corridor	Corridors may be found in all ecosites associated with water. Determined based on identifying significant amphibian breeding habitat (wetland).	Identified after Amphibian Breeding Habitat - Wetland is confirmed. Movement corridors should be considered when amphibian breeding habitat is confirmed as SWH from Amphibian Breeding Habitat (Wetland).	Amphibian movement corridors are likely present along watercourses in proximity to the proposed pipeline route.
Deer Movement Corridor	Corridors may be found in all forested ecosites. Determined based on MNRF identifying Deer Wintering Areas.	Movement corridors should be considered when Deer Wintering Areas are identified.	Deer movement corridor anticipated to/from the Deer Wintering Area to the west along hedgerows, east along Spencer Creek, and south along riparian vegetation.

REFERENCES

MNRF. 2015. Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E. January, 2015. 41 pp.

Appendix D-2: Habitat Potential for Threatened or Endangered Species in Proximity to the Proposed Pipeline Route

Species	Habitat Preference	Habitat Potential
PLANTS		
American Chestnut	Grows in rich mixed and deciduous forests, frequently with oak; most populations have been decimated by chestnut blight (Nixon, 1997). Typical habitat is upland deciduous forest on acid to neutral, sandy soil (COSEWIC, 2004a).	Suitable habitat for the species may be present in proximity to the proposed pipeline route where deciduous forests occur. A botanical inventory will be completed in 2019-2020 to confirm species presence or absence.
American Columbo	Occurs in a variety of habitats but is most commonly associated with dry open forested slopes but can be found in clearings and thickets as well as swampy areas; Its long-life span may allow for persistence in sub-optimal habitats (COSEWIC, 2006). Grows in dry to moist deciduous forests and openings (Reznicek et al., 2011).	Suitable habitat for the species may be present in proximity to the proposed pipeline route where openings occur in thickets or deciduous forests. A botanical inventory will be completed in 2019-2020 to confirm species presence or absence.
Bashful Clubrush	Bashful Bulrush requires open-canopied forest with little shrub cover and excellent drainage (Crins 1986). It is found on semi-open south- or west-facing slopes in deciduous and mixed woods. It is only known to occur in southern Ontario in the valley of the Rouge River in the eastern region of Metropolitan Toronto and in Hamilton (COSEWIC 2000).	Suitable habitat for the species may be present in proximity to the proposed pipeline route. A botanical inventory will be completed in 2019-2020 to confirm species presence or absence.
Butternut	Found in a variety of habitats throughout Southern Ontario, including woodlands and hedgerows (Farrar, 1995).	Suitable habitat exists for this species may be present in proximity to the proposed pipeline route within any deciduous or mixed woodlands and hedgerows. A botanical inventory will be completed in 2019-2020 to confirm species presence or absence.
Eastern Flowering Dogwood	Eastern flowering dogwood is an understory plant of dry to fresh deciduous and mixed forests, which frequently grows on the tops of slopes or other dry microsites, and occasionally in moister areas where no flooding occurs; preferred soils range from sand to sandy loam and clay loam (COSEWIC, 2007)	Suitable habitat exists for this species may be present in proximity to the proposed pipeline route within any deciduous or mixed woodlands. A botanical inventory will be completed in 2019-2020 to confirm species presence or absence.
Red Mulberry	Red Mulberry occurs in moist forests habitats including river valleys, floodplains, swales, sandspits, and slopes of the Niagara Escarpment (COSEWIC 2014).	Suitable habitat exists for this species may be present in proximity to the proposed pipeline route within moist forests and thickets. A botanical inventory will be completed in 2019-2020 to confirm species presence or absence.
Spotted Wintergreen	Occurs in a variety of forested habitats including coniferous, mixed, and deciduous forests, as well as dry sand communities (Freeman, 2009).	Suitable habitat for the species may be present in proximity to the proposed pipeline route. A botanical inventory will be completed in 2019-2020 to confirm species presence or absence.

Appendix D-2: Habitat Potential for Threatened or Endangered Species in Proximity to the Proposed Pipeline Route

Species	Habitat Preference	Habitat Potential
REPTILES		
Blanding's Turtle	Lakes, ponds, and marshes; prefers shallow water with abundant aquatic vegetation and a soft bottom (MacCulloch, 2002).	Suitable habitat for this species may be present in proximity to the proposed pipeline route within the PSWs. A habitat assessment and surveys will be completed in 2019-2020.
Eastern Spiny Softshell	Found along lakes and large rivers. Requires sandy beaches or riverbanks for nesting, shallow soft-bottomed water bodies to function as nurseries or refugia, basking areas and deep pools for thermoregulation, and riffle areas for foraging (COSEWIC 2002).	This species is associated with the Syndenham and Thames Rivers and not known to occur in proximity to the proposed pipeline route. Suitable habitat for this species is considered absent in proximity to the proposed pipeline route.
Amphibians		
Jefferson Salamander	The Jefferson Salamander is terrestrial during the adult stage and inhabits upland deciduous forests with suitable breeding areas including limestone sinkhole ponds, kettle ponds, vernal pools and other natural basins. Breeding areas are often ephemeral and are fed by spring runoff, groundwater, or springs. In Canada, the species is associated with mature, Carolinian forests. Suitable habitat is often only available in fragmented deciduous woodlots of marginal agricultural land (COSEWIC, 2010).	This species is not known to occur in proximity to the proposed pipeline route (Ontario Nature 2017). Suitable habitat for this species is considered absent in proximity to the proposed pipeline route.
BIRDS		
Bank Swallow	Bank Swallows excavate nests in exposed earth banks along watercourses and lakeshores, roadsides, stockpiles of soil, and the sides of sand and gravel pits (Falconer et al., 2016). Any suitable habitat may be present if stockpiles of soil are present or in areas of sand/gravel extraction.	Potential habitat will be identified, and habitat use determined through breeding bird surveys conducted in June 2020.
Barn Swallow	Nest on walls or ledges of barns and other human-made structures such as bridges, culverts or other buildings; forages in open areas for flying insects (COSEWIC 2011).	Suitable nesting habitat is available in barns and old structures; however, no structures are proposed for removal.
Bobolink	Nests primarily in forage crops with a mixture of grasses and broad-leaved forbs, predominantly hayfields and pastures (COSEWIC 2010).	Suitable habitat is present within proximity to the proposed pipeline route. Habitat use will be determined through breeding bird surveys conducted in June 2020.

Appendix D-2: Habitat Potential for Threatened or Endangered Species in Proximity to the Proposed Pipeline Route

Species	Habitat Preference	Habitat Potential
Cerulean Warbler	Breeds mainly in mature deciduous or swamp forest. The species generally prefers tracts over 100 ha in size but it has been found to breed in woodlots as small as 10 ha (Hamel, 2000).	Suitable habitat is present within proximity to the proposed pipeline route. Habitat use will be determined through breeding bird surveys conducted in June 2020.
Chimney Swift	Chimney Swifts primarily use chimneys for roosting and nesting, and only rarely nest in large hollow trees (Fitzgerald et al., 2014; Zanchetta et al., 2014).	There may be available chimneys along the proposed route, but no structures are proposed for removal.
Eastern Meadowlark	Meadows, hayfields and pastures; also, other open habitat types including mown lawn (COSEWIC 2011). Prefers large (~5 ha), low-lying wet grasslands with abundant litter (COSEWIC 2011).	Suitable habitat is present within proximity to the proposed pipeline route. Habitat use will be determined through breeding bird surveys conducted in June 2020.
Eastern Whip-poor-will	Whip-poor-will favour open woodlands with frequent clearings. Its preferred nesting sites contain shaded leaf litter or pine needles and generally occur along wooded edges or in clearings without any herbaceous growth (Cadman et al. 1987). The species is considered to be area-sensitive, preferring 100 hectares of suitable habitat for breeding.	Potential habitat will be identified during studies undertaken in 2019-2020.
Least Bittern	Nests in freshwater marshes where dense aquatic vegetation occurs with woody vegetation and open water. They are found most commonly in marshes greater than 5 ha in size (Gibbs et al., 1992).	Suitable large marshes may occur within proximity to the proposed pipeline route. Habitat use will be determined if required in May/June 2020.
Loggerhead Shrike	This species prefers early successional shrubland, including unimproved pastured areas. It utilizes open country with short vegetation, including pastures with fence rows, old orchards, mowed roadsides, cemeteries, golf courses, agricultural fields, riparian areas and open woodlands (Reuven, 1996).	Suitable pastureland may occur within proximity to the proposed pipeline route. Habitat use will be determined if required in June 2020.
Louisiana Waterthrush	In Ontario, this species prefers deciduous and mixed forests with a strong Eastern Hemlock component, in deeply incised ravines (Cadman et al. 2007). It will also inhabit large flooded tracts of mature deciduous swamp forest. It shows a preference for nesting along pristine headwater streams and associated wetlands occurring in large expanses of mature forest and less frequently inhabits wooded swamps (COSEWIC, 2006).	Suitable habitat for the species may be present in proximity to the proposed pipeline route. Habitat use will be determined through breeding bird surveys conducted in June 2020.

Appendix D-2: Habitat Potential for Threatened or Endangered Species in Proximity to the Proposed Pipeline Route

Species	Habitat Preference	Habitat Potential
Yellow-breasted Chat	Prefers scrubby, early successional habitat; recorded in shrub thickets, woodland edges, hedgerows, regenerating abandoned fields and young coniferous plantations, and in hydro and rail rights-of-way (Cadman et al. 2007).	Suitable habitat for the species may be present in proximity to the proposed pipeline route. Habitat use will be determined through breeding bird surveys conducted in June 2020.
MAMMALS		
Little Brown Myotis	Trees, buildings and bridges for roosting; trees for nesting; caves and mines for hibernation (COSEWIC 2013).	Suitable roosting habitat is available in barns and old structures; however, no structures are proposed for removal. Candidate maternity roost trees will be identified within suitable ELC communities. Limits of clearing to be determined in 2019-2020.
Northern Myotis	Caves provide overwintering habitat (COSEWIC 2013). Rarely uses human-made structures for roosting (COSEWIC 2013).	Candidate maternity roost trees will be identified within suitable ELC communities. Limits of clearing to be determined in 2019-2020.
Small-footed Myotis	Small-footed myotis hibernate in the fall in caves and abandoned mines after mating occurs near these communal sites. During summer months, this bat typically roosts in crevices and cracks associated with rocky sites (e.g. rip rap, rock piles, bluffs, bedrock outcrops) but also have also been found in old buildings (e.g., barns, and houses).	Suitable roosting habitat is available in barns and old structures; however, no structures are proposed for removal.
Tri-colored Bat	Found in a variety of habitats; caves provide overwintering habitat (COSEWIC 2013).	Candidate maternity roost trees will be identified within suitable ELC communities. Limits of clearing to be determined in 2019-2020.

APPENDIX E:
CONTAMINATION OVERVIEW STUDY



Kirkwall-Hamilton Pipeline Project: Contamination Overview Study

FINAL REPORT

June 18, 2019

Prepared for:

Enbridge Gas Inc.

Prepared by:

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

Project No.: 160961299

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Executive Summary

As of January 1, 2019, Union Gas and Enbridge Gas Distribution have amalgamated into one utility with the legal name Enbridge Gas Inc. (Enbridge Gas). To increase existing capacity and accommodate additional demand for natural gas, Enbridge Gas is proposing to construct a new 48-inch diameter natural gas pipeline located within the City of Hamilton. The proposed pipeline will be constructed between Enbridge Gas' existing Kirkwall valve site, located northeast of the intersection of Safari Road and Valens Road, and Enbridge Gas' existing Hamilton valve site, located east of Highway 6 and north of Carlisle Road. The proposed pipeline will parallel two existing Enbridge Gas pipelines from the Kirkwall valve site for approximately 7 km, then parallel three existing Enbridge Gas pipelines for approximately 3 km to the Hamilton valve site. The total length of the proposed pipeline will be approximately 10 km. If approved, construction of the pipeline could begin as early as spring/summer 2021 and be complete by the end of 2021.

Enbridge Gas retained Stantec Consulting Ltd. (Stantec) to complete a Contamination Overview Study (COS) for the proposed project. The proposed pipeline generally runs north of Safari Road and south of Concession 8 West between Valens Road and just east of Highway 6. This length of proposed pipeline will be referred to herein as the "Site" (**Figure 1**, **Appendix A**). The specific purpose of the COS was to assess if evidence of potential and actual environmental contamination exists at the Site as a result of current and past activities on the Site or adjacent/neighbouring properties.

To fulfill the objective of the COS, historical records and documentation available for the Site and the surrounding areas were reviewed and a site reconnaissance was completed on January 4, 2019. Following the review of historical records and the site reconnaissance, potential sources of contamination (PSOC) for the Site were identified, as summarized below. PSOC were ranked as either high, moderate, or low depending on the distance of the potential source from the Site and the activity associated with the potential source. The following is a summary of the identified PSOC associated with the Site:

Table 1: Summary of Potential Sources of Contamination

PSOC ID No.	Description of Potential Source	Location	Approximate Distance from the Site	Contaminant of Concern	Potential for Concern	Explanation of Potential for Concern
1	Enbridge Gas Kirkwall Valve Site	1374 Valens Road	Adjacent property to the west	Petroleum Hydrocarbons (PHCs), Polycyclic Aromatic Hydrocarbons (PAHs), and Volatile Organic Compounds (VOCs)	Low	Presence of metering equipment. No evidence of soil or groundwater contamination identified through Site observation and historical records review process.
2	Trans Canada Kirkwall Compressor Station	1376 Valens Road	Adjacent property to the west	PHCs, PAHs, and VOCs	Low	Presence of metering equipment. No evidence of soil or groundwater contamination identified through Site observation and historical records review process.
3	Imported Fill Material	Entire Site	On Site	PHCs, PAHs, VOCs, Metals and Inorganics	Moderate	It is expected that fill materials of unknown quality were imported onto the Site for the purposes of construction within the easement Therefore, the PSOC associated with imported fill along the Site is considered to be moderate.

Table 1: Summary of Potential Sources of Contamination

PSOC ID No.	Description of Potential Source	Location	Approximate Distance from the Site	Contaminant of Concern	Potential for Concern	Explanation of Potential for Concern
4	Pad-Mounted Transformers	Off Glenariff Drive	Within Study Area	PHCs and PCBs	Low	A pad-mounted transformer was identified off Glenariff Drive associated with the residential communities off Concession 8 West. Given the potential for this transformer to contain PCBs and/or transformer oil, it is considered to represent a PSOC with low potential concern.
5	Scrap Cars, Debris, and Stockpiles	1454 Middletown Road	Approximately 75 m south of the Site	PHCs, PAHs, and VOCs	Low	Stockpiles of unknown origin/quality and several cars in varying states of disrepair were observed at this property, in addition to several piles of debris. The potential for migration of contaminants from these materials onto the Site represents a potential concern. This PSOC is considered to be low due to the distance of the property from the Site.

Table 1: Summary of Potential Sources of Contamination

PSOC ID No.	Description of Potential Source	Location	Approximate Distance from the Site	Contaminant of Concern	Potential for Concern	Explanation of Potential for Concern
6	Historical Spills	Portions of Brock Road and Highway 6 within Study Area	On Site and within Study Area	PHCs, PAHs, and VOCs	Low	A few unplottable records existed for spills (≤100 L) of diesel, gasoline, and oil along Brock Road and Highway 6 between 1990 and 1997. These spills may have occurred within the Study Area. The PSOC associated with these spills is considered to be low due to the age and size of the spills.
7	Verbinnen's Tree Nursery	1504 Brock Road	Adjacent property to the south	Pesticides and Herbicides	Low	During the site reconnaissance, a tree nursery was identified adjacent to the south of the Site. It is possible that bulk storage of pesticides and herbicides may be present given their likely use at the tree nursery to protect against disease and pests. Based on the nature of the activities at this property, the PSOC is considered to be low.
8	Hamilton Valve Site	43 Carlisle Road	Adjacent property to the southeast	PHCs, PAHs, and VOCs	Low	Presence of metering equipment. No evidence of soil or groundwater contamination identified through Site observation and historical records review process.



Based on the above, the following recommendations are provided:

- Should excess soil be generated at the Site during future construction activities, representative soil samples should be collected in coordination with a qualified person for environmental site assessment (QP_{ESA}) as defined by Ontario Regulation 153/04 and submitted for chemical analysis to determine management options and appropriate handling and health and safety guidelines.
- Should excess soil be generated at the Site during construction activities, soils that do not meet the Standards listed in Table 1 of the Ministry of Environment, Conservation, and Parks (MECP) document *Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act* (April 15, 2011) may not be considered inert fill upon excavation, and off-site management options for excess soils that cannot be reused within the Site must be considered. It is understood that salt-related parameters may not be considered to be contaminants at areas of the Site that cross a road alignment, when de-icing salt has been used for winter road maintenance (O.Reg. 153/04 s.48 (3)); however, soil or water impacted by salt should be managed according to MECP guidance if it is to be removed from the Site.
- Should excess water be generated at the Site during construction activities, water quality analyses should be conducted to determine appropriate management methods, such as is done in support of a permit to take water (PTTW). This work should be done in coordination with a QP_{ESA} to maintain data quality and provide an appropriate assessment of water quality. The QP_{ESA} should be aware of the PSOCs identified herein so as to select an appropriate list of analytes.
- Should evidence of soil or water impacts be identified during construction (e.g., staining, odours, debris/waste, petroleum hydrocarbon sheen) samples should be collected for laboratory analyses to confirm concentrations of potential contaminants so as to develop appropriate material management, and health and safety guidelines.
- Water wells within the study area can provide a conduit from the ground surface, and should be abandoned in accordance with Reg. 903 if they are no longer in use.
- A Phase I ESA, and Phase II ESA (if recommended as part of the Phase I ESA) should be considered for property that will be acquired by Enbridge Gas and a site-specific evaluation of PSOCs should be completed. If building demolition will be required, designated substance surveys should be completed for buildings or structures prior to demolition.

The statements made in this Executive Summary text are subject to the limitations included in **Section 5.0** and are to be read in conjunction with the remainder of this report.

1.0 INTRODUCTION

As of January 1, 2019, Union Gas and Enbridge Gas Distribution have amalgamated into one utility with the legal name Enbridge Gas Inc. (Enbridge Gas).To increase existing capacity and accommodate additional demand for natural gas, Enbridge Gasis proposing to construct a new 48-inch diameter natural gas pipeline located within the City of Hamilton. The proposed pipeline will be constructed between Enbridge Gas' existing Kirkwall valve site, located northeast of the intersection of Safari Road and Valens Road and Enbridge Gas' existing Hamilton valve site, located just east of Highway 6 and north of Carlisle Road. The proposed pipeline will parallel two existing Enbridge Gas pipelines from the Kirkwall valve site for approximately 7 km, then parallel three existing Enbridge Gas pipelines for approximately 3 km to the Hamilton valve site. The total length of the proposed pipeline will be approximately 10 km. If approved, construction of the pipeline could begin as early as spring/summer 2021 and be complete by the end of 2021.

Enbridge Gas retained Stantec Consulting Ltd. (Stantec) to complete a Contamination Overview Study (COS) for the proposed project. The proposed pipeline generally runs north of Safari Road and south of Concession 8 West between Valens Road and just east of Highway 6. This length of proposed pipeline running along existing pipelines will be referred to herein as the "Site" (**Figure 1**, **Appendix A**). The specific purpose of the COS was to assess if evidence of potential and actual environmental contamination exists at the Site as a result of current and past activities on the Site or adjacent/neighbouring properties.

1.1 OBJECTIVE

The objective of the COS was to identify properties or areas that represented the potential for site contamination at the time of the investigation. The Canadian Standards Association (CSA) Standard Z768-01 for Phase I Environmental Site Assessment (ESA) defines contamination as the presence of a substance of concern, or a condition, in concentrations above appropriate pre-established criteria in soil, water, groundwater, air, or structures (CSA, R2016). Potential sources of contamination (PSOC) were qualitatively ranked as either a high, moderate, or low concern. **Section 2.0** provides a definition of each qualitative ranking.

1.2 SCOPE OF WORK

The scope of work completed to fulfill the objective of the COS entailed a modified Phase I ESA, as follows:

- Review of historical records and documentation available for the Site and study area (within 250 m of the Site between the Kirkwall Valve Site and Hamilton Valve Site). This review included a database search and a review of historical aerial photographs.
- Completion of a site reconnaissance of the Site and study area where accessible by public roadways.

The COS used the following documents as guidance to conduct the investigation:

- CSA, 2001. Standard Z768-01: Phase I Environmental Site Assessment. November 2001, reaffirmed 2016.
- Ontario, 2011. Ontario Regulation 153/04, Records of Site Condition, July 2011, as amended.

The COS deviated from a standard Phase I ESA in that site interviews were not completed with individual landowners, fire insurance plans were not ordered, city directory searches and title searches were not completed, well records were not reviewed, and requests were not directly made to the Ontario Ministry of the Environment, Conservation and Parks (MECP) for information they have on file for the Site. Much of this information was obtained through a database search completed by Environmental Risk Information Services (ERIS). The site reconnaissance comprised a windshield level survey that was conducted only in areas accessible by public roadways. Furthermore, although the guidance provided in O.Reg. 153/04 was referenced for the completion of the COS, it was not intended to meet all investigation and reporting requirements of a Phase One ESA as presented in Schedule D of O.Reg. 153/04.

2.0 METHODOLOGY

This section describes the methods used to complete the historical records review and the site reconnaissance activities. A list of PSOCs contributing to potential environmental concerns at the Site was developed using the information obtained from the COS (refer to **Table 1**).

High, Moderate, and Low potential concerns identified within the study area were generally defined as follows:

- **High**: Current or former potentially contaminating activity at which soil and/or groundwater contamination is typically found (e.g., gasoline service station, dry cleaning operation, known soil and/or groundwater contamination, heavy industrial operations) adjacent to the Site or within 50 m of the Site in the inferred upgradient direction.
- **Moderate**: Current or former potentially contaminating activity at which soil and/or groundwater contamination is typically found (e.g., gasoline service station, dry cleaning operation, known soil and/or groundwater contamination, heavy industrial operations, reported spills) within 50 m of the Site in the inferred downgradient direction or within 75 m of the Site in the inferred upgradient direction.
- **Low**: Current or former potentially contaminating activity between 75 m and 250 m from the Site in the inferred downgradient direction OR between 75 m and 250 m from the Site in the inferred upgradient direction, or a source of potential contamination where the source has likely been remediated or the contamination has likely attenuated (e.g., the potential for concern associated with a spill of a limited quantity of fuel (<50 L) to a roadway).

Section 4.0 summarizes PSOCs that represent environmental concerns at the Site, while **Table 1** provides the justification for ranking the PSOC as High, Moderate, or Low.

2.1 HISTORICAL RECORDS REVIEW

The historical records review consisted of a review of information available from government, public, and other agencies or parties, and information on file at Stantec. In addition, topographic mapping and geological reference maps were reviewed to develop a conceptual understanding of site physiography and hydrogeology. Information was reviewed from the following sources:

- Aerial/Satellite Imagery:
  - ESRI World Imagery from ERIS
  - City of Hamilton GIS Services (1995, 2002, 2005, 2007, 2010, 2012, 2014, 2015, and 2017)
  - Earth Observation Data Management System (Natural Resources Canada) (1966, 1972, 1980, and 1992)

- ERIS – The ERIS report documented a database search for the Site and properties within 250 m of the Site. The ERIS report, including full references for each database searched, is provided in **Appendix D**, and included searches of the following:
  - Federal Databases, including but not limited to: federal tanks, spills, polychlorinated biphenyl (PCB) storage sites, and waste disposal site databases
  - Private Databases, including but not limited to: private tank listings, waste disposal site databases, and manufacturing directories
  - Provincial Databases, including but not limited to: provincial tanks, certificates of approval/environmental compliance approvals, waste generators, waste disposal sites, and spills
- Topographic/Geologic/Physiographic Mapping:
  - Barnett, P.J., Cowan, W.R. and Henry, A.P. 1991. Quaternary geology of Ontario, southern sheet; Ontario Geological Survey, Map 2556, scale 1:1 000 000.
  - Ontario Geological Survey, 1991. Bedrock Geology of Ontario, Southern Sheet; Map 2544, Scale 1: 1,000,000
  - Ontario Ministry of Natural Resources and Forestry, 2019. Make a Topographic Map website

A search of MECP Freedom of Information (FOI) files and the Technical Standards and Safety Authority (TSSA) was not completed. Information typically available through the FOI and TSSA offices was accessed by the ERIS database search.

2.2 SITE RECONNAISSANCE

Site reconnaissance activities included:

- A windshield level survey of the preferred route along Carlisle Road, Highway 6, Concession 8 West, Brock Road, Safari Road, Middletown Road, Valens Road, and Westover Road, between the Kirkwall Valve Site and Compressor Station and Hamilton Valve Site in the City of Hamilton. The windshield level survey included observations and photographic documentation of the Site from publicly accessible roadways.
- Observation of properties adjacent to the Site to determine land use, where visible from public roadways.

Mr. Mark de Verteuil, B.Sc., and Ms. Dawn Brake-Holmes, B.Sc. (Hons), of Stantec carried out the site reconnaissance on January 4, 2019.

3.0 RESULTS

3.1 HISTORICAL RECORDS REVIEW

This section presents the findings of the historical records review. The site location is presented on **Figure 1** (**Appendix A**). The ERIS report prepared for the Site is included in **Appendix D**.

3.1.1 Aerial and Satellite Imagery

The earliest available aerial photograph was from 1966. Aerial photographs and satellite imagery were reviewed for the study area from the Kirkwall Valve Site to the Hamilton Valve Site. The study area is illustrated in **Figures 2.1** and **2.2**, **Appendix A**.

The table below (Table 2) provides a summary of pertinent information obtained from the aerial photographs and satellite imagery listed above.

Table 2: Summary of Aerial Photographs and Satellite Imagery

Year	Summary
1966	The study area appeared to consist of agricultural or wooded areas, with some agricultural buildings and residential homes. Major roadways were generally visible in the same locations as present-day conditions. Several watercourses appeared to cross the Site, including Spencer Creek. No infrastructure associated with the valve sites could be observed.
1972	The study area was generally consistent with the layout as shown on the 1966 aerial photograph, with the exception of new residential development in the vicinity of the Beverly Hills Adult Lifestyle Community (shown on Figure 2.1) and some ground disturbance visible beyond the study area to the south, near a waterbody at the intersection of Brock Road and Safari Road. The area of the Kirkwall Valve Site and Kirkwall Compressor Station is not shown in the aerial photo coverage of 1972; however, there was no sign of development at the Hamilton Valve Site.
1980	The study area was generally consistent with the layout as shown on the 1972 aerial photograph, with the exception of additional residential construction in the vicinity of the Beverly Hills Adult Lifestyle Community, and Ponderosa Nature Resort (shown on Figure 2.1). Disturbed earth continued to be visible around the waterbody at the intersection of Brock Road and Safari Road. Small rectangular buildings or other structures were noted at the present-day location of Verbinnen's Nursery, adjacent to Brock Road (shown on Figure 2.2). A strip of cleared land following the approximate site alignment was also observed between Valens Road and Ponderosa Nature Resort, suggesting that a pipeline easement was under construction.
1992, 1995	The study area was generally consistent with the layout as shown on the 1980 aerial photograph, with the exception of additional ground disturbance visible along the approximate site alignment, between Ponderosa Nature Resort and Brock Road. Infrastructure associated with the Kirkwall Valve Site and Compressor Station and Hamilton Valve Site were visible in 1995, and approximate site alignment appeared to extend to Highway 6. An oval track associated with an agricultural property was visible adjacent to the south of the Study Area between Highway 6 and Brock Road.

Table 2: Summary of Aerial Photographs and Satellite Imagery

Year	Summary
2002	The study area was generally consistent with the layout as shown on the 1992 and 1995 aerial imagery, with the exception of the development of the Antrim Glen Retirement Community (shown on Figure 2.1) and disturbed earth to the southwest of the Antrim Glen Retirement Community and within the northern half of the Study Area.
2005, 2007	The study area was generally consistent with the layout as shown on the 2002 aerial imagery, with the exception of additional development at the Antrim Glen Retirement Community, particularly to the south of the community, near the approximate site alignment, and east of the community, near Ponderosa Nature Resort. Two lagoons were visible within the study area to the southwest of the Antrim Glen Retirement Community and north of the Site. A new large building or greenhouse was visible to the east of the Hamilton Valve Site in 2005 and this building was expanded in 2007.
2010, 2012, 2014, 2015, 2017	The study area was generally consistent with the layout as shown on the 2005 and 2007 aerial imagery, with the exception of the completion of additional development at the Antrim Glen Retirement Community in 2010.

3.1.2 Physiographic Setting

According to the Quaternary Geology of Ontario map published by the Ontario Geologic Survey (Map 2556), the surficial soil in the vicinity of the Site generally consists of Wentworth Till (sandy silt to silt matrix, highly calcareous) with some glaciofluvial ice-contact deposits of gravel and sand with minor till and organic deposits including peat. Map 2556 also noted that there was exposed Paleozoic bedrock in the vicinity of the Site, consisting of carbonate or clastic sedimentary rock exposed at the surface or covered by a thin layer of overburden.

A number of borehole and WWIS records within the study area were provided by ERIS. In general, the overburden material for the boreholes within 250 m of the Site consisted of a layer of sandy clay, sand, sand and gravel, or clay with gravel, usually underlain by bedrock (identified as limestone) to the termination of the boreholes at depths up to 70.0 m (200 ft) below ground surface (BGS). Occasionally, bedrock was also identified at the surface, or peat layers were identified within the overburden stratigraphy.

According to bedrock geology mapping published by the Ontario Geologic Survey (Map 2544), bedrock in the vicinity of the Site is classified as the Arnabel Formation or Guelph Formation and consists of sandstone, shale, dolostone, and siltstone. Bedrock was not encountered in any of the borehole records reviewed in the ERIS report to depths of 10.3 m BGS; however, the well records described above identified limestone bedrock at depths of between approximately 0.3 m (1 ft) and 59.4 m (195 ft) BGS. The depth to water in the WWIS wells was identified between approximately 5.5 m (18 ft) and 60.4 m (198 ft) BGS.

3.1.3 Hydrogeological Setting

The Site was observed to consist of mostly flat land with some rolling hills covered by agricultural fields or low-lying vegetation that form part of an existing natural gas pipeline easement. The Site crossed four roads: Westover Road, Middletown Road, Brock Road, and Highway 6. The adjacent properties were generally at the same grade as the Site, although ditches were sometimes located on either side of roadways that intersected the Site.

Based on a review of available maps and the topography observed in the vicinity of the Site, the inferred regional groundwater flow appears to be to the south toward the Niagara Escarpment and Lake Ontario, which were situated approximately 11.1 km and 13.6 km southeast of the eastern limit of the Site, respectively. The elevation of the local groundwater table can generally mimic the local topography and may not reflect the regional trend in drainage. The local shallow groundwater flow pattern also can be influenced by subsurface structures in the vicinity, such as building foundations, weeping tiles, and utility trenches.

As shown in **Figures 2.1** to **2.2** (**Appendix A**), there are several small watercourses in the vicinity of the Study Area, including Spencer's Creek and an unnamed tributary that extends mainly along the northern side of the Site from the Ponderosa Nature Resort and discharges into Bronte Creek to the west of Highway 6. A large waterbody was observed to the south of the study area, near the intersection of Brock Road and Safari Road, and constructed lagoons were observed north of the Site within the study area to the east of Spencer Creek.

3.1.4 ERIS Historical Database Review

This section summarizes pertinent information provided by the ERIS database review. The complete ERIS report is included in **Appendix D** and additional details regarding identified PSOCs are included in **Table 1, Appendix B**.

3.1.4.1 Trans Canada Kirkwall Compressor Station

At the Kirkwall Compressor Station, records from the National Energy Board Pipeline Incidents (NEBI) and National Pollutant Release inventory (NPRI) databases were identified in the ERIS report for Trans Canada related to a release of natural gas in 2009 due to cracked or damaged equipment, in addition to air releases of 2.5 and 10 micron particulate matter, carbon monoxide, and nitrous oxides between 2002 and 2013, and 2015. Although releases to air are not considered to represent potential concerns to the Site, given the presence of a compressor station with significant infrastructure related to pipeline maintenance and operations directly adjacent to the Site, this property is considered to represent a potential source of contamination (**PSOC 2**).

3.1.4.2 Beverly Hills and Antrim Glen Residential Communities

The Beverly Hills Adult Lifestyle Community and Antrim Glen Retirement Community, located at Lots 32 and 33, Concession 7, Beverly Township, City of Hamilton had relevant records within the ERIS report. This included a certificate of approval for additions to the sewage treatment works servicing the Beverly

Hills Adult Lifestyle Community in 2006, which identified a sewage lagoon with approximately 30,700 m^3 of storage capacity. Permits to Take Water (PTTWs) were listed for both properties under Parkbridge B/P Inc. and Belmac Estate Properties Inc. in 2006 and 2009. Two spills of raw sewage (200 L in 2004 and 140,000 L in 2010) were also listed for the Antrim Glen Retirement Community. Given the residential land use of these properties, the nature of the material released, and the time elapsed, the sewage lagoons and releases were not considered to represent a PSOC for the Site.

3.1.4.3 Ponderosa Nature Resort

The Ponderosa Nature Resort, located at Lot 34, Concession 7, Flamborough Township had relevant records within the ERIS report. This included a certificate of approval in 2001 for the temporary installation of a sewage line and holding tank to accommodate a flow of 600 L/ day. The temporary installation was to be replaced by a permanent facility in 2003. A PTTW was also identified for Ponderosa Nature Resort in 2011. The activities related to this resort are not considered to represent a PSOC at the Site.

3.1.4.4 Historical Spills

Records for spills related to vehicular accidents and leaks within the study area were noted in both the plottable and unplottable sections of the ERIS report. The spills anticipated to represent PSOCs for the Site are summarized below:

- A spill of 100 L of diesel fuel onto Highway 6 in 1997 was reported approximately 4 km north of Concession 7 East in Flamborough (i.e., within the Study Area; **Figure 2.2**, **Appendix A**).
- A spill of an unknown volume of diesel fuel to the ditch in 1990 was reported along Brock Road in Flamborough (potentially within the Study Area; **Figure 2.2**, **Appendix A**).
- A leak of 23 L of furnace oil/ gasoline in 1993 was reported along Highway 6 in Flamborough (potentially within the Study Area; **Figure 2.2**, **Appendix A**).

Residual impacts to soil and/or groundwater that may remain following these releases represents a PSOC. Because the precise spill locations are not known for several of these incidents, the PSOC was identified along the length of the reported roadways within the Site (**PSOC 6**). Full spill details can be found in the ERIS report (**Appendix D**).

3.1.4.5 Water Wells

Records for water wells were included in the ERIS report from searches of the WWIS database. These records indicate that water wells have been drilled at multiple locations within 250 m of the Site. Forty-two wells were advanced between 1954 and 2017, with stratigraphy, depth to bedrock, and water levels as described above. The water uses for these wells included irrigation, livestock, domestic, water supply, observation, and unknown (one from 1991 to depth of 18.3 m). Full details can be found in the ERIS report (**Appendix D**). The presence of water wells within the study area does not represent a PSOC for

the Site; however, it should be noted that wells can provide a conduit from the ground surface, and should be abandoned in accordance with Reg. 903 if they are no longer in use.

3.1.4.6 Other Records

ERIS provided several unplottable records that could be associated with the study area. One record considered environmentally relevant, and that was not associated with any of the sections described above, was for an Ontario Ministry of Transportation waste generator listing for oil skimmings and sludges at Highway 6 in Hamilton, Ontario. Although the location of waste generation along Highway 6 was not confirmed, this listing was considered to contribute to **PSOC 6** since Highway 6 intersects the Study Area (**Figure 2.2**, **Appendix A**).

3.2 SITE RECONNAISSANCE

The results of the site reconnaissance conducted on January 4, 2019 are summarized in the following sections. Pertinent photographs of the Site are provided in **Appendix C**, and the site details are indicated on **Figures. 2.1** to **2.2**, **Appendix A**.

3.2.1 General Site Layout and Observations

The Site extends from the Kirkwall Valve Site at 1374 Valens Road in Hamilton, Ontario to the Hamilton Valve Site at 43 Carlisle Road in Hamilton, Ontario (length of approximately 10 km). The proposed pipeline generally runs north of Safari Road and south of Concession 8 West between Valens Road and just east of Highway 6 (**Figure 1**, **Appendix A**). The observed surface features on the Site included cultivated fields, low-lying vegetation, and asphalt or gravel roadways. Adjacent surface features included wooded areas, the compressor station (PSOC 2), and commercial properties, residential properties, and small waterways. Natural gas pipeline markers and overhead electrical lines were observed along nearby roadways and occasionally crossing the Study Area. During the windshield level survey, stockpiles and piles of debris were observed at different locations on agricultural or commercial properties within the Study Area. These included scrap cars and debris at 1454 Middletown Road, approximately 75 m south of the Site, and stockpiles at 1490 Highway 6, approximately 110 m south of the Site. The locations of observed stockpiles and debris are indicated on **Figures 2.1** and **2.2**, **Appendix A**. Given that the stockpiles observed at 1490 Highway 6 are located at a distance > 100 m from the Site, they were not considered to contribute to a PSOC. However, the materials observed at 1454 Middletown Road were considered to represent a PSOC, due to the potential for release of fuel or other fluids and the potential for the stockpiles or debris to be disturbed during the construction if moved closer to the Site (**PSOC 5**).

Given that the proposed pipeline was observed to intersect numerous roadways, it is likely that road de-icing materials have impacted the soil and/or groundwater quality at these locations within the Site. Salt-related parameters are not considered to be contaminants in a road alignment when de-icing salt has been used for winter road maintenance (O.Reg. 153/04 s.48 (3)); however, salt-impacted soil or water would require special management measures if being removed off-site.

The majority of the properties adjacent to the Site and within the Study Area were residential or agricultural properties. Other properties of note have been described below.

The Enbridge Gas Kirkwall Valve Site is present at the western limit of the Site and is accessed from Valens Road between Safari Road and Concession 8 West. This property was observed to include industrial buildings and infrastructure relating to pipeline maintenance and operations (such as metering equipment). Given the nature of this facility and possibility for storage of maintenance fluids or fuels, it was considered to be a PSOC (**PSOC 1**).

The Trans Canada Kirkwall Compressor Station is located at the adjacent property to the south of the Kirkwall Valve Site. Based on the presence of industrial buildings and infrastructure relating to pipeline maintenance and operations at the Compressor Station, and possibility for storage of maintenance fluids or fuels, it was considered to be a PSOC (**PSOC 2**).

In the central portion of the Site, which is the preferred new pipeline route, two residential communities (Beverly Hills Adult Lifestyle Community, Antrim Glen Retirement Community) and a vacation resort (Ponderosa Nature Resort) are located adjacent to the Site. The Site is located directly south of the Beverly Hill Adult Lifestyle Community, and intersects the southern portions of the Antrim Glen Retirement Community and Ponderosa Nature Resort. A pad-mounted transformer was identified in the southeastern corner of the Antrim Glen Retirement Community and was considered to be a PSOC (**PSOC 4**), as discussed below.

A tree nursery (Verbinnen's Nursery) was observed at 1504 Brock Road adjacent to the southern side of the Site. Given the expected use of pesticides and herbicides to protect against disease and pests, and the possibility of bulk storage of such materials, it was considered to be a PSOC (**PSOC 7**).

The eastern limit of the Site is the Hamilton Valve Site, accessed from Carlisle Road east of Highway 6. Similar to the Kirkwall Valve Site, given the nature of this facility, presence of metering equipment, and possibility for storage of maintenance fluids or fuels, it was considered to be a PSOC (**PSOC 8**).

3.2.2 Site Services

Overhead electrical lines, roadside ditches, and culverts were observed within the Study Area. Natural gas pipelines were present throughout the Site and Study Area, as evidenced by the presence of pipeline markers. Various underground telecommunication or other services are also expected to be present within the Study Area.

3.2.3 Storage Tanks

No storage tanks were observed on the Site; however, it is expected that nearby residential and/or agricultural properties could be heated by fuel oil and have associated aboveground fuel storage tanks. Based on the anticipated limited size of these domestic tanks and distance from the Site, they are not anticipated to represent PSOCs.



Although no evidence of fuel storage tanks was observed, it is possible that fuel is stored at the Hamilton or Kirkwall Valve Sites or the Kirkwall Compressor Station. As indicated above, these facilities were considered to be PSOCs (**PSOCs 1**, **2**, **8**)

3.2.4 Building Materials

Typical road construction materials (e.g., asphalt, concrete, etc.) were present and building materials associated with culverts were also present along the roadways. No buildings were observed within the Site, although commercial, industrial, and residential buildings were observed within the Study Area, as described above.

3.2.5 PCBs

Pole-mounted transformers were identified along the roadways within the Study Area, as well as a pad-mounted transformer off Glenariff Drive associated with the residential communities to the south of Concession 8 West. Given the recent construction of the pad-mounted transformer (i.e., between 1995 and 2002 from a review of aerial imagery), the potential for it to contain polychlorinated biphenyls (PCBs) is considered low; however, it was considered to be a PSOC (**PSOC 4**). It is anticipated that the most, if not all, of the pole-mounted transformers have been upgraded and no longer contain PCBs. Given this, and the limited size and distance from the Site, pole-mounted transformers at the Site are not considered to represent a PSOC.

3.2.6 Chemical Storage

Chemical storage was not observed on the Site, although as indicated above, it is anticipated that chemical storage may be present at the commercial and industrial properties identified within the Study Area. These include the Kirkwall and Hamilton Valve Sites, Kirkwall Compressor Station, and Verbinnen's Nursery.

3.2.7 Waste Generation and Disposal

No evidence of waste generation or disposal was observed on the Site or within the study area.

3.2.8 Surficial Staining, Fill, Debris, and Vegetation Observations

Surficial staining or stressed vegetation was not observed at the Site; however, numerous stockpiles of soil and/ or debris were observed within the Study Area. It is also likely that fill materials were imported onto the Site for the purposes of construction within the easement. The environmental quality of the imported fill through the length of the Site is unknown and represents a PSOC (**PSOC 3**).

4.0 ENVIRONMENTAL CONCERNS

PSOC were identified that may contribute to environmental concerns at the Site. The PSOC are summarized in Section 4.1 and are listed in **Table 1** (**Appendix B**), along with a ranking of the likelihood (i.e., high, moderate, or low) that the soil and/or groundwater quality at the Site has been impacted.

4.1 POTENTIAL SOURCES OF CONTAMINATION

Properties or features identified as being PSOCs to the Site are summarized below:

- **PSOC 1** – The presence of the Kirkwall Valve Site and associated infrastructure relating to pipeline maintenance and operations (such as metering equipment) at 1374 Valens Road (**Figure 2.1, Appendix A**). This PSOC is interpreted to be low given that no evidence of soil or groundwater contamination was identified through Site observation or historical records review.
- **PSOC 2** – The presence of the Kirkwall Compressor Station and associated infrastructure relating to pipeline maintenance and operations (such as metering equipment) at 1376 Valens Road (**Figure 2.1, Appendix A**). This PSOC is i interpreted to be low, given that no evidence of soil or groundwater contamination was identified through Site observation or historical records review.
- **PSOC 3** – Imported fill materials along the route, which follows an existing natural gas pipeline easement (**Figures 2.1** to **2.2**, **Appendix A**). This PSOC is interpreted to be moderate.
- **PSOC 4** – Pad-mounted transformer located off Glenariff Drive near the residential communities off of Concession 8 West. This PSOC is interpreted to be low.
- **PSOC 5** – Scrap cars, piles of debris, and stockpiles located at 1454 Middletown Road (**Figure 2.2**, **Appendix A**). Based on the distance of the materials observed at 1454 Middletown Road from the Site (approximately 75 m), the potential for the release of fuel or other fluids or the disturbance of stockpiles or debris to impact the Site is considered to represent a low PSOC.
- **PSOC 6** – Historical spills of diesel, gasoline, and oil along Brock Road and Highway 6, which may have occurred within the study area (**Figure 2.2**, **Appendix A**). This PSOC is interpreted to be low, given the age and small volumes of the spills (less than 100 L), and the uncertainty of their exact locations in relation to the Site.
- **PSOC 7** – Potential pesticide and herbicide use and bulk storage at Verbinnen's Tree Nursery at 1504 Brock Road (**Figure 2.2**, **Appendix A**). This PSOC is interpreted to be low based on the nature of the activities at the Site.
- **PSOC 8** – The presence of the Hamilton Valve Site and associated infrastructure relating to pipeline maintenance and operations (such as metering equipment) at 43 Carlisle Road (**Figure 2.2, Appendix A**). This PSOC is interpreted to be low given that no evidence of soil or groundwater contamination was identified through Site observation or historical records review.

4.2 RECOMMENDATIONS

Based on the PSOCs identified in Section 4.1, the following recommendations are provided:

- Should excess soil be generated at the Site during future construction activities, representative soil samples should be collected and submitted for chemical analysis in coordination with a qualified person for environmental site assessment (QP_{ESA}) as defined by Ontario Regulation 153/04, to determine management options.

- Should excess soil be generated at the Site during construction activities, soils that do not meet the Standards listed in Table 1 of the MECP document *Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act* (April 15, 2011) may not be considered inert fill upon excavation, and off-site management options for excess soils that cannot be reused within the Site must be considered. It is understood that salt-related parameters may not be considered to be contaminants in areas of the Site that cross a road alignment, when de-icing salt has been used for winter road maintenance (O.Reg. 153/04 s.48 (3)); however, soil or water impacted by salt should be managed according to MECP guidance if it is to be removed from the Site.

- Should excess water be generated at the Site during construction activities, water quality analyses should be conducted to determine appropriate management methods, such as is done in support of a permit to take water (PTTW). This work should be done in coordination with a QP_{ESA}, to maintain data quality and provide an appropriate assessment of water quality. The QP_{ESA} should be aware of the PSOCs identified herein so as to select an appropriate list of analytes.

- Should evidence of soil or water impacts be identified during construction (e.g., staining, odours, debris/waste, petroleum hydrocarbon sheen) samples should be collected for laboratory analyses to confirm concentrations of potential contaminants so as to develop appropriate material management, and health and safety guidelines.

- Water wells within the study area can provide a conduit from the ground surface, and should be abandoned in accordance with Reg. 903 if they are no longer in use.

- A Phase I ESA, and Phase II ESA (if recommended as part of the Phase I ESA) should be considered for any property that will be acquired by Enbridge Gas and a site-specific evaluation of PSOCs should be completed. If building demolition will be required, designated substance surveys should be completed for buildings or structures prior to demolition.



5.0 LIMITATIONS

This report documents work that was performed in accordance with generally accepted professional standards at the time and location in which the services were provided. No other representations, warranties or guarantees are made concerning the accuracy or completeness of the data or conclusions contained within this report, including no assurance that this work has uncovered all potential liabilities associated with the identified property.

This report provides an evaluation of selected environmental conditions associated with the identified portion of the property that was assessed at the time the work was conducted and is based on information obtained by and/or provided to Stantec at that time. There are no assurances regarding the accuracy and completeness of this information. All information received from the client or third parties in the preparation of this report has been assumed by Stantec to be correct. Stantec assumes no responsibility for any deficiency or inaccuracy in information received from others.

The opinions in this report can only be relied upon as they relate to the condition of the portion of the identified property that was assessed at the time the work was conducted. Activities at the property subsequent to Stantec's assessment may have significantly altered the property's condition. Stantec cannot comment on other areas of the property that were not assessed.

Conclusions made within this report consist of Stantec's professional opinion as of the time of the writing of this report, and are based solely on the scope of work described in the report, the limited data available and the results of the work. They are not a certification of the property's environmental condition. This report should not be construed as legal advice.

This report has been prepared for the exclusive use of the client identified herein and any use by any third party is prohibited. Stantec assumes no responsibility for losses, damages, liabilities or claims, howsoever arising, from third party use of this report.

This report is limited by the following:

- Review of the specific databases and information sources listed.
- Site visit of the preferred route included observations from publicly accessible areas only.

The locations of any utilities, buildings and structures, and property boundaries illustrated in or described within this report, if any, including pole lines, conduits, water mains, sewers and other surface or sub-surface utilities and structures are not guaranteed. Before starting work, the exact location of all such utilities and structures should be confirmed and Stantec assumes no liability for damage to them.

The conclusions are based on the site conditions encountered by Stantec at the time the work was performed at the specific testing and/or sampling locations, and conditions may vary among sampling locations. Factors such as areas of potential concern identified in previous studies, site conditions (e.g., utilities) and cost may have constrained the sampling locations used in this assessment. In addition, analysis has been carried out for only a limited number of chemical parameters, and it should not be



inferred that other chemical species are not present. Due to the nature of the investigation and the limited data available, Stantec does not warrant against undiscovered environmental liabilities nor that the sampling results are indicative of the condition of the entire site. As the purpose of this report is to identify site conditions which may pose an environmental risk; the identification of non-environmental risks to structures or people on the site is beyond the scope of this assessment.

Should additional information become available which differs significantly from our understanding of conditions presented in this report, Stantec specifically disclaims any responsibility to update the conclusions in this report.

This report was prepared by Janice Cooper, M.Sc., EIT, and reviewed by Grace Ferguson, M.Sc., P.Eng. Qualifications are provided in **Appendix E**.

All of which is respectfully submitted,

STANTEC CONSULTING LTD.

Digitally signed by Janice Cooper
Date: 2019.06.18 20:17:48 -04'00'

Janice Cooper, M.Sc., EIT
Environmental Scientist
Tel: 519-585-7317
janice.cooper@stantec.com

Digitally signed by Grace Ferguson
Date: 2019.06.19 08:57:12 -04'00'

Grace Ferguson, M.Sc., P.Eng.
Senior Hydrogeologist
Tel: 519-585-7456
grace.ferguson@stantec.com

6.0 REFERENCES

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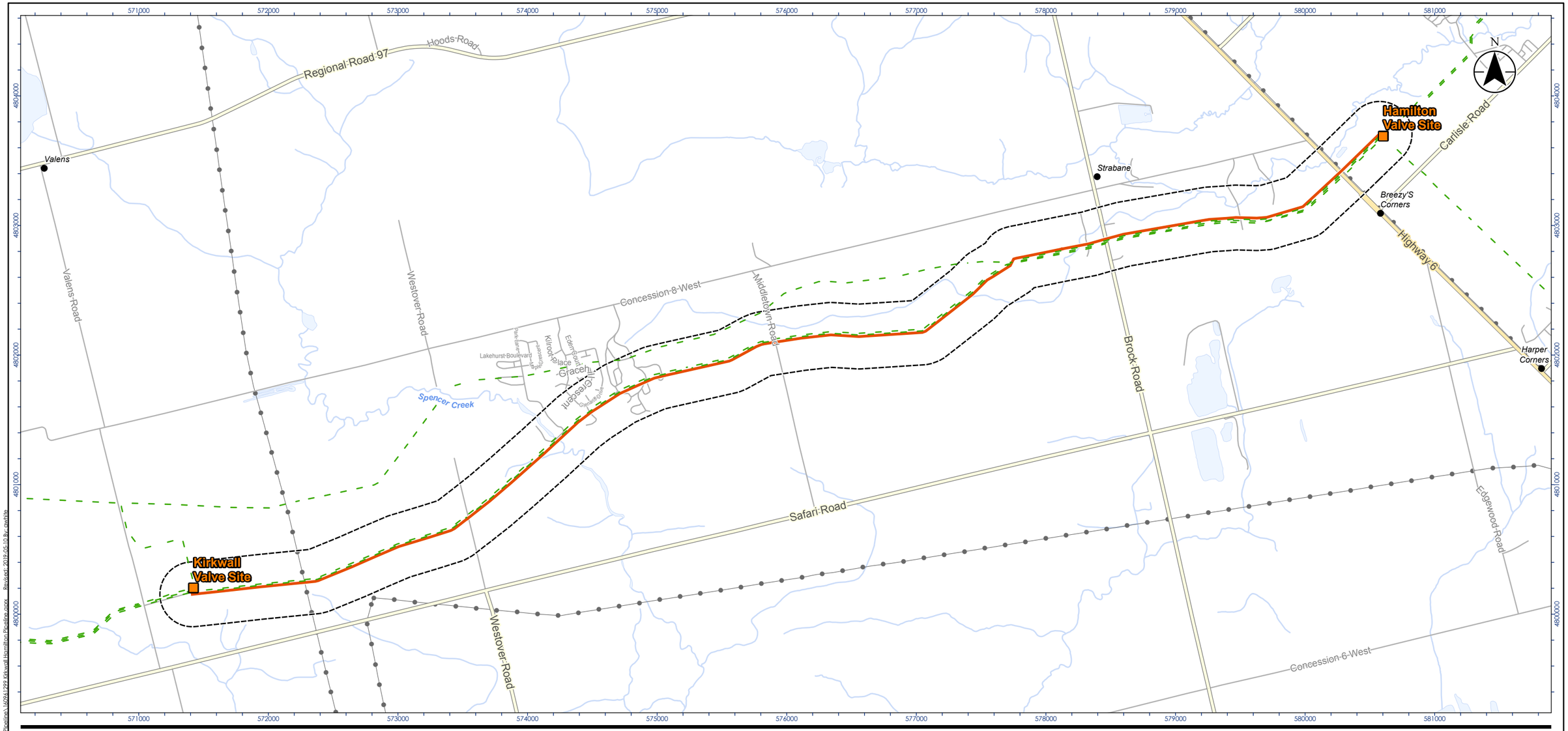
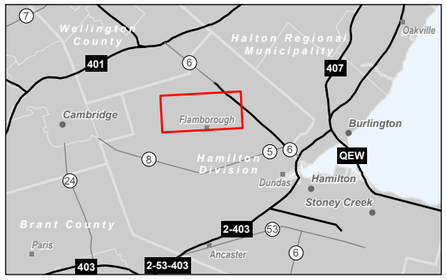
APPENDIX A
FIGURES







Legend

- Existing Enbridge Station
- Preferred Route
- Study Area
- Existing Pipeline
- Municipal Boundary, Lower
- Highway
- Major Road
- Minor Road
- Hydro Line
- Watercourse
- Waterbody

0 0.5 1 km

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2019.

Stantec

Project Location
City of Hamilton

160961299

Client/Project
ENBRIDGE GAS INC.
KIRKWALL TO HAMILTON PIPELINE PROJECT

Figure No.
1

Title
Site Plan

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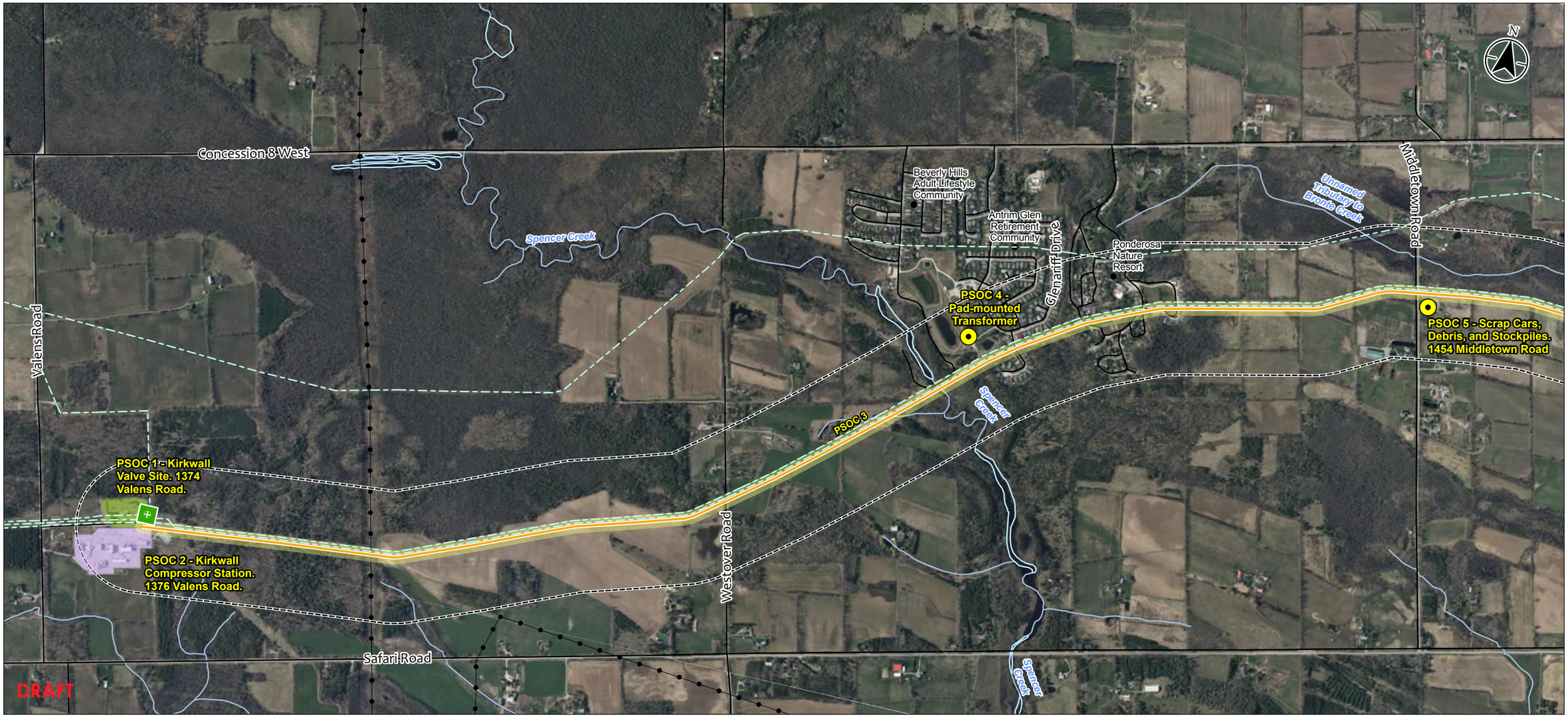
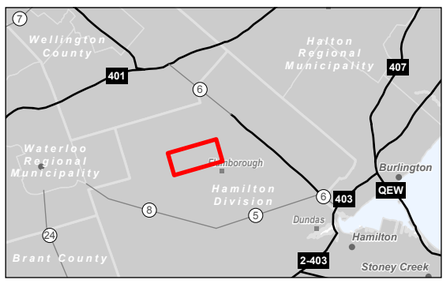
C:\Cad\2019\01\160961299\active\160961299-A03-drawings-site_context\160961299 Kirkwall Hamilton Pipeline\160961299 Kirkwall Hamilton Pipeline.aprx Revised: 2019-05-10 By: rowhite





Legend

- Site
- Existing Enbridge Station
- 250 m Zone of Investigation
- Potential Source of Contamination (PSOC) (point)
- PSOC 1 - Kirkwall Valve Site. 1374 Valens Road.
- PSOC 2 - Kirkwall Compressor Station. 1376 Valens Road.
- PSOC 3 Fill Materials
- Roads
- Existing Enbridge Gas Inc. Pipeline
- Hydro Line
- Waterbody
- Watercourse

0 250 500 m

1:15,000 (At original document size of 11x17)

Notes

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3. Orthoimagery © First Base Solutions, 2018. Imagery Date, 2017.

Stantec

Project Location
City of Hamilton

160961299
Prepared by AMW on 2019-05-29
Technical Review by MD on 2019-05-09

Client/Project
Enbridge Gas Inc.
Kirkwall to Hamilton Pipeline

Figure No.
2.1

DRAFT

Title
Sources of Contamination

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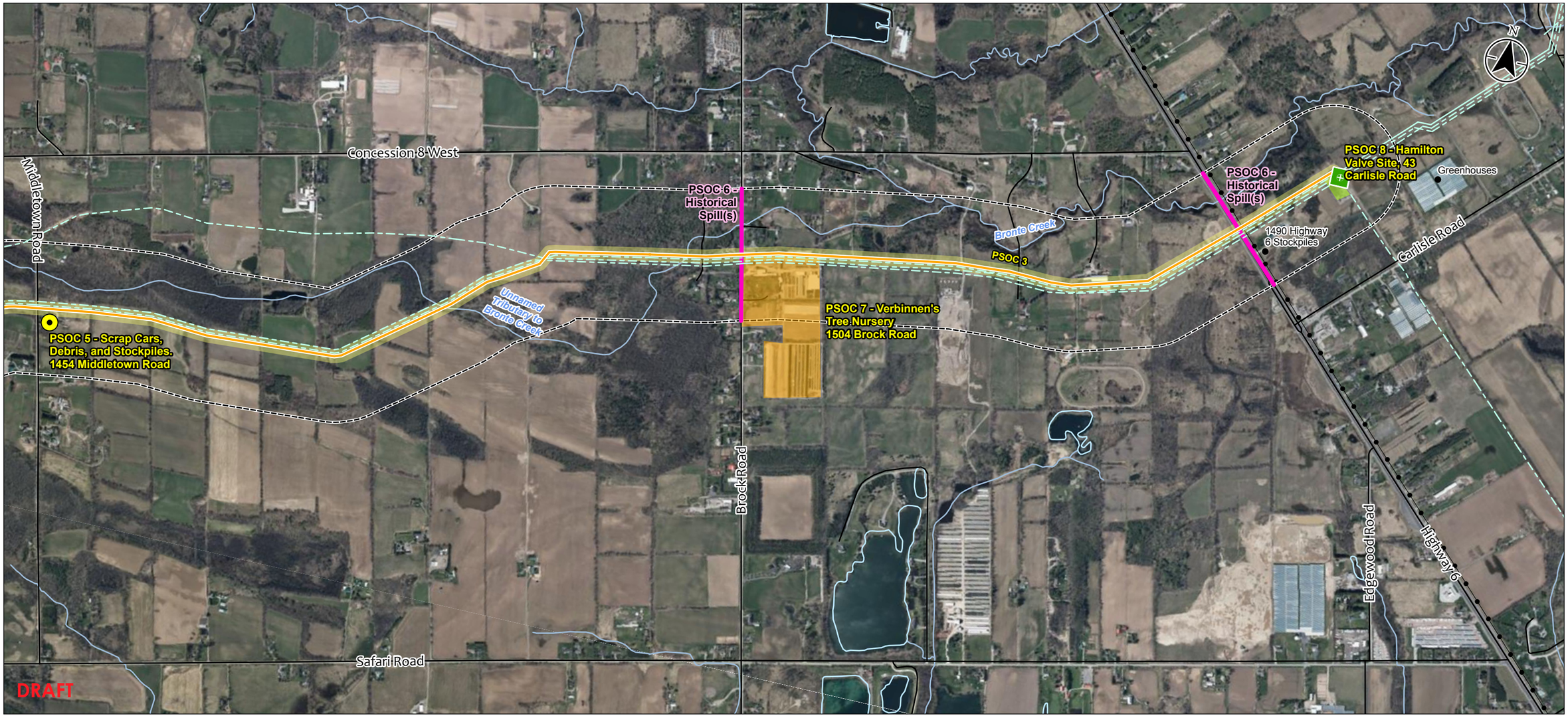
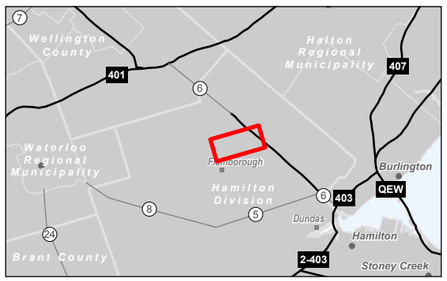
\\Cd1220.ca021.01420.corp.local\160961299\03_drawings\gis_cad\mxd\160961299 Kirkwall Hamilton Pipeline\160961299 Kirkwall Hamilton Pipeline.mxd Revised: 2019-05-29 By: mwhite





Legend

- Site
- Existing Enbridge Station
- 250 m Zone of Investigation
- Potential Source of Contamination (PSOC) (point)
- PSOC 3 Fill Materials
- PSOC 6 Historical Spill(s)
- PSOC 7 - Verbinnen's Tree Nursery 1504 Brock Road
- PSOC 8 - Hamilton Valve Site, 43 Carlisle Road
- Roads
- Existing Enbridge Gas Inc. Pipeline
- Hydro Line
- Waterbody
- Watercourse

0 250 500 m

1:15,000 (At original document size of 11x17)

Notes

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Stantec

Project Location
City of Hamilton

160961299
Prepared by AMW on 2019-05-29
Technical Review by MD on 2019-05-09

Client/Project
Enbridge Gas Inc.
Kirkwall to Hamilton Pipeline

Figure No.
2.2

DRAFT

Title
Sources of Contamination

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APPENDIX B
PSOC TABLE

Table 1: Summary of Potential Sources of Contamination

PSOC ID No.	Description of Potential Source	Location	Approximate Distance from the Site	Contaminant of Concern	Potential for Concern	Explanation of Potential for Concern
1	Enbridge Gas Kirkwall Valve Site	1374 Valens Road	Adjacent property to the west	Petroleum Hydrocarbons (PHCs), Polycyclic Aromatic Hydrocarbons (PAHs), and Volatile Organic Compounds (VOCs)	Low	Presence of metering equipment. No evidence of soil or groundwater contamination identified through Site observation and historical records review process.
2	Trans Canada Kirkwall Compressor Station	1376 Valens Road	Adjacent property to the west	PHCs, PAHs, and VOCs	Low	Presence of metering equipment. No evidence of soil or groundwater contamination identified through Site observation and historical records review process.
3	Imported fill material	Entire Site	On Site	PHCs, PAHs, VOCs, Metals and Inorganics	Moderate	It is expected that fill materials of unknown quality were imported onto the Site for the purposes of construction within the easement Therefore, the PSOC associated with imported fill along the Site is considered to be moderate.

PSOC ID No.	Description of Potential Source	Location	Approximate Distance from the Site	Contaminant of Concern	Potential for Concern	Explanation of Potential for Concern
4	Pad-mounted transformers	Off Glenariff Drive	Within Study Area	PHCs and PCBs	Low	A pad-mounted transformer was identified off Glenariff Drive associated with the residential communities off Concession 8 West. Given the potential for this transformer to contain PCBs and/or transformer oil, it is considered to represent a PSOC with low potential concern.
5	Scrap Cars, Debris, and Stockpiles	1454 Middletown Road	Approximately 75 m south of the Site	PHCs, PAHs, and VOCs	Low	Stockpiles of unknown origin/quality and several cars in varying states of disrepair were observed at this property, in addition to several piles of debris. The potential for migration of contaminants from these materials onto the Site represents a potential concern. This PSOC is considered to be low due to the distance of the property from the Site.

PSOC ID No.	Description of Potential Source	Location	Approximate Distance from the Site	Contaminant of Concern	Potential for Concern	Explanation of Potential for Concern
6	Historical Spills	Portions of Brock Road and Highway 6 within Study Area	On Site and within Study Area	PHCs, PAHs, and VOCs	Low	A few unplottable records existed for spills (≤100 L) of diesel, gasoline, and oil along Brock Road and Highway 6 between 1990 and 1997. These spills may have occurred within the Study Area. The PSOC associated with these spills is considered to be low due to the age and size of the spills.
7	Verbinnen's Tree Nursery	1504 Brock Road	Adjacent property to the south	Pesticides and Herbicides	Low	During the site reconnaissance, a tree nursery was identified adjacent to the south of the Site. It is possible that bulk storage of pesticides and herbicides may be present given their likely use at the tree nursery to protect against disease and pests. Based on the nature of the activities at this property, the PSOC is considered to be low.

PSOC ID No.	Description of Potential Source	Location	Approximate Distance from the Site	Contaminant of Concern	Potential for Concern	Explanation of Potential for Concern
8	Hamilton Valve Site	43 Carlisle Road	Adjacent property to the southeast	PHCs, PAHs, and VOCs	Low	Presence of metering equipment. No evidence of soil or groundwater contamination identified through Site observation and historical records review process.

APPENDIX C
PHOTOGRAPHIC LOG



Photo 1 Enbridge Gas Kirkwall Valve Site, located at 1374 Valens Road (PSOC 1).



Photo 2 TransCanada Kirkwall Compressor Station, located at 1376 Valens Road (PSOC 2).

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Photo 3 Pad-mounted transformer, located off Glenariff Drive south of the Antrim Glen Retirement Community (PSOC 4)



Photo 4 Scrap cars located at 1454 Middletown Road (PSOC 5).

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Photo 5 Stockpiles and debris at 1454 Middletown Road (PSOC 5).



Photo 6 Verbinnen's Tree Nursery, located at 1504 Brock Road (PSOC 7).

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Photo 7 Hamilton Valve Site, located at 43 Carlisle Road (PSOC 8).

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APPENDIX D
RELEVANT HISTORICAL INFORMATION

Disclaimer: The following Appendix falls under the category of exceptions as the information came from another organization, not Stantec. Therefore, this appendix is not accessible as per Accessibility for Ontarians with Disabilities Act, 2005 (AODA).

ENVIRONMENTAL RISK INFORMATION SERVICES

DATABASE REPORT

Project Property:	*quote* *n/a* *ON L0R 1K0 ON*
Project No:	*160961299.200.200*
Report Type:	*Quote - Custom-Build Your Own Report*
Order No:	*20181024125*
Requested by:	*Stantec Consulting Ltd.*
Date Completed:	*October 30, 2018*

Environmental Risk Information Services
A division of Glacier Media Inc.
P: 1.866.517.5204
E: info@erisinfo.com

www.erisinfo.com

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Executive Summary

Property Information:

Project Property:	*quote* *n/a ON L0R 1K0 ON*
Project No:	*160961299.200.200*

Order Information:

Order No:	*20181024125*
Date Requested:	*October 24, 2018*
Requested by:	*Stantec Consulting Ltd.*
Report Type:	*Quote - Custom-Build Your Own Report*

Historical/Products:

Excel Add-On	*Excel Add-On*

Executive Summary: Report Summary

Database	Name	Searched	Project Property	Boundary to 0.25km	Total
AAGR	*Abandoned Aggregate Inventory*	Y	0	0	0
AGR	*Aggregate Inventory*	Y	0	0	0
AMIS	*Abandoned Mine Information System*	Y	0	0	0
ANDR	*Anderson's Waste Disposal Sites*	Y	0	0	0
AUWR	*Automobile Wrecking & Supplies*	Y	0	0	0
BORE	*Borehole*	Y	0	8	8
CA	*Certificates of Approval*	Y	0	0	0
CFOT	*Commercial Fuel Oil Tanks*	Y	0	0	0
CHEM	*Chemical Register*	Y	0	0	0
CNG	*Compressed Natural Gas Stations*	Y	0	0	0
COAL	*Inventory of Coal Gasification Plants and Coal Tar Sites*	Y	0	0	0
CONV	*Compliance and Convictions*	Y	0	0	0
CPU	*Certificates of Property Use*	Y	0	0	0
DRL	*Drill Hole Database*	Y	0	0	0
DRYCLEANERS	*Dry Cleaning Facilities*	Y	0	0	0
EASR	*Environmental Activity and Sector Registry*	Y	0	0	0
EBR	*Environmental Registry*	Y	0	0	0
ECA	*Environmental Compliance Approval*	Y	0	3	3
EEM	*Environmental Effects Monitoring*	Y	0	0	0
EHS	*ERIS Historical Searches*	Y	0	3	3
EIIS	*Environmental Issues Inventory System*	Y	0	0	0
EMHE	*Emergency Management Historical Event*	Y	0	0	0
EXP	*List of TSSA Expired Facilities*	Y	0	0	0
FCON	*Federal Convictions*	Y	0	0	0
FCS	*Contaminated Sites on Federal Land*	Y	0	0	0
FOFT	*Fisheries & Oceans Fuel Tanks*	Y	0	0	0
FST	*Fuel Storage Tank*	Y	0	0	0
FSTH	*Fuel Storage Tank - Historic*	Y	0	0	0
GEN	*Ontario Regulation 347 Waste Generators Summary*	Y	0	0	0
GHG	*Greenhouse Gas Emissions from Large Facilities*	Y	0	0	0
HINC	*TSSA Historic Incidents*	Y	0	0	0
IAFT	*Indian & Northern Affairs Fuel Tanks*	Y	0	0	0
INC	*TSSA Incidents*	Y	0	0	0
LIMO	*Landfill Inventory Management Ontario*	Y	0	0	0
MINE	*Canadian Mine Locations*	Y	0	0	0
MISA PENALTY	*Environmental Penalty Annual Report*	Y	0	0	0

Database	Name	Searched	Project Property	Boundary to 0.25km	Total
MNR	Mineral Occurrences	Y	0	0	0
NATE	National Analysis of Trends in Emergencies System (NATES)	Y	0	0	0
NCPL	Non-Compliance Reports	Y	0	0	0
NDFT	National Defense & Canadian Forces Fuel Tanks	Y	0	0	0
NDSP	National Defense & Canadian Forces Spills	Y	0	0	0
NDWD	National Defence & Canadian Forces Waste Disposal Sites	Y	0	0	0
NEBI	National Energy Board Pipeline Incidents	Y	0	1	1
NEBW	National Energy Board Wells	Y	0	0	0
NEES	National Environmental Emergencies System (NEES)	Y	0	0	0
NPCB	National PCB Inventory	Y	0	0	0
NPRI	National Pollutant Release Inventory	Y	0	14	14
OGW	Oil and Gas Wells	Y	0	0	0
OOGW	Ontario Oil and Gas Wells	Y	0	0	0
OPCB	Inventory of PCB Storage Sites	Y	0	0	0
ORD	Orders	Y	0	0	0
PAP	Canadian Pulp and Paper	Y	0	0	0
PCFT	Parks Canada Fuel Storage Tanks	Y	0	0	0
PES	Pesticide Register	Y	0	0	0
PINC	TSSA Pipeline Incidents	Y	0	0	0
PRT	Private and Retail Fuel Storage Tanks	Y	0	0	0
PTTW	Permit to Take Water	Y	0	0	0
REC	Ontario Regulation 347 Waste Receivers Summary	Y	0	0	0
RSC	Record of Site Condition	Y	0	0	0
RST	Retail Fuel Storage Tanks	Y	0	0	0
SCT	Scott's Manufacturing Directory	Y	0	0	0
SPL	Ontario Spills	Y	0	2	2
SRDS	Wastewater Discharger Registration Database	Y	0	0	0
TANK	Anderson's Storage Tanks	Y	0	0	0
TCFT	Transport Canada Fuel Storage Tanks	Y	0	0	0
VAR	TSSA Variances for Abandonment of Underground Storage Tanks	Y	0	0	0
WDS	Waste Disposal Sites - MOE CA Inventory	Y	0	0	0
WDSH	Waste Disposal Sites - MOE 1991 Historical Approval Inventory	Y	0	0	0
WWIS	Water Well Information System	Y	0	46	46
	Total:		0	77	77

Executive Summary: Site Report Summary - Project Property

Map Key	DB	Company/Site Name	Address	Dir/Dist (m)	Elev diff (m)	Page Number

No records found in the selected databases for the project property.

Executive Summary: Site Report Summary - Surrounding Properties

Map Key	DB	Company/Site Name	Address	Dir/Dist (m)	Elev Diff (m)	Page Number
1	WWIS		lot 7 con 7 ON **Well ID:** 6810347	ENE/5.7	-7.19	25
2	WWIS		lot 7 con 7 ON **Well ID:** 6809875	ENE/10.1	-7.75	27
3	ECA	Parkbridge G/P Inc.	Hamilton ON L0L 2P0	WSW/10.7	3.39	31
4	ECA	New Country Investors Ltd.	Hamilton ON M2N 6G8	WSW/17.1	4.00	31
5	WWIS		lot 34 con 7 ON **Well ID:** 6812181	WSW/22.1	4.00	31
6	WWIS		lot 34 con 7 ON **Well ID:** 6807519	WSW/24.2	5.00	34
7	ECA	Belmac Estate Properties Inc.	Hamilton ON L0L 2P0	WSW/34.1	-0.76	37
8	WWIS		Hamilton ON **Well ID:** 7281367	WSW/37.3	5.00	37
9	WWIS		lot 32 con 7 ON **Well ID:** 6813045	WSW/41.1	0.79	44
9	WWIS		lot 32 con 7 ON **Well ID:** 6812044	WSW/41.1	0.79	47
10	NEBI	TransCanada PipeLines Limited	Hamilton ON	WSW/41.9	1.00	50
11	WWIS		lot 33 con 7 ON	SW/47.1	1.09	51

Map Key	DB	Company/Site Name	Address	Dir/Dist (m)	Elev Diff (m)	Page Number
			Well ID: 6810703			
12	WWIS		lot 7 con 7 ON ***Well ID:*** 6810346	ENE/52.8	-6.00	54
13	EHS		780 Concession Rd 8 W Hamilton ON N0B2J0 ***Order ID:*** 566928	ENE/53.6	0.39	57
14	WWIS		lot 31 con 7 ON ***Well ID:*** 6807572	WSW/57.2	2.69	57
15	WWIS		lot 16 con 1 ON ***Well ID:*** 5005530	WSW/57.3	4.00	60
16	WWIS		lot 31 con 7 ON ***Well ID:*** 6807576	WSW/57.6	5.00	64
17	WWIS		lot 11 con 7 ON ***Well ID:*** 6806543	ENE/71.5	-10.98	67
18	WWIS		lot 7 con 7 ON ***Well ID:*** 6806533	ENE/79.8	-4.95	69
19	WWIS		lot 31 con 7 ON ***Well ID:*** 6809554	WSW/84.4	1.31	72
20	WWIS		lot 34 con 7 FLAMBOROUGH ON ***Well ID:*** 7206722	WSW/86.3	5.00	75
21	WWIS		lot 6 con 7 ON ***Well ID:*** 6809427	ENE/90.4	-5.00	76
22	WWIS		lot 9 con 7 MILLGROVE ON ***Well ID:*** 7226659	ENE/99.0	3.34	80
23	WWIS		ACTON ON ***Well ID:*** 7042163	E/101.2	-2.40	87
24	SPL		1264 8th Concession Road West Hamilton ON	WSW/103.2	5.00	90

Map Key	DB	Company/Site Name	Address	Dir/Dist (m)	Elev Diff (m)	Page Number
24	SPL	Parkbridge Lifestyle Communities Inc.	1264 8th Concession Rd W Part of Lots 32 and 33, Concession 7, geographic townsh Hamilton ON L0R 1K0	WSW/103.2	5.00	90
25	WWIS		lot 31 con 7 ON ***Well ID:*** 6809278	WSW/104.3	3.05	91
26	WWIS		lot 1 con 7 ON ***Well ID:*** 6807665	NNW/104.5	-2.00	93
27	WWIS		lot 7 con 7 ON ***Well ID:*** 6806527	ENE/105.4	-9.78	96
28	WWIS		ON ***Well ID:*** 7143751	W/108.4	5.00	99
29	BORE		ON	ENE/113.5	-10.32	100
30	BORE		ON	ENE/115.3	-12.42	101
31	BORE		ON	ENE/116.3	-12.77	101
32	WWIS		lot 34 con 7 ON ***Well ID:*** 6808445	WSW/116.6	5.00	102
33	BORE		ON	ENE/116.8	-11.87	105
34	WWIS		lot 31 con 7 ON ***Well ID:*** 6808253	WSW/117.5	5.00	105
35	BORE		ON	ENE/126.4	-12.42	108
36	NPRI	TRANSCANADA PIPELINES LIMITED	PT LOT 25 CON 7, PLAN 62R-8308 PTS 1-8 EX PLANS 62R-9684, 62R-9685, 62R-	WSW/127.2	0.66	109

Map Key	DB	Company/Site Name	Address	Dir/Dist (m)	Elev Diff (m)	Page Number
			10903 HAMILTON ON			
36	NPRI	TRANSCANADA PIPELINES LIMITED	PT LOT 25 CON 7, PLAN 62R-8308 PTS 1-8 EX PLANS 62R-9684, 62R-9685, 62R-10903 HAMILTON ON	WSW/127.2	0.66	110
36	NPRI	TRANSCANADA PIPELINES	PT LOT 25 CON 7, PLAN 62R-8308 PTS 1-8 EX PLANS 62R-9684, 62R-9685, 62R-10903 HAMILTON ON	WSW/127.2	0.66	111
36	NPRI	TRANSCANADA PIPELINES	PT LOT 25 CON 7, PLAN 62R-8308 PTS 1-8 EX PLANS 62R-9684, 62R-9685, 62R-10903 HAMILTON ON	WSW/127.2	0.66	113
36	NPRI	TRANSCANADA PIPELINES	PT LOT 25 CON 7, PLAN 62R-8308 PTS 1-8 NOT AVAILABLE HAMILTON ON	WSW/127.2	0.66	114
36	NPRI	TRANSCANADA PIPELINES	PT LOT 25 CON 7, PLAN 62R-8308 PTS 1-8 NOT AVAILABLE HAMILTON ON	WSW/127.2	0.66	116
36	NPRI	TRANSCANADA PIPELINES	PT LOT 25 CON 7, PLAN 62R-8308 PTS 1-8 NOT AVAILABLE HAMILTON ON	WSW/127.2	0.66	117
36	NPRI	TRANSCANADA PIPELINES	PT LOT 25 CON 7, PLAN 62R-8308 PTS 1-8 NOT AVAILABLE HAMILTON ON	WSW/127.2	0.66	119
36	NPRI	TRANSCANADA PIPELINES LTD.	PT LOT 25 CON 7, PLAN 62R-8308 PTS 1-8 NOT AVAILABLE HAMILTON ON	WSW/127.2	0.66	120
36	NPRI	TRANSCANADA PIPELINES LTD.	NOT AVAILABLE Hamilton ON	WSW/127.2	0.66	121
36	NPRI	TRANSCANADA PIPELINES LTD.	n/a n/a ON n/a	WSW/127.2	0.66	122
36	NPRI	TRANSCANADA PIPELINES LTD.	NOT AVAILABLE Hamilton ON	WSW/127.2	0.66	123

Map Key	DB	Company/Site Name	Address	Dir/Dist (m)	Elev Diff (m)	Page Number
36	NPRI	TransCanada PipeLines Ltd.	NOT AVAILABLE Hamilton ON	WSW/127.2	0.66	124
36	NPRI	TRANSCANADA PIPELINES LTD.	NOT AVAILABLE Hamilton ON	WSW/127.2	0.66	125
37	WWIS		lot 13 con 9 ON ***Well ID:*** 6808147	ENE/127.3	-11.00	126
38	BORE		ON	ENE/127.8	-12.39	128
39	BORE		ON	ENE/128.1	-12.42	129
40	BORE		ON	ENE/132.0	-12.42	129
41	WWIS		lot 6 con 7 ON ***Well ID:*** 6809552	ENE/137.0	-5.08	130
42	WWIS		lot 35 con 7 ON ***Well ID:*** 6810002	W/139.1	6.76	133
43	WWIS		lot 10 con 7 ON ***Well ID:*** 6810186	ENE/139.7	-6.95	137
44	WWIS		lot 33 con 7 ON ***Well ID:*** 6810279	SW/166.5	1.00	140
45	WWIS		lot 30 con 7 ON ***Well ID:*** 6809041	WSW/183.7	1.97	143
46	WWIS		lot 34 con 7 ON ***Well ID:*** 6800950	W/191.6	4.69	146
47	WWIS		lot 36 con 7 ON	ENE/193.9	-5.00	148

Map Key	DB	Company/Site Name	Address	Dir/Dist (m)	Elev Diff (m)	Page Number
			Well ID: 6813531			
48	WWIS		lot 13 con 9 ON ***Well ID:*** 6803040	ENE/207.0	-7.36	150
49	WWIS		lot 30 con 7 ON ***Well ID:*** 6813584	WSW/213.5	3.00	153
50	WWIS		lot 4 con 7 STRABANE ON ***Well ID:*** 6814308	SSW/215.7	18.08	156
51	WWIS		lot 31 con 7 ON ***Well ID:*** 6809021	WSW/216.6	3.97	162
52	WWIS		lot 1 con 7 ON ***Well ID:*** 6806821	SSE/220.4	15.84	165
53	WWIS		lot 34 con 7 ON ***Well ID:*** 6800951	SSW/225.2	2.27	168
54	WWIS		lot 1 con 7 ON ***Well ID:*** 6806873	NNW/226.1	-0.88	170
55	WWIS		lot 36 con 7 ON ***Well ID:*** 6808740	S/235.0	17.01	173
56	WWIS		lot 31 con 7 ON ***Well ID:*** 6813022	WSW/237.9	13.99	176
56	WWIS		lot 31 con 7 ON ***Well ID:*** 6813044	WSW/237.9	13.99	179
56	WWIS		lot 31 con 7 ON ***Well ID:*** 6811497	WSW/237.9	13.99	183
57	WWIS		lot 7 con 7 ON ***Well ID:*** 6807838	ENE/237.9	-5.27	185
58	WWIS		lot 36 con 7 ON	SSW/238.7	0.85	188

Map Key	DB	Company/Site Name	Address	Dir/Dist (m)	Elev Diff (m)	Page Number
			Well ID: 6810831			
59	EHS		1434 Middletown Road Millgrove ON L0R 1V0 ***Order ID:*** 621135	SSE/243.8	15.83	191
60	EHS		955 4th Concession Road West Hamilton ON ***Order ID:*** 107799	ENE/247.0	-10.00	192

Executive Summary: Summary By Data Source

BORE - Borehole

A search of the BORE database, dated 1875-Jul 2014 has found that there are 8 BORE site(s) within approximately 0.25 kilometers of the project property.

Site	Address	Distance (m)	Map Key
	ON	113.5	29
	ON	115.3	30
	ON	116.3	31
	ON	116.8	33
	ON	126.4	35
	ON	127.8	38
	ON	128.1	39
	ON	132.0	40

ECA - Environmental Compliance Approval

A search of the ECA database, dated Oct 2011-Sep 30, 2018 has found that there are 3 ECA site(s) within approximately 0.25

kilometers of the project property.

Site	Address	Distance (m)	Map Key
Parkbridge G/P Inc.	Hamilton ON L0L 2P0	10.7	3
New Country Investors Ltd.	Hamilton ON M2N 6G8	17.1	4
Belmac Estate Properties Inc.	Hamilton ON L0L 2P0	34.1	7

EHS - ERIS Historical Searches

A search of the EHS database, dated 1999-Jul 31, 2018 has found that there are 3 EHS site(s) within approximately 0.25 kilometers of the project property.

Site	Address	Distance (m)	Map Key
	780 Concession Rd 8 W Hamilton ON N0B2J0 ***Order ID:*** 566928	53.6	13
	1434 Middletown Road Millgrove ON L0R 1V0 ***Order ID:*** 621135	243.8	59
	955 4th Concession Road West Hamilton ON ***Order ID:*** 107799	247.0	60

NEBI - National Energy Board Pipeline Incidents

A search of the NEBI database, dated 2008-Jun 30, 2018 has found that there are 1 NEBI site(s) within approximately 0.25 kilometers of the project property.

Site	Address	Distance (m)	Map Key
TransCanada PipeLines Limited	Hamilton ON	41.9	10

NPRI - National Pollutant Release Inventory

A search of the NPRI database, dated 1993-May 2017 has found that there are 14 NPRI site(s) within approximately 0.25 kilometers of the project property.

Site	Address	Distance (m)	Map Key
TRANSCANADA PIPELINES	PT LOT 25 CON 7, PLAN 62R-8308 PTS 1-8 EX PLANS 62R-9684, 62R-9685, 62R-10903 HAMILTON ON	127.2	36
TRANSCANADA PIPELINES	PT LOT 25 CON 7, PLAN 62R-8308 PTS 1-8 NOT AVAILABLE HAMILTON ON	127.2	36
TRANSCANADA PIPELINES	PT LOT 25 CON 7, PLAN 62R-8308 PTS 1-8 NOT AVAILABLE HAMILTON ON	127.2	36
TRANSCANADA PIPELINES LTD.	PT LOT 25 CON 7, PLAN 62R-8308 PTS 1-8 NOT AVAILABLE HAMILTON ON	127.2	36
TRANSCANADA PIPELINES LTD.	NOT AVAILABLE Hamilton ON	127.2	36
TRANSCANADA PIPELINES LTD.	n/a n/a ON n/a	127.2	36
TRANSCANADA PIPELINES LTD.	NOT AVAILABLE Hamilton ON	127.2	36
TransCanada PipeLines Ltd.	NOT AVAILABLE Hamilton ON	127.2	36
TRANSCANADA PIPELINES LTD.	NOT AVAILABLE Hamilton ON	127.2	36
TRANSCANADA PIPELINES LIMITED	PT LOT 25 CON 7, PLAN 62R-8308 PTS 1-8 EX PLANS 62R-9684, 62R-9685, 62R-10903 HAMILTON ON	127.2	36
TRANSCANADA PIPELINES LIMITED	PT LOT 25 CON 7, PLAN 62R-8308 PTS 1-8 EX PLANS 62R-9684, 62R-9685, 62R-10903 HAMILTON ON	127.2	36

Site	Address	Distance (m)	Map Key
TRANSCANADA PIPELINES	PT LOT 25 CON 7, PLAN 62R-8308 PTS 1-8 EX PLANS 62R-9684, 62R-9685, 62R-10903 HAMILTON ON	127.2	36
TRANSCANADA PIPELINES	PT LOT 25 CON 7, PLAN 62R-8308 PTS 1-8 NOT AVAILABLE HAMILTON ON	127.2	36
TRANSCANADA PIPELINES	PT LOT 25 CON 7, PLAN 62R-8308 PTS 1-8 NOT AVAILABLE HAMILTON ON	127.2	36

SPL - Ontario Spills

A search of the SPL database, dated 1988-Jul 2018 has found that there are 2 SPL site(s) within approximately 0.25 kilometers of the project property.

Site	Address	Distance (m)	Map Key
Parkbridge Lifestyle Communities Inc.	1264 8th Concession Rd W Part of Lots 32 and 33, Concession 7, geographic townsh Hamilton ON L0R 1K0	103.2	24
	1264 8th Concession Road West Hamilton ON	103.2	24

WWIS - Water Well Information System

A search of the WWIS database, dated Dec 31, 2017 has found that there are 46 WWIS site(s) within approximately 0.25 kilometers of the project property.

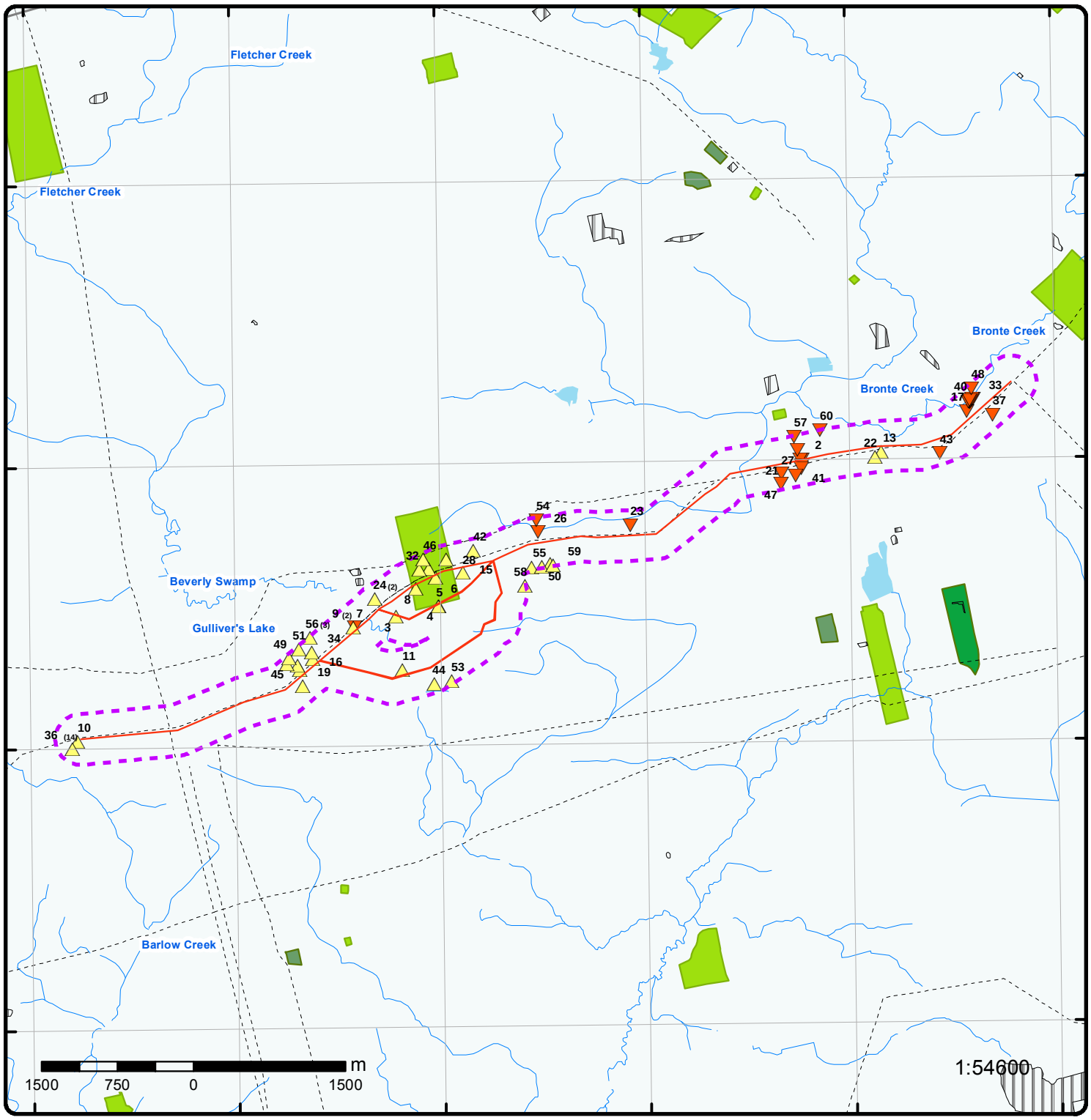
Site	Address	Distance (m)	Map Key
	lot 7 con 7 ON ***Well ID:*** 6810347	5.7	1
	lot 7 con 7 ON ***Well ID:*** 6809875	10.1	2
	lot 34 con 7 ON	22.1	5

Site	Address	Distance (m)	Map Key
	Well ID: 6812181		
	lot 34 con 7 ON	24.2	6
	Well ID: 6807519		
	Hamilton ON	37.3	8
	Well ID: 7281367		
	lot 32 con 7 ON	41.1	9
	Well ID: 6813045		
	lot 32 con 7 ON	41.1	9
	Well ID: 6812044		
	lot 33 con 7 ON	47.1	11
	Well ID: 6810703		
	lot 7 con 7 ON	52.8	12
	Well ID: 6810346		
	lot 31 con 7 ON	57.2	14
	Well ID: 6807572		
	lot 16 con 1 ON	57.3	15
	Well ID: 5005530		
	lot 31 con 7 ON	57.6	16
	Well ID: 6807576		
	lot 11 con 7 ON	71.5	17
	Well ID: 6806543		
	lot 7 con 7 ON	79.8	18
	Well ID: 6806533		

Site	Address	Distance (m)	Map Key
	lot 31 con 7 ON ***Well ID:*** 6809554	84.4	19
	lot 34 con 7 FLAMBOROUGH ON ***Well ID:*** 7206722	86.3	20
	lot 6 con 7 ON ***Well ID:*** 6809427	90.4	21
	lot 9 con 7 MILLGROVE ON ***Well ID:*** 7226659	99.0	22
	ACTON ON ***Well ID:*** 7042163	101.2	23
	lot 31 con 7 ON ***Well ID:*** 6809278	104.3	25
	lot 1 con 7 ON ***Well ID:*** 6807665	104.5	26
	lot 7 con 7 ON ***Well ID:*** 6806527	105.4	27
	ON ***Well ID:*** 7143751	108.4	28
	lot 34 con 7 ON ***Well ID:*** 6808445	116.6	32
	lot 31 con 7 ON ***Well ID:*** 6808253	117.5	34
	lot 13 con 9 ON	127.3	37

Site	Address	Distance (m)	Map Key
	Well ID: 6808147		
	lot 6 con 7 ON ***Well ID:*** 6809552	137.0	41
	lot 35 con 7 ON ***Well ID:*** 6810002	139.1	42
	lot 10 con 7 ON ***Well ID:*** 6810186	139.7	43
	lot 33 con 7 ON ***Well ID:*** 6810279	166.5	44
	lot 30 con 7 ON ***Well ID:*** 6809041	183.7	45
	lot 34 con 7 ON ***Well ID:*** 6800950	191.6	46
	lot 36 con 7 ON ***Well ID:*** 6813531	193.9	47
	lot 13 con 9 ON ***Well ID:*** 6803040	207.0	48
	lot 30 con 7 ON ***Well ID:*** 6813584	213.5	49
	lot 4 con 7 STRABANE ON ***Well ID:*** 6814308	215.7	50
	lot 31 con 7 ON ***Well ID:*** 6809021	216.6	51

Site	Address	Distance (m)	Map Key
	lot 1 con 7 ON ***Well ID:*** 6806821	220.4	52
	lot 34 con 7 ON ***Well ID:*** 6800951	225.2	53
	lot 1 con 7 ON ***Well ID:*** 6806873	226.1	54
	lot 36 con 7 ON ***Well ID:*** 6808740	235.0	55
	lot 31 con 7 ON ***Well ID:*** 6813022	237.9	56
	lot 31 con 7 ON ***Well ID:*** 6813044	237.9	56
	lot 31 con 7 ON ***Well ID:*** 6811497	237.9	56
	lot 7 con 7 ON ***Well ID:*** 6807838	237.9	57
	lot 36 con 7 ON ***Well ID:*** 6810831	238.7	58



Map : 0.25 Kilometer Radius

Order No: 20181024125

Address: n/a, ON L0R 1K0, ON

[redacted]

- Project Property
- Buffer Outline
- Eris Sites with Higher Elevation
- Eris Sites with Same Elevation
- Eris Sites with Lower Elevation
- Eris Sites with Unknown Elevation
- Industrial and Resource - Regions
- Main Line
- Sidetrack
- Transit Line
- Abandoned Line
- National Park
- Provincial or Territorial Park
- Other Park
- Golf Course or Driving Range
- Park or Sports Field
- Other Recreation Area

Source: © 2015 DMTI Spatial Inc.

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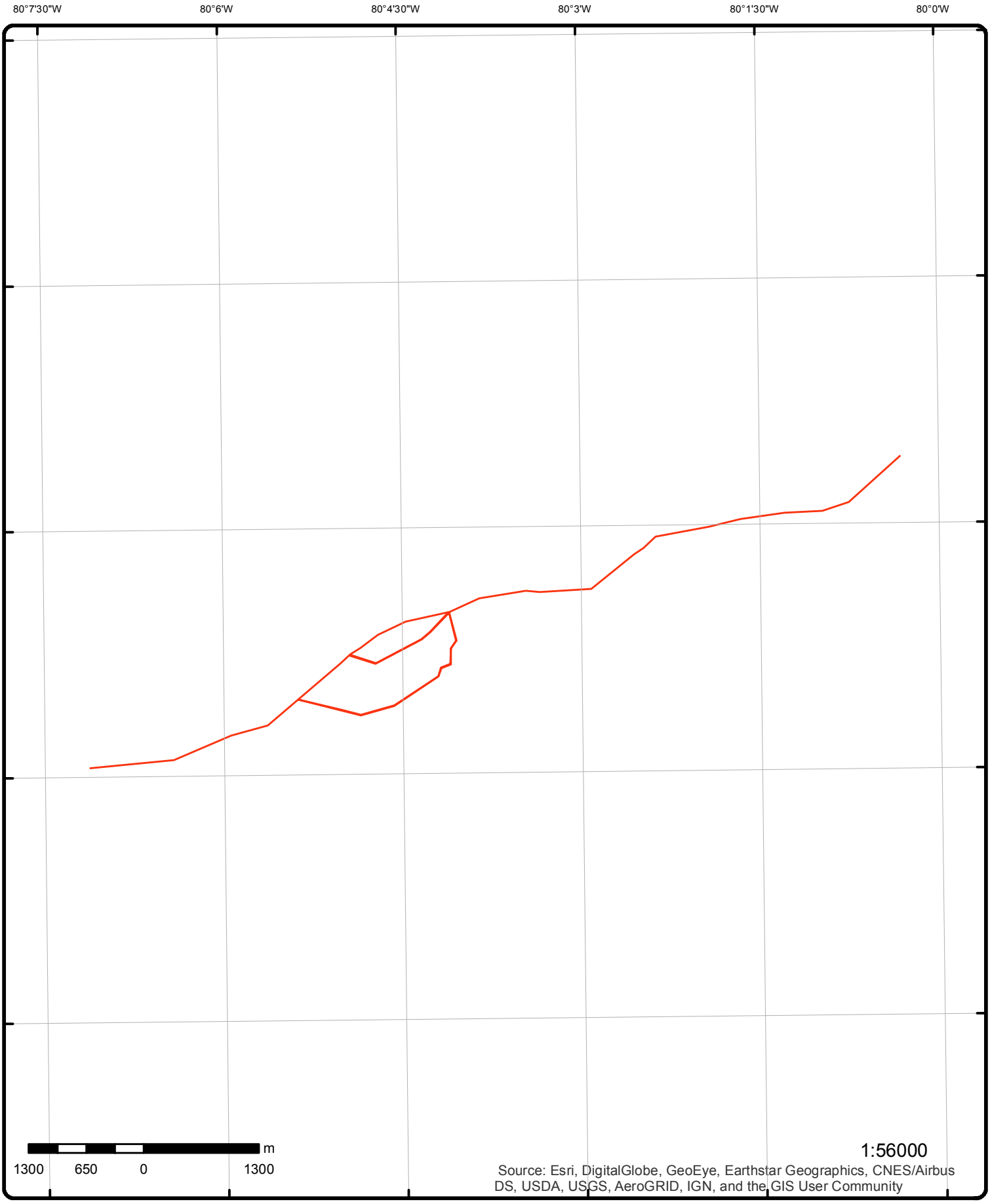

Aerial (2013)

Address: n/a, ON L0R 1K0, ON

Source: ESRI World Imagery

Order No: 20181024125

[redacted]

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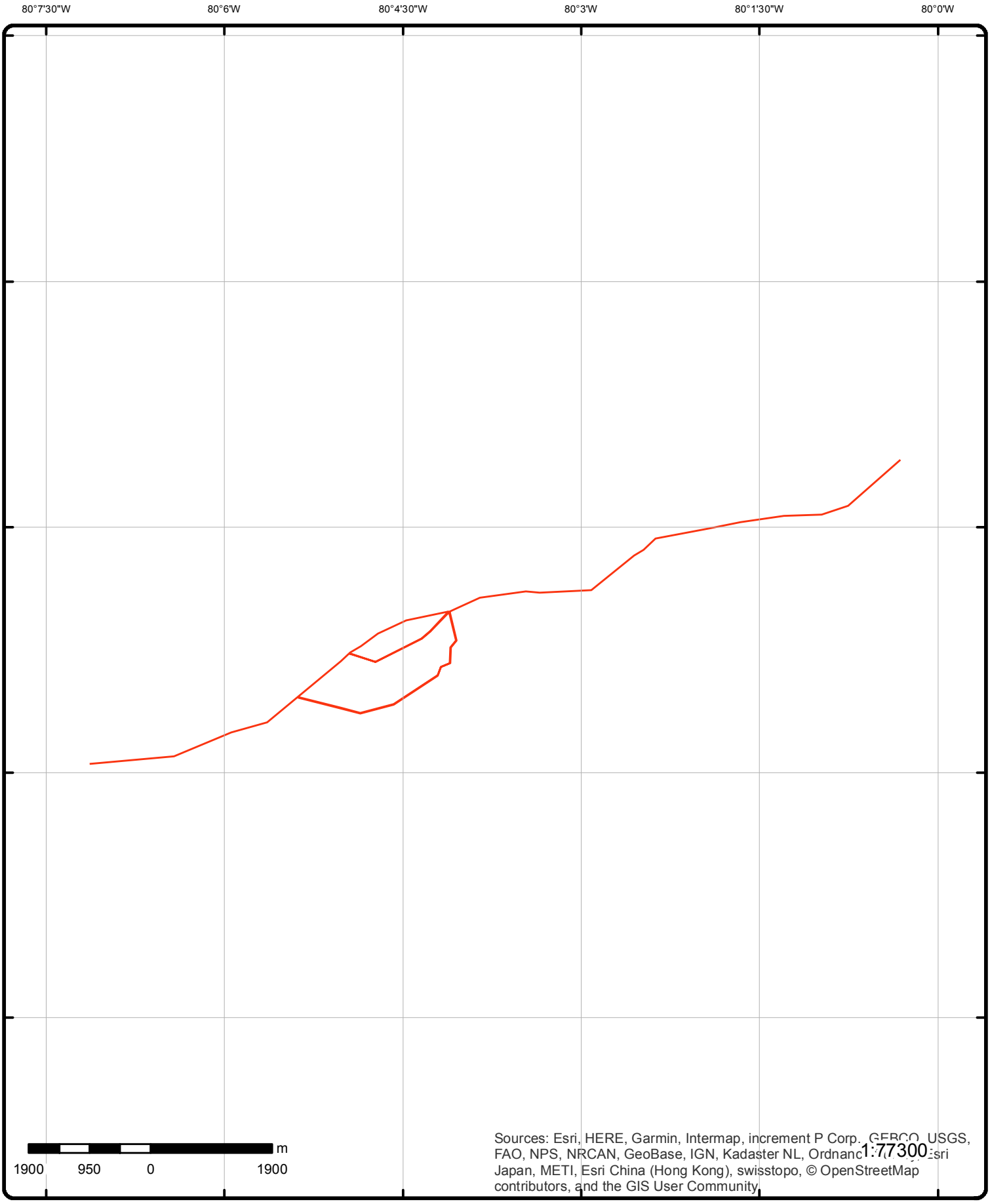

Topographic Map

Address: n/a, ON L0R 1K0, ON

Source: ESRI World Topographic Map

Order No: 20181024125

[redacted]

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Detail Report

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
1	1 of 1	ENE/5.7	262.7 / -7.19	lot 7 con 7 ON	WWIS

Well ID:	6810347	**Data Entry Status:**	
Construction Date:		**Data Src:**	1
Primary Water Use:	Irrigation	**Date Received:**	1/15/1982
Sec. Water Use:	0	**Selected Flag:**	Yes
Final Well Status:	Water Supply	**Abandonment Rec:**	
Water Type:		**Contractor:**	4208
Casing Material:		**Form Version:**	1
Audit No:		**Owner:**	
Tag:		**Street Name:**	
Construction Method:		**County:**	WENTWORTH
Elevation (m):		**Municipality:**	WEST FLAMBOROUGH TOWNSHIP
Elevation Reliability:		**Site Info:**	
Depth to Bedrock:		**Lot:**	007
Well Depth:		**Concession:**	07
Overburden/Bedrock:		**Concession Name:**	CON
Pump Rate:		**Easting NAD83:**	
Static Water Level:		**Northing NAD83:**	
Flowing (Y/N):		**Zone:**	
Flow Rate:		**UTM Reliability:**	
Clear/Cloudy:			

Bore Hole Information

Bore Hole ID:	10487673	**Elevation:**	263.67
DP2BR:	17	**Elevrc:**	
Spatial Status:		**Zone:**	17
Code OB:	r	**East83:**	578514.4
Code OB Desc:	Bedrock	**Org CS:**	
Open Hole:		**North83:**	4802923
Cluster Kind:		**UTMRC:**	4
Date Completed:	08-JUN-81	**UTMRC Desc:**	margin of error : 30 m - 100 m
Remarks:		**Location Method:**	p4
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Overburden and Bedrock Materials Interval

Formation ID:	932694485
Layer:	2
Color:	2
General Color:	GREY
Mat1:	15
Most Common Material:	LIMESTONE
Mat2:	
Other Materials:	
Mat3:	

Other Materials:	
Formation Top Depth:	17
Formation End Depth:	37
Formation End Depth UOM:	ft

Overburden and Bedrock Materials Interval

Formation ID:	932694484
Layer:	1
Color:	6
General Color:	BROWN
Mat1:	05
Most Common Material:	CLAY
Mat2:	81
Other Materials:	SANDY
Mat3:	
Other Materials:	
Formation Top Depth:	0
Formation End Depth:	17
Formation End Depth UOM:	ft

Method of Construction & Well Use

Method Construction ID:	966810347
Method Construction Code:	4
Method Construction:	Rotary (Air)
Other Method Construction:	

Pipe Information

Pipe ID:	11036243
Casing No:	1
Comment:	
Alt Name:	

Construction Record - Casing

Casing ID:	930797330
Layer:	1
Material:	1
Open Hole or Material:	STEEL
Depth From:	
Depth To:	17
Casing Diameter:	6
Casing Diameter UOM:	inch
Casing Depth UOM:	ft

Results of Well Yield Testing

Pump Test ID:	996810347
Pump Set At:	
Static Level:	6
Final Level After Pumping:	35
Recommended Pump Depth:	35
Pumping Rate:	150
Flowing Rate:	
Recommended Pump Rate:	150
Levels UOM:	ft
Rate UOM:	GPM
Water State After Test Code:	1

Water State After Test:	CLEAR
Pumping Test Method:	1
Pumping Duration HR:	1
Pumping Duration MIN:	0
Flowing:	N

Draw Down & Recovery

Pump Test Detail ID:	935145787
Test Type:	Recovery
Test Duration:	60
Test Level:	6
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	934352482
Test Type:	Recovery
Test Duration:	15
Test Level:	6
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	934623992
Test Type:	Recovery
Test Duration:	30
Test Level:	6
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	934867148
Test Type:	Recovery
Test Duration:	45
Test Level:	6
Test Level UOM:	ft

Water Details

Water ID:	933979733
Layer:	1
Kind Code:	1
Kind:	FRESH
Water Found Depth:	20
Water Found Depth UOM:	ft

Water Details

Water ID:	933979734
Layer:	2
Kind Code:	1
Kind:	FRESH
Water Found Depth:	35
Water Found Depth UOM:	ft

2	***1 of 1***	***ENE/10.1***	***262.1 / -7.75***	***lot 7 con 7 ON***	***WWIS***

Well ID: 6809875 ***Data Entry Status:***

Construction Date:		**Data Src:**	1
Primary Water Use:	Irrigation	**Date Received:**	1/9/1979
Sec. Water Use:	0	**Selected Flag:**	Yes
Final Well Status:	Water Supply	**Abandonment Rec:**	
Water Type:		**Contractor:**	4208
Casing Material:		**Form Version:**	1
Audit No:		**Owner:**	
Tag:		**Street Name:**	
Construction Method:		**County:**	WENTWORTH
Elevation (m):		**Municipality:**	WEST FLAMBOROUGH TOWNSHIP
Elevation Reliability:		**Site Info:**	
Depth to Bedrock:		**Lot:**	007
Well Depth:		**Concession:**	07
Overburden/Bedrock:		**Concession Name:**	CON
Pump Rate:		**Easting NAD83:**	
Static Water Level:		**Northing NAD83:**	
Flowing (Y/N):		**Zone:**	
Flow Rate:		**UTM Reliability:**	
Clear/Cloudy:			

Bore Hole Information

Bore Hole ID:	10487208	**Elevation:**	263.82
DP2BR:	22	**Elevrc:**	
Spatial Status:		**Zone:**	17
Code OB:	r	**East83:**	578494.4
Code OB Desc:	Bedrock	**Org CS:**	
Open Hole:		**North83:**	4802923
Cluster Kind:		**UTMRC:**	4
Date Completed:	12-SEP-78	**UTMRC Desc:**	margin of error : 30 m - 100 m
Remarks:		**Location Method:**	p4
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Overburden and Bedrock Materials Interval

Formation ID:	932692919
Layer:	1
Color:	6
General Color:	BROWN
Mat1:	05
Most Common Material:	CLAY
Mat2:	81
Other Materials:	SANDY
Mat3:	
Other Materials:	
Formation Top Depth:	0
Formation End Depth:	22
Formation End Depth UOM:	ft

Overburden and Bedrock Materials Interval

Formation ID:	932692921
Layer:	3
Color:	2
General Color:	GREY
Mat1:	15

Most Common Material:	LIMESTONE
Mat2:	
Other Materials:	
Mat3:	
Other Materials:	
Formation Top Depth:	30
Formation End Depth:	40
Formation End Depth UOM:	ft

Overburden and Bedrock Materials Interval

Formation ID:	932692920
Layer:	2
Color:	2
General Color:	GREY
Mat1:	17
Most Common Material:	SHALE
Mat2:	12
Other Materials:	STONES
Mat3:	85
Other Materials:	SOFT
Formation Top Depth:	22
Formation End Depth:	30
Formation End Depth UOM:	ft

Method of Construction & Well Use

Method Construction ID:	966809875
Method Construction Code:	2
Method Construction:	Rotary (Convent.)
Other Method Construction:	

Pipe Information

Pipe ID:	11035778
Casing No:	1
Comment:	
Alt Name:	

Construction Record - Casing

Casing ID:	930796654
Layer:	1
Material:	
Open Hole or Material:	
Depth From:	
Depth To:	22
Casing Diameter:	6
Casing Diameter UOM:	inch
Casing Depth UOM:	ft

Results of Well Yield Testing

Pump Test ID:	996809875
Pump Set At:	
Static Level:	8
Final Level After Pumping:	40
Recommended Pump Depth:	35
Pumping Rate:	90
Flowing Rate:	

Recommended Pump Rate:	50
Levels UOM:	ft
Rate UOM:	GPM
Water State After Test Code:	1
Water State After Test:	CLEAR
Pumping Test Method:	1
Pumping Duration HR:	1
Pumping Duration MIN:	0
Flowing:	N

Draw Down & Recovery

Pump Test Detail ID:	934350837
Test Type:	Recovery
Test Duration:	15
Test Level:	8
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	935144734
Test Type:	Recovery
Test Duration:	60
Test Level:	8
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	934875282
Test Type:	Recovery
Test Duration:	45
Test Level:	8
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	934614326
Test Type:	Recovery
Test Duration:	30
Test Level:	8
Test Level UOM:	ft

Water Details

Water ID:	933979127
Layer:	1
Kind Code:	1
Kind:	FRESH
Water Found Depth:	30
Water Found Depth UOM:	ft

Water Details

Water ID:	933979128
Layer:	2
Kind Code:	1
Kind:	FRESH
Water Found Depth:	37
Water Found Depth UOM:	ft

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
3	1 of 1	WSW/10.7	273.2 / 3.39	Parkbridge G/P Inc. Hamilton ON L0L 2P0	ECA

Approval No:	3720-4MDPAG	**SWP Area Name:**	Hamilton
Approval Date:	2005-06-22	**MOE District:**	Hamilton
Status:	Approved	**City:**	
Record Type:	ECA	**Longitude:**	-80.0804
Link Source:	IDS	**Latitude:**	43.3615
Approval Type:	ECA-Municipal Drinking Water Systems		
Project Type:	Municipal Drinking Water Systems		
Address:			
Full Address:			
Full PDF Link:			

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
4	1 of 1	WSW/17.1	273.9 / 4.00	New Country Investors Ltd. Hamilton ON M2N 6G8	ECA

Approval No:	0764-4UDL8P	**SWP Area Name:**	Halton
Approval Date:	2001-03-12	**MOE District:**	Hamilton
Status:	Approved	**City:**	Hamilton
Record Type:	ECA	**Longitude:**	-80.0752
Link Source:	IDS	**Latitude:**	43.3624
Approval Type:	ECA-MUNICIPAL AND PRIVATE SEWAGE WORKS		
Project Type:	MUNICIPAL AND PRIVATE SEWAGE WORKS		
Address:			
Full Address:			
Full PDF Link:	https://www.accessenvironment.ene.gov.on.ca/instruments/4848-4TKS27-14.pdf		

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
5	1 of 1	WSW/22.1	273.9 / 4.00	lot 34 con 7 ON	WWIS

Well ID:	6812181	**Data Entry Status:**	
Construction Date:		**Data Src:**	1
Primary Water Use:	Public	**Date Received:**	3/17/1992
Sec. Water Use:		**Selected Flag:**	Yes
Final Well Status:	Water Supply	**Abandonment Rec:**	
Water Type:		**Contractor:**	4207
Casing Material:		**Form Version:**	1
Audit No:	093542	**Owner:**	
Tag:		**Street Name:**	
Construction Method:		**County:**	WENTWORTH
Elevation (m):		**Municipality:**	BEVERLY TOWNSHIP
Elevation Reliability:		**Site Info:**	
Depth to Bedrock:		**Lot:**	034
Well Depth:		**Concession:**	07
Overburden/Bedrock:		**Concession Name:**	CON
Pump Rate:		**Easting NAD83:**	
Static Water Level:		**Northing NAD83:**	
Flowing (Y/N):		**Zone:**	
Flow Rate:		**UTM Reliability:**	
Clear/Cloudy:			

Bore Hole Information

Bore Hole ID:	10489495	**Elevation:**	273.62
DP2BR:	10	**Elevrc:**	
Spatial Status:		**Zone:**	17
Code OB:	r	**East83:**	574933.3
Code OB Desc:	Bedrock	**Org CS:**	
Open Hole:		**North83:**	4801469

Cluster Kind:
Date Completed: 07-MAR-92
Remarks:
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:
UTMRC: 9
UTMRC Desc: unknown UTM
Location Method: lot

Overburden and Bedrock Materials Interval

Formation ID: 932700840
Layer: 1
Color: 6
General Color: BROWN
Mat1: 05
Most Common Material: CLAY
Mat2: 12
Other Materials: STONES
Mat3: 13
Other Materials: BOULDERS
Formation Top Depth: 0
Formation End Depth: 10
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 932700841
Layer: 2
Color: 2
General Color: GREY
Mat1: 15
Most Common Material: LIMESTONE
Mat2:
Other Materials:
Mat3:
Other Materials:
Formation Top Depth: 10
Formation End Depth: 97
Formation End Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 966812181
Method Construction Code: 4
Method Construction: Rotary (Air)
Other Method Construction:

Pipe Information

Pipe ID: 11038065
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930800090

Layer: 2
Material: 4
Open Hole or Material: OPEN HOLE
Depth From:
Depth To: 97
Casing Diameter: 6
Casing Diameter UOM: inch
Casing Depth UOM: ft

Construction Record - Casing

Casing ID: 930800089
Layer: 1
Material: 1
Open Hole or Material: STEEL
Depth From:
Depth To: 21
Casing Diameter: 6
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pump Test ID: 996812181
Pump Set At:
Static Level: 8
Final Level After Pumping: 97
Recommended Pump Depth: 95
Pumping Rate: 20
Flowing Rate:
Recommended Pump Rate: 20
Levels UOM: ft
Rate UOM: GPM
Water State After Test Code: 1
Water State After Test: CLEAR
Pumping Test Method: 1
Pumping Duration HR: 1
Pumping Duration MIN: 0
Flowing: N

Draw Down & Recovery

Pump Test Detail ID: 934880462
Test Type: Recovery
Test Duration: 45
Test Level: 8
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 935142132
Test Type: Recovery
Test Duration: 60
Test Level: 8
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934629555
Test Type: Recovery
Test Duration: 30
Test Level: 8

Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934358066
Test Type: Recovery
Test Duration: 15
Test Level: 9
Test Level UOM: ft

Water Details

Water ID: 933982204
Layer: 1
Kind Code: 1
Kind: FRESH
Water Found Depth: 95
Water Found Depth UOM: ft

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6 | **1 of 1** | **WSW/24.2** | **274.9 / 5.00** | **lot 34 con 7 ON** | **WWIS**

Well ID: 6807519
Construction Date:
Primary Water Use: Public
Sec. Water Use: 0
Final Well Status: Water Supply
Water Type:
Casing Material:
Audit No:
Tag:
Construction Method:
Elevation (m):
Elevation Reliability:
Depth to Bedrock:
Well Depth:
Overburden/Bedrock:
Pump Rate:
Static Water Level:
Flowing (Y/N):
Flow Rate:
Clear/Cloudy:

Data Entry Status:
Data Src: 1
Date Received: 8/5/1970
Selected Flag: Yes
Abandonment Rec:
Contractor: 1205
Form Version: 1
Owner:
Street Name:
County: WENTWORTH
Municipality: BEVERLY TOWNSHIP
Site Info:
Lot: 034
Concession: 07
Concession Name: CON
Easting NAD83:
Northing NAD83:
Zone:
UTM Reliability:

Bore Hole Information

Bore Hole ID: 10484930
DP2BR: 14
Spatial Status:
Code OB: r
Code OB Desc: Bedrock
Open Hole:
Cluster Kind:
Date Completed: 16-JUL-70
Remarks:
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Elevation: 273.57
Elevrc:
Zone: 17
East83: 574904.3
Org CS:
North83: 4801753
UTMRC: 4
UTMRC Desc: margin of error : 30 m - 100 m
Location Method: p4

Overburden and Bedrock

Materials Interval

Formation ID:	932685568
Layer:	1
Color:	6
General Color:	BROWN
Mat1:	05
Most Common Material:	CLAY
Mat2:	12
Other Materials:	STONES
Mat3:	
Other Materials:	
Formation Top Depth:	0
Formation End Depth:	14
Formation End Depth UOM:	ft

Overburden and Bedrock Materials Interval

Formation ID:	932685569
Layer:	2
Color:	2
General Color:	GREY
Mat1:	15
Most Common Material:	LIMESTONE
Mat2:	
Other Materials:	
Mat3:	
Other Materials:	
Formation Top Depth:	14
Formation End Depth:	50
Formation End Depth UOM:	ft

Method of Construction & Well Use

Method Construction ID:	966807519
Method Construction Code:	1
Method Construction:	Cable Tool
Other Method Construction:	

Pipe Information

Pipe ID:	11033500
Casing No:	1
Comment:	
Alt Name:	

Construction Record - Casing

Casing ID:	930793044
Layer:	2
Material:	4
Open Hole or Material:	OPEN HOLE
Depth From:	
Depth To:	50
Casing Diameter:	6
Casing Diameter UOM:	inch
Casing Depth UOM:	ft

Construction Record - Casing

Casing ID:	930793043
Layer:	1
Material:	1
Open Hole or Material:	STEEL
Depth From:	
Depth To:	15
Casing Diameter:	6
Casing Diameter UOM:	inch
Casing Depth UOM:	ft

Results of Well Yield Testing

Pump Test ID:	996807519
Pump Set At:	
Static Level:	6
Final Level After Pumping:	10
Recommended Pump Depth:	47
Pumping Rate:	15
Flowing Rate:	
Recommended Pump Rate:	8
Levels UOM:	ft
Rate UOM:	GPM
Water State After Test Code:	1
Water State After Test:	CLEAR
Pumping Test Method:	2
Pumping Duration HR:	2
Pumping Duration MIN:	0
Flowing:	N

Draw Down & Recovery

Pump Test Detail ID:	934351914
Test Type:	Draw Down
Test Duration:	15
Test Level:	10
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	934868156
Test Type:	Draw Down
Test Duration:	45
Test Level:	10
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	935138408
Test Type:	Draw Down
Test Duration:	60
Test Level:	10
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	934616332
Test Type:	Draw Down
Test Duration:	30
Test Level:	10
Test Level UOM:	ft

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

Water Details

Water ID:	933976295
Layer:	1
Kind Code:	1
Kind:	FRESH
Water Found Depth:	48
Water Found Depth UOM:	ft

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7 ***1 of 1*** ***WSW/34.1*** ***269.1 / -0.76*** ***Belmac Estate Properties Inc.*** ***ECA***

Hamilton ON L0L 2P0

Approval No:	5241-6S3QQ2	***SWP Area Name:***	Hamilton
Approval Date:	2006-08-16	***MOE District:***	Hamilton
Status:	Approved	***City:***	Hamilton
Record Type:	ECA	***Longitude:***	-80.0855
Link Source:	IDS	***Latitude:***	43.3606
Approval Type:	ECA-MUNICIPAL AND PRIVATE SEWAGE WORKS		
Project Type:	MUNICIPAL AND PRIVATE SEWAGE WORKS		
Address:			
Full Address:			
Full PDF Link:	https://www.accessenvironment.ene.gov.on.ca/instruments/7721-6RKHFN-14.pdf		

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8 ***1 of 1*** ***WSW/37.3*** ***274.9 / 5.00*** ***WWIS***

Hamilton ON

Well ID:	7281367	***Data Entry Status:***	
Construction Date:		***Data Src:***	
Primary Water Use:	Livestock	***Date Received:***	2/17/2017
Sec. Water Use:	Domestic	***Selected Flag:***	Yes
Final Well Status:	Water Supply	***Abandonment Rec:***	
Water Type:		***Contractor:***	7221
Casing Material:		***Form Version:***	7
Audit No:	Z249188	***Owner:***	
Tag:	A202574	***Street Name:***	207 8TH CONCESSION WEST
Construction Method:		***County:***	WENTWORTH
Elevation (m):		***Municipality:***	BEVERLY TOWNSHIP
Elevation Reliability:		***Site Info:***	
Depth to Bedrock:		***Lot:***	
Well Depth:		***Concession:***	
Overburden/Bedrock:		***Concession Name:***	
Pump Rate:		***Easting NAD83:***	
Static Water Level:		***Northing NAD83:***	
Flowing (Y/N):		***Zone:***	
Flow Rate:		***UTM Reliability:***	
Clear/Cloudy:			

Bore Hole Information

Bore Hole ID:	1006354812	***Elevation:***	273.71
DP2BR:		***Elevrc:***	
Spatial Status:		***Zone:***	17
Code OB:		***East83:***	574709
Code OB Desc:		***Org CS:***	UTM83
Open Hole:		***North83:***	4801646
Cluster Kind:		***UTMRC:***	4
Date Completed:	07-FEB-17	***UTMRC Desc:***	margin of error : 30 m - 100 m
Remarks:		***Location Method:***	wwr
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			

Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Overburden and Bedrock Materials Interval

Formation ID:	1006588741
Layer:	1
Color:	6
General Color:	BROWN
Mat1:	28
Most Common Material:	SAND
Mat2:	11
Other Materials:	GRAVEL
Mat3:	05
Other Materials:	CLAY
Formation Top Depth:	0
Formation End Depth:	2.7
Formation End Depth UOM:	m

Overburden and Bedrock Materials Interval

Formation ID:	1006588743
Layer:	3
Color:	2
General Color:	GREY
Mat1:	15
Most Common Material:	LIMESTONE
Mat2:	
Other Materials:	
Mat3:	
Other Materials:	
Formation Top Depth:	19.2
Formation End Depth:	27.4
Formation End Depth UOM:	m

Overburden and Bedrock Materials Interval

Formation ID:	1006588742
Layer:	2
Color:	6
General Color:	BROWN
Mat1:	15
Most Common Material:	LIMESTONE
Mat2:	
Other Materials:	
Mat3:	
Other Materials:	
Formation Top Depth:	2.7
Formation End Depth:	19.2
Formation End Depth UOM:	m

Annular Space/Abandonment Sealing Record

Plug ID:	1006588781
Layer:	1
Plug From:	0
Plug To:	10.7

Plug Depth UOM: m

Method of Construction & Well Use

Method Construction ID: 1006588780
Method Construction Code: 2
Method Construction: Rotary (Convent.)
Other Method Construction:

Pipe Information

Pipe ID: 1006588739
Casing No: 0
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 1006588749
Layer: 2
Material: 4
Open Hole or Material: OPEN HOLE
Depth From: 10.7
Depth To: 27.4
Casing Diameter: 15.6
Casing Diameter UOM: cm
Casing Depth UOM: m

Construction Record - Casing

Casing ID: 1006588748
Layer: 1
Material: 1
Open Hole or Material: STEEL
Depth From: -.8
Depth To: 10.7
Casing Diameter: 16
Casing Diameter UOM: cm
Casing Depth UOM: m

Construction Record - Screen

Screen ID: 1006588750
Layer:
Slot:
Screen Top Depth:
Screen End Depth:
Screen Material:
Screen Depth UOM: m
Screen Diameter UOM: cm
Screen Diameter:

Results of Well Yield Testing

Pump Test ID: 1006588740
Pump Set At: 15.24
Static Level: 10.6
Final Level After Pumping: 11.64
Recommended Pump Depth: 15.2
Pumping Rate: 68.16

Flowing Rate:
Recommended Pump Rate: 54.5
Levels UOM: m
Rate UOM: LPM
Water State After Test Code: 1
Water State After Test: CLEAR
Pumping Test Method: 0
Pumping Duration HR: 1
Pumping Duration MIN: 0
Flowing:

Draw Down & Recovery

Pump Test Detail ID: 1006588762
Test Type: Draw Down
Test Duration: 10
Test Level: 11.61
Test Level UOM: m

Draw Down & Recovery

Pump Test Detail ID: 1006588767
Test Type: Recovery
Test Duration: 20
Test Level: 10.6
Test Level UOM: m

Draw Down & Recovery

Pump Test Detail ID: 1006588774
Test Type: Draw Down
Test Duration: 50
Test Level: 11.64
Test Level UOM: m

Draw Down & Recovery

Pump Test Detail ID: 1006588752
Test Type: Draw Down
Test Duration: 1
Test Level: 11.44
Test Level UOM: m

Draw Down & Recovery

Pump Test Detail ID: 1006588755
Test Type: Recovery
Test Duration: 2
Test Level: 10.64
Test Level UOM: m

Draw Down & Recovery

Pump Test Detail ID: 1006588765
Test Type: Recovery
Test Duration: 15
Test Level: 10.6
Test Level UOM: m

Draw Down & Recovery

Pump Test Detail ID: 1006588769
Test Type: Recovery
Test Duration: 25
Test Level: 10.6
Test Level UOM: m

Draw Down & Recovery

Pump Test Detail ID: 1006588773
Test Type: Recovery
Test Duration: 40
Test Level: 10.6
Test Level UOM: m

Draw Down & Recovery

Pump Test Detail ID: 1006588751
Test Type: Recovery
Test Duration: 0
Test Level: 11.64
Test Level UOM: m

Draw Down & Recovery

Pump Test Detail ID: 1006588754
Test Type: Draw Down
Test Duration: 2
Test Level: 11.54
Test Level UOM: m

Draw Down & Recovery

Pump Test Detail ID: 1006588756
Test Type: Draw Down
Test Duration: 3
Test Level: 11.58
Test Level UOM: m

Draw Down & Recovery

Pump Test Detail ID: 1006588759
Test Type: Recovery
Test Duration: 4
Test Level: 10.64
Test Level UOM: m

Draw Down & Recovery

Pump Test Detail ID: 1006588772
Test Type: Draw Down
Test Duration: 40
Test Level: 11.64
Test Level UOM: m

Draw Down & Recovery

Pump Test Detail ID: 1006588757
Test Type: Recovery
Test Duration: 3

Test Level: 10.67
Test Level UOM: m

Draw Down & Recovery

Pump Test Detail ID: 1006588764
Test Type: Draw Down
Test Duration: 15
Test Level: 11.64
Test Level UOM: m

Draw Down & Recovery

Pump Test Detail ID: 1006588766
Test Type: Draw Down
Test Duration: 20
Test Level: 11.64
Test Level UOM: m

Draw Down & Recovery

Pump Test Detail ID: 1006588770
Test Type: Draw Down
Test Duration: 30
Test Level: 11.64
Test Level UOM: m

Draw Down & Recovery

Pump Test Detail ID: 1006588775
Test Type: Recovery
Test Duration: 50
Test Level: 10.6
Test Level UOM: m

Draw Down & Recovery

Pump Test Detail ID: 1006588753
Test Type: Recovery
Test Duration: 1
Test Level: 10.67
Test Level UOM: m

Draw Down & Recovery

Pump Test Detail ID: 1006588758
Test Type: Draw Down
Test Duration: 4
Test Level: 11.61
Test Level UOM: m

Draw Down & Recovery

Pump Test Detail ID: 1006588760
Test Type: Draw Down
Test Duration: 5
Test Level: 11.61
Test Level UOM: m

Draw Down & Recovery

Pump Test Detail ID: 1006588768
Test Type: Draw Down
Test Duration: 25
Test Level: 11.64
Test Level UOM: m

Draw Down & Recovery

Pump Test Detail ID: 1006588771
Test Type: Recovery
Test Duration: 30
Test Level: 10.6
Test Level UOM: m

Draw Down & Recovery

Pump Test Detail ID: 1006588776
Test Type: Draw Down
Test Duration: 60
Test Level: 11.64
Test Level UOM: m

Draw Down & Recovery

Pump Test Detail ID: 1006588761
Test Type: Recovery
Test Duration: 5
Test Level: 10.63
Test Level UOM: m

Draw Down & Recovery

Pump Test Detail ID: 1006588763
Test Type: Recovery
Test Duration: 10
Test Level: 10.6
Test Level UOM: m

Draw Down & Recovery

Pump Test Detail ID: 1006588777
Test Type: Recovery
Test Duration: 60
Test Level: 10.6
Test Level UOM: m

Water Details

Water ID: 1006588747
Layer: 1
Kind Code: 8
Kind: Untested
Water Found Depth: 27.4
Water Found Depth UOM: m

Hole Diameter

Hole ID: 1006588745

Diameter:	21.6
Depth From:	7.6
Depth To:	10.7
Hole Depth UOM:	m
Hole Diameter UOM:	cm

Hole Diameter

Hole ID:	1006588746
Diameter:	15.6
Depth From:	10.7
Depth To:	27.4
Hole Depth UOM:	m
Hole Diameter UOM:	cm

Hole Diameter

Hole ID:	1006588744
Diameter:	25
Depth From:	0
Depth To:	7.6
Hole Depth UOM:	m
Hole Diameter UOM:	cm

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9 ***1 of 2*** ***WSW/41.1*** ***270.6 / 0.79*** ***lot 32 con 7 ON*** ***WWIS***

Well ID:	6813045	**Data Entry Status:**	
Construction Date:		**Data Src:**	1
Primary Water Use:	Public	**Date Received:**	12/1/1998
Sec. Water Use:		**Selected Flag:**	Yes
Final Well Status:	Water Supply	**Abandonment Rec:**	
Water Type:		**Contractor:**	4005
Casing Material:		**Form Version:**	1
Audit No:	198301	**Owner:**	
Tag:		**Street Name:**	
Construction Method:		**County:**	WENTWORTH
Elevation (m):		**Municipality:**	BEVERLY TOWNSHIP
Elevation Reliability:		**Site Info:**	
Depth to Bedrock:		**Lot:**	032
Well Depth:		**Concession:**	07
Overburden/Bedrock:		**Concession Name:**	CON
Pump Rate:		**Easting NAD83:**	
Static Water Level:		**Northing NAD83:**	
Flowing (Y/N):		**Zone:**	
Flow Rate:		**UTM Reliability:**	
Clear/Cloudy:			

Bore Hole Information

Bore Hole ID:	10490358	**Elevation:**	269.67
DP2BR:	5	**Elevrc:**	
Spatial Status:		**Zone:**	17
Code OB:	r	**East83:**	574092.3
Code OB Desc:	Bedrock	**Org CS:**	
Open Hole:		**North83:**	4801267
Cluster Kind:		**UTMRC:**	9
Date Completed:	28-OCT-98	**UTMRC Desc:**	unknown UTM
Remarks:		**Location Method:**	lot
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			

Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Overburden and Bedrock Materials Interval

Formation ID: 932703687
Layer: 2
Color: 2
General Color: GREY
Mat1: 15
Most Common Material: LIMESTONE
Mat2:
Other Materials:
Mat3:
Other Materials:
Formation Top Depth: 5
Formation End Depth: 100
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 932703686
Layer: 1
Color: 6
General Color: BROWN
Mat1: 05
Most Common Material: CLAY
Mat2: 28
Other Materials: SAND
Mat3:
Other Materials:
Formation Top Depth: 0
Formation End Depth: 5
Formation End Depth UOM: ft

Annular Space/Abandonment Sealing Record

Plug ID: 933211874
Layer: 1
Plug From: 0
Plug To: 21
Plug Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 966813045
Method Construction Code: 5
Method Construction: Air Percussion
Other Method Construction:

Pipe Information

Pipe ID: 11038928
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID:	930801504
Layer:	1
Material:	1
Open Hole or Material:	STEEL
Depth From:	
Depth To:	21
Casing Diameter:	8
Casing Diameter UOM:	inch
Casing Depth UOM:	ft

Construction Record - Casing

Casing ID:	930801505
Layer:	2
Material:	4
Open Hole or Material:	OPEN HOLE
Depth From:	
Depth To:	100
Casing Diameter:	8
Casing Diameter UOM:	inch
Casing Depth UOM:	ft

Results of Well Yield Testing

Pump Test ID:	996813045
Pump Set At:	
Static Level:	6
Final Level After Pumping:	8
Recommended Pump Depth:	50
Pumping Rate:	75
Flowing Rate:	
Recommended Pump Rate:	75
Levels UOM:	ft
Rate UOM:	GPM
Water State After Test Code:	1
Water State After Test:	CLEAR
Pumping Test Method:	1
Pumping Duration HR:	24
Pumping Duration MIN:	0
Flowing:	N

Draw Down & Recovery

Pump Test Detail ID:	934351606
Test Type:	Recovery
Test Duration:	15
Test Level:	6
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	934623058
Test Type:	Recovery
Test Duration:	30
Test Level:	6
Test Level UOM:	ft

Water Details

Water ID: 933983416
Layer: 1
Kind Code: 5
Kind: Not stated
Water Found Depth: 24
Water Found Depth UOM: ft

Water Details

Water ID: 933983417
Layer: 2
Kind Code: 5
Kind: Not stated
Water Found Depth: 47
Water Found Depth UOM: ft

Water Details

Water ID: 933983418
Layer: 3
Kind Code: 5
Kind: Not stated
Water Found Depth: 50
Water Found Depth UOM: ft

Water Details

Water ID: 933983419
Layer: 4
Kind Code: 5
Kind: Not stated
Water Found Depth: 65
Water Found Depth UOM: ft

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9 | **2 of 2** | **WSW/41.1** | **270.6 / 0.79** | **lot 32 con 7 ON** | **WWIS**

Well ID: 6812044
Construction Date:
Primary Water Use:
Sec. Water Use:
Final Well Status:
Water Type:
Casing Material:
Audit No: 76471
Tag:
Construction Method:
Elevation (m):
Elevation Reliability:
Depth to Bedrock:
Well Depth:
Overburden/Bedrock:
Pump Rate:
Static Water Level:
Flowing (Y/N):
Flow Rate:
Clear/Cloudy:

Data Entry Status:
Data Src: 1
Date Received: 6/24/1991
Selected Flag: Yes
Abandonment Rec:
Contractor: 4005
Form Version: 1
Owner:
Street Name:
County: WENTWORTH
Municipality: BEVERLY TOWNSHIP
Site Info:
Lot: 032
Concession: 07
Concession Name: CON
Easting NAD83:
Northing NAD83:
Zone:
UTM Reliability:

Bore Hole Information

Bore Hole ID: 10489358
DP2BR: 4
Elevation: 269.67
Elevrc:

Spatial Status:		***Zone:***	17
Code OB:	r	***East83:***	574092.3
Code OB Desc:	Bedrock	***Org CS:***	
Open Hole:		***North83:***	4801267
Cluster Kind:		***UTMRC:***	9
Date Completed:	05-JUN-91	***UTMRC Desc:***	unknown UTM
Remarks:		***Location Method:***	lot
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Overburden and Bedrock Materials Interval

Formation ID:	932700354
Layer:	2
Color:	2
General Color:	GREY
Mat1:	15
Most Common Material:	LIMESTONE
Mat2:	73
Other Materials:	HARD
Mat3:	
Other Materials:	
Formation Top Depth:	4
Formation End Depth:	60
Formation End Depth UOM:	ft

Overburden and Bedrock Materials Interval

Formation ID:	932700353
Layer:	1
Color:	6
General Color:	BROWN
Mat1:	28
Most Common Material:	SAND
Mat2:	11
Other Materials:	GRAVEL
Mat3:	77
Other Materials:	LOOSE
Formation Top Depth:	0
Formation End Depth:	4
Formation End Depth UOM:	ft

Method of Construction & Well Use

Method Construction ID:	966812044
Method Construction Code:	0
Method Construction:	Not Known
Other Method Construction:	

Pipe Information

Pipe ID:	11037928
Casing No:	1
Comment:	
Alt Name:	

Construction Record - Casing

Casing ID:	930799874
Layer:	1
Material:	
Open Hole or Material:	
Depth From:	
Depth To:	20
Casing Diameter:	6
Casing Diameter UOM:	inch
Casing Depth UOM:	ft

Construction Record - Casing

Casing ID:	930799875
Layer:	2
Material:	
Open Hole or Material:	
Depth From:	
Depth To:	60
Casing Diameter:	6
Casing Diameter UOM:	inch
Casing Depth UOM:	ft

Results of Well Yield Testing

Pump Test ID:	996812044
Pump Set At:	
Static Level:	5
Final Level After Pumping:	
Recommended Pump Depth:	
Pumping Rate:	8
Flowing Rate:	
Recommended Pump Rate:	
Levels UOM:	ft
Rate UOM:	GPM
Water State After Test Code:	2
Water State After Test:	CLOUDY
Pumping Test Method:	1
Pumping Duration HR:	1
Pumping Duration MIN:	0
Flowing:	N

Draw Down & Recovery

Pump Test Detail ID:	934628496
Test Type:	Draw Down
Test Duration:	30
Test Level:	55
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	934357546
Test Type:	Draw Down
Test Duration:	15
Test Level:	55
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID: 934881072
Test Type: Draw Down
Test Duration: 45
Test Level: 55
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 935142045
Test Type: Draw Down
Test Duration: 60
Test Level: 55
Test Level UOM: ft

Water Details

Water ID: 933982002
Layer: 1
Kind Code: 5
Kind: Not stated
Water Found Depth: 35
Water Found Depth UOM: ft

Water Details

Water ID: 933982003
Layer: 2
Kind Code: 5
Kind: Not stated
Water Found Depth: 52
Water Found Depth UOM: ft

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10 ***1 of 1*** ***WSW/41.9*** ***270.9 / 1.00*** ***TransCanada PipeLines Limited*** ***NEBI***

Hamilton ON

Incident No:	INC2009-034	***Regulation:***	OPR
Status:	Closed	***Schedule:***	NULL
Facility Name:	NULL	***Application Method:***	NULL
Facility Type:	NULL	***Investigation Type:***	Standard Review
Approx Vol Released:	Not Provided	***Equip or Comp Involv:***	Station/Facility, Compression, Piping, Weld
Vol Released (M3):	0	***Equip Never Inspect:***	No
Release Type:	Gas	***Oper Prs at Failure:***	NULL
Release Substance:	Natural Gas - Sweet	***Oper Beyond Limits:***	NULL
Substance:	Natural Gas - Sweet	***Lic Max Oper Prs:***	0
Coating Type:	NULL	***Restricted Oper Prs:***	NULL
Coating Condition:	NULL	***Emergency Level:***	Level I
Coating Location:	NULL	***No Evacuated:***	0
Year Coating Applied:	NULL	***Fatalities:***	NULL
Material:	Stainless Steel	***Activity at Fatality:***	NULL
Material Grade:	NULL	***Aff Off Pipe R of Way:***	No
Dsgn Dp of Cover (m):	NULL	***Individuals Injured:***	NULL
Depth of Cover (m):	NULL	***Type of Injury:***	NULL
Dsgn Wall Th (mm):	NULL	***Affects Co. Property:***	Yes
Wall Thickness (mm):	NULL	***Off Co. Property:***	No
Custom W Th (mm):	NULL	***Activity at Incident:***	Operation
Weld Type:	NULL	***NEB Staff Deployed?:***	No
Insulation Installed:	No	***Near Pop Centre:***	Hamilton
Pipeline Name:	TCPL - Station 1301 (Kirkwall Compressor Station)	***Population Density:***	Unknown Population Density (Historical Data Migration)
Pipe Length (km):	NULL	***Workdays Lost:***	NULL

Pipeline/Fac Type:	NULL	**Nominal Pipe Size:**	NPS 1
Pipe/Fac Equip:	Yes	**Work Restr by Injury:**	NULL
Pipe Out Diam (NPS):	NULL	**Kilometre Post:**	NULL
Pipe Body Release:	No	**Year:**	2009
In-Service Year:	NULL	**Pipe Oper Intrption:**	NULL
Year of Installation:	NULL	**Rupture:**	No
Year of Manufacture:	NULL	**Env Conditions:**	NULL
How Discovered:	Employee / Contractor (Onsite)	**Residual Env Effects:**	No
Discovered Date:	2009/04/20 03:40:00 PM Eastern	**Seam Type:**	NULL
Occurrence Date:	NULL	**Seam Clock Position:**	NULL
Last Maint. Date:	NULL	**Seam Joining Method:**	NULL
Closed Date:	7/27/2012	**Source of Explosion:**	NULL
Reported Date:	4/23/2009	**Source of Fire:**	NULL
Repair Date:	NULL	**Cath Protect Reading:**	NULL
Repair Type:	Replacement	**Recent Inspection Dt:**	NULL
Land Use:	Unknown Land Use (Historical Data Migration)	**Aff Pipeline R of Way:**	No
Recent Rout Inspect:	No	**Marker:**	small_green
Recent Inspect Type:	NULL	**Facility Latitude:**	NULL
Recent Maintenance:	Replacement	**Facility Longitude:**	NULL
Recent Rout Maint:	No	**Latitude:**	43.35064
No Maint. Done:	No	**Longitude:**	-80.1193
Significant:	No		

Related NEB Event No:	NULL
Incident Type:	Release of Substance
Incident Types:	Release of Substance
Substance Carried:	NULL
Design Standard:	NULL
Basic Cause Category:	Maintenance
Immed Cause Cat:	Corrosion and Cracking
Detailed Basic Cause:	Job or system factors, Excessive wear and tear, Improper loading or rate of use
Detailed Immediate Cause:	Damage or deterioration mechanism, Cracking, Corrosion Fatigue

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11 | ***1 of 1*** | ***SW/47.1*** | ***270.9 / 1.09*** | ***lot 33 con 7 ON*** | ***WWIS***

Well ID:	6810703	**Data Entry Status:**	
Construction Date:		**Data Src:**	1
Primary Water Use:	Domestic	**Date Received:**	8/10/1984
Sec. Water Use:	0	**Selected Flag:**	Yes
Final Well Status:	Water Supply	**Abandonment Rec:**	
Water Type:		**Contractor:**	4005
Casing Material:		**Form Version:**	1
Audit No:		**Owner:**	
Tag:		**Street Name:**	
Construction Method:		**County:**	WENTWORTH
Elevation (m):		**Municipality:**	BEVERLY TOWNSHIP
Elevation Reliability:		**Site Info:**	
Depth to Bedrock:		**Lot:**	033
Well Depth:		**Concession:**	07
Overburden/Bedrock:		**Concession Name:**	CON
Pump Rate:		**Easting NAD83:**	
Static Water Level:		**Northing NAD83:**	
Flowing (Y/N):		**Zone:**	
Flow Rate:		**UTM Reliability:**	
Clear/Cloudy:			

Bore Hole Information

Bore Hole ID:	10488025	**Elevation:**	270.76
DP2BR:	40	**Elevrc:**	
Spatial Status:		**Zone:**	17
Code OB:	r	**East83:**	574574.3
Code OB Desc:	Bedrock	**Org CS:**	

Open Hole:		**North83:**	4800843
Cluster Kind:		**UTMRC:**	4
Date Completed:	25-JUL-84	**UTMRC Desc:**	margin of error : 30 m - 100 m
Remarks:		**Location Method:**	p4
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Overburden and Bedrock Materials Interval

Formation ID:	932695657
Layer:	1
Color:	6
General Color:	BROWN
Mat1:	05
Most Common Material:	CLAY
Mat2:	13
Other Materials:	BOULDERS
Mat3:	77
Other Materials:	LOOSE
Formation Top Depth:	0
Formation End Depth:	23
Formation End Depth UOM:	ft

Overburden and Bedrock Materials Interval

Formation ID:	932695659
Layer:	3
Color:	2
General Color:	GREY
Mat1:	15
Most Common Material:	LIMESTONE
Mat2:	73
Other Materials:	HARD
Mat3:	
Other Materials:	
Formation Top Depth:	40
Formation End Depth:	86
Formation End Depth UOM:	ft

Overburden and Bedrock Materials Interval

Formation ID:	932695658
Layer:	2
Color:	6
General Color:	BROWN
Mat1:	28
Most Common Material:	SAND
Mat2:	11
Other Materials:	GRAVEL
Mat3:	77
Other Materials:	LOOSE
Formation Top Depth:	23
Formation End Depth:	40
Formation End Depth UOM:	ft

Method of Construction & Well Use

Method Construction ID:	966810703
Method Construction Code:	1
Method Construction:	Cable Tool
Other Method Construction:	

Pipe Information

Pipe ID:	11036595
Casing No:	1
Comment:	
Alt Name:	

Results of Well Yield Testing

Pump Test ID:	996810703
Pump Set At:	
Static Level:	28
Final Level After Pumping:	66
Recommended Pump Depth:	83
Pumping Rate:	18
Flowing Rate:	
Recommended Pump Rate:	10
Levels UOM:	ft
Rate UOM:	GPM
Water State After Test Code:	1
Water State After Test:	CLEAR
Pumping Test Method:	1
Pumping Duration HR:	1
Pumping Duration MIN:	0
Flowing:	N

Draw Down & Recovery

Pump Test Detail ID:	934353617
Test Type:	Recovery
Test Duration:	15
Test Level:	32
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	934625634
Test Type:	Recovery
Test Duration:	30
Test Level:	28
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	935147007
Test Type:	Recovery
Test Duration:	60
Test Level:	28
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	934868229

Test Type:	Recovery
Test Duration:	45
Test Level:	28
Test Level UOM:	ft

Water Details

Water ID:	933980166
Layer:	1
Kind Code:	1
Kind:	FRESH
Water Found Depth:	52
Water Found Depth UOM:	ft

Water Details

Water ID:	933980167
Layer:	2
Kind Code:	1
Kind:	FRESH
Water Found Depth:	85
Water Found Depth UOM:	ft

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12 | ***1 of 1*** | ***ENE/52.8*** | ***263.9 / -6.00*** | ***lot 7 con 7 ON*** | ***WWIS***

Well ID:	6810346	**Data Entry Status:**	
Construction Date:		**Data Src:**	1
Primary Water Use:	Domestic	**Date Received:**	1/15/1982
Sec. Water Use:	0	**Selected Flag:**	Yes
Final Well Status:	Water Supply	**Abandonment Rec:**	
Water Type:		**Contractor:**	4208
Casing Material:		**Form Version:**	1
Audit No:		**Owner:**	
Tag:		**Street Name:**	
Construction Method:		**County:**	WENTWORTH
Elevation (m):		**Municipality:**	WEST FLAMBOROUGH TOWNSHIP
Elevation Reliability:		**Site Info:**	
Depth to Bedrock:		**Lot:**	007
Well Depth:		**Concession:**	07
Overburden/Bedrock:		**Concession Name:**	CON
Pump Rate:		**Easting NAD83:**	
Static Water Level:		**Northing NAD83:**	
Flowing (Y/N):		**Zone:**	
Flow Rate:		**UTM Reliability:**	
Clear/Cloudy:			

Bore Hole Information

Bore Hole ID:	10487672	**Elevation:**	264.84
DP2BR:	23	**Elevrc:**	
Spatial Status:		**Zone:**	17
Code OB:	r	**East83:**	578514.4
Code OB Desc:	Bedrock	**Org CS:**	
Open Hole:		**North83:**	4802863
Cluster Kind:		**UTMRC:**	4
Date Completed:	08-JUN-81	**UTMRC Desc:**	margin of error : 30 m - 100 m
Remarks:		**Location Method:**	p4
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			

Source Revision Comment:
Supplier Comment:

Overburden and Bedrock Materials Interval

Formation ID:	932694482
Layer:	1
Color:	6
General Color:	BROWN
Mat1:	05
Most Common Material:	CLAY
Mat2:	81
Other Materials:	SANDY
Mat3:	
Other Materials:	
Formation Top Depth:	0
Formation End Depth:	23
Formation End Depth UOM:	ft

Overburden and Bedrock Materials Interval

Formation ID:	932694483
Layer:	2
Color:	2
General Color:	GREY
Mat1:	15
Most Common Material:	LIMESTONE
Mat2:	
Other Materials:	
Mat3:	
Other Materials:	
Formation Top Depth:	23
Formation End Depth:	30
Formation End Depth UOM:	ft

Method of Construction & Well Use

Method Construction ID:	966810346
Method Construction Code:	4
Method Construction:	Rotary (Air)
Other Method Construction:	

Pipe Information

Pipe ID:	11036242
Casing No:	1
Comment:	
Alt Name:	

Construction Record - Casing

Casing ID:	930797329
Layer:	1
Material:	1
Open Hole or Material:	STEEL
Depth From:	
Depth To:	23
Casing Diameter:	6
Casing Diameter UOM:	inch

Casing Depth UOM: ft

Results of Well Yield Testing

Pump Test ID: 996810346
Pump Set At:
Static Level: 5
Final Level After Pumping: 30
Recommended Pump Depth: 20
Pumping Rate: 40
Flowing Rate:
Recommended Pump Rate: 10
Levels UOM: ft
Rate UOM: GPM
Water State After Test Code: 1
Water State After Test: CLEAR
Pumping Test Method: 1
Pumping Duration HR: 1
Pumping Duration MIN: 0
Flowing: N

Draw Down & Recovery

Pump Test Detail ID: 934352481
Test Type: Recovery
Test Duration: 15
Test Level: 5
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934623991
Test Type: Recovery
Test Duration: 30
Test Level: 5
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934867147
Test Type: Recovery
Test Duration: 45
Test Level: 5
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 935145786
Test Type: Recovery
Test Duration: 60
Test Level: 5
Test Level UOM: ft

Water Details

Water ID: 933979732
Layer: 1
Kind Code: 1
Kind: FRESH
Water Found Depth: 26
Water Found Depth UOM: ft

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
13	1 of 1	ENE/53.6	270.2 / 0.39	780 Concession Rd 8 W Hamilton ON N0B2J0	EHS

Order ID:	566928	**Date Received:**	29-MAR-18
Order No:	20180329033	**Lot/Building Size:**	
Customer ID:	129588	**Municipality:**	HAMILTON
Company ID:	80685	**Client Prov/State:**	ON
Status:	C	**Search Radius (km):**	.25
Report Code:	4CAN	**Large Radius:**	.35
Report Type:	Custom Report	**X:**	-80.021165
Report Date:	05-APR-18	**Y:**	43.375658
Report Requested by:	Monarch Environmental Consulting Ltd.		
Nearest Intersection:			
Previous Site Name:			
Additional Info Ordered:	Fire Insur. Maps and/or Site Plans		

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
14	1 of 1	WSW/57.2	272.5 / 2.69	lot 31 con 7 ON	WWIS

Well ID:	6807572	**Data Entry Status:**	
Construction Date:		**Data Src:**	1
Primary Water Use:	Domestic	**Date Received:**	9/17/1970
Sec. Water Use:	0	**Selected Flag:**	Yes
Final Well Status:	Water Supply	**Abandonment Rec:**	
Water Type:		**Contractor:**	2309
Casing Material:		**Form Version:**	1
Audit No:		**Owner:**	
Tag:		**Street Name:**	
Construction Method:		**County:**	WENTWORTH
Elevation (m):		**Municipality:**	BEVERLY TOWNSHIP
Elevation Reliability:		**Site Info:**	
Depth to Bedrock:		**Lot:**	031
Well Depth:		**Concession:**	07
Overburden/Bedrock:		**Concession Name:**	CON
Pump Rate:		**Easting NAD83:**	
Static Water Level:		**Northing NAD83:**	
Flowing (Y/N):		**Zone:**	
Flow Rate:		**UTM Reliability:**	
Clear/Cloudy:			

Bore Hole Information

Bore Hole ID:	10484980	**Elevation:**	273.72
DP2BR:	1	**Elevrc:**	
Spatial Status:		**Zone:**	17
Code OB:	r	**East83:**	573564.3
Code OB Desc:	Bedrock	**Org CS:**	
Open Hole:		**North83:**	4800843
Cluster Kind:		**UTMRC:**	4
Date Completed:	11-AUG-70	**UTMRC Desc:**	margin of error : 30 m - 100 m
Remarks:		**Location Method:**	p4
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Overburden and Bedrock Materials Interval

Formation ID:	932685731
Layer:	2
Color:	2
General Color:	GREY
Mat1:	15
Most Common Material:	LIMESTONE
Mat2:	
Other Materials:	
Mat3:	
Other Materials:	
Formation Top Depth:	1
Formation End Depth:	59
Formation End Depth UOM:	ft

Overburden and Bedrock Materials Interval

Formation ID:	932685730
Layer:	1
Color:	6
General Color:	BROWN
Mat1:	02
Most Common Material:	TOPSOIL
Mat2:	09
Other Materials:	MEDIUM SAND
Mat3:	
Other Materials:	
Formation Top Depth:	0
Formation End Depth:	1
Formation End Depth UOM:	ft

Method of Construction & Well Use

Method Construction ID:	966807572
Method Construction Code:	1
Method Construction:	Cable Tool
Other Method Construction:	

Pipe Information

Pipe ID:	11033550
Casing No:	1
Comment:	
Alt Name:	

Construction Record - Casing

Casing ID:	930793134
Layer:	1
Material:	1
Open Hole or Material:	STEEL
Depth From:	
Depth To:	10
Casing Diameter:	6
Casing Diameter UOM:	inch
Casing Depth UOM:	ft

Construction Record - Casing

Casing ID:	930793135
Layer:	2

Material:	4
Open Hole or Material:	OPEN HOLE
Depth From:	
Depth To:	59
Casing Diameter:	6
Casing Diameter UOM:	inch
Casing Depth UOM:	ft

Results of Well Yield Testing

Pump Test ID:	996807572
Pump Set At:	
Static Level:	15
Final Level After Pumping:	54
Recommended Pump Depth:	56
Pumping Rate:	5
Flowing Rate:	
Recommended Pump Rate:	4
Levels UOM:	ft
Rate UOM:	GPM
Water State After Test Code:	1
Water State After Test:	CLEAR
Pumping Test Method:	2
Pumping Duration HR:	1
Pumping Duration MIN:	0
Flowing:	N

Draw Down & Recovery

Pump Test Detail ID:	934352374
Test Type:	Draw Down
Test Duration:	15
Test Level:	54
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	934616375
Test Type:	Draw Down
Test Duration:	30
Test Level:	54
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	935138451
Test Type:	Draw Down
Test Duration:	60
Test Level:	54
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	934868615
Test Type:	Draw Down
Test Duration:	45
Test Level:	54
Test Level UOM:	ft

Water Details

Water ID:	933976348
Layer:	1
Kind Code:	1
Kind:	FRESH
Water Found Depth:	55
Water Found Depth UOM:	ft

15 **1 of 1** **WSW/57.3** **273.9 / 4.00** **lot 16 con 1 ON** **WWIS**

Well ID:	5005530	**Data Entry Status:**	
Construction Date:		**Data Src:**	1
Primary Water Use:	Domestic	**Date Received:**	8/25/2003
Sec. Water Use:		**Selected Flag:**	Yes
Final Well Status:	Water Supply	**Abandonment Rec:**	
Water Type:		**Contractor:**	7154
Casing Material:		**Form Version:**	1
Audit No:	264311	**Owner:**	
Tag:		**Street Name:**	
Construction Method:		**County:**	PERTH
Elevation (m):		**Municipality:**	SOUTH EASTHOPE TOWNSHIP
Elevation Reliability:		**Site Info:**	
Depth to Bedrock:		**Lot:**	016
Well Depth:		**Concession:**	01
Overburden/Bedrock:		**Concession Name:**	CON
Pump Rate:		**Easting NAD83:**	
Static Water Level:		**Northing NAD83:**	
Flowing (Y/N):		**Zone:**	
Flow Rate:		**UTM Reliability:**	
Clear/Cloudy:			

Bore Hole Information

Bore Hole ID:	10546580	**Elevation:**	272.95
DP2BR:	195	**Elevrc:**	
Spatial Status:		**Zone:**	17
Code OB:	r	**East83:**	575174
Code OB Desc:	Bedrock	**Org CS:**	N83a
Open Hole:		**North83:**	4801800
Cluster Kind:		**UTMRC:**	8
Date Completed:	06-AUG-03	**UTMRC Desc:**	margin of error : 3 km - 10 km
Remarks:		**Location Method:**	wc
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Overburden and Bedrock Materials Interval

Formation ID:	932934844
Layer:	3
Color:	6
General Color:	BROWN
Mat1:	05
Most Common Material:	CLAY
Mat2:	12
Other Materials:	STONES
Mat3:	
Other Materials:	
Formation Top Depth:	96

Formation End Depth: 103
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 932934846
Layer: 5
Color: 2
General Color: GREY
Mat1: 06
Most Common Material: SILT
Mat2:
Other Materials:
Mat3:
Other Materials:
Formation Top Depth: 105
Formation End Depth: 188
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 932934842
Layer: 1
Color: 6
General Color: BROWN
Mat1: 02
Most Common Material: TOPSOIL
Mat2:
Other Materials:
Mat3:
Other Materials:
Formation Top Depth: 0
Formation End Depth: 2
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 932934843
Layer: 2
Color: 6
General Color: BROWN
Mat1: 05
Most Common Material: CLAY
Mat2:
Other Materials:
Mat3:
Other Materials:
Formation Top Depth: 2
Formation End Depth: 96
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 932934847
Layer: 6
Color: 2
General Color: GREY
Mat1: 05

Most Common Material:	CLAY
Mat2:	12
Other Materials:	STONES
Mat3:	
Other Materials:	
Formation Top Depth:	188
Formation End Depth:	195
Formation End Depth UOM:	ft

Overburden and Bedrock Materials Interval

Formation ID:	932934845
Layer:	4
Color:	2
General Color:	GREY
Mat1:	05
Most Common Material:	CLAY
Mat2:	84
Other Materials:	SILTY
Mat3:	
Other Materials:	
Formation Top Depth:	103
Formation End Depth:	105
Formation End Depth UOM:	ft

Overburden and Bedrock Materials Interval

Formation ID:	932934848
Layer:	7
Color:	6
General Color:	BROWN
Mat1:	26
Most Common Material:	ROCK
Mat2:	
Other Materials:	
Mat3:	
Other Materials:	
Formation Top Depth:	195
Formation End Depth:	200
Formation End Depth UOM:	ft

Annular Space/Abandonment Sealing Record

Plug ID:	933243562
Layer:	1
Plug From:	0
Plug To:	192
Plug Depth UOM:	ft

Method of Construction & Well Use

Method Construction ID:	965005530
Method Construction Code:	2
Method Construction:	Rotary (Convent.)
Other Method Construction:	

Pipe Information

Pipe ID: 11095150
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930543566
Layer: 1
Material: 1
Open Hole or Material: STEEL
Depth From:
Depth To:
Casing Diameter: 6
Casing Diameter UOM: inch
Casing Depth UOM: ft

Construction Record - Casing

Casing ID: 930543567
Layer: 2
Material: 4
Open Hole or Material: OPEN HOLE
Depth From:
Depth To:
Casing Diameter: 6
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pump Test ID: 995005530
Pump Set At:
Static Level: 16
Final Level After Pumping: 59
Recommended Pump Depth: 100
Pumping Rate: 12
Flowing Rate:
Recommended Pump Rate: 12
Levels UOM: ft
Rate UOM: GPM
Water State After Test Code: 1
Water State After Test: CLEAR
Pumping Test Method: 1
Pumping Duration HR: 2
Pumping Duration MIN: 0
Flowing: N

Draw Down & Recovery

Pump Test Detail ID: 935054229
Test Type: Draw Down
Test Duration: 60
Test Level: 59
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934789276
Test Type: Draw Down
Test Duration: 45
Test Level: 58

Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934254503
Test Type: Draw Down
Test Duration: 15
Test Level: 48
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934526816
Test Type: Draw Down
Test Duration: 30
Test Level: 57
Test Level UOM: ft

Water Details

Water ID: 934040533
Layer: 2
Kind Code: 1
Kind: FRESH
Water Found Depth: 196
Water Found Depth UOM: ft

Water Details

Water ID: 934040532
Layer: 1
Kind Code: 1
Kind: FRESH
Water Found Depth: 194
Water Found Depth UOM: ft

Water Details

Water ID: 934040534
Layer: 3
Kind Code: 1
Kind: FRESH
Water Found Depth: 198
Water Found Depth UOM: ft

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16 | ***1 of 1*** | ***WSW/57.6*** | ***274.9 / 5.00*** | ***lot 31 con 7 ON*** | ***WWIS***

Well ID: 6807576
Construction Date:
Primary Water Use: Domestic
Sec. Water Use: 0
Final Well Status: Water Supply
Water Type:
Casing Material:
Audit No:
Tag:
Construction Method:
Elevation (m):
Elevation Reliability:
Depth to Bedrock:

Data Entry Status:
Data Src: 1
Date Received: 9/22/1970
Selected Flag: Yes
Abandonment Rec:
Contractor: 2309
Form Version: 1
Owner:
Street Name:
County: WENTWORTH
Municipality: BEVERLY TOWNSHIP
Site Info:
Lot: 031

Well Depth:		***Concession:***	07
Overburden/Bedrock:		***Concession Name:***	CON
Pump Rate:		***Easting NAD83:***	
Static Water Level:		***Northing NAD83:***	
Flowing (Y/N):		***Zone:***	
Flow Rate:		***UTM Reliability:***	
Clear/Cloudy:			

Bore Hole Information

Bore Hole ID:	10484984	***Elevation:***	273.78
DP2BR:	18	***Elevrc:***	
Spatial Status:		***Zone:***	17
Code OB:	r	***East83:***	573694.3
Code OB Desc:	Bedrock	***Org CS:***	
Open Hole:		***North83:***	4800953
Cluster Kind:		***UTMRC:***	4
Date Completed:	16-SEP-70	***UTMRC Desc:***	margin of error : 30 m - 100 m
Remarks:		***Location Method:***	p4
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Overburden and Bedrock Materials Interval

Formation ID:	932685742
Layer:	2
Color:	
General Color:	
Mat1:	15
Most Common Material:	LIMESTONE
Mat2:	
Other Materials:	
Mat3:	
Other Materials:	
Formation Top Depth:	18
Formation End Depth:	70
Formation End Depth UOM:	ft

Overburden and Bedrock Materials Interval

Formation ID:	932685741
Layer:	1
Color:	6
General Color:	BROWN
Mat1:	05
Most Common Material:	CLAY
Mat2:	09
Other Materials:	MEDIUM SAND
Mat3:	12
Other Materials:	STONES
Formation Top Depth:	0
Formation End Depth:	18
Formation End Depth UOM:	ft

Method of Construction & Well Use

Method Construction ID: 966807576
Method Construction Code: 1
Method Construction: Cable Tool
Other Method Construction:

Pipe Information

Pipe ID: 11033554
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930793142
Layer: 1
Material: 1
Open Hole or Material: STEEL
Depth From:
Depth To: 22
Casing Diameter: 6
Casing Diameter UOM: inch
Casing Depth UOM: ft

Construction Record - Casing

Casing ID: 930793143
Layer: 2
Material: 4
Open Hole or Material: OPEN HOLE
Depth From:
Depth To: 70
Casing Diameter:
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pump Test ID: 996807576
Pump Set At:
Static Level: 58
Final Level After Pumping: 65
Recommended Pump Depth: 65
Pumping Rate: 20
Flowing Rate:
Recommended Pump Rate: 3
Levels UOM: ft
Rate UOM: GPM
Water State After Test Code: 1
Water State After Test: CLEAR
Pumping Test Method: 2
Pumping Duration HR: 2
Pumping Duration MIN: 0
Flowing: N

Draw Down & Recovery

Pump Test Detail ID: 934352378
Test Type: Draw Down
Test Duration: 15
Test Level: 58

Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 935138455
Test Type: Draw Down
Test Duration: 60
Test Level: 65
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934868619
Test Type: Draw Down
Test Duration: 45
Test Level: 61
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934616379
Test Type: Draw Down
Test Duration: 30
Test Level: 60
Test Level UOM: ft

Water Details

Water ID: 933976352
Layer: 1
Kind Code: 1
Kind: FRESH
Water Found Depth: 68
Water Found Depth UOM: ft

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17 | ***1 of 1*** | ***ENE/71.5*** | ***258.9 / -10.98*** | ***lot 11 con 7 ON*** | ***WWIS***

Well ID: 6806543
Construction Date:
Primary Water Use: Livestock
Sec. Water Use: Domestic
Final Well Status: Water Supply
Water Type:
Casing Material:
Audit No:
Tag:
Construction Method:
Elevation (m):
Elevation Reliability:
Depth to Bedrock:
Well Depth:
Overburden/Bedrock:
Pump Rate:
Static Water Level:
Flowing (Y/N):
Flow Rate:
Clear/Cloudy:

Data Entry Status:
Data Src: 1
Date Received: 10/26/1965
Selected Flag: Yes
Abandonment Rec:
Contractor: 5417
Form Version: 1
Owner:
Street Name:
County: WENTWORTH
Municipality: WEST FLAMBOROUGH TOWNSHIP
Site Info:
Lot: 011
Concession: 07
Concession Name: CON
Easting NAD83:
Northing NAD83:
Zone:
UTM Reliability:

Bore Hole Information

Bore Hole ID:	10484001	**Elevation:**	259.35
DP2BR:		**Elevrc:**	
Spatial Status:		**Zone:**	17
Code OB:	o	**East83:**	580137.4
Code OB Desc:	Overburden	**Org CS:**	
Open Hole:		**North83:**	4803399
Cluster Kind:		**UTMRC:**	5
Date Completed:	23-JUN-65	**UTMRC Desc:**	margin of error : 100 m - 300 m
Remarks:		**Location Method:**	p5
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Overburden and Bedrock Materials Interval

Formation ID:	932682665
Layer:	3
Color:	
General Color:	
Mat1:	10
Most Common Material:	COARSE SAND
Mat2:	11
Other Materials:	GRAVEL
Mat3:	
Other Materials:	
Formation Top Depth:	45
Formation End Depth:	46
Formation End Depth UOM:	ft

Overburden and Bedrock Materials Interval

Formation ID:	932682663
Layer:	1
Color:	6
General Color:	BROWN
Mat1:	05
Most Common Material:	CLAY
Mat2:	09
Other Materials:	MEDIUM SAND
Mat3:	
Other Materials:	
Formation Top Depth:	0
Formation End Depth:	34
Formation End Depth UOM:	ft

Overburden and Bedrock Materials Interval

Formation ID:	932682664
Layer:	2
Color:	
General Color:	
Mat1:	09
Most Common Material:	MEDIUM SAND
Mat2:	05
Other Materials:	CLAY
Mat3:	11
Other Materials:	GRAVEL

Formation Top Depth:	34
Formation End Depth:	45
Formation End Depth UOM:	ft

Method of Construction & Well Use

Method Construction ID:	966806543
Method Construction Code:	1
Method Construction:	Cable Tool
Other Method Construction:	

Pipe Information

Pipe ID:	11032571
Casing No:	1
Comment:	
Alt Name:	

Construction Record - Casing

Casing ID:	930791440
Layer:	1
Material:	1
Open Hole or Material:	STEEL
Depth From:	
Depth To:	46
Casing Diameter:	6
Casing Diameter UOM:	inch
Casing Depth UOM:	ft

Results of Well Yield Testing

Pump Test ID:	996806543
Pump Set At:	
Static Level:	18
Final Level After Pumping:	30
Recommended Pump Depth:	40
Pumping Rate:	30
Flowing Rate:	
Recommended Pump Rate:	10
Levels UOM:	ft
Rate UOM:	GPM
Water State After Test Code:	1
Water State After Test:	CLEAR
Pumping Test Method:	1
Pumping Duration HR:	0
Pumping Duration MIN:	45
Flowing:	N

Water Details

Water ID:	933975262
Layer:	1
Kind Code:	1
Kind:	FRESH
Water Found Depth:	45
Water Found Depth UOM:	ft

18	***1 of 1***	***ENE/79.8***	***264.9 / -4.95***	***lot 7 con 7 ON***	***WWIS***

Well ID:	6806533	***Data Entry Status:***	
Construction Date:		***Data Src:***	1
Primary Water Use:	Domestic	***Date Received:***	1/3/1967
Sec. Water Use:	0	***Selected Flag:***	Yes
Final Well Status:	Water Supply	***Abandonment Rec:***	
Water Type:		***Contractor:***	4602
Casing Material:		***Form Version:***	1
Audit No:		***Owner:***	
Tag:		***Street Name:***	
Construction Method:		***County:***	WENTWORTH
Elevation (m):		***Municipality:***	WEST FLAMBOROUGH TOWNSHIP
Elevation Reliability:		***Site Info:***	
Depth to Bedrock:		***Lot:***	007
Well Depth:		***Concession:***	07
Overburden/Bedrock:		***Concession Name:***	CON
Pump Rate:		***Easting NAD83:***	
Static Water Level:		***Northing NAD83:***	
Flowing (Y/N):		***Zone:***	
Flow Rate:		***UTM Reliability:***	
Clear/Cloudy:			

Bore Hole Information

Bore Hole ID:	10483991	***Elevation:***	265.52
DP2BR:	33	***Elevrc:***	
Spatial Status:		***Zone:***	17
Code OB:	r	***East83:***	578508.4
Code OB Desc:	Bedrock	***Org CS:***	
Open Hole:		***North83:***	4802834
Cluster Kind:		***UTMRC:***	5
Date Completed:	28-DEC-66	***UTMRC Desc:***	margin of error : 100 m - 300 m
Remarks:		***Location Method:***	p5
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Overburden and Bedrock Materials Interval

Formation ID:	932682634
Layer:	2
Color:	
General Color:	
Mat1:	15
Most Common Material:	LIMESTONE
Mat2:	
Other Materials:	
Mat3:	
Other Materials:	
Formation Top Depth:	33
Formation End Depth:	44
Formation End Depth UOM:	ft

Overburden and Bedrock Materials Interval

Formation ID:	932682633
Layer:	1
Color:	6

General Color:	BROWN
Mat1:	09
Most Common Material:	MEDIUM SAND
Mat2:	
Other Materials:	
Mat3:	
Other Materials:	
Formation Top Depth:	0
Formation End Depth:	33
Formation End Depth UOM:	ft

Method of Construction & Well Use

Method Construction ID:	966806533
Method Construction Code:	1
Method Construction:	Cable Tool
Other Method Construction:	

Pipe Information

Pipe ID:	11032561
Casing No:	1
Comment:	
Alt Name:	

Construction Record - Casing

Casing ID:	930791425
Layer:	2
Material:	4
Open Hole or Material:	OPEN HOLE
Depth From:	
Depth To:	44
Casing Diameter:	6
Casing Diameter UOM:	inch
Casing Depth UOM:	ft

Construction Record - Casing

Casing ID:	930791424
Layer:	1
Material:	1
Open Hole or Material:	STEEL
Depth From:	
Depth To:	34
Casing Diameter:	6
Casing Diameter UOM:	inch
Casing Depth UOM:	ft

Results of Well Yield Testing

Pump Test ID:	996806533
Pump Set At:	
Static Level:	15
Final Level After Pumping:	44
Recommended Pump Depth:	42
Pumping Rate:	10
Flowing Rate:	
Recommended Pump Rate:	5
Levels UOM:	ft
Rate UOM:	GPM

Water State After Test Code:	2
Water State After Test:	CLOUDY
Pumping Test Method:	1
Pumping Duration HR:	1
Pumping Duration MIN:	0
Flowing:	N

Water Details

Water ID:	933975252
Layer:	1
Kind Code:	1
Kind:	FRESH
Water Found Depth:	43
Water Found Depth UOM:	ft

19 | ***1 of 1*** | ***WSW/84.4*** | ***271.2 / 1.31*** | ***lot 31 con 7 ON*** | ***WWIS***

Well ID:	6809554	**Data Entry Status:**	
Construction Date:		**Data Src:**	1
Primary Water Use:	Domestic	**Date Received:**	2/15/1977
Sec. Water Use:	0	**Selected Flag:**	Yes
Final Well Status:	Water Supply	**Abandonment Rec:**	
Water Type:		**Contractor:**	4005
Casing Material:		**Form Version:**	1
Audit No:		**Owner:**	
Tag:		**Street Name:**	
Construction Method:		**County:**	WENTWORTH
Elevation (m):		**Municipality:**	BEVERLY TOWNSHIP
Elevation Reliability:		**Site Info:**	
Depth to Bedrock:		**Lot:**	031
Well Depth:		**Concession:**	07
Overburden/Bedrock:		**Concession Name:**	CON
Pump Rate:		**Easting NAD83:**	
Static Water Level:		**Northing NAD83:**	
Flowing (Y/N):		**Zone:**	
Flow Rate:		**UTM Reliability:**	
Clear/Cloudy:			

Bore Hole Information

Bore Hole ID:	10486896	**Elevation:**	271.16
DP2BR:	11	**Elevrc:**	
Spatial Status:		**Zone:**	17
Code OB:	r	**East83:**	573594.3
Code OB Desc:	Bedrock	**Org CS:**	
Open Hole:		**North83:**	4800683
Cluster Kind:		**UTMRC:**	4
Date Completed:	02-JAN-77	**UTMRC Desc:**	margin of error : 30 m - 100 m
Remarks:		**Location Method:**	p4
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Overburden and Bedrock Materials Interval

Formation ID:	932691860

Layer:	1
Color:	6
General Color:	BROWN
Mat1:	28
Most Common Material:	SAND
Mat2:	11
Other Materials:	GRAVEL
Mat3:	77
Other Materials:	LOOSE
Formation Top Depth:	0
Formation End Depth:	11
Formation End Depth UOM:	ft

Overburden and Bedrock Materials Interval

Formation ID:	932691861
Layer:	2
Color:	2
General Color:	GREY
Mat1:	15
Most Common Material:	LIMESTONE
Mat2:	73
Other Materials:	HARD
Mat3:	
Other Materials:	
Formation Top Depth:	11
Formation End Depth:	30
Formation End Depth UOM:	ft

Method of Construction & Well Use

Method Construction ID:	966809554
Method Construction Code:	1
Method Construction:	Cable Tool
Other Method Construction:	

Pipe Information

Pipe ID:	11035466
Casing No:	1
Comment:	
Alt Name:	

Construction Record - Casing

Casing ID:	930796209
Layer:	2
Material:	4
Open Hole or Material:	OPEN HOLE
Depth From:	
Depth To:	30
Casing Diameter:	
Casing Diameter UOM:	inch
Casing Depth UOM:	ft

Construction Record - Casing

Casing ID:	930796208
Layer:	1
Material:	1

Open Hole or Material: STEEL
Depth From:
Depth To: 11
Casing Diameter: 6
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pump Test ID: 996809554
Pump Set At:
Static Level: 6
Final Level After Pumping: 15
Recommended Pump Depth: 26
Pumping Rate:
Flowing Rate:
Recommended Pump Rate: 10
Levels UOM: ft
Rate UOM: GPM
Water State After Test Code: 1
Water State After Test: CLEAR
Pumping Test Method:
Pumping Duration HR:
Pumping Duration MIN:
Flowing: N

Draw Down & Recovery

Pump Test Detail ID: 934349749
Test Type: Recovery
Test Duration: 15
Test Level: 6
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934874241
Test Type: Recovery
Test Duration: 45
Test Level: 6
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 935143552
Test Type: Recovery
Test Duration: 60
Test Level: 6
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934613689
Test Type: Recovery
Test Duration: 30
Test Level: 6
Test Level UOM: ft

Water Details

Water ID: 933978752

Layer:	1
Kind Code:	1
Kind:	FRESH
Water Found Depth:	27
Water Found Depth UOM:	ft

20 **1 of 1** **WSW/86.3** **274.9 / 5.00** **lot 34 con 7 FLAMBOROUGH ON** **WWIS**

Well ID:	7206722	**Data Entry Status:**	
Construction Date:		**Data Src:**	
Primary Water Use:		**Date Received:**	8/19/2013
Sec. Water Use:		**Selected Flag:**	Yes
Final Well Status:	Water Supply	**Abandonment Rec:**	
Water Type:		**Contractor:**	6020
Casing Material:		**Form Version:**	7
Audit No:	Z139373	**Owner:**	
Tag:	A118863	**Street Name:**	3 501
Construction Method:		**County:**	WENTWORTH
Elevation (m):		**Municipality:**	BEVERLY TOWNSHIP
Elevation Reliability:		**Site Info:**	
Depth to Bedrock:		**Lot:**	034
Well Depth:		**Concession:**	07
Overburden/Bedrock:		**Concession Name:**	CON
Pump Rate:		**Easting NAD83:**	
Static Water Level:		**Northing NAD83:**	
Flowing (Y/N):		**Zone:**	
Flow Rate:		**UTM Reliability:**	
Clear/Cloudy:			

Bore Hole Information

Bore Hole ID:	1004536454	**Elevation:**	272.47
DP2BR:		**Elevrc:**	
Spatial Status:		**Zone:**	17
Code OB:		**East83:**	574834
Code OB Desc:		**Org CS:**	UTM83
Open Hole:		**North83:**	4801842
Cluster Kind:		**UTMRC:**	4
Date Completed:	10-JUN-13	**UTMRC Desc:**	margin of error : 30 m - 100 m
Remarks:		**Location Method:**	wwr
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Method of Construction & Well Use

Method Construction ID:	1004971341
Method Construction Code:	
Method Construction:	
Other Method Construction:	

Pipe Information

Pipe ID:	1004971335
Casing No:	0
Comment:	
Alt Name:	

Construction Record - Casing

Casing ID:	1004971339
Layer:	
Material:	
Open Hole or Material:	
Depth From:	
Depth To:	
Casing Diameter:	
Casing Diameter UOM:	inch
Casing Depth UOM:	ft

Construction Record - Screen

Screen ID:	1004971340
Layer:	
Slot:	
Screen Top Depth:	
Screen End Depth:	
Screen Material:	
Screen Depth UOM:	ft
Screen Diameter UOM:	inch
Screen Diameter:	

Water Details

Water ID:	1004971338
Layer:	
Kind Code:	
Kind:	
Water Found Depth:	
Water Found Depth UOM:	ft

Hole Diameter

Hole ID:	1004971337
Diameter:	
Depth From:	
Depth To:	
Hole Depth UOM:	ft
Hole Diameter UOM:	inch

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21 ***1 of 1*** ***ENE/90.4*** ***264.9 / -5.00*** ***lot 6 con 7 ON*** ***WWIS***

Well ID:	6809427	***Data Entry Status:***	
Construction Date:		***Data Src:***	1
Primary Water Use:	Domestic	***Date Received:***	8/9/1976
Sec. Water Use:	0	***Selected Flag:***	Yes
Final Well Status:	Water Supply	***Abandonment Rec:***	
Water Type:		***Contractor:***	2309
Casing Material:		***Form Version:***	1
Audit No:		***Owner:***	
Tag:		***Street Name:***	
Construction Method:		***County:***	WENTWORTH
Elevation (m):		***Municipality:***	WEST FLAMBOROUGH TOWNSHIP
Elevation Reliability:		***Site Info:***	
Depth to Bedrock:		***Lot:***	006
Well Depth:		***Concession:***	07
Overburden/Bedrock:		***Concession Name:***	CON
Pump Rate:		***Easting NAD83:***	

Static Water Level:
Flowing (Y/N):
Flow Rate:
Clear/Cloudy:
Northing NAD83:
Zone:
UTM Reliability:

Bore Hole Information

Bore Hole ID:	10486771	***Elevation:***	265.19
DP2BR:	36	***Elevrc:***	
Spatial Status:		***Zone:***	17
Code OB:	r	***East83:***	578314.4
Code OB Desc:	Bedrock	***Org CS:***	
Open Hole:		***North83:***	4802783
Cluster Kind:		***UTMRC:***	4
Date Completed:	20-JUL-76	***UTMRC Desc:***	margin of error : 30 m - 100 m
Remarks:		***Location Method:***	p4
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Overburden and Bedrock Materials Interval

Formation ID:	932691499
Layer:	2
Color:	6
General Color:	BROWN
Mat1:	28
Most Common Material:	SAND
Mat2:	
Other Materials:	
Mat3:	
Other Materials:	
Formation Top Depth:	19
Formation End Depth:	30
Formation End Depth UOM:	ft

Overburden and Bedrock Materials Interval

Formation ID:	932691498
Layer:	1
Color:	6
General Color:	BROWN
Mat1:	28
Most Common Material:	SAND
Mat2:	79
Other Materials:	PACKED
Mat3:	
Other Materials:	
Formation Top Depth:	0
Formation End Depth:	19
Formation End Depth UOM:	ft

Overburden and Bedrock Materials Interval

Formation ID:	932691500
Layer:	3

Color:	6
General Color:	BROWN
Mat1:	28
Most Common Material:	SAND
Mat2:	12
Other Materials:	STONES
Mat3:	
Other Materials:	
Formation Top Depth:	30
Formation End Depth:	36
Formation End Depth UOM:	ft

Overburden and Bedrock Materials Interval

Formation ID:	932691501
Layer:	4
Color:	2
General Color:	GREY
Mat1:	15
Most Common Material:	LIMESTONE
Mat2:	73
Other Materials:	HARD
Mat3:	
Other Materials:	
Formation Top Depth:	36
Formation End Depth:	45
Formation End Depth UOM:	ft

Method of Construction & Well Use

Method Construction ID:	966809427
Method Construction Code:	1
Method Construction:	Cable Tool
Other Method Construction:	

Pipe Information

Pipe ID:	11035341
Casing No:	1
Comment:	
Alt Name:	

Construction Record - Casing

Casing ID:	930796018
Layer:	1
Material:	1
Open Hole or Material:	STEEL
Depth From:	
Depth To:	36
Casing Diameter:	6
Casing Diameter UOM:	inch
Casing Depth UOM:	ft

Construction Record - Casing

Casing ID:	930796019
Layer:	2
Material:	4
Open Hole or Material:	OPEN HOLE

Depth From:
Depth To: 45
Casing Diameter: 6
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pump Test ID: 996809427
Pump Set At:
Static Level: 9
Final Level After Pumping: 14
Recommended Pump Depth: 25
Pumping Rate: 30
Flowing Rate:
Recommended Pump Rate: 7
Levels UOM: ft
Rate UOM: GPM
Water State After Test Code: 1
Water State After Test: CLEAR
Pumping Test Method: 2
Pumping Duration HR: 1
Pumping Duration MIN: 0
Flowing: N

Draw Down & Recovery

Pump Test Detail ID: 934358002
Test Type: Draw Down
Test Duration: 15
Test Level: 12
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934613173
Test Type: Draw Down
Test Duration: 30
Test Level: 14
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934874143
Test Type: Draw Down
Test Duration: 45
Test Level: 14
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 935144149
Test Type: Draw Down
Test Duration: 60
Test Level: 14
Test Level UOM: ft

Water Details

Water ID: 933978588
Layer: 1

Kind Code:	1
Kind:	FRESH
Water Found Depth:	44
Water Found Depth UOM:	ft

22 **1 of 1** **ENE/99.0** **273.2 / 3.34** **lot 9 con 7 MILLGROVE ON** **WWIS**

Well ID:	7226659	**Data Entry Status:**	
Construction Date:		**Data Src:**	
Primary Water Use:	Irrigation	**Date Received:**	9/4/2014
Sec. Water Use:	Industrial	**Selected Flag:**	Yes
Final Well Status:	Water Supply	**Abandonment Rec:**	
Water Type:		**Contractor:**	7385
Casing Material:		**Form Version:**	7
Audit No:	Z189645	**Owner:**	
Tag:	A166160	**Street Name:**	780 CON 8 RD.
Construction Method:		**County:**	WENTWORTH
Elevation (m):		**Municipality:**	WEST FLAMBOROUGH TOWNSHIP
Elevation Reliability:		**Site Info:**	
Depth to Bedrock:		**Lot:**	009
Well Depth:		**Concession:**	07
Overburden/Bedrock:		**Concession Name:**	CON
Pump Rate:		**Easting NAD83:**	
Static Water Level:		**Northing NAD83:**	
Flowing (Y/N):		**Zone:**	
Flow Rate:		**UTM Reliability:**	
Clear/Cloudy:			

Bore Hole Information

Bore Hole ID:	1005111003	**Elevation:**	274.41
DP2BR:		**Elevrc:**	
Spatial Status:		**Zone:**	17
Code OB:		**East83:**	579237
Code OB Desc:		**Org CS:**	UTM83
Open Hole:		**North83:**	4802946
Cluster Kind:		**UTMRC:**	4
Date Completed:	26-AUG-14	**UTMRC Desc:**	margin of error : 30 m - 100 m
Remarks:		**Location Method:**	wwr
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Overburden and Bedrock Materials Interval

Formation ID:	1005251668
Layer:	3
Color:	2
General Color:	GREY
Mat1:	05
Most Common Material:	CLAY
Mat2:	11
Other Materials:	GRAVEL
Mat3:	
Other Materials:	
Formation Top Depth:	35
Formation End Depth:	60
Formation End Depth UOM:	ft

Overburden and Bedrock Materials Interval

Formation ID:	1005251666
Layer:	1
Color:	6
General Color:	BROWN
Mat1:	05
Most Common Material:	CLAY
Mat2:	12
Other Materials:	STONES
Mat3:	
Other Materials:	
Formation Top Depth:	0
Formation End Depth:	18
Formation End Depth UOM:	ft

Overburden and Bedrock Materials Interval

Formation ID:	1005251667
Layer:	2
Color:	6
General Color:	BROWN
Mat1:	28
Most Common Material:	SAND
Mat2:	
Other Materials:	
Mat3:	
Other Materials:	
Formation Top Depth:	18
Formation End Depth:	35
Formation End Depth UOM:	ft

Overburden and Bedrock Materials Interval

Formation ID:	1005251669
Layer:	4
Color:	2
General Color:	GREY
Mat1:	26
Most Common Material:	ROCK
Mat2:	
Other Materials:	
Mat3:	
Other Materials:	
Formation Top Depth:	60
Formation End Depth:	106
Formation End Depth UOM:	ft

Annular Space/Abandonment Sealing Record

Plug ID:	1005251705
Layer:	1
Plug From:	0
Plug To:	20
Plug Depth UOM:	ft

Method of Construction & Well

Use

Method Construction ID: 1005251704
Method Construction Code: 4
Method Construction: Rotary (Air)
Other Method Construction:

Pipe Information

Pipe ID: 1005251664
Casing No: 0
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 1005251674
Layer: 2
Material: 4
Open Hole or Material: OPEN HOLE
Depth From: 61
Depth To: 106
Casing Diameter: 6.125
Casing Diameter UOM: inch
Casing Depth UOM: ft

Construction Record - Casing

Casing ID: 1005251673
Layer: 1
Material: 1
Open Hole or Material: STEEL
Depth From: 2
Depth To: 61
Casing Diameter: 6.25
Casing Diameter UOM: inch
Casing Depth UOM: ft

Construction Record - Screen

Screen ID: 1005251675
Layer:
Slot:
Screen Top Depth:
Screen End Depth:
Screen Material:
Screen Depth UOM: ft
Screen Diameter UOM: inch
Screen Diameter:

Results of Well Yield Testing

Pump Test ID: 1005251665
Pump Set At: 60
Static Level: 12
Final Level After Pumping: 14
Recommended Pump Depth: 60
Pumping Rate: 16
Flowing Rate:
Recommended Pump Rate: 16
Levels UOM: ft
Rate UOM: GPM

Water State After Test Code: 1
Water State After Test: CLEAR
Pumping Test Method: 0
Pumping Duration HR: 1
Pumping Duration MIN: 0
Flowing: N

Draw Down & Recovery

Pump Test Detail ID: 1005251692
Test Type: Draw Down
Test Duration: 25
Test Level: 14
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 1005251694
Test Type: Draw Down
Test Duration: 30
Test Level: 14
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 1005251679
Test Type: Recovery
Test Duration: 2
Test Level: 12
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 1005251685
Test Type: Recovery
Test Duration: 5
Test Level: 12
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 1005251688
Test Type: Draw Down
Test Duration: 15
Test Level: 14
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 1005251701
Test Type: Recovery
Test Duration: 60
Test Level: 12
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 1005251683
Test Type: Recovery
Test Duration: 4

Test Level: 12
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 1005251690
Test Type: Draw Down
Test Duration: 20
Test Level: 14
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 1005251676
Test Type: Draw Down
Test Duration: 1
Test Level: 13
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 1005251677
Test Type: Recovery
Test Duration: 1
Test Level: 12
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 1005251686
Test Type: Draw Down
Test Duration: 10
Test Level: 14
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 1005251697
Test Type: Recovery
Test Duration: 40
Test Level: 12
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 1005251680
Test Type: Draw Down
Test Duration: 3
Test Level: 14
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 1005251689
Test Type: Recovery
Test Duration: 15
Test Level: 12
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 1005251691
Test Type: Recovery
Test Duration: 20
Test Level: 12
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 1005251681
Test Type: Recovery
Test Duration: 3
Test Level: 12
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 1005251700
Test Type: Draw Down
Test Duration: 60
Test Level: 14
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 1005251678
Test Type: Draw Down
Test Duration: 2
Test Level: 14
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 1005251682
Test Type: Draw Down
Test Duration: 4
Test Level: 14
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 1005251684
Test Type: Draw Down
Test Duration: 5
Test Level: 14
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 1005251687
Test Type: Recovery
Test Duration: 10
Test Level: 12
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 1005251693
Test Type: Recovery

Test Duration: 25
Test Level: 12
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 1005251696
Test Type: Draw Down
Test Duration: 40
Test Level: 14
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 1005251699
Test Type: Recovery
Test Duration: 50
Test Level: 12
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 1005251695
Test Type: Recovery
Test Duration: 30
Test Level: 12
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 1005251698
Test Type: Draw Down
Test Duration: 50
Test Level: 14
Test Level UOM: ft

Water Details

Water ID: 1005251672
Layer: 1
Kind Code: 1
Kind: FRESH
Water Found Depth: 106
Water Found Depth UOM: ft

Hole Diameter

Hole ID: 1005251671
Diameter: 6.125
Depth From: 20
Depth To: 106
Hole Depth UOM: ft
Hole Diameter UOM: inch

Hole Diameter

Hole ID: 1005251670
Diameter: 10
Depth From: 0
Depth To: 20

Hole Depth UOM: ft
Hole Diameter UOM: inch

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23 | **1 of 1** | **E/101.2** | **267.5 / -2.40** | **ACTON ON** | **WWIS**

Well ID: 7042163
Construction Date:
Primary Water Use: Not Used
Sec. Water Use:
Final Well Status: Observation Wells
Water Type:
Casing Material:
Audit No: Z46579
Tag: A005325
Construction Method:
Elevation (m):
Elevation Reliability:
Depth to Bedrock:
Well Depth:
Overburden/Bedrock:
Pump Rate:
Static Water Level:
Flowing (Y/N):
Flow Rate:
Clear/Cloudy:

Data Entry Status:
Data Src:
Date Received: 3/29/2007
Selected Flag: Yes
Abandonment Rec:
Contractor: 6032
Form Version: 3
Owner:
Street Name: 73 COMMERCE CRES
County: HALTON
Municipality: HALTON HILLS TOWN (ACTON)
Site Info:
Lot:
Concession:
Concession Name:
Easting NAD83:
Northing NAD83:
Zone:
UTM Reliability:

Bore Hole Information

Bore Hole ID: 11764660
DP2BR:
Spatial Status:
Code OB: x
Code OB Desc: Unknown type in the lower layer(s)
Open Hole:
Cluster Kind:
Date Completed: 04-JAN-07
Remarks:
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Elevation: 268.71
Elevrc:
Zone: 17
East83: 576820
Org CS: UTM83
North83: 4802272
UTMRC: 3
UTMRC Desc: margin of error : 10 - 30 m
Location Method: wwr

Overburden and Bedrock Materials Interval

Formation ID: 933096189
Layer: 2
Color:
General Color:
Mat1: 28
Most Common Material: SAND
Mat2: 06
Other Materials: SILT
Mat3: 91
Other Materials: WATER-BEARING
Formation Top Depth: 3.05
Formation End Depth: 3.05
Formation End Depth UOM: m

Overburden and Bedrock Materials Interval

Formation ID:	933096188
Layer:	1
Color:	
General Color:	
Mat1:	28
Most Common Material:	SAND
Mat2:	06
Other Materials:	SILT
Mat3:	91
Other Materials:	WATER-BEARING
Formation Top Depth:	0
Formation End Depth:	3.05
Formation End Depth UOM:	m

Overburden and Bedrock Materials Interval

Formation ID:	933096193
Layer:	6
Color:	
General Color:	
Mat1:	
Most Common Material:	
Mat2:	
Other Materials:	
Mat3:	
Other Materials:	
Formation Top Depth:	3.05
Formation End Depth:	
Formation End Depth UOM:	m

Overburden and Bedrock Materials Interval

Formation ID:	933096190
Layer:	3
Color:	
General Color:	
Mat1:	28
Most Common Material:	SAND
Mat2:	06
Other Materials:	SILT
Mat3:	91
Other Materials:	WATER-BEARING
Formation Top Depth:	3.05
Formation End Depth:	3.05
Formation End Depth UOM:	m

Overburden and Bedrock Materials Interval

Formation ID:	933096192
Layer:	5
Color:	
General Color:	
Mat1:	28
Most Common Material:	SAND
Mat2:	06
Other Materials:	SILT
Mat3:	91

Other Materials: WATER-BEARING
Formation Top Depth: 3.05
Formation End Depth: 3.05
Formation End Depth UOM: m

Overburden and Bedrock Materials Interval

Formation ID: 933096191
Layer: 4
Color:
General Color:
Mat1: 28
Most Common Material: SAND
Mat2: 06
Other Materials: SILT
Mat3: 91
Other Materials: WATER-BEARING
Formation Top Depth: 3.05
Formation End Depth: 3.05
Formation End Depth UOM: m

Annular Space/Abandonment Sealing Record

Plug ID: 933316345
Layer: 2
Plug From: .3
Plug To: 1.07
Plug Depth UOM: m

Annular Space/Abandonment Sealing Record

Plug ID: 933316344
Layer: 1
Plug From: 0
Plug To: .3
Plug Depth UOM: m

Method of Construction & Well Use

Method Construction ID: 967042163
Method Construction Code: 6
Method Construction: Boring
Other Method Construction:

Pipe Information

Pipe ID: 11772380
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930897481
Layer: 1
Material: 5
Open Hole or Material: PLASTIC

Depth From:	0
Depth To:	1.52
Casing Diameter:	.5
Casing Diameter UOM:	cm
Casing Depth UOM:	m

Construction Record - Screen

Screen ID:	933423787
Layer:	1
Slot:	10
Screen Top Depth:	1.52
Screen End Depth:	3.05
Screen Material:	5
Screen Depth UOM:	m
Screen Diameter UOM:	cm
Screen Diameter:	.5

Hole Diameter

Hole ID:	11850960
Diameter:	16
Depth From:	0
Depth To:	3.05
Hole Depth UOM:	m
Hole Diameter UOM:	cm

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24 **1 of 2** **WSW/103.2** **274.9 / 5.00** **1264 8th Concession Road West**
Hamilton ON **SPL**

Ref No:	8510-64ALV6	**Discharger Report:**	
Site No:		**Material Group:**	Waste
Incident Dt:	8/28/2004	**Client Type:**	
Year:		**Sector Type:**	Other
Incident Cause:	Other Discharges	**Source Type:**	
Incident Event:		**Nearest Watercourse:**	
Contaminant Code:	44	**Site Name:**	ANTRIM GLEN RETIREMENT COMMUNITY
Contaminant Name:	SEWAGE,RAW UNCHLORINATED	**Site Address:**	
Contaminant Limit 1:		**Site District Office:**	Hamilton
Contam Limit Freq 1:		**Site County/District:**	
Contaminant UN No 1:		**Site Postal Code:**	
Contaminant Qty:	200 L	**Site Region:**	West Central
Environment Impact:	Not Anticipated	**Site Municipality:**	Hamilton
Nature of Impact:	Soil Contamination	**Site Lot:**	
Receiving Medium:	Land	**Site Conc:**	
Receiving Env:		**Northing:**	4801539
Health/Env Conseq:		**Easting:**	574306
MOE Response:		**Site Geo Ref Accu:**	
Dt MOE Arvl on Scn:		**Site Geo Ref Meth:**	
MOE Reported Dt:	8/28/2004	**Site Map Datum:**	
Dt Document Closed:			
Agency Involved:			
SAC Action Class:	Spill to Land		
Incident Reason:	Process upset		
Incident Summary:	Antrim Glen Retirement,200 L sewage to rd		

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24 **2 of 2** **WSW/103.2** **274.9 / 5.00** **Parkbridge Lifestyle Communities Inc.**
1264 8th Concession Rd W Part of Lots 32 and
33, Concession 7, geographic townsh
Hamilton ON L0R 1K0 **SPL**

Ref No:	5134-82LRCQ	**Discharger Report:**	

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

Site No:		**Material Group:**	
Incident Dt:		**Client Type:**	
Year:		**Sector Type:**	Sewage Treatment
Incident Cause:	Process Upset	**Source Type:**	
Incident Event:		**Nearest Watercourse:**	
Contaminant Code:	44	**Site Name:**	Antrim Glen Retirement Community
Contaminant Name:	SEWAGE,RAW UNCHLORINATED	**Site Address:**	
Contaminant Limit 1:		**Site District Office:**	
Contam Limit Freq 1:		**Site County/District:**	
Contaminant UN No 1:		**Site Postal Code:**	
Contaminant Qty:	140 m3	**Site Region:**	
Environment Impact:	Possible	**Site Municipality:**	
Nature of Impact:	Soil Contamination; Surface Water Pollution	**Site Lot:**	
Receiving Medium:		**Site Conc:**	
Receiving Env:		**Northing:**	4801539
Health/Env Conseq:		**Easting:**	574306
MOE Response:	Planned Field Response	**Site Geo Ref Accu:**	
Dt MOE Arvl on Scn:		**Site Geo Ref Meth:**	
MOE Reported Dt:	2/12/2010	**Site Map Datum:**	
Dt Document Closed:	3/18/2010		
Agency Involved:			
SAC Action Class:	Land Spills		
Incident Reason:	Equipment Failure - Malfunction of system components		
Incident Summary:	Parkbridge Cmunty: est. 140 m3 raw sewage to containment		

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25 | ***1 of 1*** | ***WSW/104.3*** | ***272.9 / 3.05*** | ***lot 31 con 7 ON*** | ***WWIS***

Well ID:	6809278	**Data Entry Status:**	
Construction Date:		**Data Src:**	1
Primary Water Use:	Domestic	**Date Received:**	12/29/1975
Sec. Water Use:	0	**Selected Flag:**	Yes
Final Well Status:	Water Supply	**Abandonment Rec:**	
Water Type:		**Contractor:**	2309
Casing Material:		**Form Version:**	1
Audit No:		**Owner:**	
Tag:		**Street Name:**	
Construction Method:		**County:**	WENTWORTH
Elevation (m):		**Municipality:**	BEVERLY TOWNSHIP
Elevation Reliability:		**Site Info:**	
Depth to Bedrock:		**Lot:**	031
Well Depth:		**Concession:**	07
Overburden/Bedrock:		**Concession Name:**	CON
Pump Rate:		**Easting NAD83:**	
Static Water Level:		**Northing NAD83:**	
Flowing (Y/N):		**Zone:**	
Flow Rate:		**UTM Reliability:**	
Clear/Cloudy:			

Bore Hole Information

Bore Hole ID:	10486628	**Elevation:**	273.38
DP2BR:	0	**Elevrc:**	
Spatial Status:		**Zone:**	17
Code OB:	r	**East83:**	573542.3
Code OB Desc:	Bedrock	**Org CS:**	
Open Hole:		**North83:**	4800886
Cluster Kind:		**UTMRC:**	4
Date Completed:	15-OCT-75	**UTMRC Desc:**	margin of error : 30 m - 100 m
Remarks:		**Location Method:**	p4
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			

Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Overburden and Bedrock Materials Interval

Formation ID:	932691045
Layer:	1
Color:	2
General Color:	GREY
Mat1:	15
Most Common Material:	LIMESTONE
Mat2:	73
Other Materials:	HARD
Mat3:	
Other Materials:	
Formation Top Depth:	0
Formation End Depth:	58
Formation End Depth UOM:	ft

Method of Construction & Well Use

Method Construction ID:	966809278
Method Construction Code:	1
Method Construction:	Cable Tool
Other Method Construction:	

Pipe Information

Pipe ID:	11035198
Casing No:	1
Comment:	
Alt Name:	

Construction Record - Casing

Casing ID:	930795830
Layer:	2
Material:	4
Open Hole or Material:	OPEN HOLE
Depth From:	
Depth To:	58
Casing Diameter:	6
Casing Diameter UOM:	inch
Casing Depth UOM:	ft

Construction Record - Casing

Casing ID:	930795829
Layer:	1
Material:	1
Open Hole or Material:	STEEL
Depth From:	
Depth To:	10
Casing Diameter:	6
Casing Diameter UOM:	inch
Casing Depth UOM:	ft

Results of Well Yield Testing

Pump Test ID:	996809278
Pump Set At:	
Static Level:	10
Final Level After Pumping:	22
Recommended Pump Depth:	25
Pumping Rate:	25
Flowing Rate:	
Recommended Pump Rate:	7
Levels UOM:	ft
Rate UOM:	GPM
Water State After Test Code:	1
Water State After Test:	CLEAR
Pumping Test Method:	2
Pumping Duration HR:	1
Pumping Duration MIN:	0
Flowing:	N

Draw Down & Recovery

Pump Test Detail ID:	934357463
Test Type:	Draw Down
Test Duration:	15
Test Level:	20
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	934621416
Test Type:	Draw Down
Test Duration:	30
Test Level:	22
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	935143078
Test Type:	Draw Down
Test Duration:	60
Test Level:	22
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	934873627
Test Type:	Draw Down
Test Duration:	45
Test Level:	22
Test Level UOM:	ft

Water Details

Water ID:	933978412
Layer:	1
Kind Code:	1
Kind:	FRESH
Water Found Depth:	50
Water Found Depth UOM:	ft

26	***1 of 1***	***NNW/104.5***	***267.9 / -2.00***	***lot 1 con 7 ON***	***WWIS***

Well ID:	6807665	***Data Entry Status:***	
Construction Date:		***Data Src:***	1
Primary Water Use:	Domestic	***Date Received:***	1/5/1971
Sec. Water Use:	0	***Selected Flag:***	Yes
Final Well Status:	Water Supply	***Abandonment Rec:***	
Water Type:		***Contractor:***	4208
Casing Material:		***Form Version:***	1
Audit No:		***Owner:***	
Tag:		***Street Name:***	
Construction Method:		***County:***	WENTWORTH
Elevation (m):		***Municipality:***	WEST FLAMBOROUGH TOWNSHIP
Elevation Reliability:		***Site Info:***	
Depth to Bedrock:		***Lot:***	001
Well Depth:		***Concession:***	07
Overburden/Bedrock:		***Concession Name:***	CON
Pump Rate:		***Easting NAD83:***	
Static Water Level:		***Northing NAD83:***	
Flowing (Y/N):		***Zone:***	
Flow Rate:		***UTM Reliability:***	
Clear/Cloudy:			

Bore Hole Information

Bore Hole ID:	10485072	***Elevation:***	268.6
DP2BR:	32	***Elevrc:***	
Spatial Status:		***Zone:***	17
Code OB:	r	***East83:***	575914.3
Code OB Desc:	Bedrock	***Org CS:***	
Open Hole:		***North83:***	4802203
Cluster Kind:		***UTMRC:***	4
Date Completed:	26-OCT-70	***UTMRC Desc:***	margin of error : 30 m - 100 m
Remarks:		***Location Method:***	p4
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Overburden and Bedrock Materials Interval

Formation ID:	932686038
Layer:	1
Color:	2
General Color:	GREY
Mat1:	05
Most Common Material:	CLAY
Mat2:	12
Other Materials:	STONES
Mat3:	
Other Materials:	
Formation Top Depth:	0
Formation End Depth:	32
Formation End Depth UOM:	ft

Overburden and Bedrock Materials Interval

Formation ID:	932686039
Layer:	2
Color:	2

General Color:	GREY
Mat1:	15
Most Common Material:	LIMESTONE
Mat2:	17
Other Materials:	SHALE
Mat3:	
Other Materials:	
Formation Top Depth:	32
Formation End Depth:	40
Formation End Depth UOM:	ft

Method of Construction & Well Use

Method Construction ID:	966807665
Method Construction Code:	1
Method Construction:	Cable Tool
Other Method Construction:	

Pipe Information

Pipe ID:	11033642
Casing No:	1
Comment:	
Alt Name:	

Construction Record - Casing

Casing ID:	930793295
Layer:	1
Material:	1
Open Hole or Material:	STEEL
Depth From:	
Depth To:	32
Casing Diameter:	6
Casing Diameter UOM:	inch
Casing Depth UOM:	ft

Construction Record - Casing

Casing ID:	930793296
Layer:	2
Material:	4
Open Hole or Material:	OPEN HOLE
Depth From:	
Depth To:	40
Casing Diameter:	
Casing Diameter UOM:	inch
Casing Depth UOM:	ft

Results of Well Yield Testing

Pump Test ID:	996807665
Pump Set At:	
Static Level:	10
Final Level After Pumping:	32
Recommended Pump Depth:	35
Pumping Rate:	15
Flowing Rate:	
Recommended Pump Rate:	10
Levels UOM:	ft
Rate UOM:	GPM

Water State After Test Code:
Water State After Test:
Pumping Test Method: 2
Pumping Duration HR: 1
Pumping Duration MIN: 30
Flowing: N

Draw Down & Recovery

Pump Test Detail ID: 934352451
Test Type: Recovery
Test Duration: 15
Test Level: 12
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934616868
Test Type: Recovery
Test Duration: 30
Test Level: 10
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 935138529
Test Type: Recovery
Test Duration: 60
Test Level: 10
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934868690
Test Type: Recovery
Test Duration: 45
Test Level: 10
Test Level UOM: ft

Water Details

Water ID: 933976450
Layer: 1
Kind Code: 1
Kind: FRESH
Water Found Depth: 35
Water Found Depth UOM: ft

---

27 | ***1 of 1*** | ***ENE/105.4*** | ***260.1 / -9.78*** | ***lot 7 con 7 ON*** | ***WWIS***

Well ID: 6806527
Construction Date:
Primary Water Use: Domestic
Sec. Water Use: 0
Final Well Status: Water Supply
Water Type:
Casing Material:
Audit No:
Tag:
Construction Method:

Data Entry Status:
Data Src: 1
Date Received: 11/10/1954
Selected Flag: Yes
Abandonment Rec:
Contractor: 4208
Form Version: 1
Owner:
Street Name:
County: WENTWORTH

Elevation (m):		***Municipality:***	WEST FLAMBOROUGH TOWNSHIP
Elevation Reliability:		***Site Info:***	
Depth to Bedrock:		***Lot:***	007
Well Depth:		***Concession:***	07
Overburden/Bedrock:		***Concession Name:***	CON
Pump Rate:		***Easting NAD83:***	
Static Water Level:		***Northing NAD83:***	
Flowing (Y/N):		***Zone:***	
Flow Rate:		***UTM Reliability:***	
Clear/Cloudy:			

Bore Hole Information

Bore Hole ID:	10483985	***Elevation:***	262.47
DP2BR:	6	***Elevrc:***	
Spatial Status:		***Zone:***	17
Code OB:	r	***East83:***	578469.4
Code OB Desc:	Bedrock	***Org CS:***	
Open Hole:		***North83:***	4803015
Cluster Kind:		***UTMRC:***	9
Date Completed:	16-OCT-54	***UTMRC Desc:***	unknown UTM
Remarks:		***Location Method:***	p9
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Overburden and Bedrock Materials Interval

Formation ID:	932682619
Layer:	2
Color:	
General Color:	
Mat1:	15
Most Common Material:	LIMESTONE
Mat2:	
Other Materials:	
Mat3:	
Other Materials:	
Formation Top Depth:	6
Formation End Depth:	20
Formation End Depth UOM:	ft

Overburden and Bedrock Materials Interval

Formation ID:	932682618
Layer:	1
Color:	
General Color:	
Mat1:	05
Most Common Material:	CLAY
Mat2:	
Other Materials:	
Mat3:	
Other Materials:	
Formation Top Depth:	0
Formation End Depth:	6
Formation End Depth UOM:	ft

Method of Construction & Well Use

Method Construction ID:	966806527
Method Construction Code:	1
Method Construction:	Cable Tool
Other Method Construction:	

Pipe Information

Pipe ID:	11032555
Casing No:	1
Comment:	
Alt Name:	

Construction Record - Casing

Casing ID:	930791413
Layer:	2
Material:	4
Open Hole or Material:	OPEN HOLE
Depth From:	
Depth To:	20
Casing Diameter:	6
Casing Diameter UOM:	inch
Casing Depth UOM:	ft

Construction Record - Casing

Casing ID:	930791412
Layer:	1
Material:	1
Open Hole or Material:	STEEL
Depth From:	
Depth To:	10
Casing Diameter:	6
Casing Diameter UOM:	inch
Casing Depth UOM:	ft

Results of Well Yield Testing

Pump Test ID:	996806527
Pump Set At:	
Static Level:	8
Final Level After Pumping:	12
Recommended Pump Depth:	
Pumping Rate:	7
Flowing Rate:	
Recommended Pump Rate:	
Levels UOM:	ft
Rate UOM:	GPM
Water State After Test Code:	1
Water State After Test:	CLEAR
Pumping Test Method:	1
Pumping Duration HR:	1
Pumping Duration MIN:	0
Flowing:	N

Water Details

Water ID:	933975246

Layer:	1
Kind Code:	1
Kind:	FRESH
Water Found Depth:	18
Water Found Depth UOM:	ft

28 **1 of 1** **W/108.4** **274.9 / 5.00** **ON** **WWIS**

Well ID:	7143751	**Data Entry Status:**	
Construction Date:		**Data Src:**	
Primary Water Use:	Public	**Date Received:**	4/23/2010
Sec. Water Use:	Domestic	**Selected Flag:**	Yes
Final Well Status:	Other Status	**Abandonment Rec:**	
Water Type:		**Contractor:**	3428
Casing Material:		**Form Version:**	7
Audit No:	Z108199	**Owner:**	
Tag:	A021801	**Street Name:**	1218 CON 8 W
Construction Method:		**County:**	WENTWORTH
Elevation (m):		**Municipality:**	BEVERLY TOWNSHIP
Elevation Reliability:		**Site Info:**	
Depth to Bedrock:		**Lot:**	
Well Depth:		**Concession:**	
Overburden/Bedrock:		**Concession Name:**	
Pump Rate:		**Easting NAD83:**	
Static Water Level:		**Northing NAD83:**	
Flowing (Y/N):		**Zone:**	
Flow Rate:		**UTM Reliability:**	
Clear/Cloudy:			

Bore Hole Information

Bore Hole ID:	1002961815	**Elevation:**	274.78
DP2BR:		**Elevrc:**	
Spatial Status:		**Zone:**	17
Code OB:		**East83:**	575007
Code OB Desc:		**Org CS:**	UTM83
Open Hole:		**North83:**	4801933
Cluster Kind:		**UTMRC:**	4
Date Completed:	01-APR-10	**UTMRC Desc:**	margin of error : 30 m - 100 m
Remarks:		**Location Method:**	wwr
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Method of Construction & Well Use

Method Construction ID:	1003130670
Method Construction Code:	
Method Construction:	
Other Method Construction:	

Pipe Information

Pipe ID:	1003130660
Casing No:	0
Comment:	
Alt Name:	

Construction Record - Casing

Casing ID:	1003130665
Layer:	1
Material:	1
Open Hole or Material:	STEEL
Depth From:	.81
Depth To:	7
Casing Diameter:	15
Casing Diameter UOM:	cm
Casing Depth UOM:	m

Construction Record - Casing

Casing ID:	1003130666
Layer:	2
Material:	4
Open Hole or Material:	OPEN HOLE
Depth From:	7
Depth To:	29.9
Casing Diameter:	15
Casing Diameter UOM:	cm
Casing Depth UOM:	m

Construction Record - Screen

Screen ID:	1003130667
Layer:	
Slot:	
Screen Top Depth:	
Screen End Depth:	
Screen Material:	
Screen Depth UOM:	m
Screen Diameter UOM:	cm
Screen Diameter:	

Water Details

Water ID:	1003130664
Layer:	
Kind Code:	
Kind:	
Water Found Depth:	
Water Found Depth UOM:	m

Hole Diameter

Hole ID:	1003130662
Diameter:	
Depth From:	
Depth To:	
Hole Depth UOM:	m
Hole Diameter UOM:	cm

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
29	1 of 1	ENE/113.5	259.5 / -10.32	ON	BORE

Borehole ID:	891535	***Type:***	Borehole
Use:	Geotechnical/Geological Investigation	***Status:***	Decommissioned
Drill Method:	Hand auger	***UTM Zone:***	17

Easting:	580172	**Northing:**	4803487
Location Accuracy:		**Orig. Ground Elev m:**	258
Elev. Reliability Note:		**DEM Ground Elev m:**	260
Total Depth m:	2.4	**Primary Name:**	
Township:	WEST FLAMBOROUGH	**Concession:**	CON 7
Lot:	LOT 11	**Municipality:**	
Completion Date:	15-JUL-1999	**Static Water Level:**	-999.9
Primary Water Use:		**Sec. Water Use:**	

--Details--

Stratum ID:	8505124	**Top Depth(m):**	0.0
Bottom Depth(m):	2.4	**Stratum Desc:**	0.2m Topsoil. Brown sand fill. With gravel, trace silt. Compact, damp. Moist

---

30 ***1 of 1*** ***ENE/115.3*** ***257.4 / -12.42*** ***ON*** ***BORE***

Borehole ID:	891537	**Type:**	Borehole
Use:	Geotechnical/Geological Investigation	**Status:**	Decommissioned
Drill Method:	Hand auger	**UTM Zone:**	17
Easting:	580167	**Northing:**	4803484
Location Accuracy:		**Orig. Ground Elev m:**	257
Elev. Reliability Note:		**DEM Ground Elev m:**	259
Total Depth m:	3	**Primary Name:**	
Township:	WEST FLAMBOROUGH	**Concession:**	CON 7
Lot:	LOT 11	**Municipality:**	
Completion Date:	28-JUL-1999	**Static Water Level:**	.4
Primary Water Use:		**Sec. Water Use:**	

--Details--

Stratum ID:	8505128	**Top Depth(m):**	0.0
Bottom Depth(m):	1.7	**Stratum Desc:**	Brown mixture of clay, sand, gravel and silt (Fill), occasional cobbles. Loose to compact, wet
Stratum ID:	8505129	**Top Depth(m):**	1.7
Bottom Depth(m):	1.9	**Stratum Desc:**	Grey/black, sand with frequent organic clay layers. Loose, wet
Stratum ID:	8505130	**Top Depth(m):**	1.9
Bottom Depth(m):	3.0	**Stratum Desc:**	Grey, sand and gravel. Trace silt, compact, wet

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31 ***1 of 1*** ***ENE/116.3*** ***257.1 / -12.77*** ***ON*** ***BORE***

Borehole ID:	891533	**Type:**	Borehole
Use:	Geotechnical/Geological Investigation	**Status:**	Decommissioned
Drill Method:	Hollow stem auger	**UTM Zone:**	17
Easting:	580189	**Northing:**	4803506
Location Accuracy:		**Orig. Ground Elev m:**	260
Elev. Reliability Note:		**DEM Ground Elev m:**	260
Total Depth m:	8	**Primary Name:**	
Township:	EAST FLAMBOROUGH	**Concession:**	
Lot:		**Municipality:**	
Completion Date:	09-JUL-1999	**Static Water Level:**	4.7
Primary Water Use:		**Sec. Water Use:**	

--Details--

Stratum ID:	8505118	**Top Depth(m):**	0.0
Bottom Depth(m):	1.2	**Stratum Desc:**	Brown, sand fill with gravel. Damp

Stratum ID:	8505119	**Top Depth(m):**	1.2
Bottom Depth(m):	3.3	**Stratum Desc:**	Brown/ Black. Mixture of sand, gravel and topsoil (Fill) damp
Stratum ID:	8505120	**Top Depth(m):**	3.3
Bottom Depth(m):	5.6	**Stratum Desc:**	Grey/Black sand, with frequent Peat Layers loose, wet.
Stratum ID:	8505121	**Top Depth(m):**	5.6
Bottom Depth(m):	8.0	**Stratum Desc:**	Grey, sand and gravel. Wet. Sand layers, compact to very dense

32 **1 of 1** **WSW/116.6** **274.9 / 5.00** **lot 34 con 7 ON** **WWIS**

Well ID:	6808445	**Data Entry Status:**	
Construction Date:		**Data Src:**	1
Primary Water Use:	Public	**Date Received:**	5/29/1973
Sec. Water Use:	Domestic	**Selected Flag:**	Yes
Final Well Status:	Water Supply	**Abandonment Rec:**	
Water Type:		**Contractor:**	4005
Casing Material:		**Form Version:**	1
Audit No:		**Owner:**	
Tag:		**Street Name:**	
Construction Method:		**County:**	WENTWORTH
Elevation (m):		**Municipality:**	BEVERLY TOWNSHIP
Elevation Reliability:		**Site Info:**	
Depth to Bedrock:		**Lot:**	034
Well Depth:		**Concession:**	07
Overburden/Bedrock:		**Concession Name:**	CON
Pump Rate:		**Easting NAD83:**	
Static Water Level:		**Northing NAD83:**	
Flowing (Y/N):		**Zone:**	
Flow Rate:		**UTM Reliability:**	
Clear/Cloudy:			

Bore Hole Information

Bore Hole ID:	10485813	**Elevation:**	271.6
DP2BR:	5	**Elevrc:**	
Spatial Status:		**Zone:**	17
Code OB:	r	**East83:**	574744.3
Code OB Desc:	Bedrock	**Org CS:**	
Open Hole:		**North83:**	4801833
Cluster Kind:		**UTMRC:**	4
Date Completed:	22-MAY-73	**UTMRC Desc:**	margin of error : 30 m - 100 m
Remarks:		**Location Method:**	p4
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Overburden and Bedrock Materials Interval

Formation ID:	932688390
Layer:	2
Color:	2
General Color:	GREY

Mat1: 15
Most Common Material: LIMESTONE
Mat2:
Other Materials:
Mat3:
Other Materials:
Formation Top Depth: 5
Formation End Depth: 50
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 932688389
Layer: 1
Color: 6
General Color: BROWN
Mat1: 28
Most Common Material: SAND
Mat2: 11
Other Materials: GRAVEL
Mat3:
Other Materials:
Formation Top Depth: 0
Formation End Depth: 5
Formation End Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 966808445
Method Construction Code: 1
Method Construction: Cable Tool
Other Method Construction:

Pipe Information

Pipe ID: 11034383
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930794582
Layer: 1
Material: 1
Open Hole or Material: STEEL
Depth From:
Depth To: 12
Casing Diameter: 6
Casing Diameter UOM: inch
Casing Depth UOM: ft

Construction Record - Casing

Casing ID: 930794583
Layer: 2
Material: 4
Open Hole or Material: OPEN HOLE
Depth From:
Depth To: 50

Casing Diameter:
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pump Test ID: 996808445
Pump Set At:
Static Level: 8
Final Level After Pumping: 25
Recommended Pump Depth: 47
Pumping Rate: 25
Flowing Rate:
Recommended Pump Rate: 20
Levels UOM: ft
Rate UOM: GPM
Water State After Test Code: 1
Water State After Test: CLEAR
Pumping Test Method: 2
Pumping Duration HR: 1
Pumping Duration MIN: 30
Flowing: N

Draw Down & Recovery

Pump Test Detail ID: 934355160
Test Type: Recovery
Test Duration: 15
Test Level: 8
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934619147
Test Type: Recovery
Test Duration: 30
Test Level: 8
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934871378
Test Type: Recovery
Test Duration: 45
Test Level: 8
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 935131901
Test Type: Recovery
Test Duration: 60
Test Level: 8
Test Level UOM: ft

Water Details

Water ID: 933977356
Layer: 1
Kind Code: 1
Kind: FRESH

Water Found Depth: 18
Water Found Depth UOM: ft

Water Details

Water ID: 933977357
Layer: 2
Kind Code: 1
Kind: FRESH
Water Found Depth: 46
Water Found Depth UOM: ft

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33 | **1 of 1** | **ENE/116.8** | **258.0 / -11.87** | **ON** | **BORE**

Borehole ID: 891538
Use: Geotechnical/Geological Investigation
Drill Method: Hand auger
Easting: 580198
Location Accuracy:
Elev. Reliability Note:
Total Depth m: 3.3
Township: EAST FLAMBOROUGH
Lot: LOT 13
Completion Date: 28-JUL-1999
Primary Water Use:

Type: Borehole
Status: Decommissioned
UTM Zone: 17
Northing: 4803514
Orig. Ground Elev m: 257
DEM Ground Elev m: 259
Primary Name:
Concession: CON 9
Municipality:
Static Water Level: 1.1
Sec. Water Use:

--Details--

Stratum ID: 8505131
Bottom Depth(m): 1.5
Top Depth(m): 0.0
Stratum Desc: 0.3m Topsoil brown/grey mixture of silt, clay, sand and gravel (fill) trace asphalt fragments, cobbles, compact damp. Wet

Stratum ID: 8505132
Bottom Depth(m): 1.9
Top Depth(m): 1.5
Stratum Desc: Grey, sand. Trace gravel, organics, wet

Stratum ID: 8505133
Bottom Depth(m): 3.3
Top Depth(m): 1.9
Stratum Desc: Grey sand. Fine to medium trace gravel, silt. Compact to dense, wet

---

34 | **1 of 1** | **WSW/117.5** | **274.9 / 5.00** | **lot 31 con 7 ON** | **WWIS**

Well ID: 6808253
Construction Date:
Primary Water Use: Livestock
Sec. Water Use: Domestic
Final Well Status: Water Supply
Water Type:
Casing Material:
Audit No:
Tag:
Construction Method:
Elevation (m):
Elevation Reliability:
Depth to Bedrock:
Well Depth:
Overburden/Bedrock:
Pump Rate:
Static Water Level:
Flowing (Y/N):
Flow Rate:

Data Entry Status:
Data Src: 1
Date Received: 10/24/1972
Selected Flag: Yes
Abandonment Rec:
Contractor: 2309
Form Version: 1
Owner:
Street Name:
County: WENTWORTH
Municipality: BEVERLY TOWNSHIP
Site Info:
Lot: 031
Concession: 07
Concession Name: CON
Easting NAD83:
Northing NAD83:
Zone:
UTM Reliability:

Clear/Cloudy:

Bore Hole Information

Bore Hole ID:	10485627	***Elevation:***	278.32
DP2BR:	9	***Elevrc:***	
Spatial Status:		***Zone:***	17
Code OB:	r	***East83:***	573684.3
Code OB Desc:	Bedrock	***Org CS:***	
Open Hole:		***North83:***	4801023
Cluster Kind:		***UTMRC:***	4
Date Completed:	29-SEP-72	***UTMRC Desc:***	margin of error : 30 m - 100 m
Remarks:		***Location Method:***	p4
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Overburden and Bedrock Materials Interval

Formation ID:	932687801
Layer:	2
Color:	2
General Color:	GREY
Mat1:	15
Most Common Material:	LIMESTONE
Mat2:	
Other Materials:	
Mat3:	
Other Materials:	
Formation Top Depth:	9
Formation End Depth:	62
Formation End Depth UOM:	ft

Overburden and Bedrock Materials Interval

Formation ID:	932687800
Layer:	1
Color:	6
General Color:	BROWN
Mat1:	05
Most Common Material:	CLAY
Mat2:	12
Other Materials:	STONES
Mat3:	11
Other Materials:	GRAVEL
Formation Top Depth:	0
Formation End Depth:	9
Formation End Depth UOM:	ft

Method of Construction & Well Use

Method Construction ID:	966808253
Method Construction Code:	1
Method Construction:	Cable Tool
Other Method Construction:	

Pipe Information

Pipe ID: 11034197
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930794254
Layer: 1
Material: 1
Open Hole or Material: STEEL
Depth From:
Depth To: 12
Casing Diameter: 6
Casing Diameter UOM: inch
Casing Depth UOM: ft

Construction Record - Casing

Casing ID: 930794255
Layer: 2
Material: 4
Open Hole or Material: OPEN HOLE
Depth From:
Depth To: 62
Casing Diameter: 6
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pump Test ID: 996808253
Pump Set At:
Static Level: 24
Final Level After Pumping: 30
Recommended Pump Depth: 50
Pumping Rate: 10
Flowing Rate:
Recommended Pump Rate: 7
Levels UOM: ft
Rate UOM: GPM
Water State After Test Code: 1
Water State After Test: CLEAR
Pumping Test Method: 2
Pumping Duration HR: 1
Pumping Duration MIN: 0
Flowing: N

Draw Down & Recovery

Pump Test Detail ID: 934618567
Test Type: Draw Down
Test Duration: 30
Test Level: 30
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934354575
Test Type: Draw Down

Test Duration: 15
Test Level: 30
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934870801
Test Type: Draw Down
Test Duration: 45
Test Level: 30
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 935131319
Test Type: Draw Down
Test Duration: 60
Test Level: 30
Test Level UOM: ft

Water Details

Water ID: 933977138
Layer: 2
Kind Code: 1
Kind: FRESH
Water Found Depth: 62
Water Found Depth UOM: ft

Water Details

Water ID: 933977137
Layer: 1
Kind Code: 1
Kind: FRESH
Water Found Depth: 60
Water Found Depth UOM: ft

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35 **1 of 1** **ENE/126.4** **257.4 / -12.42** **ON** **BORE**

Borehole ID: 891534
Use: Geotechnical/Geological Investigation
Drill Method: Hand auger
Easting: 580163
Location Accuracy:
Elev. Reliability Note:
Total Depth m: 2.4
Township: WEST FLAMBOROUGH
Lot: LOT 11
Completion Date: 15-JUL-1999
Primary Water Use:

Type: Borehole
Status: Decommissioned
UTM Zone: 17
Northing: 4803496
Orig. Ground Elev m: 269
DEM Ground Elev m: 260
Primary Name:
Concession: CON 7
Municipality:
Static Water Level: -999.9
Sec. Water Use:

--Details--

Stratum ID: 8505122
Bottom Depth(m): 2.2
Top Depth(m): 0.0
Stratum Desc: 0.2m Topsoil brown, sand fill with gravel, dense, damp

Stratum ID: 8505123
Bottom Depth(m): 2.4
Top Depth(m): 2.2
Stratum Desc: Brown, mixture of silt, sand and gravel (Fill) Damp

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
36	1 of 14	WSW/127.2	270.5 / 0.66	TRANSCANADA PIPELINES LIMITED PT LOT 25 CON 7, PLAN 62R-8308 PTS 1-8 EX PLANS 62R-9684, 62R-9685, 62R-10903 HAMILTON ON	NPRI

NPRI ID:	6750	**Org ID:**	70394
Other ID:	*	**Submit Date:**	6/30/2004
No Other ID:	0	**Last Modified:**	5/29/2015 3:28:24 PM
Track ID:	77635	**Contact ID:**	
Report ID:	162894	**Cont Type:**	
Report Type:	NPRI	**Contact Title:**	
Rpt Type ID:	1	**Cont First Name:**	
Report Year:	2002	**Cont Last Name:**	
Not-Current Rpt?:	No	**Contact Position:**	
Yr of Last Filed Rpt:	2013	**Contact Fax:**	
Fac ID:	135846	**Contact Ph.:**	
Fac Name:	STATION 1301	**Cont Area Code:**	
Fac Address1:	PT LOT 25 CON 7, PLAN 62R-8308 PTS 1-8	**Contact Tel.:**	
Fac Address2:	EX PLANS 62R-9684, 62R-9685, 62R-10903	**Contact Ext.:**	
Fac Postal Zip:		**Cont Fax Area Cde:**	
Facility Lat:	43.35	**Contact Fax:**	
Facility Long:	-80.1199	**Contact Email:**	
DLS (Last Filed Rpt):		**Latitude:**	43.35
Facility DLS:		**Longitude:**	-80.1199
Datum:	1983	**UTM Zone:**	
Facility Cmnts:	False	**UTM Northing:**	
URL:	www.transcanada.com	**UTM Easting:**	
No of Empl.:	1	**Waste Streams:**	False
Parent Co.:	*	**No Streams:**	0
No Parent Co.:	1	**Waste Off Sites:**	False
Pollut Prev Cmnts:	Fals	**No Off Sites:**	0
Stacks:	False	**Shutdown:**	False
No of Stacks:		**No of Shutdown:**	0
Canadian SIC Code (2 digit):			
Canadian SIC Code:			
SIC Code Description:			
American SIC Code:			
NAICS Code (2 digit):	48		
NAICS 2 Description:	Transportation and Warehousing		
NAICS Code (4 digit):	4862		
NAICS 4 Description:	Pipeline transportation of natural gas		
NAICS Code (6 digit):	486210		
NAICS 6 Description:	Pipeline transportation of natural gas		

Substance Release Report

Category Type ID:	1
Category Type Desc:	Stack / Point
Category Type Desc (fr):	Rejets de cheminée ou ponctuels
Grouping:	Total Air
Trans Code:	ASta
Chem:	PM2.5 - Particulate Matter <= 2.5 Microns
Chem (fr):	PM2,5 - Matière particulaire <= 2,5 microns
Quantity:	1.65
Unit:	tonnes
Basis of Estimate Cd:	E E2
Basis of Estimate Desc:	E- Emission Factor - In use from 1994 to 2002 ; E2- Published Emission Factors - In use from 2003 and onward

Category Type ID:	1
Category Type Desc:	Stack / Point
Category Type Desc (fr):	Rejets de cheminée ou ponctuels
Grouping:	Total Air

Trans Code:	ASta
Chem:	PM10 - Particulate Matter <= 10 Microns
Chem (fr):	PM10 - Matière particulaire <= 10 microns
Quantity:	1.65
Unit:	tonnes
Basis of Estimate Cd:	E E2
Basis of Estimate Desc:	E- Emission Factor - In use from 1994 to 2002 ; E2- Published Emission Factors - In use from 2003 and onward
Category Type ID:	1
Category Type Desc:	Stack / Point
Category Type Desc (fr):	Rejets de cheminée ou ponctuels
Grouping:	Total Air
Trans Code:	ASta
Chem:	Carbon monoxide
Chem (fr):	Monoxyde de carbone
Quantity:	49.92
Unit:	tonnes
Basis of Estimate Cd:	E E2
Basis of Estimate Desc:	E- Emission Factor - In use from 1994 to 2002 ; E2- Published Emission Factors - In use from 2003 and onward
Category Type ID:	1
Category Type Desc:	Stack / Point
Category Type Desc (fr):	Rejets de cheminée ou ponctuels
Grouping:	Total Air
Trans Code:	ASta
Chem:	Nitrogen oxides (expressed as NO2)
Chem (fr):	Oxydes d'azote (exprimés en NO2)
Quantity:	205.36
Unit:	tonnes
Basis of Estimate Cd:	E E2
Basis of Estimate Desc:	E- Emission Factor - In use from 1994 to 2002 ; E2- Published Emission Factors - In use from 2003 and onward

36	2 of 14	WSW/127.2	270.5 / 0.66	**TRANSCANADA PIPELINES LIMITED** **PT LOT 25 CON 7, PLAN 62R-8308 PTS 1-8 EX PLANS 62R-9684, 62R-9685, 62R-10903** **HAMILTON ON**	NPRI

NPRI ID:	6750	**Org ID:**	70394
Other ID:	*	**Submit Date:**	5/30/2004
No Other ID:		**Last Modified:**	5/29/2015 3:28:24 PM
Track ID:	74441	**Contact ID:**	
Report ID:	154551	**Cont Type:**	
Report Type:	NPRI	**Contact Title:**	
Rpt Type ID:	1	**Cont First Name:**	
Report Year:	2003	**Cont Last Name:**	
Not-Current Rpt?:	No	**Contact Position:**	
Yr of Last Filed Rpt:	2013	**Contact Fax:**	
Fac ID:	135846	**Contact Ph.:**	
Fac Name:	STATION 1301	**Cont Area Code:**	
Fac Address1:	PT LOT 25 CON 7, PLAN 62R-8308 PTS 1-8	**Contact Tel.:**	
Fac Address2:	EX PLANS 62R-9684, 62R-9685, 62R-10903	**Contact Ext.:**	
Fac Postal Zip:		**Cont Fax Area Cde:**	
Facility Lat:	43.35	**Contact Fax:**	
Facility Long:	-80.1199	**Contact Email:**	
DLS (Last Filed Rpt):		**Latitude:**	43.35
Facility DLS:		**Longitude:**	-80.1199
Datum:	1983	**UTM Zone:**	
Facility Cmnts:	False	**UTM Northing:**	
URL:	www.transcanada.com	**UTM Easting:**	
No of Empl.:	1	**Waste Streams:**	True?
Parent Co.:	*	**No Streams:**	
No Parent Co.:	1	**Waste Off Sites:**	False
Pollut Prev Cmnts:	Fals	**No Off Sites:**	
Stacks:	True	**Shutdown:**	True
No of Stacks:		**No of Shutdown:**	9

Canadian SIC Code (2 digit):
Canadian SIC Code:
SIC Code Description:
American SIC Code:
NAICS Code (2 digit): 48
NAICS 2 Description: Transportation and Warehousing
NAICS Code (4 digit): 4862
NAICS 4 Description: Pipeline transportation of natural gas
NAICS Code (6 digit): 486210
NAICS 6 Description: Pipeline transportation of natural gas

Substance Release Report

Category Type ID: 1
Category Type Desc: Stack / Point
Category Type Desc (fr): Rejets de cheminée ou ponctuels
Grouping: Total Air
Trans Code: ASta
Chem: PM10 - Particulate Matter <= 10 Microns
Chem (fr): PM10 - Matière particulaire <= 10 microns
Quantity: 1.74
Unit: tonnes
Basis of Estimate Cd: E2
Basis of Estimate Desc: E2- Published Emission Factors - In use from 2003 and onward

Category Type ID: 1
Category Type Desc: Stack / Point
Category Type Desc (fr): Rejets de cheminée ou ponctuels
Grouping: Total Air
Trans Code: ASta
Chem: Carbon monoxide
Chem (fr): Monoxyde de carbone
Quantity: 50.33
Unit: tonnes
Basis of Estimate Cd: E2
Basis of Estimate Desc: E2- Published Emission Factors - In use from 2003 and onward

Category Type ID: 1
Category Type Desc: Stack / Point
Category Type Desc (fr): Rejets de cheminée ou ponctuels
Grouping: Total Air
Trans Code: ASta
Chem: Nitrogen oxides (expressed as NO2)
Chem (fr): Oxydes d'azote (exprimés en NO2)
Quantity: 226.11
Unit: tonnes
Basis of Estimate Cd: E2
Basis of Estimate Desc: E2- Published Emission Factors - In use from 2003 and onward

Category Type ID: 1
Category Type Desc: Stack / Point
Category Type Desc (fr): Rejets de cheminée ou ponctuels
Grouping: Total Air
Trans Code: ASta
Chem: PM2.5 - Particulate Matter <= 2.5 Microns
Chem (fr): PM2,5 - Matière particulaire <= 2,5 microns
Quantity: 1.74
Unit: tonnes
Basis of Estimate Cd: E2
Basis of Estimate Desc: E2- Published Emission Factors - In use from 2003 and onward

36	*3 of 14*	*WSW/127.2*	*270.5 / 0.66*	***TRANSCANADA PIPELINES*** ***PT LOT 25 CON 7, PLAN 62R-8308 PTS 1-8 EX PLANS 62R-9684, 62R-9685, 62R-10903***	*NPRI*

HAMILTON ON

NPRI ID:	6750	***Org ID:***	70386
Other ID:	*	***Submit Date:***	5/9/2005
No Other ID:		***Last Modified:***	5/29/2015 3:28:24 PM
Track ID:	25215	***Contact ID:***	
Report ID:	83127	***Cont Type:***	
Report Type:	NPRI	***Contact Title:***	
Rpt Type ID:	1	***Cont First Name:***	
Report Year:	2004	***Cont Last Name:***	
Not-Current Rpt?:	No	***Contact Position:***	
Yr of Last Filed Rpt:	2013	***Contact Fax:***	
Fac ID:	135846	***Contact Ph.:***	
Fac Name:	STATION 1301	***Cont Area Code:***	
Fac Address1:	PT LOT 25 CON 7, PLAN 62R-8308 PTS 1-8	***Contact Tel.:***	
Fac Address2:	EX PLANS 62R-9684, 62R-9685, 62R-10903	***Contact Ext.:***	
Fac Postal Zip:		***Cont Fax Area Cde:***	
Facility Lat:	43.35	***Contact Fax:***	
Facility Long:	-80.1199	***Contact Email:***	
DLS (Last Filed Rpt):		***Latitude:***	43.35
Facility DLS:		***Longitude:***	-80.1199
Datum:	1983	***UTM Zone:***	
Facility Cmnts:	True	***UTM Northing:***	
URL:	www.transcanada.com	***UTM Easting:***	
No of Empl.:	1	***Waste Streams:***	False
Parent Co.:	N	***No Streams:***	
No Parent Co.:		***Waste Off Sites:***	False
Pollut Prev Cmnts:	True	***No Off Sites:***	
Stacks:	No	***Shutdown:***	
No of Stacks:		***No of Shutdown:***	
Canadian SIC Code (2 digit):			
Canadian SIC Code:			
SIC Code Description:			
American SIC Code:			
NAICS Code (2 digit):	48		
NAICS 2 Description:	Transportation and Warehousing		
NAICS Code (4 digit):	4862		
NAICS 4 Description:	Pipeline transportation of natural gas		
NAICS Code (6 digit):	486210		
NAICS 6 Description:	Pipeline transportation of natural gas		

Substance Release Report

Category Type ID:	1
Category Type Desc:	Stack / Point
Category Type Desc (fr):	Rejets de cheminée ou ponctuels
Grouping:	Total Air
Trans Code:	ASta
Chem:	Carbon monoxide
Chem (fr):	Monoxyde de carbone
Quantity:	49.34
Unit:	tonnes
Basis of Estimate Cd:	E2
Basis of Estimate Desc:	E2- Published Emission Factors - In use from 2003 and onward

Category Type ID:	1
Category Type Desc:	Stack / Point
Category Type Desc (fr):	Rejets de cheminée ou ponctuels
Grouping:	Total Air
Trans Code:	ASta
Chem:	PM10 - Particulate Matter <= 10 Microns
Chem (fr):	PM10 - Matière particulaire <= 10 microns
Quantity:	1.62
Unit:	tonnes

Basis of Estimate Cd:	E2
Basis of Estimate Desc:	E2- Published Emission Factors - In use from 2003 and onward
Category Type ID:	1
Category Type Desc:	Stack / Point
Category Type Desc (fr):	Rejets de cheminée ou ponctuels
Grouping:	Total Air
Trans Code:	ASta
Chem:	Nitrogen oxides (expressed as NO2)
Chem (fr):	Oxydes d'azote (exprimés en NO2)
Quantity:	198.83
Unit:	tonnes
Basis of Estimate Cd:	E2
Basis of Estimate Desc:	E2- Published Emission Factors - In use from 2003 and onward
Category Type ID:	1
Category Type Desc:	Stack / Point
Category Type Desc (fr):	Rejets de cheminée ou ponctuels
Grouping:	Total Air
Trans Code:	ASta
Chem:	PM2.5 - Particulate Matter <= 2.5 Microns
Chem (fr):	PM2,5 - Matière particulaire <= 2,5 microns
Quantity:	1.62
Unit:	tonnes
Basis of Estimate Cd:	E2
Basis of Estimate Desc:	E2- Published Emission Factors - In use from 2003 and onward

36 | ***4 of 14*** | ***WSW/127.2*** | ***270.5 / 0.66*** | ***TRANSCANADA PIPELINES***
PT LOT 25 CON 7, PLAN 62R-8308 PTS 1-8 EX
PLANS 62R-9684, 62R-9685, 62R-10903
HAMILTON ON | ***NPRI***

NPRI ID:	6750	**Org ID:**	70386
Other ID:	*	**Submit Date:**	5/23/2006
No Other ID:		**Last Modified:**	5/29/2015 3:28:24 PM
Track ID:	35089	**Contact ID:**	
Report ID:	96572	**Cont Type:**	
Report Type:	NPRI	**Contact Title:**	
Rpt Type ID:	1	**Cont First Name:**	
Report Year:	2005	**Cont Last Name:**	
Not-Current Rpt?:	No	**Contact Position:**	
Yr of Last Filed Rpt:	2013	**Contact Fax:**	
Fac ID:	135846	**Contact Ph.:**	
Fac Name:	STATION 1301	**Cont Area Code:**	
Fac Address1:	PT LOT 25 CON 7, PLAN 62R-8308 PTS 1-8	**Contact Tel.:**	
Fac Address2:	EX PLANS 62R-9684, 62R-9685, 62R-10903	**Contact Ext.:**	
Fac Postal Zip:		**Cont Fax Area Cde:**	
Facility Lat:	43.35	**Contact Fax:**	
Facility Long:	-80.1199	**Contact Email:**	
DLS (Last Filed Rpt):		**Latitude:**	43.35
Facility DLS:		**Longitude:**	-80.1199
Datum:	1983	**UTM Zone:**	
Facility Cmnts:	False	**UTM Northing:**	
URL:	www.transcanada.com	**UTM Easting:**	
No of Empl.:	1	**Waste Streams:**	False
Parent Co.:	N	**No Streams:**	
No Parent Co.:		**Waste Off Sites:**	False
Pollut Prev Cmnts:	False	**No Off Sites:**	
Stacks:	False	**Shutdown:**	
No of Stacks:		**No of Shutdown:**	
Canadian SIC Code (2 digit):			
Canadian SIC Code:			
SIC Code Description:			
American SIC Code:			
NAICS Code (2 digit):	48		

NAICS 2 Description:	Transportation and Warehousing
NAICS Code (4 digit):	4862
NAICS 4 Description:	Pipeline transportation of natural gas
NAICS Code (6 digit):	486210
NAICS 6 Description:	Pipeline transportation of natural gas

Substance Release Report

Category Type ID:	1
Category Type Desc:	Stack / Point
Category Type Desc (fr):	Rejets de cheminée ou ponctuels
Grouping:	Total Air
Trans Code:	ASta
Chem:	Carbon monoxide
Chem (fr):	Monoxyde de carbone
Quantity:	46.27
Unit:	tonnes
Basis of Estimate Cd:	E2
Basis of Estimate Desc:	E2- Published Emission Factors - In use from 2003 and onward

Category Type ID:	1
Category Type Desc:	Stack / Point
Category Type Desc (fr):	Rejets de cheminée ou ponctuels
Grouping:	Total Air
Trans Code:	ASta
Chem:	Nitrogen oxides (expressed as NO2)
Chem (fr):	Oxydes d'azote (exprimés en NO2)
Quantity:	193.52
Unit:	tonnes
Basis of Estimate Cd:	E2
Basis of Estimate Desc:	E2- Published Emission Factors - In use from 2003 and onward

Category Type ID:	1
Category Type Desc:	Stack / Point
Category Type Desc (fr):	Rejets de cheminée ou ponctuels
Grouping:	Total Air
Trans Code:	ASta
Chem:	PM10 - Particulate Matter <= 10 Microns
Chem (fr):	PM10 - Matière particulaire <= 10 microns
Quantity:	1.71
Unit:	tonnes
Basis of Estimate Cd:	E2
Basis of Estimate Desc:	E2- Published Emission Factors - In use from 2003 and onward

Category Type ID:	1
Category Type Desc:	Stack / Point
Category Type Desc (fr):	Rejets de cheminée ou ponctuels
Grouping:	Total Air
Trans Code:	ASta
Chem:	PM2.5 - Particulate Matter <= 2.5 Microns
Chem (fr):	PM2,5 - Matière particulaire <= 2,5 microns
Quantity:	1.71
Unit:	tonnes
Basis of Estimate Cd:	E2
Basis of Estimate Desc:	E2- Published Emission Factors - In use from 2003 and onward

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36 ***5 of 14*** ***WSW/127.2*** ***270.5 / 0.66*** ***TRANSCANADA PIPELINES***
PT LOT 25 CON 7, PLAN 62R-8308 PTS 1-8 NOT AVAILABLE
HAMILTON ON ***NPRI***

NPRI ID:	6750	**Org ID:**	70386
Other ID:	*	**Submit Date:**	5/29/2007
No Other ID:		**Last Modified:**	5/29/2015 3:28:24 PM

Track ID:	45309			**Contact ID:**	
Report ID:	105735			**Cont Type:**	
Report Type:	NPRI			**Contact Title:**	
Rpt Type ID:	1			**Cont First Name:**	
Report Year:	2006			**Cont Last Name:**	
Not-Current Rpt?:	No			**Contact Position:**	
Yr of Last Filed Rpt:	2013			**Contact Fax:**	
Fac ID:	135851			**Contact Ph.:**	
Fac Name:	STATION 1301 - KIRKWALL			**Cont Area Code:**	
Fac Address1:	PT LOT 25 CON 7, PLAN 62R-8308 PTS 1-8			**Contact Tel.:**	
Fac Address2:	NOT AVAILABLE			**Contact Ext.:**	
Fac Postal Zip:				**Cont Fax Area Cde:**	
Facility Lat:	43.35			**Contact Fax:**	
Facility Long:	-80.1199			**Contact Email:**	
DLS (Last Filed Rpt):				**Latitude:**	43.35
Facility DLS:				**Longitude:**	-80.1199
Datum:	1983			**UTM Zone:**	
Facility Cmnts:	False			**UTM Northing:**	
URL:	www.transcanada.com			**UTM Easting:**	
No of Empl.:	1			**Waste Streams:**	True?
Parent Co.:	N			**No Streams:**	
No Parent Co.:				**Waste Off Sites:**	False
Pollut Prev Cmnts:	False			**No Off Sites:**	
Stacks:	True			**Shutdown:**	
No of Stacks:				**No of Shutdown:**	

Canadian SIC Code (2 digit):
Canadian SIC Code:
SIC Code Description:
American SIC Code:

NAICS Code (2 digit):	48
NAICS 2 Description:	Transportation and Warehousing
NAICS Code (4 digit):	4862
NAICS 4 Description:	Pipeline transportation of natural gas
NAICS Code (6 digit):	486210
NAICS 6 Description:	Pipeline transportation of natural gas

Substance Release Report

Category Type ID:	1
Category Type Desc:	Stack / Point
Category Type Desc (fr):	Rejets de cheminée ou ponctuels
Grouping:	Total Air
Trans Code:	ASta
Chem:	PM2.5 - Particulate Matter <= 2.5 Microns
Chem (fr):	PM2,5 - Matière particulaire <= 2,5 microns
Quantity:	1.429
Unit:	tonnes
Basis of Estimate Cd:	E2
Basis of Estimate Desc:	E2- Published Emission Factors - In use from 2003 and onward

Category Type ID:	1
Category Type Desc:	Stack / Point
Category Type Desc (fr):	Rejets de cheminée ou ponctuels
Grouping:	Total Air
Trans Code:	ASta
Chem:	Nitrogen oxides (expressed as NO2)
Chem (fr):	Oxydes d'azote (exprimés en NO2)
Quantity:	126.666
Unit:	tonnes
Basis of Estimate Cd:	E2
Basis of Estimate Desc:	E2- Published Emission Factors - In use from 2003 and onward

Category Type ID:	1
Category Type Desc:	Stack / Point
Category Type Desc (fr):	Rejets de cheminée ou ponctuels

Grouping:	Total Air
Trans Code:	ASta
Chem:	PM10 - Particulate Matter <= 10 Microns
Chem (fr):	PM10 - Matière particulaire <= 10 microns
Quantity:	1.429
Unit:	tonnes
Basis of Estimate Cd:	E2
Basis of Estimate Desc:	E2- Published Emission Factors - In use from 2003 and onward

Category Type ID:	1
Category Type Desc:	Stack / Point
Category Type Desc (fr):	Rejets de cheminée ou ponctuels
Grouping:	Total Air
Trans Code:	ASta
Chem:	Carbon monoxide
Chem (fr):	Monoxyde de carbone
Quantity:	27.179
Unit:	tonnes
Basis of Estimate Cd:	E2
Basis of Estimate Desc:	E2- Published Emission Factors - In use from 2003 and onward

36 | ***6 of 14*** | ***WSW/127.2*** | ***270.5 / 0.66*** | ***TRANSCANADA PIPELINES***
PT LOT 25 CON 7, PLAN 62R-8308 PTS 1-8 NOT AVAILABLE
HAMILTON ON | ***NPRI***

NPRI ID:	6750	**Org ID:**	70386
Other ID:	*	**Submit Date:**	5/29/2008
No Other ID:		**Last Modified:**	5/29/2015 3:28:24 PM
Track ID:	55698	**Contact ID:**	
Report ID:	118046	**Cont Type:**	
Report Type:	NPRI	**Contact Title:**	
Rpt Type ID:	1	**Cont First Name:**	
Report Year:	2007	**Cont Last Name:**	
Not-Current Rpt?:	No	**Contact Position:**	
Yr of Last Filed Rpt:	2013	**Contact Fax:**	
Fac ID:	135851	**Contact Ph.:**	
Fac Name:	STATION 1301 - KIRKWALL	**Cont Area Code:**	
Fac Address1:	PT LOT 25 CON 7, PLAN 62R-8308 PTS 1-8	**Contact Tel.:**	
Fac Address2:	NOT AVAILABLE	**Contact Ext.:**	
Fac Postal Zip:		**Cont Fax Area Cde:**	
Facility Lat:	43.35	**Contact Fax:**	
Facility Long:	-80.1199	**Contact Email:**	
DLS (Last Filed Rpt):		**Latitude:**	43.35
Facility DLS:		**Longitude:**	-80.1199
Datum:	1983	**UTM Zone:**	
Facility Cmnts:	False	**UTM Northing:**	
URL:	www.transcanada.com	**UTM Easting:**	
No of Empl.:	1	**Waste Streams:**	True?
Parent Co.:	N	**No Streams:**	
No Parent Co.:		**Waste Off Sites:**	True?
Pollut Prev Cmnts:	False	**No Off Sites:**	
Stacks:	True	**Shutdown:**	
No of Stacks:		**No of Shutdown:**	
Canadian SIC Code (2 digit):			
Canadian SIC Code:			
SIC Code Description:			
American SIC Code:			
NAICS Code (2 digit):	48		
NAICS 2 Description:	Transportation and Warehousing		
NAICS Code (4 digit):	4862		
NAICS 4 Description:	Pipeline transportation of natural gas		
NAICS Code (6 digit):	486210		
NAICS 6 Description:	Pipeline transportation of natural gas		

Substance Release Report

Category Type ID:	1
Category Type Desc:	Stack / Point
Category Type Desc (fr):	Rejets de cheminée ou ponctuels
Grouping:	Total Air
Trans Code:	ASta
Chem:	Carbon monoxide
Chem (fr):	Monoxyde de carbone
Quantity:	36.465
Unit:	tonnes
Basis of Estimate Cd:	E2
Basis of Estimate Desc:	E2- Published Emission Factors - In use from 2003 and onward

Category Type ID:	1
Category Type Desc:	Stack / Point
Category Type Desc (fr):	Rejets de cheminée ou ponctuels
Grouping:	Total Air
Trans Code:	ASta
Chem:	PM2.5 - Particulate Matter <= 2.5 Microns
Chem (fr):	PM2,5 - Matière particulaire <= 2,5 microns
Quantity:	1.489
Unit:	tonnes
Basis of Estimate Cd:	E2
Basis of Estimate Desc:	E2- Published Emission Factors - In use from 2003 and onward

Category Type ID:	1
Category Type Desc:	Stack / Point
Category Type Desc (fr):	Rejets de cheminée ou ponctuels
Grouping:	Total Air
Trans Code:	ASta
Chem:	Nitrogen oxides (expressed as NO2)
Chem (fr):	Oxydes d'azote (exprimés en NO2)
Quantity:	157.721
Unit:	tonnes
Basis of Estimate Cd:	E2
Basis of Estimate Desc:	E2- Published Emission Factors - In use from 2003 and onward

Category Type ID:	1
Category Type Desc:	Stack / Point
Category Type Desc (fr):	Rejets de cheminée ou ponctuels
Grouping:	Total Air
Trans Code:	ASta
Chem:	PM10 - Particulate Matter <= 10 Microns
Chem (fr):	PM10 - Matière particulaire <= 10 microns
Quantity:	1.489
Unit:	tonnes
Basis of Estimate Cd:	E2
Basis of Estimate Desc:	E2- Published Emission Factors - In use from 2003 and onward

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36	7 of 14	WSW/127.2	270.5 / 0.66	TRANSCANADA PIPELINES PT LOT 25 CON 7, PLAN 62R-8308 PTS 1-8 NOT AVAILABLE HAMILTON ON	NPRI

NPRI ID:	6750	***Org ID:***	70386
Other ID:	*	***Submit Date:***	5/28/2009
No Other ID:		***Last Modified:***	5/29/2015 3:28:24 PM
Track ID:	65933	***Contact ID:***	
Report ID:	126710	***Cont Type:***	
Report Type:	NPRI	***Contact Title:***	
Rpt Type ID:	1	***Cont First Name:***	
Report Year:	2008	***Cont Last Name:***	
Not-Current Rpt?:	No	***Contact Position:***	

Yr of Last Filed Rpt:	2013	***Contact Fax:***	
Fac ID:	135851	***Contact Ph.:***	
Fac Name:	STATION 1301 - KIRKWALL	***Cont Area Code:***	
Fac Address1:	PT LOT 25 CON 7, PLAN 62R-8308 PTS 1-8	***Contact Tel.:***	
Fac Address2:	NOT AVAILABLE	***Contact Ext.:***	
Fac Postal Zip:		***Cont Fax Area Cde:***	
Facility Lat:	43.35	***Contact Fax:***	
Facility Long:	-80.1199	***Contact Email:***	
DLS (Last Filed Rpt):		***Latitude:***	43.35
Facility DLS:		***Longitude:***	-80.1199
Datum:	1983	***UTM Zone:***	
Facility Cmnts:	No	***UTM Northing:***	
URL:	www.transcanada.com	***UTM Easting:***	
No of Empl.:	1	***Waste Streams:***	No
Parent Co.:	N	***No Streams:***	
No Parent Co.:		***Waste Off Sites:***	No
Pollut Prev Cmnts:	No	***No Off Sites:***	
Stacks:	No	***Shutdown:***	No
No of Stacks:		***No of Shutdown:***	
Canadian SIC Code (2 digit):			
Canadian SIC Code:			
SIC Code Description:			
American SIC Code:			
NAICS Code (2 digit):	48		
NAICS 2 Description:	Transportation and Warehousing		
NAICS Code (4 digit):	4862		
NAICS 4 Description:	Pipeline transportation of natural gas		
NAICS Code (6 digit):	486210		
NAICS 6 Description:	Pipeline transportation of natural gas		

Substance Release Report

Category Type ID:	1
Category Type Desc:	Stack / Point
Category Type Desc (fr):	Rejets de cheminée ou ponctuels
Grouping:	Total Air
Trans Code:	ASta
Chem:	PM2.5 - Particulate Matter <= 2.5 Microns
Chem (fr):	PM2,5 - Matière particulaire <= 2,5 microns
Quantity:	1.377
Unit:	tonnes
Basis of Estimate Cd:	E2
Basis of Estimate Desc:	E2- Published Emission Factors - In use from 2003 and onward

Category Type ID:	1
Category Type Desc:	Stack / Point
Category Type Desc (fr):	Rejets de cheminée ou ponctuels
Grouping:	Total Air
Trans Code:	ASta
Chem:	PM10 - Particulate Matter <= 10 Microns
Chem (fr):	PM10 - Matière particulaire <= 10 microns
Quantity:	1.377
Unit:	tonnes
Basis of Estimate Cd:	E2
Basis of Estimate Desc:	E2- Published Emission Factors - In use from 2003 and onward

Category Type ID:	1
Category Type Desc:	Stack / Point
Category Type Desc (fr):	Rejets de cheminée ou ponctuels
Grouping:	Total Air
Trans Code:	ASta
Chem:	Carbon monoxide
Chem (fr):	Monoxyde de carbone
Quantity:	34.581
Unit:	tonnes

Basis of Estimate Cd:	E2
Basis of Estimate Desc:	E2- Published Emission Factors - In use from 2003 and onward
Category Type ID:	1
Category Type Desc:	Stack / Point
Category Type Desc (fr):	Rejets de cheminée ou ponctuels
Grouping:	Total Air
Trans Code:	ASta
Chem:	Nitrogen oxides (expressed as NO2)
Chem (fr):	Oxydes d'azote (exprimés en NO2)
Quantity:	138.119
Unit:	tonnes
Basis of Estimate Cd:	E2
Basis of Estimate Desc:	E2- Published Emission Factors - In use from 2003 and onward

36 | ***8 of 14*** | ***WSW/127.2*** | ***270.5 / 0.66*** | ***TRANSCANADA PIPELINES***
PT LOT 25 CON 7, PLAN 62R-8308 PTS 1-8 NOT AVAILABLE
HAMILTON ON | ***NPRI***

NPRI ID:	6750	**Org ID:**	70386
Other ID:	*	**Submit Date:**	5/19/2010
No Other ID:		**Last Modified:**	5/29/2015 3:28:24 PM
Track ID:	83445	**Contact ID:**	
Report ID:	137305	**Cont Type:**	
Report Type:	NPRI	**Contact Title:**	
Rpt Type ID:	1	**Cont First Name:**	
Report Year:	2009	**Cont Last Name:**	
Not-Current Rpt?:	No	**Contact Position:**	
Yr of Last Filed Rpt:	2013	**Contact Fax:**	
Fac ID:	135851	**Contact Ph.:**	
Fac Name:	STATION 1301 - KIRKWALL	**Cont Area Code:**	
Fac Address1:	PT LOT 25 CON 7, PLAN 62R-8308 PTS 1-8	**Contact Tel.:**	
Fac Address2:	NOT AVAILABLE	**Contact Ext.:**	
Fac Postal Zip:		**Cont Fax Area Cde:**	
Facility Lat:	43.35	**Contact Fax:**	
Facility Long:	-80.1199	**Contact Email:**	
DLS (Last Filed Rpt):		**Latitude:**	43.35
Facility DLS:		**Longitude:**	-80.1199
Datum:	1983	**UTM Zone:**	
Facility Cmnts:	No	**UTM Northing:**	
URL:	www.transcanada.com	**UTM Easting:**	
No of Empl.:	1	**Waste Streams:**	No
Parent Co.:	N	**No Streams:**	
No Parent Co.:		**Waste Off Sites:**	No
Pollut Prev Cmnts:	No	**No Off Sites:**	
Stacks:	No	**Shutdown:**	No
No of Stacks:		**No of Shutdown:**	
Canadian SIC Code (2 digit):			
Canadian SIC Code:			
SIC Code Description:			
American SIC Code:			
NAICS Code (2 digit):	48		
NAICS 2 Description:	Transportation and Warehousing		
NAICS Code (4 digit):	4862		
NAICS 4 Description:	Pipeline transportation of natural gas		
NAICS Code (6 digit):	486210		
NAICS 6 Description:	Pipeline transportation of natural gas		

Substance Release Report

Category Type ID:	13
Category Type Desc:	All Media
Category Type Desc (fr):	Rejets à tous les médias

Grouping:	Total All Media<1t
Trans Code:	
Chem:	PM2.5 - Particulate Matter <= 2.5 Microns
Chem (fr):	PM2,5 - Matière particulaire <= 2,5 microns
Quantity:	.874
Unit:	tonnes
Basis of Estimate Cd:	
Basis of Estimate Desc:	

Category Type ID:	1
Category Type Desc:	Stack / Point
Category Type Desc (fr):	Rejets de cheminée ou ponctuels
Grouping:	Total Air
Trans Code:	ASta
Chem:	Nitrogen oxides (expressed as NO2)
Chem (fr):	Oxydes d'azote (exprimés en NO2)
Quantity:	76.673
Unit:	tonnes
Basis of Estimate Cd:	E2
Basis of Estimate Desc:	E2- Published Emission Factors - In use from 2003 and onward

Category Type ID:	13
Category Type Desc:	All Media
Category Type Desc (fr):	Rejets à tous les médias
Grouping:	Total All Media<1t
Trans Code:	
Chem:	PM10 - Particulate Matter <= 10 Microns
Chem (fr):	PM10 - Matière particulaire <= 10 microns
Quantity:	.874
Unit:	tonnes
Basis of Estimate Cd:	
Basis of Estimate Desc:	

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36 | ***9 of 14*** | ***WSW/127.2*** | ***270.5 / 0.66*** | ***TRANSCANADA PIPELINES LTD.***
PT LOT 25 CON 7, PLAN 62R-8308 PTS 1-8 NOT AVAILABLE
HAMILTON ON | ***NPRI***

NPRI ID:	6750	**Org ID:**	101523
Other ID:	Y	**Submit Date:**	10/11/2011
No Other ID:	3	**Last Modified:**	5/29/2015 3:28:24 PM
Track ID:	95075	**Contact ID:**	
Report ID:	149127	**Cont Type:**	
Report Type:	NPRI	**Contact Title:**	
Rpt Type ID:	1	**Cont First Name:**	
Report Year:	2010	**Cont Last Name:**	
Not-Current Rpt?:	No	**Contact Position:**	
Yr of Last Filed Rpt:	2013	**Contact Fax:**	
Fac ID:	135851	**Contact Ph.:**	
Fac Name:	STATION 1301 - KIRKWALL	**Cont Area Code:**	
Fac Address1:	PT LOT 25 CON 7, PLAN 62R-8308 PTS 1-8	**Contact Tel.:**	
Fac Address2:	NOT AVAILABLE	**Contact Ext.:**	
Fac Postal Zip:		**Cont Fax Area Cde:**	
Facility Lat:	43.35	**Contact Fax:**	
Facility Long:	-80.1199	**Contact Email:**	
DLS (Last Filed Rpt):		**Latitude:**	43.35
Facility DLS:		**Longitude:**	-80.1199
Datum:	1983	**UTM Zone:**	
Facility Cmnts:	No	**UTM Northing:**	
URL:		**UTM Easting:**	
No of Empl.:	1	**Waste Streams:**	No
Parent Co.:	Y	**No Streams:**	
No Parent Co.:	1	**Waste Off Sites:**	No
Pollut Prev Cmnts:	No	**No Off Sites:**	
Stacks:	No	**Shutdown:**	No

No of Stacks:		**No of Shutdown:**	
Canadian SIC Code (2 digit):			
Canadian SIC Code:			
SIC Code Description:			
American SIC Code:			
NAICS Code (2 digit):	48		
NAICS 2 Description:	Transportation and Warehousing		
NAICS Code (4 digit):	4862		
NAICS 4 Description:	Pipeline transportation of natural gas		
NAICS Code (6 digit):	486210		
NAICS 6 Description:	Pipeline transportation of natural gas		

Substance Release Report

Category Type ID:	1
Category Type Desc:	Stack / Point
Category Type Desc (fr):	Rejets de cheminée ou ponctuels
Grouping:	Total Air
Trans Code:	ASta
Chem:	Nitrogen oxides (expressed as NO2)
Chem (fr):	Oxydes d'azote (exprimés en NO2)
Quantity:	50.027
Unit:	tonnes
Basis of Estimate Cd:	E2
Basis of Estimate Desc:	E2- Published Emission Factors - In use from 2003 and onward

Category Type ID:	13
Category Type Desc:	All Media
Category Type Desc (fr):	Rejets à tous les médias
Grouping:	Total All Media<1t
Trans Code:	
Chem:	PM2.5 - Particulate Matter <= 2.5 Microns
Chem (fr):	PM2,5 - Matière particulaire <= 2,5 microns
Quantity:	.409
Unit:	tonnes
Basis of Estimate Cd:	
Basis of Estimate Desc:	

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36 | ***10 of 14*** | ***WSW/127.2*** | ***270.5 / 0.66*** | ***TRANSCANADA PIPELINES LTD.*** ***NOT AVAILABLE*** ***Hamilton ON*** | ***NPRI***

NPRI ID:	6750	**Org ID:**	101523
Other ID:		**Submit Date:**	6/28/2012
No Other ID:		**Last Modified:**	5/29/2015 3:28:24 PM
Track ID:	100144	**Contact ID:**	
Report ID:	4031	**Cont Type:**	
Report Type:	NPRI	**Contact Title:**	
Rpt Type ID:	1	**Cont First Name:**	
Report Year:	2011	**Cont Last Name:**	
Not-Current Rpt?:	No	**Contact Position:**	
Yr of Last Filed Rpt:	2013	**Contact Fax:**	
Fac ID:	235913	**Contact Ph.:**	
Fac Name:	Station 1301 - Kirkwall	**Cont Area Code:**	
Fac Address1:	NOT AVAILABLE	**Contact Tel.:**	
Fac Address2:		**Contact Ext.:**	
Fac Postal Zip:		**Cont Fax Area Cde:**	
Facility Lat:	43.35	**Contact Fax:**	
Facility Long:	-80.1199	**Contact Email:**	
DLS (Last Filed Rpt):		**Latitude:**	43.35
Facility DLS:		**Longitude:**	-80.1199
Datum:	1983	**UTM Zone:**	
Facility Cmnts:		**UTM Northing:**	
URL:		**UTM Easting:**	

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

No of Empl.:	1	***Waste Streams:***	
Parent Co.:		***No Streams:***	
No Parent Co.:		***Waste Off Sites:***	
Pollut Prev Cmnts:		***No Off Sites:***	
Stacks:		***Shutdown:***	
No of Stacks:		***No of Shutdown:***	
Canadian SIC Code (2 digit):			
Canadian SIC Code:			
SIC Code Description:			
American SIC Code:			
NAICS Code (2 digit):	48		
NAICS 2 Description:	Transportation and Warehousing		
NAICS Code (4 digit):	4862		
NAICS 4 Description:	Pipeline transportation of natural gas		
NAICS Code (6 digit):	486210		
NAICS 6 Description:	Pipeline transportation of natural gas		

Substance Release Report

Category Type ID:	1
Category Type Desc:	Stack / Point
Category Type Desc (fr):	Rejets de cheminée ou ponctuels
Grouping:	Total Air
Trans Code:	ASta
Chem:	PM2.5 - Particulate Matter <= 2.5 Microns
Chem (fr):	PM2,5 - Matière particulaire <= 2,5 microns
Quantity:	.3
Unit:	tonnes
Basis of Estimate Cd:	E2
Basis of Estimate Desc:	E2- Published Emission Factors - In use from 2003 and onward

Category Type ID:	1
Category Type Desc:	Stack / Point
Category Type Desc (fr):	Rejets de cheminée ou ponctuels
Grouping:	Total Air
Trans Code:	ASta
Chem:	Nitrogen oxides (expressed as NO2)
Chem (fr):	Oxydes d'azote (exprimés en NO2)
Quantity:	38
Unit:	tonnes
Basis of Estimate Cd:	E2
Basis of Estimate Desc:	E2- Published Emission Factors - In use from 2003 and onward

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36	***11 of 14***	***WSW/127.2***	***270.5 / 0.66***	***TRANSCANADA PIPELINES LTD.*** ***n/a*** ***n/a ON n/a***	***NPRI***

NPRI ID:	0000006750	***Org ID:***	
Other ID:		***Submit Date:***	
No Other ID:		***Last Modified:***	
Track ID:		***Contact ID:***	
Report ID:	88868028	***Cont Type:***	MED
Report Type:		***Contact Title:***	
Rpt Type ID:		***Cont First Name:***	
Report Year:	2012	***Cont Last Name:***	
Not-Current Rpt?:		***Contact Position:***	
Yr of Last Filed Rpt:		***Contact Fax:***	
Fac ID:		***Contact Ph.:***	
Fac Name:	STATION 1301 - KIRKWALL	***Cont Area Code:***	
Fac Address1:		***Contact Tel.:***	
Fac Address2:		***Contact Ext.:***	
Fac Postal Zip:		***Cont Fax Area Cde:***	
Facility Lat:		***Contact Fax:***	
Facility Long:		***Contact Email:***	

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

DLS (Last Filed Rpt):		***Latitude:***	43.35
Facility DLS:		***Longitude:***	-80.1199
Datum:	1983	***UTM Zone:***	
Facility Cmnts:		***UTM Northing:***	
URL:		***UTM Easting:***	
No of Empl.:	1	***Waste Streams:***	
Parent Co.:		***No Streams:***	
No Parent Co.:		***Waste Off Sites:***	
Pollut Prev Cmnts:		***No Off Sites:***	
Stacks:		***Shutdown:***	
No of Stacks:		***No of Shutdown:***	
Canadian SIC Code (2 digit):			
Canadian SIC Code:			
SIC Code Description:			
American SIC Code:			
NAICS Code (2 digit):	48		
NAICS 2 Description:	Transportation and Warehousing		
NAICS Code (4 digit):	4862		
NAICS 4 Description:	Pipeline Transportation of Natural Gas		
NAICS Code (6 digit):	486210		
NAICS 6 Description:	Pipeline Transportation of Natural Gas		

Substance Release Report

CAS No:	11104-93-1
Report ID:	88868028
Rpt Period:	2012
Subst Released:	Nitrogen oxides (expressed as NO2)
Air:	30.149
Water:	
Land:	
Total Releases:	30.149
Units:	tonnes

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
36	12 of 14	WSW/127.2	270.5 / 0.66	TRANSCANADA PIPELINES LTD. NOT AVAILABLE Hamilton ON	NPRI

NPRI ID:	6750	***Org ID:***	101523
Other ID:		***Submit Date:***	5/23/2014
No Other ID:		***Last Modified:***	5/29/2015 3:28:24 PM
Track ID:	116978	***Contact ID:***	
Report ID:	31429	***Cont Type:***	
Report Type:	DNMC	***Contact Title:***	
Rpt Type ID:	2	***Cont First Name:***	
Report Year:	2013	***Cont Last Name:***	
Not-Current Rpt?:	No	***Contact Position:***	
Yr of Last Filed Rpt:	2013	***Contact Fax:***	
Fac ID:	235913	***Contact Ph.:***	
Fac Name:	Station 1301 - Kirkwall	***Cont Area Code:***	
Fac Address1:	NOT AVAILABLE	***Contact Tel.:***	
Fac Address2:		***Contact Ext.:***	
Fac Postal Zip:		***Cont Fax Area Cde:***	
Facility Lat:	43.35	***Contact Fax:***	
Facility Long:	-80.1199	***Contact Email:***	
DLS (Last Filed Rpt):		***Latitude:***	43.35
Facility DLS:		***Longitude:***	-80.1199
Datum:	1983	***UTM Zone:***	
Facility Cmnts:		***UTM Northing:***	
URL:		***UTM Easting:***	
No of Empl.:		***Waste Streams:***	
Parent Co.:		***No Streams:***	
No Parent Co.:		***Waste Off Sites:***	
Pollut Prev Cmnts:		***No Off Sites:***	

Stacks:		**Shutdown:**	
No of Stacks:		**No of Shutdown:**	
Canadian SIC Code (2 digit):			
Canadian SIC Code:			
SIC Code Description:			
American SIC Code:			
NAICS Code (2 digit):	48		
NAICS 2 Description:	Transportation and Warehousing		
NAICS Code (4 digit):	4862		
NAICS 4 Description:	Pipeline transportation of natural gas		
NAICS Code (6 digit):	486210		
NAICS 6 Description:	Pipeline transportation of natural gas		

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36 | ***13 of 14*** | ***WSW/127.2*** | ***270.5 / 0.66*** | ***TransCanada PipeLines Ltd.***
NOT AVAILABLE
Hamilton ON | ***NPRI***

NPRI ID:	6750	**Org ID:**	104929
Other ID:		**Submit Date:**	5/30/2016
No Other ID:		**Last Modified:**	11/18/2016 8:28:05 AM
Track ID:	137167	**Contact ID:**	
Report ID:	70493	**Cont Type:**	
Report Type:	NPRI	**Contact Title:**	
Rpt Type ID:	1	**Cont First Name:**	
Report Year:	2015	**Cont Last Name:**	
Not-Current Rpt?:	No	**Contact Position:**	
Yr of Last Filed Rpt:	2013	**Contact Fax:**	
Fac ID:	235913	**Contact Ph.:**	
Fac Name:	Station 1301 - Kirkwall	**Cont Area Code:**	
Fac Address1:	NOT AVAILABLE	**Contact Tel.:**	
Fac Address2:		**Contact Ext.:**	
Fac Postal Zip:		**Cont Fax Area Cde:**	
Facility Lat:	43.35	**Contact Fax:**	
Facility Long:	-80.1199	**Contact Email:**	
DLS (Last Filed Rpt):		**Latitude:**	43.35
Facility DLS:		**Longitude:**	-80.1199
Datum:	1983	**UTM Zone:**	
Facility Cmnts:		**UTM Northing:**	
URL:		**UTM Easting:**	
No of Empl.:	1	**Waste Streams:**	
Parent Co.:		**No Streams:**	
No Parent Co.:		**Waste Off Sites:**	
Pollut Prev Cmnts:		**No Off Sites:**	
Stacks:		**Shutdown:**	
No of Stacks:		**No of Shutdown:**	
Canadian SIC Code (2 digit):			
Canadian SIC Code:			
SIC Code Description:			
American SIC Code:			
NAICS Code (2 digit):	48		
NAICS 2 Description:	Transportation and Warehousing		
NAICS Code (4 digit):	4862		
NAICS 4 Description:	Pipeline transportation of natural gas		
NAICS Code (6 digit):	486210		
NAICS 6 Description:	Pipeline transportation of natural gas		

Substance Release Report

Category Type ID:	1
Category Type Desc:	Stack / Point
Category Type Desc (fr):	Rejets de cheminée ou ponctuels
Grouping:	Total Air
Trans Code:	ASta
Chem:	

Chem (fr):	
Quantity:	31.36
Unit:	tonnes
Basis of Estimate Cd:	E2
Basis of Estimate Desc:	E2- Published Emission Factors - In use from 2003 and onward

36 | **14 of 14** | **WSW/127.2** | **270.5 / 0.66** | **TRANSCANADA PIPELINES LTD.**
NOT AVAILABLE
Hamilton ON | **NPRI**

NPRI ID:	6750	**Org ID:**	101523
Other ID:		**Submit Date:**	5/29/2013
No Other ID:		**Last Modified:**	5/29/2015 3:28:24 PM
Track ID:	112901	**Contact ID:**	
Report ID:	88868028	**Cont Type:**	
Report Type:	NPRI	**Contact Title:**	
Rpt Type ID:	1	**Cont First Name:**	
Report Year:	2012	**Cont Last Name:**	
Not-Current Rpt?:	No	**Contact Position:**	
Yr of Last Filed Rpt:	2013	**Contact Fax:**	
Fac ID:	235913	**Contact Ph.:**	
Fac Name:	Station 1301 - Kirkwall	**Cont Area Code:**	
Fac Address1:	NOT AVAILABLE	**Contact Tel.:**	
Fac Address2:		**Contact Ext.:**	
Fac Postal Zip:		**Cont Fax Area Cde:**	
Facility Lat:	43.35	**Contact Fax:**	
Facility Long:	-80.1199	**Contact Email:**	
DLS (Last Filed Rpt):		**Latitude:**	43.35
Facility DLS:		**Longitude:**	-80.1199
Datum:	1983	**UTM Zone:**	
Facility Cmnts:		**UTM Northing:**	
URL:		**UTM Easting:**	
No of Empl.:	1	**Waste Streams:**	
Parent Co.:		**No Streams:**	
No Parent Co.:		**Waste Off Sites:**	
Pollut Prev Cmnts:		**No Off Sites:**	
Stacks:		**Shutdown:**	
No of Stacks:		**No of Shutdown:**	
Canadian SIC Code (2 digit):			
Canadian SIC Code:			
SIC Code Description:			
American SIC Code:			
NAICS Code (2 digit):	48		
NAICS 2 Description:	Transportation and Warehousing		
NAICS Code (4 digit):	4862		
NAICS 4 Description:	Pipeline transportation of natural gas		
NAICS Code (6 digit):	486210		
NAICS 6 Description:	Pipeline transportation of natural gas		

Substance Release Report

Category Type ID:	1
Category Type Desc:	Stack / Point
Category Type Desc (fr):	Rejets de cheminée ou ponctuels
Grouping:	Total Air
Trans Code:	ASta
Chem:	Nitrogen oxides (expressed as NO2)
Chem (fr):	Oxydes d'azote (exprimés en NO2)
Quantity:	30.149
Unit:	tonnes
Basis of Estimate Cd:	E2
Basis of Estimate Desc:	E2- Published Emission Factors - In use from 2003 and onward

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
37	1 of 1	ENE/127.3	258.9 / -11.00	lot 13 con 9 ON	WWIS

Well ID:	6808147	**Data Entry Status:**	
Construction Date:		**Data Src:**	1
Primary Water Use:	Domestic	**Date Received:**	7/10/1972
Sec. Water Use:	0	**Selected Flag:**	Yes
Final Well Status:	Water Supply	**Abandonment Rec:**	
Water Type:		**Contractor:**	1620
Casing Material:		**Form Version:**	1
Audit No:		**Owner:**	
Tag:		**Street Name:**	
Construction Method:		**County:**	WENTWORTH
Elevation (m):		**Municipality:**	EAST FLAMBOROUGH TOWNSHIP
Elevation Reliability:		**Site Info:**	
Depth to Bedrock:		**Lot:**	013
Well Depth:		**Concession:**	09
Overburden/Bedrock:		**Concession Name:**	CON
Pump Rate:		**Easting NAD83:**	
Static Water Level:		**Northing NAD83:**	
Flowing (Y/N):		**Zone:**	
Flow Rate:		**UTM Reliability:**	
Clear/Cloudy:			

Bore Hole Information

Bore Hole ID:	10485528	**Elevation:**	258.84
DP2BR:	26	**Elevrc:**	
Spatial Status:		**Zone:**	17
Code OB:	r	**East83:**	580394.4
Code OB Desc:	Bedrock	**Org CS:**	
Open Hole:		**North83:**	4803363
Cluster Kind:		**UTMRC:**	4
Date Completed:	19-MAY-72	**UTMRC Desc:**	margin of error : 30 m - 100 m
Remarks:		**Location Method:**	p4
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Overburden and Bedrock Materials Interval

Formation ID:	932687523
Layer:	2
Color:	
General Color:	
Mat1:	15
Most Common Material:	LIMESTONE
Mat2:	
Other Materials:	
Mat3:	
Other Materials:	
Formation Top Depth:	26
Formation End Depth:	37
Formation End Depth UOM:	ft

Overburden and Bedrock Materials Interval

Formation ID:	932687522

Layer:	1
Color:	6
General Color:	BROWN
Mat1:	05
Most Common Material:	CLAY
Mat2:	
Other Materials:	
Mat3:	
Other Materials:	
Formation Top Depth:	0
Formation End Depth:	26
Formation End Depth UOM:	ft

Method of Construction & Well Use

Method Construction ID:	966808147
Method Construction Code:	1
Method Construction:	Cable Tool
Other Method Construction:	

Pipe Information

Pipe ID:	11034098
Casing No:	1
Comment:	
Alt Name:	

Construction Record - Casing

Casing ID:	930794076
Layer:	1
Material:	1
Open Hole or Material:	STEEL
Depth From:	
Depth To:	26
Casing Diameter:	6
Casing Diameter UOM:	inch
Casing Depth UOM:	ft

Construction Record - Casing

Casing ID:	930794077
Layer:	2
Material:	4
Open Hole or Material:	OPEN HOLE
Depth From:	
Depth To:	37
Casing Diameter:	
Casing Diameter UOM:	inch
Casing Depth UOM:	ft

Results of Well Yield Testing

Pump Test ID:	996808147
Pump Set At:	
Static Level:	16
Final Level After Pumping:	20
Recommended Pump Depth:	35
Pumping Rate:	20
Flowing Rate:	
Recommended Pump Rate:	18

Levels UOM:	ft
Rate UOM:	GPM
Water State After Test Code:	1
Water State After Test:	CLEAR
Pumping Test Method:	2
Pumping Duration HR:	1
Pumping Duration MIN:	0
Flowing:	N

Draw Down & Recovery

Pump Test Detail ID:	934870297
Test Type:	Recovery
Test Duration:	45
Test Level:	16
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	934354070
Test Type:	Recovery
Test Duration:	15
Test Level:	16
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	934618063
Test Type:	Recovery
Test Duration:	30
Test Level:	16
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	935130814
Test Type:	Recovery
Test Duration:	60
Test Level:	16
Test Level UOM:	ft

Water Details

Water ID:	933977011
Layer:	1
Kind Code:	1
Kind:	FRESH
Water Found Depth:	36
Water Found Depth UOM:	ft

38 ***1 of 1*** ***ENE/127.8*** ***257.5 / -12.39*** ***ON*** ***BORE***

Borehole ID:	891539	***Type:***	Borehole
Use:	Geotechnical/Geological Investigation	***Status:***	Decommissioned
Drill Method:	Hand auger	***UTM Zone:***	17
Easting:	580191	***Northing:***	4803523
Location Accuracy:		***Orig. Ground Elev m:***	256
Elev. Reliability Note:		***DEM Ground Elev m:***	259
Total Depth m:	3.5	***Primary Name:***	
Township:	EAST FLAMBOROUGH	***Concession:***	CON 9

Lot:	LOT 13	**Municipality:**	
Completion Date:	28-JUL-1999	**Static Water Level:**	.3
Primary Water Use:		**Sec. Water Use:**	

--Details--

Stratum ID:	8505134	**Top Depth(m):**	0.0
Bottom Depth(m):	0.7	**Stratum Desc:**	0.3m Topsoil, brown. Sand fill with gravel, very loose, wet.
Stratum ID:	8505135	**Top Depth(m):**	0.7
Bottom Depth(m):	1.1	**Stratum Desc:**	Black, peat, wet
Stratum ID:	8505136	**Top Depth(m):**	1.1
Bottom Depth(m):	1.7	**Stratum Desc:**	Grey/black, sand with gravel and frequent peat layers. Very loose, wet.
Stratum ID:	8505137	**Top Depth(m):**	1.7
Bottom Depth(m):	3.5	**Stratum Desc:**	Grey. Sand. Some gravel, trace silt, wet. Loose, compact

---

39 ***1 of 1*** ***ENE/128.1*** ***257.4 / -12.42*** ***ON*** ***BORE***

Borehole ID:	891536	**Type:**	Borehole
Use:	Geotechnical/Geological Investigation	**Status:**	Decommissioned
Drill Method:	Hand auger	**UTM Zone:**	17
Easting:	580158	**Northing:**	4803493
Location Accuracy:		**Orig. Ground Elev m:**	256
Elev. Reliability Note:		**DEM Ground Elev m:**	259
Total Depth m:	3	**Primary Name:**	
Township:	WEST FLAMBOROUGH	**Concession:**	CON 7
Lot:	LOT 11	**Municipality:**	
Completion Date:	28-JUL-1999	**Static Water Level:**	.6
Primary Water Use:		**Sec. Water Use:**	

--Details--

Stratum ID:	8505125	**Top Depth(m):**	0.0
Bottom Depth(m):	1.5	**Stratum Desc:**	0.15m Topsoil. Brown, sand fill, with gravel, trace cobbles. Compact, wet
Stratum ID:	8505126	**Top Depth(m):**	1.5
Bottom Depth(m):	2.4	**Stratum Desc:**	brown/Black. Mixture of silty, clay, sand and organics (Fill) Loose to compact, wet
Stratum ID:	8505127	**Top Depth(m):**	2.4
Bottom Depth(m):	3.0	**Stratum Desc:**	Brown, sand and gravel with frequent clayey silt till-like layers compact, wet

---

40 ***1 of 1*** ***ENE/132.0*** ***257.4 / -12.42*** ***ON*** ***BORE***

Borehole ID:	891532	**Type:**	Borehole
Use:	Geotechnical/Geological Investigation	**Status:**	Decommissioned
Drill Method:	Hollow stem auger	**UTM Zone:**	17
Easting:	580164	**Northing:**	4803504
Location Accuracy:		**Orig. Ground Elev m:**	260
Elev. Reliability Note:		**DEM Ground Elev m:**	260
Total Depth m:	10.3	**Primary Name:**	
Township:	WEST FLAMBOROUGH	**Concession:**	CON 7
Lot:	LOT 11	**Municipality:**	
Completion Date:	09-JUL-1999	**Static Water Level:**	4.4

Primary Water Use: ***Sec. Water Use:***

--Details--

Stratum ID:	8505111	***Top Depth(m):***	0.0
Bottom Depth(m):	1.2	***Stratum Desc:***	Brown, sand fill with gravel damp
Stratum ID:	8505112	***Top Depth(m):***	1.2
Bottom Depth(m):	2.5	***Stratum Desc:***	Brown, mixture of silt, clay and gravel (Fill) loose, damp
Stratum ID:	8505113	***Top Depth(m):***	2.5
Bottom Depth(m):	4.1	***Stratum Desc:***	Black/Brown, mixture of gravel, sand, silt and topsoil (fill) compact, damp
Stratum ID:	8505114	***Top Depth(m):***	2.5
Bottom Depth(m):	4.1	***Stratum Desc:***	Grey/Black mixture of gravel, sand, silt and topsoil (Fill) compact, damp
Stratum ID:	8505115	***Top Depth(m):***	4.1
Bottom Depth(m):	5.0	***Stratum Desc:***	Grey/black. Sand with frequent peat layers very loose, wet.
Stratum ID:	8505116	***Top Depth(m):***	5.0
Bottom Depth(m):	8.2	***Stratum Desc:***	Grey, sand and gravel, trace silt, wet. Occasional silty layers. Loose to compact to dense
Stratum ID:	8505117	***Top Depth(m):***	8.2
Bottom Depth(m):	10.3	***Stratum Desc:***	Grey, heterogeneous mixture of silt, sand and gravel (glacial Till) wet. Loose to dense to very dense

---

41 ***1 of 1*** ***ENE/137.0*** ***264.8 / -5.08*** ***lot 6 con 7 ON*** ***WWIS***

Well ID:	6809552	***Data Entry Status:***	
Construction Date:		***Data Src:***	1
Primary Water Use:	Domestic	***Date Received:***	1/28/1977
Sec. Water Use:	0	***Selected Flag:***	Yes
Final Well Status:	Water Supply	***Abandonment Rec:***	
Water Type:		***Contractor:***	4005
Casing Material:		***Form Version:***	1
Audit No:		***Owner:***	
Tag:		***Street Name:***	
Construction Method:		***County:***	WENTWORTH
Elevation (m):		***Municipality:***	WEST FLAMBOROUGH TOWNSHIP
Elevation Reliability:		***Site Info:***	
Depth to Bedrock:		***Lot:***	006
Well Depth:		***Concession:***	07
Overburden/Bedrock:		***Concession Name:***	CON
Pump Rate:		***Easting NAD83:***	
Static Water Level:		***Northing NAD83:***	
Flowing (Y/N):		***Zone:***	
Flow Rate:		***UTM Reliability:***	
Clear/Cloudy:			

Bore Hole Information

Bore Hole ID:	10486895	***Elevation:***	266.11
DP2BR:	33	***Elevrc:***	
Spatial Status:		***Zone:***	17
Code OB:	r	***East83:***	578454.4
Code OB Desc:	Bedrock	***Org CS:***	

Open Hole:
Cluster Kind:
Date Completed: 10-DEC-76
Remarks:
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

North83: 4802763
UTMRC: 4
UTMRC Desc: margin of error : 30 m - 100 m
Location Method: p4

Overburden and Bedrock Materials Interval

Formation ID: 932691857
Layer: 1
Color: 6
General Color: BROWN
Mat1: 28
Most Common Material: SAND
Mat2: 77
Other Materials: LOOSE
Mat3:
Other Materials:
Formation Top Depth: 0
Formation End Depth: 31
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 932691858
Layer: 2
Color: 6
General Color: BROWN
Mat1: 28
Most Common Material: SAND
Mat2: 11
Other Materials: GRAVEL
Mat3: 77
Other Materials: LOOSE
Formation Top Depth: 31
Formation End Depth: 33
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 932691859
Layer: 3
Color: 2
General Color: GREY
Mat1: 15
Most Common Material: LIMESTONE
Mat2: 73
Other Materials: HARD
Mat3:
Other Materials:
Formation Top Depth: 33
Formation End Depth: 37
Formation End Depth UOM: ft

Method of Construction & Well Use

Method Construction ID:	966809552
Method Construction Code:	1
Method Construction:	Cable Tool
Other Method Construction:	

Pipe Information

Pipe ID:	11035465
Casing No:	1
Comment:	
Alt Name:	

Construction Record - Casing

Casing ID:	930796206
Layer:	1
Material:	1
Open Hole or Material:	STEEL
Depth From:	
Depth To:	34
Casing Diameter:	6
Casing Diameter UOM:	inch
Casing Depth UOM:	ft

Construction Record - Casing

Casing ID:	930796207
Layer:	2
Material:	4
Open Hole or Material:	OPEN HOLE
Depth From:	
Depth To:	37
Casing Diameter:	
Casing Diameter UOM:	inch
Casing Depth UOM:	ft

Results of Well Yield Testing

Pump Test ID:	996809552
Pump Set At:	
Static Level:	17
Final Level After Pumping:	22
Recommended Pump Depth:	30
Pumping Rate:	25
Flowing Rate:	
Recommended Pump Rate:	10
Levels UOM:	ft
Rate UOM:	GPM
Water State After Test Code:	1
Water State After Test:	CLEAR
Pumping Test Method:	2
Pumping Duration HR:	3
Pumping Duration MIN:	0
Flowing:	N

Draw Down & Recovery

Pump Test Detail ID:	934349748
Test Type:	Recovery

Test Duration: 15
Test Level: 17
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934874240
Test Type: Recovery
Test Duration: 45
Test Level: 17
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934613688
Test Type: Recovery
Test Duration: 30
Test Level: 17
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 935143551
Test Type: Recovery
Test Duration: 60
Test Level: 17
Test Level UOM: ft

Water Details

Water ID: 933978751
Layer: 1
Kind Code: 1
Kind: FRESH
Water Found Depth: 35
Water Found Depth UOM: ft

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42 | **1 of 1** | **W/139.1** | **276.6 / 6.76** | **lot 35 con 7 ON** | **WWIS**

Well ID: 6810002
Construction Date:
Primary Water Use: Livestock
Sec. Water Use: Domestic
Final Well Status: Water Supply
Water Type:
Casing Material:
Audit No:
Tag:
Construction Method:
Elevation (m):
Elevation Reliability:
Depth to Bedrock:
Well Depth:
Overburden/Bedrock:
Pump Rate:
Static Water Level:
Flowing (Y/N):
Flow Rate:
Clear/Cloudy:

Data Entry Status:
Data Src: 1
Date Received: 11/9/1979
Selected Flag: Yes
Abandonment Rec:
Contractor: 4005
Form Version: 1
Owner:
Street Name:
County: WENTWORTH
Municipality: BEVERLY TOWNSHIP
Site Info:
Lot: 035
Concession: 07
Concession Name: CON
Easting NAD83:
Northing NAD83:
Zone:
UTM Reliability:

Bore Hole Information

Bore Hole ID:	10487332	***Elevation:***	277.41
DP2BR:	35	***Elevrc:***	
Spatial Status:		***Zone:***	17
Code OB:	r	***East83:***	575274.3
Code OB Desc:	Bedrock	***Org CS:***	
Open Hole:		***North83:***	4802023
Cluster Kind:		***UTMRC:***	4
Date Completed:	15-OCT-79	***UTMRC Desc:***	margin of error : 30 m - 100 m
Remarks:		***Location Method:***	p4
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Overburden and Bedrock Materials Interval

Formation ID:	932693342
Layer:	4
Color:	2
General Color:	GREY
Mat1:	15
Most Common Material:	LIMESTONE
Mat2:	73
Other Materials:	HARD
Mat3:	
Other Materials:	
Formation Top Depth:	35
Formation End Depth:	90
Formation End Depth UOM:	ft

Overburden and Bedrock Materials Interval

Formation ID:	932693341
Layer:	3
Color:	2
General Color:	GREY
Mat1:	28
Most Common Material:	SAND
Mat2:	11
Other Materials:	GRAVEL
Mat3:	77
Other Materials:	LOOSE
Formation Top Depth:	26
Formation End Depth:	35
Formation End Depth UOM:	ft

Overburden and Bedrock Materials Interval

Formation ID:	932693340
Layer:	2
Color:	2
General Color:	GREY
Mat1:	05
Most Common Material:	CLAY
Mat2:	81
Other Materials:	SANDY

Mat3: 77
Other Materials: LOOSE
Formation Top Depth: 9
Formation End Depth: 26
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 932693339
Layer: 1
Color: 6
General Color: BROWN
Mat1: 05
Most Common Material: CLAY
Mat2: 81
Other Materials: SANDY
Mat3: 77
Other Materials: LOOSE
Formation Top Depth: 0
Formation End Depth: 9
Formation End Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 966810002
Method Construction Code: 1
Method Construction: Cable Tool
Other Method Construction:

Pipe Information

Pipe ID: 11035902
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930796860
Layer: 2
Material: 4
Open Hole or Material: OPEN HOLE
Depth From:
Depth To: 90
Casing Diameter:
Casing Diameter UOM: inch
Casing Depth UOM: ft

Construction Record - Casing

Casing ID: 930796859
Layer: 1
Material: 1
Open Hole or Material: STEEL
Depth From:
Depth To: 35
Casing Diameter: 6
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pump Test ID:	996810002
Pump Set At:	
Static Level:	35
Final Level After Pumping:	78
Recommended Pump Depth:	88
Pumping Rate:	8
Flowing Rate:	
Recommended Pump Rate:	7
Levels UOM:	ft
Rate UOM:	GPM
Water State After Test Code:	1
Water State After Test:	CLEAR
Pumping Test Method:	2
Pumping Duration HR:	2
Pumping Duration MIN:	0
Flowing:	N

Draw Down & Recovery

Pump Test Detail ID:	934623463
Test Type:	Recovery
Test Duration:	30
Test Level:	37
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	935145254
Test Type:	Recovery
Test Duration:	60
Test Level:	35
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	934351366
Test Type:	Recovery
Test Duration:	15
Test Level:	46
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	934875381
Test Type:	Recovery
Test Duration:	45
Test Level:	35
Test Level UOM:	ft

Water Details

Water ID:	933979271
Layer:	1
Kind Code:	3
Kind:	SULPHUR
Water Found Depth:	87
Water Found Depth UOM:	ft

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
43	1 of 1	ENE/139.7	262.9 / -6.95	lot 10 con 7 ON	WWIS

Well ID:	6810186	**Data Entry Status:**	
Construction Date:		**Data Src:**	1
Primary Water Use:	Domestic	**Date Received:**	1/16/1981
Sec. Water Use:	0	**Selected Flag:**	Yes
Final Well Status:	Water Supply	**Abandonment Rec:**	
Water Type:		**Contractor:**	4005
Casing Material:		**Form Version:**	1
Audit No:		**Owner:**	
Tag:		**Street Name:**	
Construction Method:		**County:**	WENTWORTH
Elevation (m):		**Municipality:**	WEST FLAMBOROUGH TOWNSHIP
Elevation Reliability:		**Site Info:**	
Depth to Bedrock:		**Lot:**	010
Well Depth:		**Concession:**	07
Overburden/Bedrock:		**Concession Name:**	CON
Pump Rate:		**Easting NAD83:**	
Static Water Level:		**Northing NAD83:**	
Flowing (Y/N):		**Zone:**	
Flow Rate:		**UTM Reliability:**	
Clear/Cloudy:			

Bore Hole Information

Bore Hole ID:	10487515	**Elevation:**	262.73
DP2BR:	39	**Elevrc:**	
Spatial Status:		**Zone:**	17
Code OB:	r	**East83:**	579874.4
Code OB Desc:	Bedrock	**Org CS:**	
Open Hole:		**North83:**	4802983
Cluster Kind:		**UTMRC:**	4
Date Completed:	12-JAN-80	**UTMRC Desc:**	margin of error : 30 m - 100 m
Remarks:		**Location Method:**	p4
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Overburden and Bedrock Materials Interval

Formation ID:	932693950
Layer:	1
Color:	6
General Color:	BROWN
Mat1:	28
Most Common Material:	SAND
Mat2:	11
Other Materials:	GRAVEL
Mat3:	77
Other Materials:	LOOSE
Formation Top Depth:	0
Formation End Depth:	21
Formation End Depth UOM:	ft

Overburden and Bedrock Materials Interval

Formation ID:	932693952

Layer:	3
Color:	2
General Color:	GREY
Mat1:	15
Most Common Material:	LIMESTONE
Mat2:	73
Other Materials:	HARD
Mat3:	
Other Materials:	
Formation Top Depth:	39
Formation End Depth:	41
Formation End Depth UOM:	ft

Overburden and Bedrock Materials Interval

Formation ID:	932693951
Layer:	2
Color:	2
General Color:	GREY
Mat1:	28
Most Common Material:	SAND
Mat2:	11
Other Materials:	GRAVEL
Mat3:	77
Other Materials:	LOOSE
Formation Top Depth:	21
Formation End Depth:	39
Formation End Depth UOM:	ft

Method of Construction & Well Use

Method Construction ID:	966810186
Method Construction Code:	1
Method Construction:	Cable Tool
Other Method Construction:	

Pipe Information

Pipe ID:	11036085
Casing No:	1
Comment:	
Alt Name:	

Construction Record - Casing

Casing ID:	930797117
Layer:	1
Material:	1
Open Hole or Material:	STEEL
Depth From:	
Depth To:	39
Casing Diameter:	6
Casing Diameter UOM:	inch
Casing Depth UOM:	ft

Construction Record - Casing

Casing ID:	930797118
Layer:	2
Material:	4

Open Hole or Material: OPEN HOLE
Depth From:
Depth To: 41
Casing Diameter:
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pump Test ID: 996810186
Pump Set At:
Static Level: 23
Final Level After Pumping: 25
Recommended Pump Depth: 35
Pumping Rate: 30
Flowing Rate:
Recommended Pump Rate: 10
Levels UOM: ft
Rate UOM: GPM
Water State After Test Code: 2
Water State After Test: CLOUDY
Pumping Test Method: 2
Pumping Duration HR: 1
Pumping Duration MIN: 0
Flowing: N

Draw Down & Recovery

Pump Test Detail ID: 934624573
Test Type: Recovery
Test Duration: 30
Test Level: 23
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934351928
Test Type: Recovery
Test Duration: 15
Test Level: 23
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 935146365
Test Type: Recovery
Test Duration: 60
Test Level: 23
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934875934
Test Type: Recovery
Test Duration: 45
Test Level: 23
Test Level UOM: ft

Water Details

Water ID: 933979525

Layer:	1
Kind Code:	1
Kind:	FRESH
Water Found Depth:	40
Water Found Depth UOM:	ft

44 **1 of 1** **SW/166.5** **270.9 / 1.00** **lot 33 con 7 ON** **WWIS**

Well ID:	6810279	**Data Entry Status:**	
Construction Date:		**Data Src:**	1
Primary Water Use:	Domestic	**Date Received:**	9/30/1981
Sec. Water Use:	0	**Selected Flag:**	Yes
Final Well Status:	Water Supply	**Abandonment Rec:**	
Water Type:		**Contractor:**	4602
Casing Material:		**Form Version:**	1
Audit No:		**Owner:**	
Tag:		**Street Name:**	
Construction Method:		**County:**	WENTWORTH
Elevation (m):		**Municipality:**	BEVERLY TOWNSHIP
Elevation Reliability:		**Site Info:**	
Depth to Bedrock:		**Lot:**	033
Well Depth:		**Concession:**	07
Overburden/Bedrock:		**Concession Name:**	CON
Pump Rate:		**Easting NAD83:**	
Static Water Level:		**Northing NAD83:**	
Flowing (Y/N):		**Zone:**	
Flow Rate:		**UTM Reliability:**	
Clear/Cloudy:			

Bore Hole Information

Bore Hole ID:	10487605	**Elevation:**	271.33
DP2BR:	16	**Elevrc:**	
Spatial Status:		**Zone:**	17
Code OB:	r	**East83:**	574894.3
Code OB Desc:	Bedrock	**Org CS:**	
Open Hole:		**North83:**	4800703
Cluster Kind:		**UTMRC:**	4
Date Completed:	11-MAY-81	**UTMRC Desc:**	margin of error : 30 m - 100 m
Remarks:		**Location Method:**	p4
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Overburden and Bedrock Materials Interval

Formation ID:	932694241
Layer:	2
Color:	
General Color:	
Mat1:	05
Most Common Material:	CLAY
Mat2:	11
Other Materials:	GRAVEL
Mat3:	
Other Materials:	
Formation Top Depth:	12
Formation End Depth:	16

Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 932694240
Layer: 1
Color: 6
General Color: BROWN
Mat1: 05
Most Common Material: CLAY
Mat2: 13
Other Materials: BOULDERS
Mat3:
Other Materials:
Formation Top Depth: 0
Formation End Depth: 12
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 932694242
Layer: 3
Color: 2
General Color: GREY
Mat1: 15
Most Common Material: LIMESTONE
Mat2:
Other Materials:
Mat3:
Other Materials:
Formation Top Depth: 16
Formation End Depth: 49
Formation End Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 966810279
Method Construction Code: 1
Method Construction: Cable Tool
Other Method Construction:

Pipe Information

Pipe ID: 11036175
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930797236
Layer: 2
Material: 4
Open Hole or Material: OPEN HOLE
Depth From:
Depth To: 49
Casing Diameter:
Casing Diameter UOM: inch
Casing Depth UOM: ft

Construction Record - Casing

Casing ID:	930797235
Layer:	1
Material:	1
Open Hole or Material:	STEEL
Depth From:	
Depth To:	16
Casing Diameter:	6
Casing Diameter UOM:	inch
Casing Depth UOM:	ft

Results of Well Yield Testing

Pump Test ID:	996810279
Pump Set At:	
Static Level:	16
Final Level After Pumping:	43
Recommended Pump Depth:	47
Pumping Rate:	18
Flowing Rate:	
Recommended Pump Rate:	15
Levels UOM:	ft
Rate UOM:	GPM
Water State After Test Code:	2
Water State After Test:	CLOUDY
Pumping Test Method:	2
Pumping Duration HR:	1
Pumping Duration MIN:	0
Flowing:	N

Draw Down & Recovery

Pump Test Detail ID:	934352010
Test Type:	Draw Down
Test Duration:	15
Test Level:	43
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	935146429
Test Type:	Draw Down
Test Duration:	60
Test Level:	43
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	934624635
Test Type:	Draw Down
Test Duration:	30
Test Level:	43
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	934867096
Test Type:	Draw Down
Test Duration:	45

Test Level: 43
Test Level UOM: ft

Water Details

Water ID: 933979632
Layer: 2
Kind Code: 1
Kind: FRESH
Water Found Depth: 43
Water Found Depth UOM: ft

Water Details

Water ID: 933979631
Layer: 1
Kind Code: 1
Kind: FRESH
Water Found Depth: 21
Water Found Depth UOM: ft

---

45 | **1 of 1** | **WSW/183.7** | **271.8 / 1.97** | **lot 30 con 7 ON** | **WWIS**

Well ID: 6809041
Construction Date:
Primary Water Use: Domestic
Sec. Water Use: 0
Final Well Status: Water Supply
Water Type:
Casing Material:
Audit No:
Tag:
Construction Method:
Elevation (m):
Elevation Reliability:
Depth to Bedrock:
Well Depth:
Overburden/Bedrock:
Pump Rate:
Static Water Level:
Flowing (Y/N):
Flow Rate:
Clear/Cloudy:

Data Entry Status:
Data Src: 1
Date Received: 12/30/1974
Selected Flag: Yes
Abandonment Rec:
Contractor: 4208
Form Version: 1
Owner:
Street Name:
County: WENTWORTH
Municipality: BEVERLY TOWNSHIP
Site Info:
Lot: 030
Concession: 07
Concession Name: CON
Easting NAD83:
Northing NAD83:
Zone:
UTM Reliability:

Bore Hole Information

Bore Hole ID: 10486394
DP2BR: 0
Spatial Status:
Code OB: r
Code OB Desc: Bedrock
Open Hole:
Cluster Kind:
Date Completed: 13-AUG-74
Remarks:
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Elevation: 271.98
Elevrc:
Zone: 17
East83: 573439.3
Org CS:
North83: 4800903
UTMRC: 4
UTMRC Desc: margin of error : 30 m - 100 m
Location Method: p4

Overburden and Bedrock Materials Interval

Formation ID:	932690327
Layer:	2
Color:	2
General Color:	GREY
Mat1:	15
Most Common Material:	LIMESTONE
Mat2:	
Other Materials:	
Mat3:	
Other Materials:	
Formation Top Depth:	5
Formation End Depth:	36
Formation End Depth UOM:	ft

Overburden and Bedrock Materials Interval

Formation ID:	932690326
Layer:	1
Color:	2
General Color:	GREY
Mat1:	15
Most Common Material:	LIMESTONE
Mat2:	
Other Materials:	
Mat3:	
Other Materials:	
Formation Top Depth:	0
Formation End Depth:	5
Formation End Depth UOM:	ft

Method of Construction & Well Use

Method Construction ID:	966809041
Method Construction Code:	2
Method Construction:	Rotary (Convent.)
Other Method Construction:	

Pipe Information

Pipe ID:	11034964
Casing No:	1
Comment:	
Alt Name:	

Construction Record - Casing

Casing ID:	930795481
Layer:	1
Material:	1
Open Hole or Material:	STEEL
Depth From:	
Depth To:	10
Casing Diameter:	6
Casing Diameter UOM:	inch
Casing Depth UOM:	ft

Construction Record - Casing

Casing ID:	930795482
Layer:	2
Material:	4
Open Hole or Material:	OPEN HOLE
Depth From:	
Depth To:	36
Casing Diameter:	6
Casing Diameter UOM:	inch
Casing Depth UOM:	ft

Results of Well Yield Testing

Pump Test ID:	996809041
Pump Set At:	
Static Level:	15
Final Level After Pumping:	35
Recommended Pump Depth:	35
Pumping Rate:	8
Flowing Rate:	
Recommended Pump Rate:	8
Levels UOM:	ft
Rate UOM:	GPM
Water State After Test Code:	1
Water State After Test:	CLEAR
Pumping Test Method:	1
Pumping Duration HR:	1
Pumping Duration MIN:	0
Flowing:	N

Draw Down & Recovery

Pump Test Detail ID:	934356861
Test Type:	Recovery
Test Duration:	15
Test Level:	15
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	934620824
Test Type:	Recovery
Test Duration:	30
Test Level:	15
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	935142488
Test Type:	Recovery
Test Duration:	60
Test Level:	15
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	934873038
Test Type:	Recovery
Test Duration:	45
Test Level:	15

Test Level UOM: ft

Water Details

Water ID: 933978113
Layer: 1
Kind Code: 1
Kind: FRESH
Water Found Depth: 33
Water Found Depth UOM: ft

---

46 | ***1 of 1*** | ***W/191.6*** | ***274.5 / 4.69*** | ***lot 34 con 7 ON*** | ***WWIS***

Well ID: 6800950
Construction Date:
Primary Water Use: Domestic
Sec. Water Use: 0
Final Well Status: Water Supply
Water Type:
Casing Material:
Audit No:
Tag:
Construction Method:
Elevation (m):
Elevation Reliability:
Depth to Bedrock:
Well Depth:
Overburden/Bedrock:
Pump Rate:
Static Water Level:
Flowing (Y/N):
Flow Rate:
Clear/Cloudy:

Data Entry Status:
Data Src: 1
Date Received: 7/26/1965
Selected Flag: Yes
Abandonment Rec:
Contractor: 1205
Form Version: 1
Owner:
Street Name:
County: WENTWORTH
Municipality: BEVERLY TOWNSHIP
Site Info:
Lot: 034
Concession: 07
Concession Name: CON
Easting NAD83:
Northing NAD83:
Zone:
UTM Reliability:

Bore Hole Information

Bore Hole ID: 10478468
DP2BR: 0
Spatial Status:
Code OB: r
Code OB Desc: Bedrock
Open Hole:
Cluster Kind:
Date Completed: 26-MAY-65
Remarks:
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Elevation: 271.32
Elevrc:
Zone: 17
East83: 574782.3
Org CS:
North83: 4801934
UTMRC: 5
UTMRC Desc: margin of error : 100 m - 300 m
Location Method: p5

Overburden and Bedrock Materials Interval

Formation ID: 932665827
Layer: 1
Color: 6
General Color: BROWN
Mat1: 15
Most Common Material: LIMESTONE

Mat2:
Other Materials:
Mat3:
Other Materials:
Formation Top Depth: 0
Formation End Depth: 62
Formation End Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 966800950
Method Construction Code: 1
Method Construction: Cable Tool
Other Method Construction:

Pipe Information

Pipe ID: 11027038
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930781207
Layer: 1
Material: 1
Open Hole or Material: STEEL
Depth From:
Depth To: 15
Casing Diameter: 6
Casing Diameter UOM: inch
Casing Depth UOM: ft

Construction Record - Casing

Casing ID: 930781208
Layer: 2
Material: 4
Open Hole or Material: OPEN HOLE
Depth From:
Depth To: 62
Casing Diameter: 6
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pump Test ID: 996800950
Pump Set At:
Static Level: 12
Final Level After Pumping: 12
Recommended Pump Depth: 50
Pumping Rate: 12
Flowing Rate:
Recommended Pump Rate: 5
Levels UOM: ft
Rate UOM: GPM
Water State After Test Code: 1
Water State After Test: CLEAR
Pumping Test Method: 1

Pumping Duration HR: 1
Pumping Duration MIN: 0
Flowing: N

Water Details

Water ID: 933969524
Layer: 1
Kind Code: 1
Kind: FRESH
Water Found Depth: 61
Water Found Depth UOM: ft

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47 | **1 of 1** | **ENE/193.9** | **264.9 / -5.00** | **lot 36 con 7 ON** | **WWIS**

Well ID: 6813531
Construction Date:
Primary Water Use: Domestic
Sec. Water Use:
Final Well Status: Water Supply
Water Type:
Casing Material:
Audit No: 227093
Tag:
Construction Method:
Elevation (m):
Elevation Reliability:
Depth to Bedrock:
Well Depth:
Overburden/Bedrock:
Pump Rate:
Static Water Level:
Flowing (Y/N):
Flow Rate:
Clear/Cloudy:

Data Entry Status:
Data Src: 1
Date Received: 9/20/2001
Selected Flag: Yes
Abandonment Rec:
Contractor: 4005
Form Version: 1
Owner:
Street Name:
County: WENTWORTH
Municipality: WEST FLAMBOROUGH TOWNSHIP
Site Info:
Lot: 036
Concession: 07
Concession Name: CON
Easting NAD83:
Northing NAD83:
Zone:
UTM Reliability:

Bore Hole Information

Bore Hole ID: 10523120
DP2BR: 48
Spatial Status:
Code OB: r
Code OB Desc: Bedrock
Open Hole:
Cluster Kind:
Date Completed: 10-SEP-01
Remarks:
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Elevation: 264.8
Elevrc:
Zone: 17
East83: 578305.9
Org CS:
North83: 4802676
UTMRC: 5
UTMRC Desc: margin of error : 100 m - 300 m
Location Method: gis

Overburden and Bedrock Materials Interval

Formation ID: 932854996
Layer: 1
Color:
General Color:

Mat1:	24
Most Common Material:	PREV. DRILLED
Mat2:	
Other Materials:	
Mat3:	
Other Materials:	
Formation Top Depth:	0
Formation End Depth:	48
Formation End Depth UOM:	ft

Overburden and Bedrock Materials Interval

Formation ID:	932854997
Layer:	2
Color:	2
General Color:	GREY
Mat1:	15
Most Common Material:	LIMESTONE
Mat2:	73
Other Materials:	HARD
Mat3:	
Other Materials:	
Formation Top Depth:	48
Formation End Depth:	62
Formation End Depth UOM:	ft

Method of Construction & Well Use

Method Construction ID:	966813531
Method Construction Code:	5
Method Construction:	Air Percussion
Other Method Construction:	

Pipe Information

Pipe ID:	11071690
Casing No:	1
Comment:	
Alt Name:	

Construction Record - Casing

Casing ID:	930802276
Layer:	1
Material:	4
Open Hole or Material:	OPEN HOLE
Depth From:	
Depth To:	
Casing Diameter:	5
Casing Diameter UOM:	inch
Casing Depth UOM:	ft

Results of Well Yield Testing

Pump Test ID:	996813531
Pump Set At:	
Static Level:	18
Final Level After Pumping:	49
Recommended Pump Depth:	
Pumping Rate:	25

Flowing Rate:	
Recommended Pump Rate:	
Levels UOM:	ft
Rate UOM:	GPM
Water State After Test Code:	
Water State After Test:	
Pumping Test Method:	
Pumping Duration HR:	1
Pumping Duration MIN:	
Flowing:	N

Draw Down & Recovery

Pump Test Detail ID:	934883776
Test Type:	Recovery
Test Duration:	45
Test Level:	18
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	934353193
Test Type:	Recovery
Test Duration:	15
Test Level:	18
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	934624220
Test Type:	Recovery
Test Duration:	30
Test Level:	18
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	935144867
Test Type:	Recovery
Test Duration:	60
Test Level:	18
Test Level UOM:	ft

Water Details

Water ID:	934015601
Layer:	1
Kind Code:	1
Kind:	FRESH
Water Found Depth:	57
Water Found Depth UOM:	ft

48	***1 of 1***	***ENE/207.0***	***262.5 / -7.36***	***lot 13 con 9 ON***	***WWIS***

Well ID:	6803040	***Data Entry Status:***	
Construction Date:		***Data Src:***	1
Primary Water Use:	Domestic	***Date Received:***	10/26/1966
Sec. Water Use:	0	***Selected Flag:***	Yes
Final Well Status:	Water Supply	***Abandonment Rec:***	
Water Type:		***Contractor:***	4602

Casing Material:		***Form Version:***	1
Audit No:		***Owner:***	
Tag:		***Street Name:***	
Construction Method:		***County:***	WENTWORTH
Elevation (m):		***Municipality:***	EAST FLAMBOROUGH TOWNSHIP
Elevation Reliability:		***Site Info:***	
Depth to Bedrock:		***Lot:***	013
Well Depth:		***Concession:***	09
Overburden/Bedrock:		***Concession Name:***	CON
Pump Rate:		***Easting NAD83:***	
Static Water Level:		***Northing NAD83:***	
Flowing (Y/N):		***Zone:***	
Flow Rate:		***UTM Reliability:***	
Clear/Cloudy:			

Bore Hole Information

Bore Hole ID:	10480501	***Elevation:***	261.82
DP2BR:	57	***Elevrc:***	
Spatial Status:		***Zone:***	17
Code OB:	r	***East83:***	580181.4
Code OB Desc:	Bedrock	***Org CS:***	
Open Hole:		***North83:***	4803621
Cluster Kind:		***UTMRC:***	5
Date Completed:	12-SEP-66	***UTMRC Desc:***	margin of error : 100 m - 300 m
Remarks:		***Location Method:***	p5
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Overburden and Bedrock Materials Interval

Formation ID:	932672180
Layer:	2
Color:	2
General Color:	GREY
Mat1:	05
Most Common Material:	CLAY
Mat2:	
Other Materials:	
Mat3:	
Other Materials:	
Formation Top Depth:	12
Formation End Depth:	34
Formation End Depth UOM:	ft

Overburden and Bedrock Materials Interval

Formation ID:	932672181
Layer:	3
Color:	2
General Color:	GREY
Mat1:	05
Most Common Material:	CLAY
Mat2:	12
Other Materials:	STONES
Mat3:	
Other Materials:	

Formation Top Depth: 34
Formation End Depth: 57
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 932672182
Layer: 4
Color: 2
General Color: GREY
Mat1: 15
Most Common Material: LIMESTONE
Mat2:
Other Materials:
Mat3:
Other Materials:
Formation Top Depth: 57
Formation End Depth: 64
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 932672179
Layer: 1
Color: 6
General Color: BROWN
Mat1: 05
Most Common Material: CLAY
Mat2:
Other Materials:
Mat3:
Other Materials:
Formation Top Depth: 0
Formation End Depth: 12
Formation End Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 966803040
Method Construction Code: 1
Method Construction: Cable Tool
Other Method Construction:

Pipe Information

Pipe ID: 11029071
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930784819
Layer: 2
Material: 4
Open Hole or Material: OPEN HOLE
Depth From:
Depth To: 64
Casing Diameter: 6

Casing Diameter UOM:	inch
Casing Depth UOM:	ft

Construction Record - Casing

Casing ID:	930784818
Layer:	1
Material:	1
Open Hole or Material:	STEEL
Depth From:	
Depth To:	58
Casing Diameter:	6
Casing Diameter UOM:	inch
Casing Depth UOM:	ft

Results of Well Yield Testing

Pump Test ID:	996803040
Pump Set At:	
Static Level:	10
Final Level After Pumping:	64
Recommended Pump Depth:	62
Pumping Rate:	5
Flowing Rate:	
Recommended Pump Rate:	5
Levels UOM:	ft
Rate UOM:	GPM
Water State After Test Code:	2
Water State After Test:	CLOUDY
Pumping Test Method:	1
Pumping Duration HR:	2
Pumping Duration MIN:	0
Flowing:	N

Water Details

Water ID:	933971597
Layer:	1
Kind Code:	1
Kind:	FRESH
Water Found Depth:	62
Water Found Depth UOM:	ft

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49 | ***1 of 1*** | ***WSW/213.5*** | ***272.9 / 3.00*** | ***lot 30 con 7 ON*** | ***WWIS***

Well ID:	6813584	**Data Entry Status:**	
Construction Date:		**Data Src:**	1
Primary Water Use:	Domestic	**Date Received:**	12/10/2001
Sec. Water Use:		**Selected Flag:**	Yes
Final Well Status:	Water Supply	**Abandonment Rec:**	
Water Type:		**Contractor:**	4005
Casing Material:		**Form Version:**	1
Audit No:	227146	**Owner:**	
Tag:		**Street Name:**	
Construction Method:		**County:**	WENTWORTH
Elevation (m):		**Municipality:**	BEVERLY TOWNSHIP
Elevation Reliability:		**Site Info:**	
Depth to Bedrock:		**Lot:**	030
Well Depth:		**Concession:**	07
Overburden/Bedrock:		**Concession Name:**	CON
Pump Rate:		**Easting NAD83:**	

Static Water Level:
Flowing (Y/N):
Flow Rate:
Clear/Cloudy:
Northing NAD83:
Zone:
UTM Reliability:

Bore Hole Information

Bore Hole ID:	10523172	***Elevation:***	272.95
DP2BR:	0	***Elevrc:***	
Spatial Status:		***Zone:***	17
Code OB:	r	***East83:***	573461.9
Code OB Desc:	Bedrock	***Org CS:***	
Open Hole:		***North83:***	4800961
Cluster Kind:		***UTMRC:***	5
Date Completed:	21-NOV-01	***UTMRC Desc:***	margin of error : 100 m - 300 m
Remarks:		***Location Method:***	gis
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Overburden and Bedrock Materials Interval

Formation ID:	932855152
Layer:	1
Color:	2
General Color:	GREY
Mat1:	15
Most Common Material:	LIMESTONE
Mat2:	
Other Materials:	
Mat3:	
Other Materials:	
Formation Top Depth:	0
Formation End Depth:	70
Formation End Depth UOM:	ft

Method of Construction & Well Use

Method Construction ID:	966813584
Method Construction Code:	4
Method Construction:	Rotary (Air)
Other Method Construction:	

Pipe Information

Pipe ID:	11071742
Casing No:	1
Comment:	
Alt Name:	

Construction Record - Casing

Casing ID:	930802360
Layer:	1
Material:	1
Open Hole or Material:	STEEL
Depth From:	

Depth To:
Casing Diameter: 6
Casing Diameter UOM: inch
Casing Depth UOM: ft

Construction Record - Casing

Casing ID: 930802361
Layer: 2
Material: 4
Open Hole or Material: OPEN HOLE
Depth From:
Depth To:
Casing Diameter: 6
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pump Test ID: 996813584
Pump Set At:
Static Level: 12
Final Level After Pumping: 65
Recommended Pump Depth:
Pumping Rate: 12
Flowing Rate:
Recommended Pump Rate:
Levels UOM: ft
Rate UOM: GPM
Water State After Test Code:
Water State After Test:
Pumping Test Method: 1
Pumping Duration HR: 1
Pumping Duration MIN:
Flowing: N

Draw Down & Recovery

Pump Test Detail ID: 935144898
Test Type: Recovery
Test Duration: 60
Test Level: 12
Test Level UOM: ft

Water Details

Water ID: 934015667
Layer: 1
Kind Code: 1
Kind: FRESH
Water Found Depth: 53
Water Found Depth UOM: ft

Water Details

Water ID: 934015668
Layer: 2
Kind Code: 1
Kind: FRESH
Water Found Depth: 66
Water Found Depth UOM: ft

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
50	1 of 1	SSW/215.7	287.9 / 18.08	lot 4 con 7 STRABANE ON	WWIS

Well ID:	6814308	**Data Entry Status:**	
Construction Date:		**Data Src:**	
Primary Water Use:	Livestock	**Date Received:**	8/12/2005
Sec. Water Use:		**Selected Flag:**	Yes
Final Well Status:	Water Supply	**Abandonment Rec:**	
Water Type:		**Contractor:**	4005
Casing Material:		**Form Version:**	3
Audit No:	Z22322	**Owner:**	
Tag:	A022063	**Street Name:**	1437 MIDDLETOWN RD
Construction Method:		**County:**	WENTWORTH
Elevation (m):		**Municipality:**	BEVERLY TOWNSHIP
Elevation Reliability:		**Site Info:**	
Depth to Bedrock:		**Lot:**	004
Well Depth:		**Concession:**	07
Overburden/Bedrock:		**Concession Name:**	CON
Pump Rate:		**Easting NAD83:**	
Static Water Level:		**Northing NAD83:**	
Flowing (Y/N):		**Zone:**	
Flow Rate:		**UTM Reliability:**	
Clear/Cloudy:			

Bore Hole Information

Bore Hole ID:	11327517	**Elevation:**	288.51
DP2BR:	65	**Elevrc:**	
Spatial Status:		**Zone:**	17
Code OB:	r	**East83:**	575849
Code OB Desc:	Bedrock	**Org CS:**	UTM83
Open Hole:		**North83:**	4801860
Cluster Kind:		**UTMRC:**	4
Date Completed:	22-JUL-05	**UTMRC Desc:**	margin of error : 30 m - 100 m
Remarks:		**Location Method:**	wwr
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Overburden and Bedrock Materials Interval

Formation ID:	933036247
Layer:	2
Color:	2
General Color:	GREY
Mat1:	11
Most Common Material:	GRAVEL
Mat2:	28
Other Materials:	SAND
Mat3:	
Other Materials:	
Formation Top Depth:	10.66
Formation End Depth:	19.81
Formation End Depth UOM:	m

Overburden and Bedrock Materials Interval

Formation ID:	933036249
Layer:	4
Color:	2
General Color:	GREY
Mat1:	15
Most Common Material:	LIMESTONE
Mat2:	
Other Materials:	
Mat3:	
Other Materials:	
Formation Top Depth:	32
Formation End Depth:	57.91
Formation End Depth UOM:	m

Overburden and Bedrock Materials Interval

Formation ID:	933036248
Layer:	3
Color:	6
General Color:	BROWN
Mat1:	15
Most Common Material:	LIMESTONE
Mat2:	
Other Materials:	
Mat3:	
Other Materials:	
Formation Top Depth:	19.81
Formation End Depth:	32
Formation End Depth UOM:	m

Overburden and Bedrock Materials Interval

Formation ID:	933036246
Layer:	1
Color:	6
General Color:	BROWN
Mat1:	05
Most Common Material:	CLAY
Mat2:	81
Other Materials:	SANDY
Mat3:	11
Other Materials:	GRAVEL
Formation Top Depth:	0
Formation End Depth:	10.66
Formation End Depth UOM:	m

Annular Space/Abandonment Sealing Record

Plug ID:	933274795
Layer:	1
Plug From:	0
Plug To:	6
Plug Depth UOM:	m

Method of Construction & Well Use

Method Construction ID:	966814308
Method Construction Code:	5

Method Construction: Air Percussion
Other Method Construction:

Pipe Information

Pipe ID: 11342372
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930872386
Layer: 2
Material: 4
Open Hole or Material: OPEN HOLE
Depth From: 19.81
Depth To: 57.91
Casing Diameter:
Casing Diameter UOM: cm
Casing Depth UOM: m

Construction Record - Casing

Casing ID: 930872385
Layer: 1
Material: 1
Open Hole or Material: STEEL
Depth From: -.75
Depth To: 19.81
Casing Diameter: 15.2
Casing Diameter UOM: cm
Casing Depth UOM: m

Results of Well Yield Testing

Pump Test ID: 11353153
Pump Set At: 56
Static Level: 22.86
Final Level After Pumping: 54.86
Recommended Pump Depth: 56.5
Pumping Rate: 45.46
Flowing Rate:
Recommended Pump Rate: 45.46
Levels UOM: m
Rate UOM: LPM
Water State After Test Code: 1
Water State After Test: CLEAR
Pumping Test Method: 1
Pumping Duration HR: 1
Pumping Duration MIN: 0
Flowing:

Draw Down & Recovery

Pump Test Detail ID: 11433528
Test Type: Recovery
Test Duration: 50
Test Level: 23.31
Test Level UOM: m

Draw Down & Recovery

Pump Test Detail ID: 11433532
Test Type: Draw Down
Test Duration: 5
Test Level: 39.62
Test Level UOM: m

Draw Down & Recovery

Pump Test Detail ID: 11433552
Test Type: Draw Down
Test Duration: 4
Test Level: 36.88
Test Level UOM: m

Draw Down & Recovery

Pump Test Detail ID: 11433529
Test Type: Draw Down
Test Duration: 60
Test Level: 54.86
Test Level UOM: m

Draw Down & Recovery

Pump Test Detail ID: 11433534
Test Type: Draw Down
Test Duration: 15
Test Level: 47.54
Test Level UOM: m

Draw Down & Recovery

Pump Test Detail ID: 11433536
Test Type: Draw Down
Test Duration: 3
Test Level: 35.69
Test Level UOM: m

Draw Down & Recovery

Pump Test Detail ID: 11433541
Test Type: Recovery
Test Duration: 4
Test Level: 44.5
Test Level UOM: m

Draw Down & Recovery

Pump Test Detail ID: 11433549
Test Type: Draw Down
Test Duration: 30
Test Level: 53.85
Test Level UOM: m

Draw Down & Recovery

Pump Test Detail ID: 11433543
Test Type: Recovery

Test Duration: 10
Test Level: 35.35
Test Level UOM: m

Draw Down & Recovery

Pump Test Detail ID: 11433545
Test Type: Draw Down
Test Duration: 20
Test Level: 50.59
Test Level UOM: m

Draw Down & Recovery

Pump Test Detail ID: 11433550
Test Type: Recovery
Test Duration: 30
Test Level: 24.38
Test Level UOM: m

Draw Down & Recovery

Pump Test Detail ID: 11433527
Test Type: Draw Down
Test Duration: 10
Test Level: 41.43
Test Level UOM: m

Draw Down & Recovery

Pump Test Detail ID: 11433538
Test Type: Draw Down
Test Duration: 2
Test Level: 31.18
Test Level UOM: m

Draw Down & Recovery

Pump Test Detail ID: 11433542
Test Type: Recovery
Test Duration: 5
Test Level: 42.97
Test Level UOM: m

Draw Down & Recovery

Pump Test Detail ID: 11433535
Test Type: Recovery
Test Duration: 3
Test Level: 46.02
Test Level UOM: m

Draw Down & Recovery

Pump Test Detail ID: 11433530
Test Type: Recovery
Test Duration: 60
Test Level: 22.86
Test Level UOM: m

Draw Down & Recovery

Pump Test Detail ID: 11433537
Test Type: Recovery
Test Duration: 2
Test Level: 48.46
Test Level UOM: m

Draw Down & Recovery

Pump Test Detail ID: 11433544
Test Type: Recovery
Test Duration: 15
Test Level: 36.78
Test Level UOM: m

Draw Down & Recovery

Pump Test Detail ID: 11433548
Test Type: Recovery
Test Duration: 25
Test Level: 26.82
Test Level UOM: m

Draw Down & Recovery

Pump Test Detail ID: 11433531
Test Type: Draw Down
Test Duration: 50
Test Level: 54.71
Test Level UOM: m

Draw Down & Recovery

Pump Test Detail ID: 11433533
Test Type: Recovery
Test Duration: 40
Test Level: 23.77
Test Level UOM: m

Draw Down & Recovery

Pump Test Detail ID: 11433539
Test Type: Recovery
Test Duration: 1
Test Level: 51.08
Test Level UOM: m

Draw Down & Recovery

Pump Test Detail ID: 11433540
Test Type: Draw Down
Test Duration: 1
Test Level: 28.86
Test Level UOM: m

Draw Down & Recovery

Pump Test Detail ID: 11433546

Test Type:	Recovery
Test Duration:	20
Test Level:	27.73
Test Level UOM:	m

Draw Down & Recovery

Pump Test Detail ID:	11433547
Test Type:	Draw Down
Test Duration:	25
Test Level:	52.66
Test Level UOM:	m

Draw Down & Recovery

Pump Test Detail ID:	11433551
Test Type:	Draw Down
Test Duration:	40
Test Level:	54.49
Test Level UOM:	m

Water Details

Water ID:	934063431
Layer:	2
Kind Code:	
Kind:	
Water Found Depth:	56.99
Water Found Depth UOM:	m

Water Details

Water ID:	934063432
Layer:	1
Kind Code:	
Kind:	
Water Found Depth:	27.43
Water Found Depth UOM:	m

Hole Diameter

Hole ID:	11548559
Diameter:	15.2
Depth From:	6
Depth To:	57.91
Hole Depth UOM:	m
Hole Diameter UOM:	cm

Hole Diameter

Hole ID:	11548560
Diameter:	25.4
Depth From:	0
Depth To:	6
Hole Depth UOM:	m
Hole Diameter UOM:	cm

51	***1 of 1***	***WSW/216.6***	***273.8 / 3.97***	***lot 31 con 7 ON***	***WWIS***

Well ID:	6809021	**Data Entry Status:**	
Construction Date:		**Data Src:**	1
Primary Water Use:	Domestic	**Date Received:**	12/2/1974
Sec. Water Use:	0	**Selected Flag:**	Yes
Final Well Status:	Water Supply	**Abandonment Rec:**	
Water Type:		**Contractor:**	1620
Casing Material:		**Form Version:**	1
Audit No:		**Owner:**	
Tag:		**Street Name:**	
Construction Method:		**County:**	WENTWORTH
Elevation (m):		**Municipality:**	BEVERLY TOWNSHIP
Elevation Reliability:		**Site Info:**	
Depth to Bedrock:		**Lot:**	031
Well Depth:		**Concession:**	07
Overburden/Bedrock:		**Concession Name:**	CON
Pump Rate:		**Easting NAD83:**	
Static Water Level:		**Northing NAD83:**	
Flowing (Y/N):		**Zone:**	
Flow Rate:		**UTM Reliability:**	
Clear/Cloudy:			

Bore Hole Information

Bore Hole ID:	10486374	**Elevation:**	274.36
DP2BR:	11	**Elevrc:**	
Spatial Status:		**Zone:**	17
Code OB:	r	**East83:**	573554.3
Code OB Desc:	Bedrock	**Org CS:**	
Open Hole:		**North83:**	4801043
Cluster Kind:		**UTMRC:**	4
Date Completed:	19-AUG-74	**UTMRC Desc:**	margin of error : 30 m - 100 m
Remarks:		**Location Method:**	p4
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Overburden and Bedrock Materials Interval

Formation ID:	932690275
Layer:	1
Color:	6
General Color:	BROWN
Mat1:	05
Most Common Material:	CLAY
Mat2:	13
Other Materials:	BOULDERS
Mat3:	
Other Materials:	
Formation Top Depth:	0
Formation End Depth:	11
Formation End Depth UOM:	ft

Overburden and Bedrock Materials Interval

Formation ID:	932690276
Layer:	2
Color:	0
General Color:	

Mat1: 15
Most Common Material: LIMESTONE
Mat2:
Other Materials:
Mat3:
Other Materials:
Formation Top Depth: 11
Formation End Depth: 60
Formation End Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 966809021
Method Construction Code: 1
Method Construction: Cable Tool
Other Method Construction:

Pipe Information

Pipe ID: 11034944
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930795452
Layer: 1
Material: 1
Open Hole or Material: STEEL
Depth From:
Depth To: 13
Casing Diameter: 6
Casing Diameter UOM: inch
Casing Depth UOM: ft

Construction Record - Casing

Casing ID: 930795453
Layer: 2
Material: 4
Open Hole or Material: OPEN HOLE
Depth From:
Depth To: 60
Casing Diameter: 6
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pump Test ID: 996809021
Pump Set At:
Static Level: 30
Final Level After Pumping: 55
Recommended Pump Depth: 58
Pumping Rate: 3
Flowing Rate:
Recommended Pump Rate: 3
Levels UOM: ft
Rate UOM: GPM
Water State After Test Code: 1

Water State After Test:	CLEAR
Pumping Test Method:	2
Pumping Duration HR:	1
Pumping Duration MIN:	0
Flowing:	N

Draw Down & Recovery

Pump Test Detail ID:	934620805
Test Type:	Recovery
Test Duration:	30
Test Level:	30
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	934356842
Test Type:	Recovery
Test Duration:	15
Test Level:	40
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	934872602
Test Type:	Recovery
Test Duration:	45
Test Level:	30
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	935142469
Test Type:	Recovery
Test Duration:	60
Test Level:	30
Test Level UOM:	ft

Water Details

Water ID:	933978091
Layer:	1
Kind Code:	1
Kind:	FRESH
Water Found Depth:	58
Water Found Depth UOM:	ft

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52 ***1 of 1*** ***SSE/220.4*** ***285.7 / 15.84*** ***lot 1 con 7 ON*** ***WWIS***

Well ID:	6806821	***Data Entry Status:***	
Construction Date:		***Data Src:***	1
Primary Water Use:	Domestic	***Date Received:***	9/25/1968
Sec. Water Use:	0	***Selected Flag:***	Yes
Final Well Status:	Water Supply	***Abandonment Rec:***	
Water Type:		***Contractor:***	1205
Casing Material:		***Form Version:***	1
Audit No:		***Owner:***	
Tag:		***Street Name:***	
Construction Method:		***County:***	WENTWORTH
Elevation (m):		***Municipality:***	WEST FLAMBOROUGH TOWNSHIP

Elevation Reliability:		**Site Info:**	
Depth to Bedrock:		**Lot:**	001
Well Depth:		**Concession:**	07
Overburden/Bedrock:		**Concession Name:**	CON
Pump Rate:		**Easting NAD83:**	
Static Water Level:		**Northing NAD83:**	
Flowing (Y/N):		**Zone:**	
Flow Rate:		**UTM Reliability:**	
Clear/Cloudy:			

Bore Hole Information

Bore Hole ID:	10484261	**Elevation:**	286.24
DP2BR:	67	**Elevrc:**	
Spatial Status:		**Zone:**	17
Code OB:	r	**East83:**	576034.3
Code OB Desc:	Bedrock	**Org CS:**	
Open Hole:		**North83:**	4801893
Cluster Kind:		**UTMRC:**	4
Date Completed:	12-SEP-68	**UTMRC Desc:**	margin of error : 30 m - 100 m
Remarks:		**Location Method:**	p4
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Overburden and Bedrock Materials Interval

Formation ID:	932683431
Layer:	3
Color:	6
General Color:	BROWN
Mat1:	15
Most Common Material:	LIMESTONE
Mat2:	
Other Materials:	
Mat3:	
Other Materials:	
Formation Top Depth:	67
Formation End Depth:	90
Formation End Depth UOM:	ft

Overburden and Bedrock Materials Interval

Formation ID:	932683430
Layer:	2
Color:	
General Color:	
Mat1:	08
Most Common Material:	FINE SAND
Mat2:	
Other Materials:	
Mat3:	
Other Materials:	
Formation Top Depth:	40
Formation End Depth:	67
Formation End Depth UOM:	ft

Overburden and Bedrock Materials Interval

Formation ID:	932683429
Layer:	1
Color:	
General Color:	
Mat1:	05
Most Common Material:	CLAY
Mat2:	
Other Materials:	
Mat3:	
Other Materials:	
Formation Top Depth:	0
Formation End Depth:	40
Formation End Depth UOM:	ft

Method of Construction & Well Use

Method Construction ID:	966806821
Method Construction Code:	1
Method Construction:	Cable Tool
Other Method Construction:	

Pipe Information

Pipe ID:	11032831
Casing No:	1
Comment:	
Alt Name:	

Construction Record - Casing

Casing ID:	930791889
Layer:	1
Material:	1
Open Hole or Material:	STEEL
Depth From:	
Depth To:	68
Casing Diameter:	6
Casing Diameter UOM:	inch
Casing Depth UOM:	ft

Construction Record - Casing

Casing ID:	930791890
Layer:	2
Material:	4
Open Hole or Material:	OPEN HOLE
Depth From:	
Depth To:	90
Casing Diameter:	6
Casing Diameter UOM:	inch
Casing Depth UOM:	ft

Results of Well Yield Testing

Pump Test ID:	996806821
Pump Set At:	
Static Level:	32
Final Level After Pumping:	69

Recommended Pump Depth:	87
Pumping Rate:	9
Flowing Rate:	
Recommended Pump Rate:	4
Levels UOM:	ft
Rate UOM:	GPM
Water State After Test Code:	2
Water State After Test:	CLOUDY
Pumping Test Method:	1
Pumping Duration HR:	1
Pumping Duration MIN:	0
Flowing:	N

Water Details

Water ID:	933975544
Layer:	1
Kind Code:	1
Kind:	FRESH
Water Found Depth:	70
Water Found Depth UOM:	ft

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53 ***1 of 1*** ***SSW/225.2*** ***272.1 / 2.27*** ***lot 34 con 7 ON*** ***WWIS***

Well ID:	6800951	***Data Entry Status:***	
Construction Date:		***Data Src:***	1
Primary Water Use:	Domestic	***Date Received:***	12/22/1964
Sec. Water Use:	0	***Selected Flag:***	Yes
Final Well Status:	Water Supply	***Abandonment Rec:***	
Water Type:		***Contractor:***	4602
Casing Material:		***Form Version:***	1
Audit No:		***Owner:***	
Tag:		***Street Name:***	
Construction Method:		***County:***	WENTWORTH
Elevation (m):		***Municipality:***	BEVERLY TOWNSHIP
Elevation Reliability:		***Site Info:***	
Depth to Bedrock:		***Lot:***	034
Well Depth:		***Concession:***	07
Overburden/Bedrock:		***Concession Name:***	CON
Pump Rate:		***Easting NAD83:***	
Static Water Level:		***Northing NAD83:***	
Flowing (Y/N):		***Zone:***	
Flow Rate:		***UTM Reliability:***	
Clear/Cloudy:			

Bore Hole Information

Bore Hole ID:	10478469	***Elevation:***	271.85
DP2BR:	5	***Elevrc:***	
Spatial Status:		***Zone:***	17
Code OB:	r	***East83:***	575061.3
Code OB Desc:	Bedrock	***Org CS:***	
Open Hole:		***North83:***	4800732
Cluster Kind:		***UTMRC:***	5
Date Completed:	09-DEC-64	***UTMRC Desc:***	margin of error : 100 m - 300 m
Remarks:		***Location Method:***	p5
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Overburden and Bedrock Materials Interval

Formation ID:	932665829
Layer:	2
Color:	6
General Color:	BROWN
Mat1:	15
Most Common Material:	LIMESTONE
Mat2:	
Other Materials:	
Mat3:	
Other Materials:	
Formation Top Depth:	5
Formation End Depth:	48
Formation End Depth UOM:	ft

Overburden and Bedrock Materials Interval

Formation ID:	932665828
Layer:	1
Color:	
General Color:	
Mat1:	02
Most Common Material:	TOPSOIL
Mat2:	11
Other Materials:	GRAVEL
Mat3:	
Other Materials:	
Formation Top Depth:	0
Formation End Depth:	5
Formation End Depth UOM:	ft

Method of Construction & Well Use

Method Construction ID:	966800951
Method Construction Code:	1
Method Construction:	Cable Tool
Other Method Construction:	

Pipe Information

Pipe ID:	11027039
Casing No:	1
Comment:	
Alt Name:	

Construction Record - Casing

Casing ID:	930781209
Layer:	1
Material:	1
Open Hole or Material:	STEEL
Depth From:	
Depth To:	6
Casing Diameter:	6
Casing Diameter UOM:	inch
Casing Depth UOM:	ft

Construction Record - Casing

Casing ID:	930781210
Layer:	2
Material:	4
Open Hole or Material:	OPEN HOLE
Depth From:	
Depth To:	48
Casing Diameter:	6
Casing Diameter UOM:	inch
Casing Depth UOM:	ft

Results of Well Yield Testing

Pump Test ID:	996800951
Pump Set At:	
Static Level:	7
Final Level After Pumping:	48
Recommended Pump Depth:	46
Pumping Rate:	2
Flowing Rate:	
Recommended Pump Rate:	2
Levels UOM:	ft
Rate UOM:	GPM
Water State After Test Code:	1
Water State After Test:	CLEAR
Pumping Test Method:	1
Pumping Duration HR:	1
Pumping Duration MIN:	30
Flowing:	N

Water Details

Water ID:	933969525
Layer:	1
Kind Code:	1
Kind:	FRESH
Water Found Depth:	22
Water Found Depth UOM:	ft

Water Details

Water ID:	933969526
Layer:	2
Kind Code:	1
Kind:	FRESH
Water Found Depth:	28
Water Found Depth UOM:	ft

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54 ***1 of 1*** ***NNW/226.1*** ***269.0 / -0.88*** ***lot 1 con 7 ON*** ***WWIS***

Well ID:	6806873	***Data Entry Status:***	
Construction Date:		***Data Src:***	1
Primary Water Use:	Domestic	***Date Received:***	1/9/1969
Sec. Water Use:	0	***Selected Flag:***	Yes
Final Well Status:	Water Supply	***Abandonment Rec:***	
Water Type:		***Contractor:***	4208
Casing Material:		***Form Version:***	1
Audit No:		***Owner:***	
Tag:		***Street Name:***	
Construction Method:		***County:***	WENTWORTH

Elevation (m):		***Municipality:***	WEST FLAMBOROUGH TOWNSHIP
Elevation Reliability:		***Site Info:***	
Depth to Bedrock:		***Lot:***	001
Well Depth:		***Concession:***	07
Overburden/Bedrock:		***Concession Name:***	CON
Pump Rate:		***Easting NAD83:***	
Static Water Level:		***Northing NAD83:***	
Flowing (Y/N):		***Zone:***	
Flow Rate:		***UTM Reliability:***	
Clear/Cloudy:			

Bore Hole Information

Bore Hole ID:	10484312	***Elevation:***	269.63
DP2BR:	23	***Elevrc:***	
Spatial Status:		***Zone:***	17
Code OB:	r	***East83:***	575894.3
Code OB Desc:	Bedrock	***Org CS:***	
Open Hole:		***North83:***	4802323
Cluster Kind:		***UTMRC:***	4
Date Completed:	17-SEP-68	***UTMRC Desc:***	margin of error : 30 m - 100 m
Remarks:		***Location Method:***	p4
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Overburden and Bedrock Materials Interval

Formation ID:	932683581
Layer:	1
Color:	
General Color:	
Mat1:	23
Most Common Material:	PREVIOUSLY DUG
Mat2:	
Other Materials:	
Mat3:	
Other Materials:	
Formation Top Depth:	0
Formation End Depth:	14
Formation End Depth UOM:	ft

Overburden and Bedrock Materials Interval

Formation ID:	932683584
Layer:	4
Color:	
General Color:	
Mat1:	15
Most Common Material:	LIMESTONE
Mat2:	
Other Materials:	
Mat3:	
Other Materials:	
Formation Top Depth:	27
Formation End Depth:	54
Formation End Depth UOM:	ft

Overburden and Bedrock Materials Interval

Formation ID:	932683582
Layer:	2
Color:	
General Color:	
Mat1:	14
Most Common Material:	HARDPAN
Mat2:	
Other Materials:	
Mat3:	
Other Materials:	
Formation Top Depth:	14
Formation End Depth:	23
Formation End Depth UOM:	ft

Overburden and Bedrock Materials Interval

Formation ID:	932683583
Layer:	3
Color:	
General Color:	
Mat1:	17
Most Common Material:	SHALE
Mat2:	
Other Materials:	
Mat3:	
Other Materials:	
Formation Top Depth:	23
Formation End Depth:	27
Formation End Depth UOM:	ft

Method of Construction & Well Use

Method Construction ID:	966806873
Method Construction Code:	1
Method Construction:	Cable Tool
Other Method Construction:	

Pipe Information

Pipe ID:	11032882
Casing No:	1
Comment:	
Alt Name:	

Construction Record - Casing

Casing ID:	930791983
Layer:	1
Material:	1
Open Hole or Material:	STEEL
Depth From:	
Depth To:	27
Casing Diameter:	6
Casing Diameter UOM:	inch
Casing Depth UOM:	ft

Construction Record - Casing

Casing ID:	930791984
Layer:	2
Material:	4
Open Hole or Material:	OPEN HOLE
Depth From:	
Depth To:	54
Casing Diameter:	6
Casing Diameter UOM:	inch
Casing Depth UOM:	ft

Results of Well Yield Testing

Pump Test ID:	996806873
Pump Set At:	
Static Level:	6
Final Level After Pumping:	40
Recommended Pump Depth:	40
Pumping Rate:	8
Flowing Rate:	
Recommended Pump Rate:	8
Levels UOM:	ft
Rate UOM:	GPM
Water State After Test Code:	1
Water State After Test:	CLEAR
Pumping Test Method:	1
Pumping Duration HR:	1
Pumping Duration MIN:	0
Flowing:	N

Water Details

Water ID:	933975605
Layer:	2
Kind Code:	1
Kind:	FRESH
Water Found Depth:	50
Water Found Depth UOM:	ft

Water Details

Water ID:	933975604
Layer:	1
Kind Code:	1
Kind:	FRESH
Water Found Depth:	28
Water Found Depth UOM:	ft

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55 ***1 of 1*** ***S/235.0*** ***286.9 / 17.01*** ***lot 36 con 7 ON*** ***WWIS***

Well ID:	6808740	***Data Entry Status:***	
Construction Date:		***Data Src:***	1
Primary Water Use:	Livestock	***Date Received:***	1/29/1974
Sec. Water Use:	0	***Selected Flag:***	Yes
Final Well Status:	Water Supply	***Abandonment Rec:***	
Water Type:		***Contractor:***	4208
Casing Material:		***Form Version:***	1
Audit No:		***Owner:***	
Tag:		***Street Name:***	
Construction Method:		***County:***	WENTWORTH

Elevation (m):		***Municipality:***	BEVERLY TOWNSHIP
Elevation Reliability:		***Site Info:***	
Depth to Bedrock:		***Lot:***	036
Well Depth:		***Concession:***	07
Overburden/Bedrock:		***Concession Name:***	CON
Pump Rate:		***Easting NAD83:***	
Static Water Level:		***Northing NAD83:***	
Flowing (Y/N):		***Zone:***	
Flow Rate:		***UTM Reliability:***	
Clear/Cloudy:			

Bore Hole Information

Bore Hole ID:	10486101	***Elevation:***	288.61
DP2BR:	70	***Elevrc:***	
Spatial Status:		***Zone:***	17
Code OB:	r	***East83:***	575950.3
Code OB Desc:	Bedrock	***Org CS:***	
Open Hole:		***North83:***	4801865
Cluster Kind:		***UTMRC:***	4
Date Completed:	15-SEP-73	***UTMRC Desc:***	margin of error : 30 m - 100 m
Remarks:		***Location Method:***	p4
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Overburden and Bedrock Materials Interval

Formation ID:	932689363
Layer:	1
Color:	2
General Color:	GREY
Mat1:	05
Most Common Material:	CLAY
Mat2:	12
Other Materials:	STONES
Mat3:	
Other Materials:	
Formation Top Depth:	0
Formation End Depth:	70
Formation End Depth UOM:	ft

Overburden and Bedrock Materials Interval

Formation ID:	932689364
Layer:	2
Color:	2
General Color:	GREY
Mat1:	15
Most Common Material:	LIMESTONE
Mat2:	
Other Materials:	
Mat3:	
Other Materials:	
Formation Top Depth:	70
Formation End Depth:	145
Formation End Depth UOM:	ft

Method of Construction & Well Use

Method Construction ID:	966808740
Method Construction Code:	2
Method Construction:	Rotary (Convent.)
Other Method Construction:	

Pipe Information

Pipe ID:	11034671
Casing No:	1
Comment:	
Alt Name:	

Construction Record - Casing

Casing ID:	930795059
Layer:	1
Material:	1
Open Hole or Material:	STEEL
Depth From:	
Depth To:	70
Casing Diameter:	6
Casing Diameter UOM:	inch
Casing Depth UOM:	ft

Results of Well Yield Testing

Pump Test ID:	996808740
Pump Set At:	
Static Level:	60
Final Level After Pumping:	145
Recommended Pump Depth:	145
Pumping Rate:	2
Flowing Rate:	
Recommended Pump Rate:	
Levels UOM:	ft
Rate UOM:	GPM
Water State After Test Code:	1
Water State After Test:	CLEAR
Pumping Test Method:	1
Pumping Duration HR:	1
Pumping Duration MIN:	0
Flowing:	N

Draw Down & Recovery

Pump Test Detail ID:	934872007
Test Type:	Recovery
Test Duration:	45
Test Level:	111
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	934355801
Test Type:	Recovery
Test Duration:	15
Test Level:	138
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	935141444
Test Type:	Recovery
Test Duration:	60
Test Level:	99
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	934619783
Test Type:	Recovery
Test Duration:	30
Test Level:	123
Test Level UOM:	ft

Water Details

Water ID:	933977728
Layer:	1
Kind Code:	1
Kind:	FRESH
Water Found Depth:	140
Water Found Depth UOM:	ft

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56 ***1 of 3*** ***WSW/237.9*** ***283.8 / 13.99*** ***lot 31 con 7 ON*** ***WWIS***

Well ID:	6813022	***Data Entry Status:***	
Construction Date:		***Data Src:***	1
Primary Water Use:	Domestic	***Date Received:***	10/5/1998
Sec. Water Use:		***Selected Flag:***	Yes
Final Well Status:	Water Supply	***Abandonment Rec:***	
Water Type:		***Contractor:***	4005
Casing Material:		***Form Version:***	1
Audit No:	190991	***Owner:***	
Tag:		***Street Name:***	
Construction Method:		***County:***	WENTWORTH
Elevation (m):		***Municipality:***	BEVERLY TOWNSHIP
Elevation Reliability:		***Site Info:***	
Depth to Bedrock:		***Lot:***	031
Well Depth:		***Concession:***	07
Overburden/Bedrock:		***Concession Name:***	CON
Pump Rate:		***Easting NAD83:***	
Static Water Level:		***Northing NAD83:***	
Flowing (Y/N):		***Zone:***	
Flow Rate:		***UTM Reliability:***	
Clear/Cloudy:			

Bore Hole Information

Bore Hole ID:	10490335	***Elevation:***	279.3
DP2BR:	130	***Elevrc:***	
Spatial Status:		***Zone:***	17
Code OB:	r	***East83:***	573668.3
Code OB Desc:	Bedrock	***Org CS:***	
Open Hole:		***North83:***	4801167
Cluster Kind:		***UTMRC:***	9
Date Completed:	10-SEP-98	***UTMRC Desc:***	unknown UTM
Remarks:		***Location Method:***	lot
Elevrc Desc:			

Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Overburden and Bedrock Materials Interval

Formation ID: 932703603
Layer: 4
Color: 2
General Color: GREY
Mat1: 05
Most Common Material: CLAY
Mat2: 85
Other Materials: SOFT
Mat3:
Other Materials:
Formation Top Depth: 115
Formation End Depth: 130
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 932703602
Layer: 3
Color: 2
General Color: GREY
Mat1: 05
Most Common Material: CLAY
Mat2: 73
Other Materials: HARD
Mat3:
Other Materials:
Formation Top Depth: 75
Formation End Depth: 115
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 932703600
Layer: 1
Color: 6
General Color: BROWN
Mat1: 05
Most Common Material: CLAY
Mat2: 28
Other Materials: SAND
Mat3:
Other Materials:
Formation Top Depth: 0
Formation End Depth: 18
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 932703601
Layer: 2

Color:	2
General Color:	GREY
Mat1:	05
Most Common Material:	CLAY
Mat2:	85
Other Materials:	SOFT
Mat3:	
Other Materials:	
Formation Top Depth:	18
Formation End Depth:	75
Formation End Depth UOM:	ft

Overburden and Bedrock Materials Interval

Formation ID:	932703604
Layer:	5
Color:	2
General Color:	GREY
Mat1:	15
Most Common Material:	LIMESTONE
Mat2:	73
Other Materials:	HARD
Mat3:	
Other Materials:	
Formation Top Depth:	130
Formation End Depth:	170
Formation End Depth UOM:	ft

Method of Construction & Well Use

Method Construction ID:	966813022
Method Construction Code:	5
Method Construction:	Air Percussion
Other Method Construction:	

Pipe Information

Pipe ID:	11038905
Casing No:	1
Comment:	
Alt Name:	

Construction Record - Casing

Casing ID:	930801465
Layer:	1
Material:	1
Open Hole or Material:	STEEL
Depth From:	
Depth To:	130
Casing Diameter:	7
Casing Diameter UOM:	inch
Casing Depth UOM:	ft

Construction Record - Casing

Casing ID:	930801466
Layer:	2
Material:	4
Open Hole or Material:	OPEN HOLE

Depth From:	
Depth To:	170
Casing Diameter:	6
Casing Diameter UOM:	inch
Casing Depth UOM:	ft

Results of Well Yield Testing

Pump Test ID:	996813022
Pump Set At:	
Static Level:	
Final Level After Pumping:	165
Recommended Pump Depth:	165
Pumping Rate:	3
Flowing Rate:	
Recommended Pump Rate:	1
Levels UOM:	ft
Rate UOM:	GPM
Water State After Test Code:	2
Water State After Test:	CLOUDY
Pumping Test Method:	1
Pumping Duration HR:	0
Pumping Duration MIN:	30
Flowing:	N

Draw Down & Recovery

Pump Test Detail ID:	934623043
Test Type:	Draw Down
Test Duration:	30
Test Level:	165
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	934351590
Test Type:	Draw Down
Test Duration:	15
Test Level:	165
Test Level UOM:	ft

Water Details

Water ID:	933983383
Layer:	1
Kind Code:	5
Kind:	Not stated
Water Found Depth:	140
Water Found Depth UOM:	ft

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56 ***2 of 3*** ***WSW/237.9*** ***283.8 / 13.99*** ***lot 31 con 7 ON*** ***WWIS***

Well ID:	6813044	***Data Entry Status:***	
Construction Date:		***Data Src:***	1
Primary Water Use:	Public	***Date Received:***	12/1/1998
Sec. Water Use:		***Selected Flag:***	Yes
Final Well Status:	Water Supply	***Abandonment Rec:***	
Water Type:		***Contractor:***	4005
Casing Material:		***Form Version:***	1
Audit No:	198300	***Owner:***	
Tag:		***Street Name:***	

Construction Method:		***County:***	WENTWORTH
Elevation (m):		***Municipality:***	BEVERLY TOWNSHIP
Elevation Reliability:		***Site Info:***	
Depth to Bedrock:		***Lot:***	031
Well Depth:		***Concession:***	07
Overburden/Bedrock:		***Concession Name:***	CON
Pump Rate:		***Easting NAD83:***	
Static Water Level:		***Northing NAD83:***	
Flowing (Y/N):		***Zone:***	
Flow Rate:		***UTM Reliability:***	
Clear/Cloudy:			

Bore Hole Information

Bore Hole ID:	10490357	***Elevation:***	279.3
DP2BR:	9	***Elevrc:***	
Spatial Status:		***Zone:***	17
Code OB:	r	***East83:***	573668.3
Code OB Desc:	Bedrock	***Org CS:***	
Open Hole:		***North83:***	4801167
Cluster Kind:		***UTMRC:***	9
Date Completed:	09-SEP-98	***UTMRC Desc:***	unknown UTM
Remarks:		***Location Method:***	lot
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Overburden and Bedrock Materials Interval

Formation ID:	932703685
Layer:	3
Color:	2
General Color:	GREY
Mat1:	15
Most Common Material:	LIMESTONE
Mat2:	73
Other Materials:	HARD
Mat3:	
Other Materials:	
Formation Top Depth:	9
Formation End Depth:	100
Formation End Depth UOM:	ft

Overburden and Bedrock Materials Interval

Formation ID:	932703683
Layer:	1
Color:	6
General Color:	BROWN
Mat1:	05
Most Common Material:	CLAY
Mat2:	28
Other Materials:	SAND
Mat3:	13
Other Materials:	BOULDERS
Formation Top Depth:	0
Formation End Depth:	8
Formation End Depth UOM:	ft

Overburden and Bedrock Materials Interval

Formation ID:	932703684
Layer:	2
Color:	6
General Color:	BROWN
Mat1:	28
Most Common Material:	SAND
Mat2:	11
Other Materials:	GRAVEL
Mat3:	
Other Materials:	
Formation Top Depth:	8
Formation End Depth:	9
Formation End Depth UOM:	ft

Annular Space/Abandonment Sealing Record

Plug ID:	933211873
Layer:	1
Plug From:	0
Plug To:	25
Plug Depth UOM:	ft

Method of Construction & Well Use

Method Construction ID:	966813044
Method Construction Code:	5
Method Construction:	Air Percussion
Other Method Construction:	

Pipe Information

Pipe ID:	11038927
Casing No:	1
Comment:	
Alt Name:	

Construction Record - Casing

Casing ID:	930801502
Layer:	1
Material:	1
Open Hole or Material:	STEEL
Depth From:	
Depth To:	25
Casing Diameter:	6
Casing Diameter UOM:	inch
Casing Depth UOM:	ft

Construction Record - Casing

Casing ID:	930801503
Layer:	2
Material:	4
Open Hole or Material:	OPEN HOLE
Depth From:	

Depth To: 100
Casing Diameter: 6
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pump Test ID: 996813044
Pump Set At:
Static Level: 6
Final Level After Pumping: 8
Recommended Pump Depth: 45
Pumping Rate: 75
Flowing Rate:
Recommended Pump Rate: 70
Levels UOM: ft
Rate UOM: GPM
Water State After Test Code: 1
Water State After Test: CLEAR
Pumping Test Method: 1
Pumping Duration HR: 1
Pumping Duration MIN: 0
Flowing: N

Draw Down & Recovery

Pump Test Detail ID: 934351605
Test Type: Recovery
Test Duration: 15
Test Level: 6
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934623057
Test Type: Recovery
Test Duration: 30
Test Level: 6
Test Level UOM: ft

Water Details

Water ID: 933983415
Layer: 3
Kind Code: 5
Kind: Not stated
Water Found Depth: 61
Water Found Depth UOM: ft

Water Details

Water ID: 933983413
Layer: 1
Kind Code: 5
Kind: Not stated
Water Found Depth: 28
Water Found Depth UOM: ft

Water Details

Water ID: 933983414

Layer:	2
Kind Code:	5
Kind:	Not stated
Water Found Depth:	39
Water Found Depth UOM:	ft

56 **3 of 3** **WSW/237.9** **283.8 / 13.99** **lot 31 con 7 ON** **WWIS**

Well ID:	6811497	**Data Entry Status:**	
Construction Date:		**Data Src:**	1
Primary Water Use:	Domestic	**Date Received:**	9/8/1988
Sec. Water Use:		**Selected Flag:**	Yes
Final Well Status:	Water Supply	**Abandonment Rec:**	
Water Type:		**Contractor:**	4005
Casing Material:		**Form Version:**	1
Audit No:	31190	**Owner:**	
Tag:		**Street Name:**	
Construction Method:		**County:**	WENTWORTH
Elevation (m):		**Municipality:**	BEVERLY TOWNSHIP
Elevation Reliability:		**Site Info:**	
Depth to Bedrock:		**Lot:**	031
Well Depth:		**Concession:**	07
Overburden/Bedrock:		**Concession Name:**	CON
Pump Rate:		**Easting NAD83:**	
Static Water Level:		**Northing NAD83:**	
Flowing (Y/N):		**Zone:**	
Flow Rate:		**UTM Reliability:**	
Clear/Cloudy:			

Bore Hole Information

Bore Hole ID:	10488811	**Elevation:**	279.3
DP2BR:	59	**Elevrc:**	
Spatial Status:		**Zone:**	17
Code OB:	r	**East83:**	573668.3
Code OB Desc:	Bedrock	**Org CS:**	
Open Hole:		**North83:**	4801167
Cluster Kind:		**UTMRC:**	9
Date Completed:	26-AUG-88	**UTMRC Desc:**	unknown UTM
Remarks:		**Location Method:**	lot
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Overburden and Bedrock Materials Interval

Formation ID:	932698407
Layer:	2
Color:	2
General Color:	GREY
Mat1:	15
Most Common Material:	LIMESTONE
Mat2:	73
Other Materials:	HARD
Mat3:	
Other Materials:	
Formation Top Depth:	59
Formation End Depth:	90

Formation End Depth UOM:	ft

Overburden and Bedrock Materials Interval

Formation ID:	932698406
Layer:	1
Color:	
General Color:	
Mat1:	24
Most Common Material:	PREV. DRILLED
Mat2:	
Other Materials:	
Mat3:	
Other Materials:	
Formation Top Depth:	0
Formation End Depth:	59
Formation End Depth UOM:	ft

Method of Construction & Well Use

Method Construction ID:	966811497
Method Construction Code:	2
Method Construction:	Rotary (Convent.)
Other Method Construction:	

Pipe Information

Pipe ID:	11037381
Casing No:	1
Comment:	
Alt Name:	

Construction Record - Casing

Casing ID:	930799046
Layer:	2
Material:	4
Open Hole or Material:	OPEN HOLE
Depth From:	
Depth To:	90
Casing Diameter:	
Casing Diameter UOM:	inch
Casing Depth UOM:	ft

Construction Record - Casing

Casing ID:	930799045
Layer:	1
Material:	2
Open Hole or Material:	GALVANIZED
Depth From:	
Depth To:	59
Casing Diameter:	6
Casing Diameter UOM:	inch
Casing Depth UOM:	ft

Results of Well Yield Testing

Pump Test ID:	996811497

Pump Set At:	
Static Level:	20
Final Level After Pumping:	70
Recommended Pump Depth:	87
Pumping Rate:	12
Flowing Rate:	
Recommended Pump Rate:	10
Levels UOM:	ft
Rate UOM:	GPM
Water State After Test Code:	2
Water State After Test:	CLOUDY
Pumping Test Method:	2
Pumping Duration HR:	1
Pumping Duration MIN:	0
Flowing:	N

Draw Down & Recovery

Pump Test Detail ID:	935140431
Test Type:	Draw Down
Test Duration:	60
Test Level:	70
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	934355889
Test Type:	Draw Down
Test Duration:	15
Test Level:	70
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	934879312
Test Type:	Draw Down
Test Duration:	45
Test Level:	70
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	934627423
Test Type:	Draw Down
Test Duration:	30
Test Level:	70
Test Level UOM:	ft

Water Details

Water ID:	933981207
Layer:	1
Kind Code:	1
Kind:	FRESH
Water Found Depth:	85
Water Found Depth UOM:	ft

57	***1 of 1***	***ENE/237.9***	***264.6 / -5.27***	***lot 7 con 7 ON***	***WWIS***

Well ID: 6807838 ***Data Entry Status:***

Construction Date:		***Data Src:***	1
Primary Water Use:	Domestic	***Date Received:***	8/20/1971
Sec. Water Use:	0	***Selected Flag:***	Yes
Final Well Status:	Water Supply	***Abandonment Rec:***	
Water Type:		***Contractor:***	1620
Casing Material:		***Form Version:***	1
Audit No:		***Owner:***	
Tag:		***Street Name:***	
Construction Method:		***County:***	WENTWORTH
Elevation (m):		***Municipality:***	WEST FLAMBOROUGH TOWNSHIP
Elevation Reliability:		***Site Info:***	
Depth to Bedrock:		***Lot:***	007
Well Depth:		***Concession:***	07
Overburden/Bedrock:		***Concession Name:***	CON
Pump Rate:		***Easting NAD83:***	
Static Water Level:		***Northing NAD83:***	
Flowing (Y/N):		***Zone:***	
Flow Rate:		***UTM Reliability:***	
Clear/Cloudy:			

Bore Hole Information

Bore Hole ID:	10485237	***Elevation:***	264.66
DP2BR:	24	***Elevrc:***	
Spatial Status:		***Zone:***	17
Code OB:	r	***East83:***	578434.4
Code OB Desc:	Bedrock	***Org CS:***	
Open Hole:		***North83:***	4803143
Cluster Kind:		***UTMRC:***	4
Date Completed:	26-JUL-71	***UTMRC Desc:***	margin of error : 30 m - 100 m
Remarks:		***Location Method:***	p4
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Overburden and Bedrock Materials Interval

Formation ID:	932686606
Layer:	2
Color:	
General Color:	
Mat1:	15
Most Common Material:	LIMESTONE
Mat2:	
Other Materials:	
Mat3:	
Other Materials:	
Formation Top Depth:	24
Formation End Depth:	33
Formation End Depth UOM:	ft

Overburden and Bedrock Materials Interval

Formation ID:	932686605
Layer:	1
Color:	6
General Color:	BROWN
Mat1:	05

Most Common Material: CLAY
Mat2:
Other Materials:
Mat3:
Other Materials:
Formation Top Depth: 0
Formation End Depth: 24
Formation End Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 966807838
Method Construction Code: 1
Method Construction: Cable Tool
Other Method Construction:

Pipe Information

Pipe ID: 11033807
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930793574
Layer: 2
Material: 4
Open Hole or Material: OPEN HOLE
Depth From:
Depth To: 33
Casing Diameter:
Casing Diameter UOM: inch
Casing Depth UOM: ft

Construction Record - Casing

Casing ID: 930793573
Layer: 1
Material: 1
Open Hole or Material: STEEL
Depth From:
Depth To: 24
Casing Diameter: 6
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pump Test ID: 996807838
Pump Set At:
Static Level: 5
Final Level After Pumping: 15
Recommended Pump Depth: 25
Pumping Rate: 20
Flowing Rate:
Recommended Pump Rate: 10
Levels UOM: ft
Rate UOM: GPM
Water State After Test Code: 1
Water State After Test: CLEAR

Pumping Test Method:	2
Pumping Duration HR:	1
Pumping Duration MIN:	0
Flowing:	N

Draw Down & Recovery

Pump Test Detail ID:	934352998
Test Type:	Recovery
Test Duration:	15
Test Level:	5
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	934869229
Test Type:	Recovery
Test Duration:	45
Test Level:	5
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	935139070
Test Type:	Recovery
Test Duration:	60
Test Level:	5
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	934616992
Test Type:	Recovery
Test Duration:	30
Test Level:	5
Test Level UOM:	ft

Water Details

Water ID:	933976652
Layer:	1
Kind Code:	1
Kind:	FRESH
Water Found Depth:	33
Water Found Depth UOM:	ft

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58 | ***1 of 1*** | ***SSW/238.7*** | ***270.7 / 0.85*** | ***lot 36 con 7 ON*** | ***WWIS***

Well ID:	6810831	**Data Entry Status:**	
Construction Date:		**Data Src:**	1
Primary Water Use:	Domestic	**Date Received:**	6/27/1985
Sec. Water Use:		**Selected Flag:**	Yes
Final Well Status:	Water Supply	**Abandonment Rec:**	
Water Type:		**Contractor:**	4005
Casing Material:		**Form Version:**	1
Audit No:		**Owner:**	
Tag:		**Street Name:**	
Construction Method:		**County:**	WENTWORTH
Elevation (m):		**Municipality:**	BEVERLY TOWNSHIP
Elevation Reliability:		**Site Info:**	

Depth to Bedrock:		***Lot:***	036
Well Depth:		***Concession:***	07
Overburden/Bedrock:		***Concession Name:***	CON
Pump Rate:		***Easting NAD83:***	
Static Water Level:		***Northing NAD83:***	
Flowing (Y/N):		***Zone:***	
Flow Rate:		***UTM Reliability:***	
Clear/Cloudy:			

Bore Hole Information

Bore Hole ID:	10488152	***Elevation:***	269.94
DP2BR:	1	***Elevrc:***	
Spatial Status:		***Zone:***	17
Code OB:	r	***East83:***	575783.3
Code OB Desc:	Bedrock	***Org CS:***	
Open Hole:		***North83:***	4801675
Cluster Kind:		***UTMRC:***	9
Date Completed:	14-JUN-85	***UTMRC Desc:***	unknown UTM
Remarks:		***Location Method:***	lot
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Overburden and Bedrock Materials Interval

Formation ID:	932696083
Layer:	2
Color:	2
General Color:	GREY
Mat1:	15
Most Common Material:	LIMESTONE
Mat2:	73
Other Materials:	HARD
Mat3:	
Other Materials:	
Formation Top Depth:	1
Formation End Depth:	59
Formation End Depth UOM:	ft

Overburden and Bedrock Materials Interval

Formation ID:	932696082
Layer:	1
Color:	6
General Color:	BROWN
Mat1:	28
Most Common Material:	SAND
Mat2:	77
Other Materials:	LOOSE
Mat3:	
Other Materials:	
Formation Top Depth:	0
Formation End Depth:	1
Formation End Depth UOM:	ft

Method of Construction & Well

Use

Method Construction ID: 966810831
Method Construction Code: 1
Method Construction: Cable Tool
Other Method Construction:

Pipe Information

Pipe ID: 11036722
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930798002
Layer: 1
Material: 1
Open Hole or Material: STEEL
Depth From:
Depth To: 20
Casing Diameter: 6
Casing Diameter UOM: inch
Casing Depth UOM: ft

Construction Record - Casing

Casing ID: 930798003
Layer: 2
Material: 4
Open Hole or Material: OPEN HOLE
Depth From:
Depth To: 59
Casing Diameter:
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pump Test ID: 996810831
Pump Set At:
Static Level: 10
Final Level After Pumping: 56
Recommended Pump Depth: 56
Pumping Rate: 4
Flowing Rate:
Recommended Pump Rate: 4
Levels UOM: ft
Rate UOM: GPM
Water State After Test Code: 1
Water State After Test: CLEAR
Pumping Test Method: 2
Pumping Duration HR: 1
Pumping Duration MIN: 0
Flowing: N

Draw Down & Recovery

Pump Test Detail ID: 934868735
Test Type: Draw Down
Test Duration: 45

Test Level: 56
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934353719
Test Type: Draw Down
Test Duration: 15
Test Level: 56
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934625724
Test Type: Draw Down
Test Duration: 30
Test Level: 56
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 935147512
Test Type: Draw Down
Test Duration: 60
Test Level: 56
Test Level UOM: ft

Water Details

Water ID: 933980327
Layer: 1
Kind Code: 1
Kind: FRESH
Water Found Depth: 40
Water Found Depth UOM: ft

Water Details

Water ID: 933980328
Layer: 2
Kind Code: 1
Kind: FRESH
Water Found Depth: 55
Water Found Depth UOM: ft

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59 | ***1 of 1*** | ***SSE/243.8*** | ***285.7 / 15.83*** | ***1434 Middletown Road Millgrove ON L0R 1V0*** | ***EHS***

Order ID: 621135
Order No: 20180904100
Customer ID: 128988
Company ID: 80428
Status: C
Report Code: 1CAN
Report Type: Site Report
Report Date: 05-SEP-18
Report Requested by: Anderson, Dennis
Nearest Intersection:
Previous Site Name:
Additional Info Ordered:

Date Received: 04-SEP-18
Lot/Building Size:
Municipality:
Client Prov/State: ON
Search Radius (km): .001
Large Radius: .003
X: -80.061235
Y: 43.365874

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
60	1 of 1	ENE/247.0	259.9 / -10.00	955 4th Concession Road West Hamilton ON	EHS

Order ID:	107799	**Date Received:**	7/23/2007
Order No:	20070723029	**Lot/Building Size:**	
Customer ID:	52567	**Municipality:**	Hamilton-Wentworth
Company ID:	26	**Client Prov/State:**	
Status:	C	**Search Radius (km):**	0.25
Report Code:	4CAN	**Large Radius:**	0.25
Report Type:	CAN - Custom Report	**X:**	-80.028594
Report Date:	8/1/2007	**Y:**	43.37764
Report Requested by:	Conestoga-Rovers & Associates		
Nearest Intersection:	Brock Road		
Previous Site Name:			
Additional Info Ordered:			

Unplottable Summary

Total: 25 Unplottable sites

DB	Company Name/Site Name	Address	City	Postal
CA	Belmac Estate Properties Inc.		Hamilton ON	
CA	REG. MUN. OF HAMILTON-WENTWORTH	HWY. #6	FLAMBOROUGH ON	
CA		Brock Street	Hamilton ON	
ECA	City of Hamilton	Brock Street	Hamilton ON	L8P 4Y5
GEN	Ministry of Transportation Ontario	Hwy 6 C2005-2019	Hamilton ON	
PRT	PIONEER PETROLEUMS ATTN LOLA LAURIE	PT LOT 13 CON 7 HWY 6	FLAMBOROUGH ON	
PRT	G WUERFEL SERVICE CENTRE & GENERAL STORE	LOT 13 CON 7 HWY 6	HAMILTON ON	
PRT	G WUERFEL SERVICE CENTRE & GENERAL STORE	PT LOT 13 CON 7 HWY 6	FLAMBOROUGH ON	
PTTW	Parkbridge G/P Inc.	Site address: 1264 8th Concession Road West, Lot 33, Concession 7, Town of Flamborough (former geographic township of Beverly), City of Hamilton	Flamborough ON	
PTTW	Belmac Estate Properties Inc.	Property of Belmac Estate Properties Inc. 1294 8th Concession Road West, Lot 32, Concession 7, Original Geographic Township of Beverly, City of Hamilton	BEVERLY ON	
PTTW	New Country Investors Ltd.	Ponderosa Nature Resort Wells Lot: 43, Concession: 7, 1218 Concession 8 West, Hamilton CITY OF HAMILTON	ON	
PTTW	Parkbridge G/P Inc.	Property of Parkbridge G/P Inc. Lot: 33, Concession: 7, Beverly, City of Hamilton BEVERLY	ON	
SPL	FARM	2 KM ALONG BRANT ROAD #4 SCOTLAND MOTOR VEHICLE (OPERATING FLUID)	HAMILTON-WENTWORTH R.M. ON	
SPL	BFI Canada Inc.	south Hwy 6, 1 km north of 403	Hamilton ON	
SPL	Element Bulk Logistics Inc.<UNOFFICIAL>	Hwy 6, Lincoln-Alexander Pkwy & Red Hill Xprsway	Hamilton ON	

SPL	SHELL CANADA PRODUCTS LTD.	HWY 6 NORTH OF FREELTON TANK TRUCK (CARGO)	FLAMBOROUGH TOWN ON
SPL	SUN-CANADIAN PIPE LINE COMPANY	SUN CANADIAN PIPELINE LTD. HIGHWAY 6 PIPELINE	FLAMBOROUGH TOWN ON
SPL	RYDER TRUCK RENTAL CANADA LTD.	ON HWY 6 AT BOTTOM OF CLAPPISON HILL. MOTOR VEHICLE (OPERATING FLUID)	FLAMBOROUGH TOWN ON
SPL	PROVOST BULK CARRIERS INC.	EAST SIDE RR #1,BETWEEN CON. 6 AND 7 , HIGHWAY 6, MILL GROVE TANK TRUCK (CARGO)	HAMILTON-WENTWORTH R.M. ON
SPL	Maple Leaf Foods Inc.	Northbound Hwy # 6, South of Hwy # 4 at Clappison Corner, Dundas<UNOFFICIAL>	Hamilton ON
SPL	TRANSPORT TRUCK	HWY 6 NORTHBOUND, RIGHT LANE AT CLAPPISON'S CORNERS MOTOR VEHICLE (OPERATING FLUID)	FLAMBOROUGH TOWN ON
SPL	Maple Leaf Foods Inc.	Highway 6 North, Flamborough EAST SHOULDER, CATCHBASINS & OUTFALL ON CLAPPISON'S HILL<UNOFFICIAL>	Hamilton ON
SPL	FARM	CONC 5 OFF HWY 6 OUTSKIRTS OF WATERDOWN	FLAMBOROUGH TOWN ON
SPL	TRANSPORT TRUCK	ON HWY. #6 NORTH, .4 KM NORTH OF CONC. 7 IN EAST FLAMBOROUGH TWP. MOTOR VEHICLE (OPERATING FLUID)	FLAMBOROUGH TOWN ON
SPL	SPIE CONSTRUCTION	BROCK ROAD	FLAMBOROUGH TOWN ON

Unplottable Report

Site: ***Belmac Estate Properties Inc.***
Hamilton ON

Database: ***CA***

Certificate #:	5241-6S3QQ2
Application Year:	2006
Issue Date:	8/16/2006
Approval Type:	Municipal and Private Sewage Works
Status:	Approved
Application Type:	
Client Name:	
Client Address:	
Client City:	
Client Postal Code:	
Project Description:	
Contaminants:	
Emission Control:	

Site: ***REG. MUN. OF HAMILTON-WENTWORTH***
HWY. #6 FLAMBOROUGH ON

Database: ***CA***

Certificate #:	7-0094-85-006
Application Year:	85
Issue Date:	3/15/85
Approval Type:	Municipal water
Status:	Approved
Application Type:	
Client Name:	
Client Address:	
Client City:	
Client Postal Code:	
Project Description:	
Contaminants:	
Emission Control:	

Site:
Brock Street Hamilton ON

Database: ***CA***

Certificate #:	7211-4YBHUL
Application Year:	01
Issue Date:	7/11/01
Approval Type:	Municipal & Private water
Status:	Approved
Application Type:	New Certificate of Approval
Client Name:	Corporation of the City of Hamilton
Client Address:	71 Main Street West
Client City:	Hamilton
Client Postal Code:	L8P 4Y5
Project Description:	Construction of watermains on Brock Street.
Contaminants:	
Emission Control:	

Site: ***City of Hamilton***
Brock Street Hamilton ON L8P 4Y5

Database: ***ECA***

Approval No: 7211-4YBHUL ***SWP Area Name:***

Approval Date: 2001-07-11
Status: Approved
Record Type: ECA
Link Source: IDS
Approval Type: ECA-Municipal and Private Water Works
Project Type: Municipal and Private Water Works
Address: Brock Street
Full Address:
Full PDF Link:
MOE District:
City:
Longitude:
Latitude:

Site: ***Ministry of Transportation Ontario***
Hwy 6 C2005-2019 Hamilton ON

Database: ***GEN***

Generator No.: ON6145621
Status:
Approval Years: 2009
Contam. Facility:
MHSW Facility:
SIC Code: 237310
SIC Description: Highway Street and Bridge Construction
PO Box No.:
Country:
Choice of Contact:
Co Admin:
Phone No. Admin:

--Details--
Waste Code: 251
Waste Description: OIL SKIMMINGS & SLUDGES

Site: ***PIONEER PETROLEUMS ATTN LOLA LAURIE***
PT LOT 13 CON 7 HWY 6 FLAMBOROUGH ON

Database: ***PRT***

Location ID: 4906
Type: retail
Expiry Date: 1993-02-28
Capacity (L): 20000
Licence #: 0030093001

Site: ***G WUERFEL SERVICE CENTRE & GENERAL STORE***
LOT 13 CON 7 HWY 6 HAMILTON ON

Database: ***PRT***

Location ID: 5960
Type: retail
Expiry Date: 1995-12-31
Capacity (L): 127193
Licence #: 0011816001

Site: ***G WUERFEL SERVICE CENTRE & GENERAL STORE***
PT LOT 13 CON 7 HWY 6 FLAMBOROUGH ON

Database: ***PRT***

Location ID: 4906
Type: retail
Expiry Date: 1994-11-30
Capacity (L): 126700
Licence #: 0076407584

Site: ***Parkbridge G/P Inc.***
Site address: 1264 8th Concession Road West, Lot 33, Concession 7, Town of Flamborough (former geographic township of Beverly), City of Hamilton Flamborough ON

Database: ***PTTW***

EBR Registry No.: IA06E0451
Ministry Ref. No.: 3062-6NHT2:
Notice Type: Instrument Decision
Notice Date: July 10, 2006

Proposal Date: April 13, 2006
Year: 2006
Proponent Address: 85 Theme Park Drive, Wasaga Beach Ontario, L0L 2P0
Instrument Type: (OWRA s. 34) - Permit to Take Water
Location Other:

Location:

Site address: 1264 8th Concession Road West, Lot 33, Concession 7, Town of Flamborough (former geographic township of Beverly), City of Hamilton Flamborough

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Site: ***Belmac Estate Properties Inc.***
Property of Belmac Estate Properties Inc. 1294 8th Concession Road West, Lot 32, Concession 7, Original Geographic Township of Beverly, City of Hamilton BEVERLY ON

Database: ***PTTW***

EBR Registry No.: 010-6549
Ministry Ref. No.: 3532-7Q7NLG
Notice Type: Instrument Decision
Notice Date: February 26, 2010
Proposal Date: April 28, 2009
Year: 2009
Proponent Address: 690 River Road West, Wasaga Beach Ontario, Canada L9Z 2P1
Instrument Type: (OWRA s. 34) - Permit to Take Water
Location Other:

Location:

Property of Belmac Estate Properties Inc. 1294 8th Concession Road West, Lot 32, Concession 7, Original Geographic Township of Beverly, City of Hamilton BEVERLY

Site: ***New Country Investors Ltd.***
Ponderosa Nature Resort Wells Lot: 43, Concession: 7, 1218 Concession 8 West, Hamilton CITY OF HAMILTON ON

Database: ***PTTW***

EBR Registry No.: 011-4875
Ministry Ref. No.: 3556-8MEKHK
Notice Type: Instrument Decision
Notice Date: July 04, 2016
Proposal Date: November 04, 2011
Year: 2011
Proponent Address: 1218 Concession , 8 West, Puslinch Ontario, Canada N0B 2J0
Instrument Type: (OWRA s. 34) - Permit to Take Water
Location Other:

Location:

Ponderosa Nature Resort Wells Lot: 43, Concession: 7, 1218 Concession 8 West, Hamilton CITY OF HAMILTON

Site: ***Parkbridge G/P Inc.***
Property of Parkbridge G/P Inc. Lot: 33, Concession: 7, Beverly, City of Hamilton BEVERLY ON

Database: ***PTTW***

EBR Registry No.: 010-6324
Ministry Ref. No.: 4236-7Q7R2D
Notice Type: Instrument Decision
Notice Date: June 10, 2009
Proposal Date: March 31, 2009
Year: 2009
Proponent Address: 85 Theme Park Drive, Wasaga Beach Ontario, L0L 2P0
Instrument Type: (OWRA s. 34) - Permit to Take Water
Location Other:

Location:

Property of Parkbridge G/P Inc. Lot: 33, Concession: 7, Beverly, City of Hamilton BEVERLY

Site: ***FARM***
2 KM ALONG BRANT ROAD #4 SCOTLAND MOTOR VEHICLE (OPERATING FLUID) HAMILTON-WENTWORTH R.M. ON

Database: ***SPL***

Ref No:	68217	***Discharger Report:***	
Site No:		***Material Group:***	
Incident Dt:	3/20/1992	***Client Type:***	
Year:		***Sector Type:***	
Incident Cause:	VALVE/FITTING LEAK OR FAILURE	***Source Type:***	
Incident Event:		***Nearest Watercourse:***	
Contaminant Code:		***Site Name:***	
Contaminant Name:		***Site Address:***	
Contaminant Limit 1:		***Site District Office:***	
Contam Limit Freq 1:		***Site County/District:***	
Contaminant UN No 1:		***Site Postal Code:***	
Contaminant Qty:		***Site Region:***	
Environment Impact:	NOT ANTICIPATED	***Site Municipality:***	16000
Nature of Impact:		***Site Lot:***	
Receiving Medium:	LAND	***Site Conc:***	
Receiving Env:		***Northing:***	
Health/Env Conseq:		***Easting:***	SCOTLAND AGRO-MART, MOE
MOE Response:		***Site Geo Ref Accu:***	
Dt MOE Arvl on Scn:		***Site Geo Ref Meth:***	
MOE Reported Dt:	3/20/1992	***Site Map Datum:***	
Dt Document Closed:			
Agency Involved:			
SAC Action Class:			
Incident Reason:	UNKNOWN		
Incident Summary:	FARM SPREADER-160 KG UREAFROM SPREADER ALONG RD FOR 2 KM,CLEANUP ONGOING.		

Site: ***BFI Canada Inc.***
south Hwy 6, 1 km north of 403 Hamilton ON

Database: ***SPL***

Ref No:	7433-7VFQ36	***Discharger Report:***	
Site No:		***Material Group:***	
Incident Dt:		***Client Type:***	
Year:		***Sector Type:***	Other
Incident Cause:	Unknown	***Source Type:***	
Incident Event:		***Nearest Watercourse:***	
Contaminant Code:	43	***Site Name:***	falling waste<UNOFFICIAL>
Contaminant Name:	GARBAGE	***Site Address:***	
Contaminant Limit 1:		***Site District Office:***	
Contam Limit Freq 1:		***Site County/District:***	
Contaminant UN No 1:		***Site Postal Code:***	
Contaminant Qty:	40 lb	***Site Region:***	
Environment Impact:	Not Anticipated	***Site Municipality:***	Hamilton
Nature of Impact:	Human Health/Safety; Other Impact(s)	***Site Lot:***	
Receiving Medium:		***Site Conc:***	
Receiving Env:		***Northing:***	
Health/Env Conseq:		***Easting:***	
MOE Response:	No Field Response	***Site Geo Ref Accu:***	
Dt MOE Arvl on Scn:		***Site Geo Ref Meth:***	
MOE Reported Dt:	8/31/2009	***Site Map Datum:***	
Dt Document Closed:	11/21/2009		
Agency Involved:			
SAC Action Class:	Land Spills		
Incident Reason:	Spill		
Incident Summary:	BFI Waste: 4 bags of waste fall from truck		

Site: ***Element Bulk Logistics Inc.<UNOFFICIAL>***
Hwy 6, Lincoln-Alexander Pkwy & Red Hill Xprsway Hamilton ON

Database: ***SPL***

Ref No:	2018-A7QV68	***Discharger Report:***	
Site No:	NA	***Material Group:***	
Incident Dt:	2016/03/04	***Client Type:***	
Year:		***Sector Type:***	Miscellaneous Industrial
Incident Cause:		***Source Type:***	
Incident Event:	Leak/Break	***Nearest Watercourse:***	
Contaminant Code:	14	***Site Name:***	Roof Asphalt Flux to roads between Nanticoke & Hamilton<UNOFFICIAL>
Contaminant Name:	ASPHALT SEALER	***Site Address:***	Hwy 6, Lincoln-Alexander Pkwy & Red Hill Xprsway
Contaminant Limit 1:		***Site District Office:***	
Contam Limit Freq 1:		***Site County/District:***	
Contaminant UN No 1:		***Site Postal Code:***	
Contaminant Qty:	1 other - see incident description	***Site Region:***	
Environment Impact:		***Site Municipality:***	Hamilton
Nature of Impact:		***Site Lot:***	
Receiving Medium:		***Site Conc:***	
Receiving Env:	Land	***Northing:***	
Health/Env Conseq:		***Easting:***	
MOE Response:	No	***Site Geo Ref Accu:***	
Dt MOE Arvl on Scn:		***Site Geo Ref Meth:***	
MOE Reported Dt:	2016/03/04	***Site Map Datum:***	
Dt Document Closed:			
Agency Involved:			
SAC Action Class:	Land Spills		
Incident Reason:	Unknown / N/A		
Incident Summary:	Element Bulk Logistics: liquid asphalt between Nanticoke & Hamilton		

Site: ***SHELL CANADA PRODUCTS LTD.***
HWY 6 NORTH OF FREELTON TANK TRUCK (CARGO) FLAMBOROUGH TOWN ON

Database: ***SPL***

Ref No:	75785	***Discharger Report:***	
Site No:		***Material Group:***	
Incident Dt:	9/4/1992	***Client Type:***	
Year:		***Sector Type:***	
Incident Cause:	TRUCK/TRAILER OVERTURN	***Source Type:***	
Incident Event:		***Nearest Watercourse:***	
Contaminant Code:		***Site Name:***	
Contaminant Name:		***Site Address:***	
Contaminant Limit 1:		***Site District Office:***	
Contam Limit Freq 1:		***Site County/District:***	
Contaminant UN No 1:		***Site Postal Code:***	
Contaminant Qty:		***Site Region:***	
Environment Impact:	CONFIRMED	***Site Municipality:***	16404
Nature of Impact:	Soil contamination	***Site Lot:***	
Receiving Medium:	LAND	***Site Conc:***	
Receiving Env:		***Northing:***	
Health/Env Conseq:		***Easting:***	FIRE DEPT., OPP
MOE Response:		***Site Geo Ref Accu:***	
Dt MOE Arvl on Scn:		***Site Geo Ref Meth:***	
MOE Reported Dt:	9/4/1992	***Site Map Datum:***	
Dt Document Closed:			
Agency Involved:			
SAC Action Class:			
Incident Reason:	ERROR		
Incident Summary:	SHELL TANK TRUCK- EXPLOSION AND FIRE. SOME GASOLINE TO GROUND.		

Site: ***SUN-CANADIAN PIPE LINE COMPANY***
SUN CANADIAN PIPELINE LTD. HIGHWAY 6 PIPELINE FLAMBOROUGH TOWN ON

Database: ***SPL***

Ref No:	92723	***Discharger Report:***	
Site No:		***Material Group:***	
Incident Dt:	10/22/1993	***Client Type:***	

Year:		***Sector Type:***	
Incident Cause:	VALVE/FITTING LEAK OR FAILURE	***Source Type:***	
Incident Event:		***Nearest Watercourse:***	
Contaminant Code:		***Site Name:***	
Contaminant Name:		***Site Address:***	
Contaminant Limit 1:		***Site District Office:***	
Contam Limit Freq 1:		***Site County/District:***	
Contaminant UN No 1:		***Site Postal Code:***	
Contaminant Qty:		***Site Region:***	
Environment Impact:	CONFIRMED	***Site Municipality:***	16404
Nature of Impact:	Soil contamination	***Site Lot:***	
Receiving Medium:	LAND	***Site Conc:***	
Receiving Env:		***Northing:***	
Health/Env Conseq:		***Easting:***	
MOE Response:		***Site Geo Ref Accu:***	
Dt MOE Arvl on Scn:		***Site Geo Ref Meth:***	
MOE Reported Dt:	10/25/1993	***Site Map Datum:***	
Dt Document Closed:			
Agency Involved:			
SAC Action Class:			
Incident Reason:	EQUIPMENT FAILURE		
Incident Summary:	SUN CANADIAN PIPELINE - 23L FURNACE OIL/GASOLINE TO SOIL: FLANGE LEAK		

Site: ***RYDER TRUCK RENTAL CANADA LTD.***
ON HWY 6 AT BOTTOM OF CLAPPISON HILL. MOTOR VEHICLE (OPERATING FLUID) FLAMBOROUGH TOWN ON

Database: ***SPL***

Ref No:	180610	***Discharger Report:***	
Site No:		***Material Group:***	
Incident Dt:	5/10/2000	***Client Type:***	
Year:		***Sector Type:***	
Incident Cause:	PIPE/HOSE LEAK	***Source Type:***	
Incident Event:		***Nearest Watercourse:***	
Contaminant Code:		***Site Name:***	
Contaminant Name:		***Site Address:***	
Contaminant Limit 1:		***Site District Office:***	
Contam Limit Freq 1:		***Site County/District:***	
Contaminant UN No 1:		***Site Postal Code:***	
Contaminant Qty:		***Site Region:***	
Environment Impact:	POSSIBLE	***Site Municipality:***	16404
Nature of Impact:	Multi Media Pollution	***Site Lot:***	
Receiving Medium:	LAND / WATER	***Site Conc:***	
Receiving Env:		***Northing:***	
Health/Env Conseq:		***Easting:***	
MOE Response:		***Site Geo Ref Accu:***	
Dt MOE Arvl on Scn:		***Site Geo Ref Meth:***	
MOE Reported Dt:	5/10/2000	***Site Map Datum:***	
Dt Document Closed:			
Agency Involved:			
SAC Action Class:			
Incident Reason:	EQUIPMENT FAILURE		
Incident Summary:	RYDER TRUCK-UKN QTY DIESEL TO DITCH & STORM SEWER.		

Site: ***PROVOST BULK CARRIERS INC.***
EAST SIDE RR #1,BETWEEN CON. 6 AND 7 , HIGHWAY 6, MILL GROVE TANK TRUCK (CARGO) HAMILTON-WENTWORTH R.M. ON

Database: ***SPL***

Ref No:	8454	***Discharger Report:***	
Site No:		***Material Group:***	
Incident Dt:	8/20/1988	***Client Type:***	
Year:		***Sector Type:***	
Incident Cause:	CONTAINER OVERFLOW	***Source Type:***	
Incident Event:		***Nearest Watercourse:***	
Contaminant Code:		***Site Name:***	
Contaminant Name:		***Site Address:***	
Contaminant Limit 1:		***Site District Office:***	
Contam Limit Freq 1:		***Site County/District:***	

Contaminant UN No 1:		***Site Postal Code:***	
Contaminant Qty:		***Site Region:***	
Environment Impact:		***Site Municipality:***	16000
Nature of Impact:		***Site Lot:***	
Receiving Medium:	LAND	***Site Conc:***	
Receiving Env:		***Northing:***	
Health/Env Conseq:		***Easting:***	
MOE Response:		***Site Geo Ref Accu:***	
Dt MOE Arvl on Scn:		***Site Geo Ref Meth:***	
MOE Reported Dt:	8/22/1988	***Site Map Datum:***	
Dt Document Closed:			
Agency Involved:			
SAC Action Class:			
Incident Reason:	UNKNOWN		
Incident Summary:	PROVOST CARTAGE-20 L DIESEL FUEL TO GROUND. 88/08/20		

Site: ***Maple Leaf Foods Inc.***
Northbound Hwy # 6, South of Hwy # 4 at Clappison Corner, Dundas<UNOFFICIAL> Hamilton ON

Database: ***SPL***

Ref No:	5712-6EQE2X	***Discharger Report:***	0
Site No:		***Material Group:***	Waste
Incident Dt:	7/28/2005	***Client Type:***	
Year:		***Sector Type:***	Other
Incident Cause:	Other Transport Accident	***Source Type:***	
Incident Event:		***Nearest Watercourse:***	
Contaminant Code:		***Site Name:***	Northbound Hwy # 6, South of Hwy # 4 at Clappison Corner, Dundas<UNOFFICIAL>
Contaminant Name:	OFFAL	***Site Address:***	
Contaminant Limit 1:		***Site District Office:***	Hamilton
Contam Limit Freq 1:		***Site County/District:***	
Contaminant UN No 1:		***Site Postal Code:***	
Contaminant Qty:		***Site Region:***	
Environment Impact:	Possible	***Site Municipality:***	Hamilton
Nature of Impact:	Soil Contamination	***Site Lot:***	
Receiving Medium:	Land	***Site Conc:***	
Receiving Env:		***Northing:***	
Health/Env Conseq:		***Easting:***	
MOE Response:		***Site Geo Ref Accu:***	
Dt MOE Arvl on Scn:		***Site Geo Ref Meth:***	
MOE Reported Dt:	7/28/2005	***Site Map Datum:***	
Dt Document Closed:			
Agency Involved:			
SAC Action Class:	Spills to Highways (usually highway accidents)		
Incident Reason:	Error- Operator error		
Incident Summary:	Rothsay-Offal onto Hwy # 6,MVA,cleaning		

Site: ***TRANSPORT TRUCK***
HWY 6 NORTHBOUND, RIGHT LANE AT CLAPPISON'S CORNERS MOTOR VEHICLE (OPERATING FLUID)
FLAMBOROUGH TOWN ON

Database: ***SPL***

Ref No:	163815	***Discharger Report:***	
Site No:		***Material Group:***	
Incident Dt:	1/19/1999	***Client Type:***	
Year:		***Sector Type:***	
Incident Cause:	OTHER CONTAINER LEAK	***Source Type:***	
Incident Event:		***Nearest Watercourse:***	
Contaminant Code:		***Site Name:***	
Contaminant Name:		***Site Address:***	
Contaminant Limit 1:		***Site District Office:***	
Contam Limit Freq 1:		***Site County/District:***	
Contaminant UN No 1:		***Site Postal Code:***	
Contaminant Qty:		***Site Region:***	
Environment Impact:	POSSIBLE	***Site Municipality:***	16404
Nature of Impact:	Soil contamination	***Site Lot:***	
Receiving Medium:	LAND	***Site Conc:***	
Receiving Env:		***Northing:***	

Health/Env Conseq:		***Easting:***	MTO,OPP
MOE Response:		***Site Geo Ref Accu:***	
Dt MOE Arvl on Scn:		***Site Geo Ref Meth:***	
MOE Reported Dt:	1/19/1999	***Site Map Datum:***	
Dt Document Closed:			
Agency Involved:			
SAC Action Class:			
Incident Reason:	DAMAGE BY MOVING EQUIPMENT		
Incident Summary:	HARMAC TRANSPORT:150L DIESEL SPILLED TO HWY FROM PUNCTURED SADDLE TK.		

Site: ***Maple Leaf Foods Inc.***
Highway 6 North, Flamborough EAST SHOULDER, CATCHBASINS & OUTFALL ON CLAPPISON'S HILL<UNOFFICIAL> Hamilton ON

Database: ***SPL***

Ref No:	7756-6U7QXJ	***Discharger Report:***	
Site No:		***Material Group:***	Oils
Incident Dt:	10/2/2006	***Client Type:***	
Year:		***Sector Type:***	Transport Truck
Incident Cause:	Overflow (Tanks Lagoons)	***Source Type:***	
Incident Event:		***Nearest Watercourse:***	
Contaminant Code:	14	***Site Name:***	HIGHWAY 6 NORTH, FLAMBOROUGH
Contaminant Name:	GREASE (N.O.S.)	***Site Address:***	HIGHWAY 6 NORTH, FLAMBOROUGH
Contaminant Limit 1:		***Site District Office:***	Hamilton - District
Contam Limit Freq 1:		***Site County/District:***	
Contaminant UN No 1:		***Site Postal Code:***	
Contaminant Qty:	3620 kg	***Site Region:***	
Environment Impact:	Confirmed	***Site Municipality:***	Hamilton
Nature of Impact:	Soil Contamination; Surface Water Pollution	***Site Lot:***	
Receiving Medium:	Land & Water	***Site Conc:***	
Receiving Env:		***Northing:***	
Health/Env Conseq:		***Easting:***	
MOE Response:		***Site Geo Ref Accu:***	
Dt MOE Arvl on Scn:		***Site Geo Ref Meth:***	
MOE Reported Dt:	10/2/2006	***Site Map Datum:***	
Dt Document Closed:			
Agency Involved:			
SAC Action Class:			
Incident Reason:	Equipment/Vehicles		
Incident Summary:	Rothsay Dundas: Grease Spill, Hwy 6 N		

Site: ***FARM***
CONC 5 OFF HWY 6 OUTSKIRTS OF WATERDOWN FLAMBOROUGH TOWN ON

Database: ***SPL***

Ref No:	34191	***Discharger Report:***	
Site No:		***Material Group:***	
Incident Dt:	5/4/1990	***Client Type:***	
Year:		***Sector Type:***	
Incident Cause:	OTHER CAUSE (N.O.S.)	***Source Type:***	
Incident Event:		***Nearest Watercourse:***	
Contaminant Code:		***Site Name:***	
Contaminant Name:		***Site Address:***	
Contaminant Limit 1:		***Site District Office:***	
Contam Limit Freq 1:		***Site County/District:***	
Contaminant UN No 1:		***Site Postal Code:***	
Contaminant Qty:		***Site Region:***	
Environment Impact:	POSSIBLE	***Site Municipality:***	16404
Nature of Impact:	Soil contamination	***Site Lot:***	
Receiving Medium:	LAND / AIR	***Site Conc:***	
Receiving Env:		***Northing:***	
Health/Env Conseq:		***Easting:***	
MOE Response:		***Site Geo Ref Accu:***	
Dt MOE Arvl on Scn:		***Site Geo Ref Meth:***	
MOE Reported Dt:	5/4/1990	***Site Map Datum:***	
Dt Document Closed:			
Agency Involved:			
SAC Action Class:			

Incident Reason: FIRE/EXPLOSION
Incident Summary: 30 BAGS OF FUNGICIDE (DITHANE M45) INVOLVED INBARN FIRE.

Site: ***TRANSPORT TRUCK***
ON HWY. #6 NORTH, .4 KM NORTH OF CONC. 7 IN EAST FLAMBOROUGH TWP. MOTOR VEHICLE (OPERATING FLUID) FLAMBOROUGH TOWN ON

Database: ***SPL***

Ref No:	138205	***Discharger Report:***	
Site No:		***Material Group:***	
Incident Dt:	3/14/1997	***Client Type:***	
Year:		***Sector Type:***	
Incident Cause:	OTHER CONTAINER LEAK	***Source Type:***	
Incident Event:		***Nearest Watercourse:***	
Contaminant Code:		***Site Name:***	
Contaminant Name:		***Site Address:***	
Contaminant Limit 1:		***Site District Office:***	
Contam Limit Freq 1:		***Site County/District:***	
Contaminant UN No 1:		***Site Postal Code:***	
Contaminant Qty:		***Site Region:***	
Environment Impact:	POSSIBLE	***Site Municipality:***	16404
Nature of Impact:	Soil contamination	***Site Lot:***	
Receiving Medium:	LAND	***Site Conc:***	
Receiving Env:		***Northing:***	
Health/Env Conseq:		***Easting:***	OPP, MTO
MOE Response:		***Site Geo Ref Accu:***	
Dt MOE Arvl on Scn:		***Site Geo Ref Meth:***	
MOE Reported Dt:	3/14/1997	***Site Map Datum:***	
Dt Document Closed:			
Agency Involved:			
SAC Action Class:			

Incident Reason: ERROR
Incident Summary: TRANSPORT TRUCK - 100 L OF DIESEL FUEL TO HWY. FROM SADDLE TANK(S).

Site: ***SPIE CONSTRUCTION***
BROCK ROAD FLAMBOROUGH TOWN ON

Database: ***SPL***

Ref No:	41450	***Discharger Report:***	
Site No:		***Material Group:***	
Incident Dt:	9/29/1990	***Client Type:***	
Year:		***Sector Type:***	
Incident Cause:	OTHER CONTAINER LEAK	***Source Type:***	
Incident Event:		***Nearest Watercourse:***	
Contaminant Code:		***Site Name:***	
Contaminant Name:		***Site Address:***	
Contaminant Limit 1:		***Site District Office:***	
Contam Limit Freq 1:		***Site County/District:***	
Contaminant UN No 1:		***Site Postal Code:***	
Contaminant Qty:		***Site Region:***	
Environment Impact:	CONFIRMED	***Site Municipality:***	16404
Nature of Impact:	Soil contamination	***Site Lot:***	
Receiving Medium:	LAND	***Site Conc:***	
Receiving Env:		***Northing:***	
Health/Env Conseq:		***Easting:***	M.O.E.
MOE Response:		***Site Geo Ref Accu:***	
Dt MOE Arvl on Scn:		***Site Geo Ref Meth:***	
MOE Reported Dt:	9/29/1990	***Site Map Datum:***	
Dt Document Closed:			
Agency Involved:			
SAC Action Class:			

Incident Reason: UNKNOWN
Incident Summary: SPIE CONSTRUCTION- DIESEL FUEL TO DITCH.

Appendix: Database Descriptions

Environmental Risk Information Services (ERIS) can search the following databases. The extent of historical information varies with each database and current information is determined by what is publicly available to ERIS at the time of update. ***Note:*** *Databases denoted with " * " indicates that the database will no longer be updated. See the individual database description for more information.*

Abandoned Aggregate Inventory: Provincial AAGR

The MAAP Program maintains a database of abandoned pits and quarries. Please note that the database is only referenced by lot and concession and city/town location. The database provides information regarding the location, type, size, land use, status and general comments.*

Government Publication Date: Sept 2002*

Aggregate Inventory: Provincial AGR

The Ontario Ministry of Natural Resources maintains a database of all active pits and quarries. The database provides information regarding the registered owner/operator, location name, operation type, approval type, and maximum annual tonnage.

Government Publication Date: Up to Sep 2018

Abandoned Mine Information System: Provincial AMIS

The Abandoned Mines Information System contains data on known abandoned and inactive mines located on both Crown and privately held lands. The information was provided by the Ministry of Northern Development and Mines (MNDM), with the following disclaimer: "the database provided has been compiled from various sources, and the Ministry of Northern Development and Mines makes no representation and takes no responsibility that such information is accurate, current or complete". Reported information includes official mine name, status, background information, mine start/end date, primary commodity, mine features, hazards and remediation.

Government Publication Date: 1800-Nov 2016

Anderson's Waste Disposal Sites: Private ANDR

The information provided in this database was collected by examining various historical documents which aimed to characterize the likely position of former waste disposal sites from 1860 to present. The research initiative behind the creation of this database was to identify those sites that are missing from the Ontario MOE Waste Disposal Site Inventory, as well as to provide revisions and corrections to the positions and descriptions of sites currently listed in the MOE inventory. In addition to historic waste disposal facilities, the database also identifies certain auto wreckers and scrap yards that have been extrapolated from documentary sources. Please note that the data is not warranted to be complete, exhaustive or authoritative. The information was collected for research purposes only.

Government Publication Date: 1860s-Present

Automobile Wrecking & Supplies: Private AUWR

This database provides an inventory of known locations that are involved in the scrap metal, automobile wrecking/recycling, and automobile parts & supplies industry. Information is provided on the company name, location and business type.

Government Publication Date: 1999-Jul 31, 2018

Borehole: Provincial BORE

A borehole is the generalized term for any narrow shaft drilled in the ground, either vertically or horizontally. The information here includes geotechnical investigations or environmental site assessments, mineral exploration, or as a pilot hole for installing piers or underground utilities. Information is from many sources such as the Ministry of Transportation (MTO) boreholes from engineering reports and projects from the 1950 to 1990's in Southern Ontario. Boreholes from the Ontario Geological Survey (OGS) including The Urban Geology Analysis Information System (UGAIS) and the York Peel Durham Toronto (YPDT) database of the Conservation Authority Moraine Coalition. This database will include fields such as location, stratigraphy, depth, elevation, year drilled, etc. For all water well data or oil and gas well data for Ontario please refer to WWIS and OOGW.

Government Publication Date: 1875-Jul 2014

Certificates of Approval: Provincial CA

This database contains the following types of approvals: Air & Noise, Industrial Sewage, Municipal & Private Sewage, Waste Management Systems and Renewable Energy Approvals. The MOE in Ontario states that any facility that releases emissions to the atmosphere, discharges contaminants to ground or surface water, provides potable water supplies, or stores, transports or disposes of waste, must have a Certificate of Approval before it can operate lawfully. Fields include approval number, business name, address, approval date, approval type and status. This database will no longer be updated, as CofA's have been replaced by either Environmental Activity and Sector Registry (EASR) or Environmental Compliance Approval (ECA). Please refer to those individual databases for any information after Oct.31, 2011.

Government Publication Date: 1985-Oct 30, 2011*

Commercial Fuel Oil Tanks: Provincial CFOT

List of commercial underground fuel oil tanks made available by the Fuels Safety Program of the Technical Standards & Safety Authority (TSSA). Ontario Regulation 213/01 of the Technical Standards and Safety Act (2000) requires that all underground tanks be registered with the TSSA. Note: the Fuels Safety Division does not register waste oil tanks in apartments, office buildings, residences, etc., or aboveground gas or diesel tanks. Records are not verified for accuracy or completeness. This is not a comprehensive or complete inventory of commercial fuel tanks in the province. The TSSA updates information in its system on an ongoing basis; this listing is a copy of the data captured at one moment in time and is hence limited by the record date provided here.

Government Publication Date: Feb 28, 2017

Chemical Register: Private CHEM

This database includes information from both a one time study conducted in 1992 and private source and is a listing of facilities that manufacture or distribute chemicals. The production of these chemical substances may involve one or more chemical reactions and/or chemical separation processes (i.e. fractionation, solvent extraction, crystallization, etc.).

Government Publication Date: 1999-Jul 31, 2018

Compressed Natural Gas Stations: Private CNG

Canada has a network of public access compressed natural gas (CNG) refuelling stations. These stations dispense natural gas in compressed form at 3,000 pounds per square inch (psi), the pressure which is allowed within the current Canadian codes and standards. The majority of natural gas refuelling is located at existing retail gasoline that have a separate refuelling island for natural gas. This list of stations is made available by the Canadian Natural Gas Vehicle Alliance.

Government Publication Date: Dec 2012 - Jul 2018

Inventory of Coal Gasification Plants and Coal Tar Sites: Provincial COAL

This inventory includes both the "Inventory of Coal Gasification Plant Waste Sites in Ontario-April 1987" and the Inventory of Industrial Sites Producing or Using Coal Tar and Related Tars in Ontario-November 1988) collected by the MOE. It identifies industrial sites that produced and continue to produce or use coal tar and other related tars. Detailed information is available and includes: facility type, size, land use, information on adjoining properties, soil condition, site operators/occupants, site description, potential environmental impacts and historic maps available. This was a one-time inventory.*

Government Publication Date: Apr 1987 and Nov 1988*

Compliance and Convictions: Provincial CONV

This database summarizes the fines and convictions handed down by the Ontario courts beginning in 1989. Companies and individuals named here have been found guilty of environmental offenses in Ontario courts of law.

Government Publication Date: 1989-Sep 2018

Certificates of Property Use: Provincial CPU

This is a subset taken from Ontario's Environmental Registry (EBR) database. It will include all CPU's on the registry such as (EPA s. 168.6) - Certificate of Property Use.

Government Publication Date: 1994-Jul 31, 2018

Drill Hole Database: Provincial DRL

The Ontario Drill Hole Database contains information on more than 113,000 percussion, overburden, sonic and diamond drill holes from assessment files on record with the department of Mines and Minerals. Please note that limited data is available for southern Ontario, as it was the last area to be completed. The database was created when surveys submitted to the Ministry were converted in the Assessment File Research Image Database (AFRI) project. However, the degree of accuracy (coordinates) as to the exact location of drill holes is dependent upon the source document submitted to the MNDM. Levels of accuracy used to locate holes are: centering on the mining claim; a sketch of the mining claim; a 1:50,000 map; a detailed company map; or from submitted a "Report of Work".

Government Publication Date: 1886-Nov 30, 2017

Dry Cleaning Facilities: Federal DRYCLEANERS

List of dry cleaning facilities made available by Environment and Climate Change Canada. Environment and Climate Change Canada's Tetrachloroethylene (Use in Dry Cleaning and Reporting Requirements) Regulations (SOR/2003-79) are intended to reduce releases of tetrachloroethylene to the environment from dry cleaning facilities.

Government Publication Date: Jan 2004-Dec 2016

Environmental Activity and Sector Registry: Provincial EASR

On October 31, 2011, a smarter, faster environmental approvals system came into effect in Ontario. The EASR allows businesses to register certain activities with the ministry, rather than apply for an approval. The registry is available for common systems and processes, to which preset rules of operation can be applied. The EASR is currently available for: heating systems, standby power systems and automotive refinishing. Businesses whose activities aren't subject to the EASR may apply for an ECA (Environmental Compliance Approval), Please see our ECA database.

Government Publication Date: Oct 2011-Sep 30, 2018

Environmental Registry: Provincial EBR

The Environmental Registry lists proposals, decisions and exceptions regarding policies, Acts, instruments, or regulations that could significantly affect the environment. Through the Registry, thirteen provincial ministries notify the public of upcoming proposals and invite their comments. For example, if a local business is requesting a permit, license, or certificate of approval to release substances into the air or water; these are notified on the registry. Data includes: Approval for discharge into the natural environment other than water (i.e. Air) - EPA s. 9, Approval for sewage works - OWRA s. 53(1), and EPA s. 27 - Approval for a waste disposal site. For information regarding Permit to Take Water (PTTW), Certificate of Property Use (CPU) and (ORD) Orders please refer to those individual databases.

Government Publication Date: 1994-Jul 31, 2018

Environmental Compliance Approval: Provincial ECA

On October 31, 2011, a smarter, faster environmental approvals system came into effect in Ontario. In the past, a business had to apply for multiple approvals (known as certificates of approval) for individual processes and pieces of equipment. Today, a business either registers itself, or applies for a single approval, depending on the types of activities it conducts. Businesses whose activities aren't subject to the EASR may apply for an ECA. A single ECA addresses all of a business's emissions, discharges and wastes. Separate approvals for air, noise and waste are no longer required. This database will also include Renewable Energy Approvals. For certificates of approval prior to Nov 1st, 2011, please refer to the CA database. For all Waste Disposal Sites please refer to the WDS database.

Government Publication Date: Oct 2011-Sep 30, 2018

Environmental Effects Monitoring: Federal EEM

The Environmental Effects Monitoring program assesses the effects of effluent from industrial or other sources on fish, fish habitat and human usage of fisheries resources. Since 1992, pulp and paper mills have been required to conduct EEM studies under the Pulp and Paper Effluent Regulations. This database provides information on the mill name, geographical location and sub-lethal toxicity data.

Government Publication Date: 1992-2007*

ERIS Historical Searches: Private EHS

ERIS has compiled a database of all environmental risk reports completed since March 1999. Available fields for this database include: site location, date of report, type of report, and search radius. As per all other databases, the ERIS database can be referenced on both the map and "Statistical Profile" page.

Government Publication Date: 1999-Jul 31, 2018

Environmental Issues Inventory System: Federal EIIS

The Environmental Issues Inventory System was developed through the implementation of the Environmental Issues and Remediation Plan. This plan was established to determine the location and severity of contaminated sites on inhabited First Nation reserves, and where necessary, to remediate those that posed a risk to health and safety; and to prevent future environmental problems. The EIIS provides information on the reserve under investigation, inventory number, name of site, environmental issue, site action (Remediation, Site Assessment), and date investigation completed.

Government Publication Date: 1992-2001*

Emergency Management Historical Event: Provincial EMHE

List of locations of historical occurrences of emergency events, including those assigned to the Ministry of Natural Resources by Order-In-Council (OIC) under the Emergency Management and Civil Protection Act, as well as events where MNR provided requested emergency response assistance. Many of these events will have involved community evacuations, significant structural loss, and/or involvement of MNR emergency response staff. These events fall into one of ten (10) type categories: Dam Failure; Drought / Low Water; Erosion; Flood; Forest Fire; Soil and Bedrock Instability; Petroleum Resource Center Event, EMO Requested Assistance, Continuity of Operations Event, Other Requested Assistance. EMHE record details are reproduced by ERIS under License with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2017.

Government Publication Date: Dec 31, 2016

List of TSSA Expired Facilities: Provincial EXP

List of facilities and tanks - for which there was once a registration - no longer registered with the Fuels Safety Program of the Technical Standards and Safety Authority (TSSA). Includes private fuel outlets, bulk plants, fuel oil tanks, gasoline stations, marinas, propane filling stations, liquid fuel tanks, piping systems, etc. Tanks which have been removed from the ground are included in the expired facilities inventory held by the TSSA. Notes: the Fuels Safety Division did not register private fuel underground/aboveground storage tanks prior to January of 1990, or furnace oil tanks prior to May 1, 2002; nor does the Division register waste oil tanks in apartments, office buildings, residences, etc., or aboveground gas or diesel tanks. Records are not verified for accuracy or completeness. This is not a comprehensive or complete inventory of expired tanks/tank facilities in the province. The TSSA updates information in its system on an ongoing basis; this listing is hence limited by the record date provided here.

Government Publication Date: Feb 28, 2017

Federal Convictions: Federal FCON

Environment Canada maintains a database referred to as the "Environmental Registry" that details prosecutions under the Canadian Environmental Protection Act (CEPA) and the Fisheries Act (FA). Information is provided on the company name, location, charge date, offence and penalty.

Government Publication Date: 1988-Jun 2007*

Contaminated Sites on Federal Land: Federal FCS

The Federal Contaminated Sites Inventory includes information on known federal contaminated sites under the custodianship of departments, agencies and consolidated Crown corporations as well as those that are being or have been investigated to determine whether they have contamination arising from past use that could pose a risk to human health or the environment. The inventory also includes non-federal contaminated sites for which the Government of Canada has accepted some or all financial responsibility. It does not include sites where contamination has been caused by, and which are under the control of, enterprise Crown corporations, private individuals, firms or other levels of government.

Government Publication Date: Jun 2000-May 2018

Fisheries & Oceans Fuel Tanks: Federal FOFT

Fisheries & Oceans Canada maintains an inventory of aboveground & underground fuel storage tanks located on Fisheries & Oceans property or controlled by DFO. Our inventory provides information on the site name, location, tank owner, tank operator, facility type, storage tank location, tank contents & capacity, and date of tank installation.

Government Publication Date: 1964-Sep 2017

Fuel Storage Tank: Provincial FST

List of registered private and retail fuel storage tanks made available by the Fuels Safety Program of the Technical Standards & Safety Authority (TSSA). Ontario Regulation 213/01 of the Technical Standards and Safety Act (2000) requires that all underground tanks be registered with the TSSA. Notes: the Fuels Safety Division did not register private fuel underground/aboveground storage tanks prior to January of 1990, or furnace oil tanks prior to May 1, 2002; nor does the Division register waste oil tanks in apartments, office buildings, residences, etc., or aboveground gas or diesel tanks. Records are not verified for accuracy or completeness. This is not a comprehensive or complete inventory of fuel storage tanks/tank facilities in the province. The TSSA updates information in its system on an ongoing basis; this listing is hence limited by the record date provided here.

Government Publication Date: Feb 28, 2017

Fuel Storage Tank - Historic: Provincial FSTH

The Fuels Safety Branch of the Ontario Ministry of Consumer and Commercial Relations maintained a database of all registered private fuel storage tanks. Public records of private fuel storage tanks are only available since the registration became effective in September 1989. This information is now collected by the Technical Standards and Safety Authority.

Government Publication Date: Pre-Jan 2010*

Ontario Regulation 347 Waste Generators Summary: Provincial GEN

Regulation 347 of the Ontario EPA defines a waste generation site as any site, equipment and/or operation involved in the production, collection, handling and/or storage of regulated wastes. A generator of regulated waste is required to register the waste generation site and each waste produced, collected, handled, or stored at the site. This database contains the registration number, company name and address of registered generators including the types of hazardous wastes generated. It includes data on waste generating facilities such as: drycleaners, waste treatment and disposal facilities, machine shops, electric power distribution etc. This information is a summary of all years from 1986 including the most currently available data. Some records may contain, within the company name, the phrase "See & Use..." followed by a series of letters and numbers. This occurs when one company is amalgamated with or taken over by another registered company. The number listed as "See & Use", refers to the new ownership and the other identification number refers to the original ownership. This phrase serves as a link between the 2 companies until operations have been fully transferred.

Government Publication Date: 1986-June 30, 2018

Greenhouse Gas Emissions from Large Facilities: Federal GHG

List of greenhouse gas emissions from large facilities made available by Environment Canada. Greenhouse gas emissions in kilotonnes of carbon dioxide equivalents (kt CO2 eq).

Government Publication Date: 2013-Dec 2016

TSSA Historic Incidents: Provincial HINC

List of historic incidences of spills and leaks of diesel, fuel oil, gasoline, natural gas, propane, and hydrogen recorded by the TSSA in their previous incident tracking system. The TSSA's Fuels Safety Program administers the Technical Standards & Safety Act 2000, providing fuel-related safety services associated with the safe transportation, storage, handling and use of fuels such as gasoline, diesel, propane, natural gas and hydrogen. Under this Act, the TSSA regulates fuel suppliers, storage facilities, transport trucks, pipelines, contractors and equipment or appliances that use fuels. Records are not verified for accuracy or completeness. This is not a comprehensive or complete inventory of historical fuel spills and leaks in the province. This listing is a copy of the data captured at one moment in time and is hence limited by the record date provided here.

Government Publication Date: 2006-June 2009*

Indian & Northern Affairs Fuel Tanks: Federal IAFT

The Department of Indian & Northern Affairs Canada (INAC) maintains an inventory of aboveground & underground fuel storage tanks located on both federal and crown land. Our inventory provides information on the reserve name, location, facility type, site/facility name, tank type, material & ID number, tank contents & capacity, and date of tank installation.

Government Publication Date: 1950-Aug 2003*

TSSA Incidents: Provincial INC

List of spills and leaks of diesel, fuel oil, gasoline, natural gas, propane, and hydrogen reported to the Spills Action Centre (SAC) and made available by the Technical Standards and Safety Authority (TSSA). Under the Technical Standards & Safety Act (2000), the TSSA regulates fuel suppliers, storage facilities, transport trucks, pipelines, contractors, and equipment or appliances that use fuels. Includes incidents from fuel-related hazards such as spills, fires, and explosions. Records are not verified for accuracy or completeness. This is not a comprehensive or complete inventory of fuel-related leaks, spills, and incidents in the province. The TSSA updates information in its system on an ongoing basis; this listing is hence limited by the record date provided here.

Government Publication Date: Feb 28, 2017

Landfill Inventory Management Ontario: Provincial LIMO

The Landfill Inventory Management Ontario (LIMO) database is updated every year, as the ministry compiles new and updated information. The inventory will include small and large landfills. Additionally, each year the ministry will request operators of the larger landfills complete a landfill data collection form that will be used to update LIMO and will include the following information from the previous operating year. This will include additional information such as estimated amount of total waste received, landfill capacity, estimated total remaining landfill capacity, fill rates, engineering designs, reporting and monitoring details, size of location, service area, approved waste types, leachate of site treatment, contaminant attenuation zone and more. The small landfills will include information such as site owner, site location and certificate of approval # and status.

Government Publication Date: Sep 30, 2017

Canadian Mine Locations: Private MINE

This information is collected from the Canadian & American Mines Handbook. The Mines database is a national database that provides over 290 listings on mines (listed as public companies) dealing primarily with precious metals and hard rocks. Listed are mines that are currently in operation, closed, suspended, or are still being developed (advanced projects). Their locations are provided as geographic coordinates (x, y and/or longitude, latitude). As of 2002, data pertaining to Canadian smelters and refineries has been appended to this database.

Government Publication Date: 1998-2009*

Environmental Penalty Annual Report: Provincial MISA PENALTY

This database contains data from Ontario's annual environmental penalty report published by the Ministry of the Environment and Climate Change. These reports provide information on environmental penalties for land or water violations issued to companies in one of the nine industrial sectors covered by the Municipal Industrial Strategy for Abatement (MISA) regulations.

Government Publication Date: Jan 1, 2011 - Dec 31, 2017

Mineral Occurrences: Provincial MNR

In the early 70's, the Ministry of Northern Development and Mines created an inventory of approximately 19,000 mineral occurrences in Ontario, in regard to metallic and industrial minerals, as well as some information on building stones and aggregate deposits. Please note that the "Horizontal Positional Accuracy" is approximately +/- 200 m. Many reference elements for each record were derived from field sketches using pace or chain/tape measurements against claim posts or topographic features in the area. The primary limiting factor for the level of positional accuracy is the scale of the source material. The testing of horizontal accuracy of the source materials was accomplished by comparing the plan metric (X and Y) coordinates of that point with the coordinates of the same point as defined from a source of higher accuracy.

Government Publication Date: 1846-Jan 2018

National Analysis of Trends in Emergencies System (NATES): Federal NATE

In 1974 Environment Canada established the National Analysis of Trends in Emergencies System (NATES) database, for the voluntary reporting of significant spill incidents. The data was to be used to assist in directing the work of the emergencies program. NATES ran from 1974 to 1994. Extensive information is available within this database including company names, place where the spill occurred, date of spill, cause, reason and source of spill, damage incurred, and amount, concentration, and volume of materials released.

Government Publication Date: 1974-1994*

Non-Compliance Reports: Provincial NCPL

The Ministry of the Environment provides information about non-compliant discharges of contaminants to air and water that exceed legal allowable limits, from regulated industrial and municipal facilities. A reported non-compliance failure may be in regard to a Control Order, Certificate of Approval, Sectoral Regulation or specific regulation/act.

Government Publication Date: Dec 31, 2016

National Defense & Canadian Forces Fuel Tanks: Federal NDFT

The Department of National Defense and the Canadian Forces maintains an inventory of all aboveground & underground fuel storage tanks located on DND lands. Our inventory provides information on the base name, location, tank type & capacity, tank contents, tank class, date of tank installation, date tank last used, and status of tank as of May 2001. This database will no longer be updated due to the new National Security protocols which have prohibited any release of this database.

Government Publication Date: Up to May 2001*

National Defense & Canadian Forces Spills: Federal NDSP

The Department of National Defense and the Canadian Forces maintains an inventory of spills to land and water. All spill sites have been classified under the "Transportation of Dangerous Goods Act - 1992". Our inventory provides information on the facility name, location, spill ID #, spill date, type of spill, as well as the quantity of substance spilled & recovered.

Government Publication Date: Mar 1999-Apr 2018

National Defence & Canadian Forces Waste Disposal Sites: Federal NDWD

The Department of National Defence and the Canadian Forces maintains an inventory of waste disposal sites located on DND lands. Where available, our inventory provides information on the base name, location, type of waste received, area of site, depth of site, year site opened/closed and status.

Government Publication Date: 2001-Apr 2007*

National Energy Board Pipeline Incidents: Federal NEBI

Locations of pipeline incidents from 2008 to present, made available by the National Energy Board (NEB). Includes incidents reported under the Onshore Pipeline Regulations and the Processing Plant Regulations related to pipelines under federal jurisdiction, does not include incident data related to pipelines under provincial or territorial jurisdiction.

Government Publication Date: 2008-Jun 30, 2018

National Energy Board Wells: Federal NEBW

The NEBW database contains information on onshore & offshore oil and gas wells that are outside provincial jurisdiction(s) and are thereby regulated by the National Energy Board. Data is provided regarding the operator, well name, well ID No./UWI, status, classification, well depth, spud and release date.

Government Publication Date: 1920-Feb 2003*

National Environmental Emergencies System (NEES): Federal NEES

In 2000, the Emergencies program implemented NEES, a reporting system for spills of hazardous substances. For the most part, this system only captured data from the Atlantic Provinces, some from Quebec and Ontario and a portion from British Columbia. Data for Alberta, Saskatchewan, Manitoba and the Territories was not captured. However, NEES is also a repository for previous Environment Canada spill datasets. NEES is composed of the historic datasets ' or Trends ' which dates from approximately 1974 to present. NEES Trends is a compilation of historic databases, which were merged and includes data from NATES (National Analysis of Trends in Emergencies System), ARTS (Atlantic Regional Trends System), and NEES. In 2001, the Emergencies Program determined that variations in reporting regimes and requirements between federal and provincial agencies made national spill reporting and trend analysis difficult to achieve. As a consequence, the department has focused efforts on capturing data on spills of substances which fall under its legislative authority only (CEPA and FA). As such, the NEES database will be decommissioned in December 2004.

Government Publication Date: 1974-2003*

National PCB Inventory: Federal NPCB

Environment Canada's National PCB inventory includes information on in-use PCB containing equipment in Canada including federal, provincial and private facilities. Federal out-of-service PCB containing equipment and PCB waste owned by the federal government or by federally regulated industries such as airlines, railway companies, broadcasting companies, telephone and telecommunications companies, pipeline companies, etc. are also listed. Although it is not Environment Canada's mandate to collect data on non-federal PCB waste, the National PCB inventory includes some information on provincial and private PCB waste and storage sites. Some addresses provided may be Head Office addresses and are not necessarily the location of where the waste is being used or stored.

Government Publication Date: 1988-2008*

National Pollutant Release Inventory: Federal NPRI

Environment Canada has defined the National Pollutant Release Inventory ("NPRI") as a federal government initiative designed to collect comprehensive national data regarding releases to air, water, or land, and waste transfers for recycling for more than 300 listed substances.

Government Publication Date: 1993-May 2017

Oil and Gas Wells: Private OGW

The Nickle's Energy Group (publisher of the Daily Oil Bulletin) collects information on drilling activity including operator and well statistics. The well information database includes name, location, class, status and depth. The main Nickle's database is updated on a daily basis, however, this database is updated on a monthly basis. More information is available at www.nickles.com.

Government Publication Date: 1988-April 30, 2018

Ontario Oil and Gas Wells: Provincial OOGW

In 1998, the MNR handed over to the Ontario Oil, Gas and Salt Resources Corporation, the responsibility of maintaining a database of oil and gas wells drilled in Ontario. The OGSR Library has over 20,000+ wells in their database. Information available for all wells in the ERIS database include well owner/operator, location, permit issue date, and well cap date, license No., status, depth and the primary target (rock unit) of the well being drilled. All geology/stratigraphy table information, plus all water table information is also provide for each well record.

Government Publication Date: 1800-May 2018

Inventory of PCB Storage Sites: Provincial OPCB

The Ontario Ministry of Environment, Waste Management Branch, maintains an inventory of PCB storage sites within the province. Ontario Regulation 11/82 (Waste Management - PCB) and Regulation 347 (Generator Waste Management) under the Ontario EPA requires the registration of inactive PCB storage equipment and/or disposal sites of PCB waste with the Ontario Ministry of Environment. This database contains information on: 1) waste quantities; 2) major and minor sites storing liquid or solid waste; and 3) a waste storage inventory.

Government Publication Date: 1987-Oct 2004; 2012-Dec 2013

Orders: Provincial ORD

This is a subset taken from Ontario's Environmental Registry (EBR) database. It will include all Orders on the registry such as (EPA s. 17) - Order for remedial work, (EPA s. 18) - Order for preventative measures, (EPA s. 43) - Order for removal of waste and restoration of site, (EPA s. 44) - Order for conformity with Act for waste disposal sites, (EPA s. 136) - Order for performance of environmental measures.

Government Publication Date: 1994-Jul 31, 2018

Canadian Pulp and Paper: Private PAP

This information is part of the Pulp and Paper Canada Directory. The Directory provides a comprehensive listing of the locations of pulp and paper mills and the products that they produce.

Government Publication Date: 1999, 2002, 2004, 2005, 2009-2014

Parks Canada Fuel Storage Tanks: Federal PCFT

Canadian Heritage maintains an inventory of known fuel storage tanks operated by Parks Canada, in both National Parks and at National Historic Sites. The database details information on site name, location, tank install/removal date, capacity, fuel type, facility type, tank design and owner/operator.

Government Publication Date: 1920-Jan 2005*

Pesticide Register: Provincial PES

The Ontario Ministry of the Environment and Climate Change maintains a database of licensed operators and vendors of registered pesticides.

Government Publication Date: 1988-Mar 2018

TSSA Pipeline Incidents: Provincial PINC

List of pipeline incidents (strikes, leaks, spills) made available by the Technical Standards and Safety Authority (TSSA). Under the Technical Standards & Safety Act (2000), the TSSA regulates fuel suppliers, storage facilities, transport trucks, pipelines, contractors, and equipment or appliances that use fuels. Records are not verified for accuracy or completeness. This is not a comprehensive or complete inventory of pipeline incidents in the province. The TSSA updates information in its system on an ongoing basis; this listing is hence limited by the record date provided here.

Government Publication Date: Feb 28, 2017

Private and Retail Fuel Storage Tanks: Provincial PRT

The Fuels Safety Branch of the Ontario Ministry of Consumer and Commercial Relations maintained a database of all registered private fuel storage tanks and licensed retail fuel outlets. This database includes an inventory of locations that have gasoline, oil, waste oil, natural gas and/or propane storage tanks on their property. The MCCR no longer collects this information. This information is now collected by the Technical Standards and Safety Authority (TSSA).

Government Publication Date: 1989-1996*

Permit to Take Water: Provincial PTTW

This is a subset taken from Ontario's Environmental Registry (EBR) database. It will include all PTTW's on the registry such as OWRA s. 34 - Permit to take water.

Government Publication Date: 1994-Jul 31, 2018

Ontario Regulation 347 Waste Receivers Summary: Provincial REC

Part V of the Ontario Environmental Protection Act ("EPA") regulates the disposal of regulated waste through an operating waste management system or a waste disposal site operated or used pursuant to the terms and conditions of a Certificate of Approval or a Provisional Certificate of Approval. Regulation 347 of the Ontario EPA defines a waste receiving site as any site or facility to which waste is transferred by a waste carrier. A receiver of regulated waste is required to register the waste receiving facility. This database represents registered receivers of regulated wastes, identified by registration number, company name and address, and includes receivers of waste such as: landfills, incinerators, transfer stations, PCB storage sites, sludge farms and water pollution control plants. This information is a summary of all years from 1986 including the most currently available data.

Government Publication Date: 1986-2016

Record of Site Condition: Provincial RSC

The Record of Site Condition (RSC) is part of the Ministry of the Environment's Brownfields Environmental Site Registry. Protection from environmental cleanup orders for property owners is contingent upon documentation known as a record of site condition (RSC) being filed in the Environmental Site Registry. In order to file an RSC, the property must have been properly assessed and shown to meet the soil, sediment and groundwater standards appropriate for the use (such as residential) proposed to take place on the property. The Record of Site Condition Regulation (O. Reg. 153/04) details requirements related to site assessment and clean up.
RSCs filed after July 1, 2011 will also be included as part of the new (O.Reg. 511/09).

Government Publication Date: 1997-Sept 2001, Oct 2004-Sep 2018

Retail Fuel Storage Tanks: Private RST

This database includes an inventory of retail fuel outlet locations (including marinas) that have on their property gasoline, oil, waste oil, natural gas and / or propane storage tanks.

Government Publication Date: 1999-Jul 31, 2018

Scott's Manufacturing Directory: Private SCT

Scott's Directories is a data bank containing information on over 200,000 manufacturers across Canada. Even though Scott's listings are voluntary, it is the most comprehensive database of Canadian manufacturers available. Information concerning a company's address, plant size, and main products are included in this database.

Government Publication Date: 1992-Mar 2011*

Ontario Spills: Provincial SPL

This database identifies information such as location (approximate), type and quantity of contaminant, date of spill, environmental impact, cause, nature of impact, etc. Information from 1988-2002 was part of the ORIS (Occurrence Reporting Information System). The SAC (Spills Action Centre) handles all spills reported in Ontario. Regulations for spills in Ontario are part of the MOE's Environmental Protection Act, Part X.

Government Publication Date: 1988-Jul 2018

Wastewater Discharger Registration Database: Provincial SRDS

Information under this heading is combination of the following 2 programs. The Municipal/Industrial Strategy for Abatement (MISA) division of the Ontario Ministry of Environment maintained a database of all direct dischargers of toxic pollutants within nine sectors including: Electric Power Generation; Mining; Petroleum Refining; Organic Chemicals; Inorganic Chemicals; Pulp & Paper; Metal Casting; Iron & Steel; and Quarries. All sampling information is now collected and stored within the Sample Result Data Store (SRDS).

Government Publication Date: 1990-Dec 31, 2016

Anderson's Storage Tanks: Private TANK

The information provided in this database was collected by examining various historical documents, which identified the location of former storage tanks, containing substances such as fuel, water, gas, oil, and other various types of miscellaneous products. Information is available in regard to business operating at tank site, tank location, permit year, permit & installation type, no. of tanks installed & configuration and tank capacity. Data contained within this database pertains only to the city of Toronto and is not warranted to be complete, exhaustive or authoritative. The information was collected for research purposes only.

Government Publication Date: 1915-1953*

Transport Canada Fuel Storage Tanks: Federal TCFT

List of fuel storage tanks currently or previously owned or operated by Transport Canada. This inventory also includes tanks on The Pickering Lands, which refers to 7,530 hectares (18,600 acres) of land in Pickering, Markham, and Uxbridge owned by the Government of Canada since 1972; properties on this land has been leased by the government since 1975, and falls under the Site Management Policy of Transport Canada, but is administered by Public Works and Government Services Canada. This inventory provides information on the site name, location, tank age, capacity and fuel type.

Government Publication Date: 1970-Aug 2017

TSSA Variances for Abandonment of Underground Storage Tanks: Provincial VAR

List of variances granted for abandoned tanks. Under the Technical Standards and Safety Authority (TSSA) Liquid Fuels Handling Code and Fuel Oil Code, all underground storage tanks must be removed within two years of disuse. If removal of a tank is not feasible, an application may be sought for a variance from this code requirement.
Records are not verified for accuracy or completeness. This is not a comprehensive or complete inventory of tank variances in the province. The TSSA updates information in its system on an ongoing basis; this listing is hence limited by the record date provided here.

Government Publication Date: Feb 28, 2017

Waste Disposal Sites - MOE CA Inventory: Provincial WDS

The Ontario Ministry of Environment, Waste Management Branch, maintains an inventory of known open (active or inactive) and closed disposal sites in the Province of Ontario. Active sites maintain a Certificate of Approval, are approved to receive and are receiving waste. Inactive sites maintain Certificate(s) of Approval but are not receiving waste. Closed sites are not receiving waste. The data contained within this database was compiled from the MOE's Certificate of Approval database. Locations of these sites may be cross-referenced to the Anderson database described under ERIS's Private Source Database section, by the CA number. All new Environmental Compliance Approvals handed out after Oct 31, 2011 for Waste Disposal Sites will still be found in this database.

Government Publication Date: Oct 2011-Sep 30, 2018

Waste Disposal Sites - MOE 1991 Historical Approval Inventory: Provincial WDSH

In June 1991, the Ontario Ministry of Environment, Waste Management Branch, published the "June 1991 Waste Disposal Site Inventory", of all known active and closed waste disposal sites as of October 30st, 1990. For each "active" site as of October 31st 1990, information is provided on site location, site/CA number, waste type, site status and site classification. For each "closed" site as of October 31st 1990, information is provided on site location, site/CA number, closure date and site classification. Locations of these sites may be cross-referenced to the Anderson database described under ERIS's Private Source Database section, by the CA number.

Government Publication Date: Up to Oct 1990*

Water Well Information System: Provincial WWIS

This database describes locations and characteristics of water wells found within Ontario in accordance with Regulation 903. It includes such information as coordinates, construction date, well depth, primary and secondary use, pump rate, static water level, well status, etc. Also included are detailed stratigraphy information, approximate depth to bedrock and the approximate depth to the water table.

Government Publication Date: Dec 31, 2017

Definitions

Database Descriptions: This section provides a detailed explanation for each database including: source, information available, time coverage, and acronyms used. They are listed in alphabetic order.

Detail Report: This is the section of the report which provides the most detail for each individual record. Records are summarized by location, starting with the project property followed by records in closest proximity.

Distance: The distance value is the distance between plotted points, not necessarily the distance between the sites' boundaries. All values are an approximation.

Direction: The direction value is the compass direction of the site in respect to the project property and/or center point of the report.

Elevation: The elevation value is taken from the location at which the records for the site address have been plotted. All values are an approximation. Source: Google Elevation API.

Executive Summary: This portion of the report is divided into 3 sections:

'Report Summary'- Displays a chart indicating how many records fall on the project property and, within the report search radii.

'Site Report Summary'-Project Property'- This section lists all the records which fall on the project property. For more details, see the 'Detail Report' section.

'Site Report Summary-Surrounding Properties'- This section summarizes all records on adjacent properties, listing them in order of proximity from the project property. For more details, see the 'Detail Report' section.

Map Key: The map key number is assigned according to closest proximity from the project property. Map Key numbers always start at #1. The project property will always have a map key of '1' if records are available. If there is a number in brackets beside the main number, this will indicate the number of records on that specific property. If there is no number in brackets, there is only one record for that property.

The symbol and colour used indicates 'elevation': the red inverted triangle will dictate 'ERIS Sites with Lower Elevation', the yellow triangle will dictate 'ERIS Sites with Higher Elevation' and the orange square will dictate 'ERIS Sites with Same Elevation.'

Unplottables: These are records that could not be mapped due to various reasons, including limited geographic information. These records may or may not be in your study area, and are included as reference.

APPENDIX E
QUALIFICATIONS

Grace P. Ferguson M.Sc., P.Eng.

Senior Hydrogeologist

Grace is a senior hydrogeologist in Stantec's Environmental Services group with more than 20 years' experience in contaminated site management. She offers clients the benefit of her technical knowledge and experience in solving a variety of environmental challenges. She has managed environmental site assessment, monitoring, and remediation projects for a wide cross-section of service sectors, including road and rail transportation, commercial real estate, the petroleum industry, insurance, land development, the Canadian Forces, industry, and waste management. This wide range of experience provides her the vision to see complex projects through from planning to closure.

Grace is a licensed Professional Engineer in the Province of Ontario and is recognized by the Ontario Ministry of the Environment, Conservation and Parks as a Qualified Person for Environmental Site Assessment under Ontario Regulation 153/04. She is also listed as a contaminant/waste specialist with the Ontario Ministry of Transportation.

EDUCATION

M.Sc., University of Waterloo / Hydrogeology, Waterloo, Ontario, 2001

B.A.Sc., University of Waterloo / Geological Engineering, Waterloo, Ontario, 1993

REGISTRATIONS

Professional Engineer #90427949, Professional Engineers Ontario, Feb 9/96

PROJECT EXPERIENCE

Environmental Risk Assessments

Risk Management Plans for Risk Assessment, Toronto, Ontario (Senior Reviewer)
Developed and reviewed risk management plans (RMPs) as part of Risk Assessments for the management of remaining soil and groundwater impacts at three former industrial sites in Toronto, in support of RSCs and to facilitate future developments.

Risk Management Plans for Redevelopment, Southern Ontario (Senior Reviewer)
Developed and reviewed risk management plans (RMPs) as part of Risk Assessments for the management of remaining soil and groundwater impacts at former petroleum sites in Elora, Barrie, Cookstown and Cambridge, Ontario.

Risk Management Plan and RSC Support, Burlington, Ontario (Qualified Person for ESA)
Provided support and input to environmental investigations for the filing of an RSC at a retirement home impacted by petroleum from an adjacent property. Developed a risk management plan for a risk assessment and reviewed updated reporting to support the RSC.

** denotes projects completed with other firms*

Grace P. Ferguson M.Sc., P.Eng.

Senior Hydrogeologist

Environmental Site Assessments Phase I, II, III

Contamination Overview Studies and Phase II Environmental Site Assessment, Peel Watermain Projects, Mississauga, Ontario (Environmental Specialist)
Completion of contamination overview studies and environmental sampling to assess the potential for generation of contaminated soil during watermain replacement work along three existing and future roadways in Mississauga. Provided fill management options for consideration in construction tendering.

Phase I ESAs Commercial Portfolio, Southern Ontario (Project Manager and Senior Reviewer)
Oversight of 10 Phase I ESAs as part of a Canada-Wide due diligence portfolio for a large commercial client. Also provided senior review of Phase I ESA reports for several of the portfolio sites.

Phase I and II Environmental Site Assessments, Commercial Properties, Kitchener, Ontario (Project Manager)
Managed and reviewed ESAs of commercial properties for financing due diligence.

Phase One and Two Environmental Site Assessments, Commercial Property, Kitchener, Ontario (Project Manager)
Managed and reviewed ESAs of a used car lot and former industrial site for due diligence in advance of potential purchase and redevelopment of the Kitchener downtown core.

Contamination Overview Study and Environmental Sampling, Windsor-Detroit Tunnel Plaza, Windsor, Ontario (Environmental Project Lead)
Managed the completion of an assessment of potential environmental concerns that could affect redevelopment of a border crossing facility.

Contamination Assessments of Road Transportation Systems, Ontario (Environmental Project Lead)
Completed contamination overview studies, preliminary site screenings, or excess materials management plans at approximately 25 existing and proposed Ontario Ministry of Transportation roadways and interchanges to support preliminary and detailed design transportation projects.

Phase I ESAs, Commercial and Industrial Properties, Kitchener, Ontario (Project Manager)
Senior technical support and review for assessments at 10 properties for due diligence purposes.

Environmental Investigation, Industrial Facility, Walkerton, Ontario (Project Manager)
Project manager for the assessment, monitoring and development of remedial options for VOC impacts to groundwater at an active industrial facility.

** denotes projects completed with other firms*

Grace P. Ferguson M.Sc., P.Eng.

Senior Hydrogeologist

Environmental Investigations, Redevelopment Site, Vaughan, Ontario (Project Manager)
Project manager for several environmental investigations relating to the redevelopment of Secondary Buffer lands surrounding a recently closed landfill site. These included Phase 1 and Phase 2 environmental site assessments, development of a groundwater monitoring program for a new golf course, and remediation of environmental impacts along a future road realignment. The project involved extensive consultation with MOE and municipal and private stakeholders.

Environmental Site Assessment, Rail Yard, Woodstock, Ontario (Project Manager)
Completion of a hydrogeological assessment of a rail yard facility, including test pit excavation, borehole drilling, monitoring well and drive point piezometer installation, soil and groundwater sampling, and hydraulic conductivity testing. Provided senior technical review of on-going groundwater monitoring activities.

Environmental Review, Proposed Development Site, Kitchener, Ontario (Senior Reviewer)
Completed a review of historical environmental work done at a property and assessed the level of effort and cost to complete the necessary work to support the filing of a Record of Site Condition with the Ontario Ministry of the Environment. This was done to determine the feasibility of site re-use options.

Environmental Site Assessments, Parkway West Compressor Station, Milton, Ontario (Environmental Specialist)
Grace managed Phase One and Phase Two Environmental Site Assessments of four parcels of land being acquired to develop a natural gas compressor station. In addition, she also managed a soil excavation program to remediate surficial impacted soil at one parcel prior to site development, and supported the client in determining off-site fill management options during development.

Environmental Retainer, Various Sites, Greater Toronto Area, Ontario (Project Manager)
Managed numerous environmental site assessments and monitoring projects at client-owned properties in advance of site redevelopment for transportation systems as part of a two-year retainer assignment. Managed Phase II ESAs , co-ordinated designated substance surveys and geophysical surveys, and recommended and implemented remedial excavation programs. Also managed on-going monitoring program at a client-owned landfill site.

Environmental Investigation, Rail Yards, Northern Ontario (Project Manager)
Senior technical reviewer for quarterly and annual groundwater monitoring at a railyard with petroleum impacts to soil and groundwater. Previously project manager for hydrogeological investigations at the yard from 2000 to 2005. Completed a remedial options/feasibility study and developed a remedial action plan to address both on-site and off-site impacts. Co-ordinated drilling and initial sampling of private domestic wells at several off-site and on-site locations.

** denotes projects completed with other firms*

Grace P. Ferguson M.Sc., P.Eng.

Senior Hydrogeologist

Phase I and II Environmental Site Assessment, Commercial/Industrial facility, Mississauga, Ontario (Project Manager)
Project management and senior technical support for a comprehensive Phase I and II ESA at a former petrochemical research and development facility in an urbanized area. Developed a conceptual site model of subsurface conditions and facilitated an understanding of potential environmental liabilities associated with the property.

Environmental Site Assessment and RSC Filing, Cambridge, Ontario (Reviewer, ESA)
Grace was a quality reviewer and QPESA for assessment of several adjacent properties to be redeveloped into a residential complex. She completed Phase One, Two and limited remediation and filed an RSC in accordance with O.Reg. 153/04 for one property that had experienced commercial use.

Phase I ESA, Wind Farm Development, Grand Valley, Ontario (Senior technical reviewer)
Provided senior review support to a Phase I ESA of a large network of proposed wind turbines, distribution lines, transformer station, and storage areas forming part of a wind farm that was under development. Identified potential environmental concerns and provided guidance to the client to manage them.

Environmental Investigation, Petrochemical Terminal Facility, Oakville, Ontario (Senior Technical Reviewer)
Senior hydrogeological technical support to an ongoing groundwater investigation at a large petrochemical terminal site. Work was done to fulfill ECA obligations associated with a phytoremediation program, and to better understand environmental conditions across the property.

Contamination Overview Study and Construction Support, King and Fountain Street Improvements, Cambridge, Ontario (Environmental Specialist)
Managed and reviewed a contamination overview study of several roadways in advance of reconstruction. Also provided ongoing environmental and waste management support for excess materials management during construction, including storage tank removals.

Contamination Overview Study and Phase I ESAs, Franklin Boulevard, Cambridge, Ontario (Project Manager)
Project manager and senior reviewer for an assessment of potential sources of contamination along an 8 km roadway and completion of 30 Phase I ESAs adjacent to the roadway, as part of detailed design for road improvements.

Phase One Environmental Site Assessment, Former Golf Course, Southern Ontario, Southern Ontario (Senior Reviewer)
Senior reviewer of a Phase One ESA completed for due diligence in advance of a potential sale of the property. The Phase One ESA was completed to the regulation standards prescribed by O.Reg. 153/04, as amended.

** denotes projects completed with other firms*

Grace P. Ferguson M.Sc., P.Eng.

Senior Hydrogeologist

Phase One and Two ESAs, Risk Assessment and Record of Site Condition, Northern Ontario (Senior Reviewer)
As a QPESA Grace provided senior level review for assessments of two former gasoline service stations. Phase One and Two ESAs were completed to the revised regulatory standards prescribed by O. Reg. 153/04 to support a Risk Assessment (RA) and Record of Site Condition (RSC). She developed a risk management plan for the RA at one site and filed a RSC.

Phase One and Two Environmental Site Assessment, Scrap Metal Facility, Kitchener, Ontario (Project Manager)
Project Manager and Senior Reviewer for Phase One and Two ESAs of a brownfield site to support potential sale and / or redevelopment. ESAs were completed to the regulatory standards prescribed by O.Reg. 153/04, as amended.

Environmental Assessments, Redevelopment Site, Kitchener, Ontario (Project Manager)
Phase I Environmental Site Assessment of a construction maintenance yard and surrounding undeveloped land. Development of recommendations for assessment work to support redevelopment approvals. Completion of environmental monitoring following limited removal of impacted soil, and environmental observation and verification sampling during removal of fuel storage facilities.

Contamination Overview Study, Phase I/II Environmental Site Assessment, and Construction Support, Weber Street Redevelopment, Kitchener, Ontario (Environmental Specialist)
Managed and reviewed a contamination overview study and Phase II Environmental Site Assessment to identify and assess potential environmental concerns along a 1.2 km section of Weber Street in Kitchener, as part of preliminary and detailed design for road reconstruction. Also provided ongoing environmental and waste management support for excess materials management during construction, including storage tank removals.

Phase I and II Environmental Site Assessments, 104 Retail Service Stations, Southern Ontario (Project Manager)
Key Project Manager for 25 of 104 retail gasoline service station sites assessed during a 60 day due diligence period. Responsible for project management and senior review of Phase I and Phase II ESAs.

Phase I and II Environmental Site Assessment and CA Support, Detroit-Windsor Truck Ferry, Windsor, Ontario (Project Manager)
Completion of Phase I and II ESA and development of waste management options at a truck ferry terminal, in preparation for infrastructure improvements. Provided ongoing support to Contract Administrator with respect to waste management and environmental issues.

Phase I ESA, Industrial Facilities, Ontario (Project Manager)
Environmental site assessments, including historical review and site reconnaissance, of an industrial plastics manufacturer and a food packaging plant.

** denotes projects completed with other firms*

Grace P. Ferguson M.Sc., P.Eng.

Senior Hydrogeologist

Environmental Site Assessment of Fisherman's Pier Lands, Hamilton and Burlington, Ontario (Project Hydrogeologist)
Completed an Environmental Site Assessment (ESA) as part of a planning study to examine potential redevelopment options for lands known as Fisherman's Pier. Identified current and historical land uses of potential environmental concern.

Environmental Assessment, Redevelopment Site, Milton, Ontario (Project Manager)
Completed a Phase I/II ESA at a vacant site and filed a Record of Site Condition to support redevelopment as a commercial facility.

Phase I and II ESAs, Highway Maintenance Patrol Yards*, Lambton and Simcoe Counties, Ontario (Project Manager)
Project manager and primary field personnel for soil and groundwater investigations at 11 maintenance patrol yards, using borehole drilling, well sampling and geophysical methods.

Phase I ESA, Various Properties, Ontario (Project Manager)
Historical reviews, site reconnaissance, reporting and senior review of commercial, institutional and vacant properties for financial institutions and land developers.

Environmental Evaluations, Federally Owned Properties*, Pickering, Ontario (Project Manager)
Completion of environmental evaluations of more than 70 rural residential, commercial, vacant and agricultural properties within the proposed Pickering Airport lands, Pickering, Ontario. Evaluations included a site reconnaissance, testing of building materials for suspected designated substances, and potable water sampling.

Phase I ESAs, Various Properties*, Ontario and Manitoba (Project Hydrogeologist)
Environmental assessments, including historical review and site reconnaissance of more than 80 residential, institutional, commercial, industrial and vacant properties in Ontario and Manitoba for various financial institutions, developers, individuals and government agencies. Institutional properties included approximately 20 nursing homes and retirement facilities.

Environmental and Historical Review, Mixed Land Use Area, Hamilton, Ontario (Project Hydrogeologist)
Environmental review of several industrial, commercial and vacant properties in the Hamilton West Harbour area as part of redevelopment planning.

Phase I and II ESAs, Various Facilities*, Toronto and Owen Sound, Ontario (Project Hydrogeologist)
Assessment of environmental conditions, including potential soil and groundwater impacts, at a former auto repair facility, a commercial property, an inactive industrial site and a former landfill site.

** denotes projects completed with other firms*

Grace P. Ferguson M.Sc., P.Eng.

Senior Hydrogeologist

Phase I and II Environmental Site Assessment (ESA), Former Industrial Facility, London, Ontario (Project Manager)

Project manager for a Phase I/II ESA to assess soil and groundwater conditions prior to purchase of a portion of vacant land formerly used as an industrial facility.

** denotes projects completed with other firms*

Janice M. Cooper M.Sc., EIT

Environmental Scientist

Janice is a Master's of Science graduate interested in the management and remediation of contaminated sites. The topic of her Master's thesis was the investigation of thermally-activated persulfate as a potential in situ remediation technique for per- and polyfluoroalkyl substances, specifically PFOA and PFOS. Prior to her graduate studies, Janice was a co-op student in Environmental Engineering, and spent a year working with Stantec in the Community Development and Environmental Services teams. She has experience in the field working on activities relating to Phase I, II, and III Environmental Site Assessments (ESAs), soil and groundwater remediation, and environmental site monitoring. From a reporting perspective, Janice developed strong research and technical writing skills through her Master's program.

EDUCATION

Master's of Science, University of Waterloo/ Master's of Science (Water), Waterloo, Ontario, 2018

Bachelor's of Applied Science, University of Waterloo/ Environmental Engineering Co-Op Program, Waterloo, Ontario, 2015

CERTIFICATIONS & TRAINING

Standard First Aid with CPR B & AED, Rescue 7 First Aid, Markham, Ontario, 2017

Enbridge 2018 Contractor Safety & Environmental Orientation, Waterloo, Ontario, 2018

Shell Retail Contractor Orientation, Waterloo, Ontario, 2018

Husky Energy Corporate Safety Orientation - Field, Waterloo, Ontario, 2018

TNPI Health & Safety for Contractors & Field Staff, Waterloo, Ontario, 2018

Petroleum Oriented Safety Training, Waterloo, Ontario, 2018

Suncor Energy Health & Safety Rules, Waterloo, Ontario, 2018

198950, Canadian National Contractor Safety Program, Waterloo, Ontario, 2018

Installer (non-freeway & TCP) Work Zone Traffic Control and Safety Course, Arges Training & Consulting, Mississauga, Ontario, 2018

Certificate of Achievement, POST 2019 LEVEL 2 - BBS - Orientation and Test, Waterloo, Ontario, 2019

REGISTRATIONS

Engineer-In-Training #100225036, Professional Engineers Ontario

PROJECT EXPERIENCE

Environmental Site Assessments Phase I, II, III

Environmental Phase II Groundwater Monitoring, Kapuskasing, Ontario (Field Technician)

Janice assisted with groundwater monitoring activities at two gas station locations in Kapuskasing, ON in support of a Phase II Environmental Site Assessment.

South Kitchener District Park, Kitchener, Ontario (Field Technician)

Janice supervised the removal of a UST and the associated excavation activities, supervised supplemental drilling and conducted well development around the site of the UST excavation, and completed stockpile sampling for movement of on-site materials.

Janice M. Cooper M.Sc., EIT

Environmental Scientist

Site Investigation Services and MNA, CFB Trenton, Trenton, Ontario (Field Technician, Laboratory Technician)
Janice assisted with the laboratory component of the monitored natural attenuation (MNA) program at the Trenton Air Force Base, as well as the groundwater sampling program component of a Phase II Environmental Assessment.

Phase I ESA, Ottawa, Ontario (Environmental Scientist)
Janice completed the Phase One reporting and historical record review for a former vehicle maintenance and service facility located in Ottawa, Ontario. Based on the findings of the Phase I ESA, a Phase II ESA work plan was developed and completed for the site, including soil and groundwater investigation.

Phase I ESA, Chatham, Ontario (Environmental Scientist)
Janice assisted with the reporting and historical review for the Phase I ESA for an active industrial property located in Chatham, Ontario.

Phase I ESA, Kingsville, Ontario (Environmental Scientist)
Janice assisted with the Phase I reporting for a Phase I conducted along a hydro easement with multiple site parcels.

Phase II ESA, Toronto, Ontario (Environmental Scientist)
Janice assisted with the Phase II reporting for various phases of a large development in Toronto, Ontario in support of a future Record of Site Condition submission.

Environmental Site Assessments

Contaminant Overview Study for the Highway 401 Planning Study from Cobourg to Colborne, Cobourg, Ontario (Environmental Scientist)
Janice completed the site visit, historical review, and reporting for the Contaminant Overview Study (COS) in support of the Highway 401 Planning Study from Cobourg to Colborne.

Contaminant Overview Study for Union Gas Limited Windsor Line Replacement, Windsor, Ontario (Environmental Scientist)
Janice assisted with the completion of the site visit, historical review, and reporting for the COS in support of the Union Gas project along the Windsor Union Gas easement.

Environmental Site Management

Chicopee Fill Management, Kitchener, Ontario (Environmental Scientist)
Janice assisted with the revision of the soil management plan for Chicopee Ski Hill according to the requirements of O. Reg. 153.

Residential Stormwater Pond Sampling, Waterloo, Ontario (Environmental Scientist)
Janice assisted with field coordination to conduct stormwater pond sediment sampling in support of Community Development project. She also helped to collect samples on Site using both Ponar and hand augering methods.

Janice M. Cooper M.Sc., EIT
Environmental Scientist

Pipeline Integrity Work (Environmental Scientist)
Janice assumed a role of laboratory coordinator in support of several concurrent projects related to investigations around Trans Canada pipelines. Janice coordinated with the lab and project managers to ensure that lab reporting met the project requirements for quality and timeliness. Summarizing, archiving, and drafting e-mail summaries was also required in order to support prompt communication with the client.

Groundwater Monitoring and Reporting

Woodstock Home Hardware Groundwater Program, Woodstock, Ontario (Environmental Scientist)
Janice conducted the field coordination for the 2018 groundwater monitoring season, and communicated with the client and project manager for this Site. She also assisted with the groundwater monitoring and sampling events, in addition to surveying monitoring wells at the Site.

Husky Oil Operations Limited | Downstream Portfolio Management 2018, Multiple Sites, Alberta and Ontario (Environmental Scientist)
Janice assisted with both the groundwater monitoring and sampling activities, as well as reporting tasks for the 2018 Husky monitoring season. UST nest inspections were a component of the on-site work, in addition to well development and low-flow sampling.

Uqsuq Groundwater Monitoring and Sampling Program, Iqaluit, Nunavut (Environmental Scientist)
Janice assisted with the field coordination and field-work component for on-going programs at various sites in Iqaluit. The groundwater monitoring and sampling activities were used to track the impacts of petroleum hydrocarbon spills.

Annual Groundwater Program, North Bay, Ontario (Environmental Scientist)
Janice completed the groundwater monitoring and sampling program at a former chemical manufacturing facility in North Bay, Ontario. She also completed the reporting tasks associated with this program.

Environmental Site Remediation

Longlac Treatment System Design, Longlac, Ontario (Engineering Intern)
Janice assisted with the design of a pump-and-treat system for the remediation of PHC-contaminated groundwater under the supervision of a P.Eng.

Bronte Creek Environmental Remediation, Oakville, Ontario (Environmental Scientist)
Janice used GWSdat to prepare time series and contour plots in support of the evaluation of the effectiveness of monitored natural attenuation and employment of oxygen releasing compounds at this Site. These activities were conducted in support of the Remedial Action Plan to address a historical release of petroleum hydrocarbons into the ecologically sensitive Site. Janice also assisted with various reporting deliverables and participated in a stakeholder meeting with all involved parties.

MP1867.05 Remedial Options, Hamilton, Ontario (Environmental Scientist)
Janice assisted with the development of a remedial options analysis for contamination around a pipeline to determine the best course of action to manage on-Site contamination.

Janice M. Cooper M.Sc., EIT
Environmental Scientist

Emergency Response
Pipeline Release Emergency Response, Ontario (Environmental Scientist)
Janice assisted with soil and air quality sampling in support of emergency response to a small pipeline release that crossed onto an agricultural property.

Wind Power
South Branch Wind Farm 30 MW, Morrisburg and Brinston, Ontario (Field Technologist)
An Environmental Effects Monitoring Plan was developed and a three-year post-construction monitoring program of a 30 MW wind power facility was required. Janice helped conduct bird and bat mortality monitoring, searcher efficiency, and scavenger trials throughout the field season.

PUBLICATIONS

Cooper, Janice M.. Investigation of the Efficacy of in situ Degradation Methods for Perfluorooctanoic Acid (PFOA) and Perfluorooctane Sulfonic Acid (PFOS) in Groundwater, Master's Thesis, University of Waterloo, 2018.

APPENDIX F:
STAGE 1 ARCHAEOLOGICAL ASSESSMENT



Stage 1 Archaeological Assessment: Kirkwall – Hamilton Pipeline Project

Parts of Various Lots and Concessions,
Geographic Townships of Beverly, West Flamborough, and East Flamborough,
former Wentworth County,
now City of Hamilton, Ontario

June 18, 2019

Prepared for:

Enbridge Gas Inc.
50 Keil Drive North
Chatham, Ontario N7M 5M1

Prepared by:

Stantec Consulting Ltd.
600-171 Queens Avenue
London, Ontario N6A 5J7

Licensee: Parker Dickson, MA
License Number: P256
PIF Number: P256-0564-2018
Project Number: 160961299

ORIGINAL REPORT

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Executive Summary

Stantec Consulting Ltd. (Stantec) was retained by Enbridge Gas Inc. (Enbridge Gas) to complete a Stage 1 archaeological assessment for the Kirkwall – Hamilton Pipeline Project (the Project). Note: As of January 1, 2019, Union Gas Ltd. and Enbridge Gas Distribution have amalgamated into one utility with the legal name Enbridge Gas Inc. The Project Area, or study area, for the Stage 1 assessment of the Project comprises approximately 6,400 hectares of various Lots and Concessions, Geographic Townships of Beverly, West Flamborough, and East Flamborough, former Wentworth County, now City of Hamilton, Ontario. The Stage 1 archaeological assessment was conducted during the preliminary planning phase of the Project in accordance with the provisions of the *Ontario Heritage Act* (Government of Ontario 1990a) and the requirements of Section 4.3.4 of the Ontario Energy Board's (OEB) *Environmental Guidelines for the Location, Construction and Operation of Hydrocarbon Pipelines and Facilities in Ontario, 7th Edition* (OEB 2016). The final route and construction easement, including any temporary land use, for the Project will be determined at a later date. Thus, the current study area for the Stage 1 archaeological assessment is large and serves to capture a broad and generalized geographic area associated with the Project.

The Stage 1 archaeological assessment was completed under Project Information Form (PIF) # P256-0564-2019 issued to Parker Dickson, MA, of Stantec, by the Ministry of Tourism, Culture and Sport (MTCS). Permission for Stantec staff to enter the study area for the purposes of the Stage 1 archaeological assessment was not required as a property inspection was not required.

The Stage 1 archaeological assessment determined that the entirety of the study area retains potential for the identification of pre-contact Indigenous, post-contact Indigenous, and Euro-Canadian archaeological resources. Numerous farm complexes, residences, municipal rights-of-way (ROWs), and other existing features (i.e., existing roads, railways, residential and commercial complexes, and buried utilities and infrastructure) are located throughout the study area; however, they were not specifically examined as part of a Stage 1 property inspection and may still retain archaeological potential. As such, these areas have been included as part of the determination that the study area exhibits potential for the identification and recovery of archaeological resources.

In accordance with Section 1.3.1 and Section 7.7.4 of the MTCS' 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011), **Stage 2 archaeological assessment is required for any portion of the Project's anticipated construction activities which impacts an area of archaeological potential**. Further details regarding Stage 2 archaeological assessment recommendations are provided in the body of the report.

The MTCS is asked to review the results presented and to accept this report into the *Ontario Public Register of Archaeological Reports*. Archaeological sites recommended for further archaeological fieldwork remain subject to Section 48(1) of the *Ontario Heritage Act* (Government of Ontario 1990a) and may not be altered, or have artifacts removed, except by a person holding an archaeological license.

The Executive Summary highlights key points from the report only; for complete information and findings, the reader should examine the complete report.

Project Personnel

Project Manager:	Michael Candido, B.Sc. (Env)
Licensed Archaeologist:	Parker Dickson, MA (P256)
GIS Specialist:	Andrew White, M.Sc.; Patrick Worsell, BES, DGIS
Report Writer:	Parker Dickson, MA (P256)
Quality Review:	Peter Popkin, Ph.D., CAHP, MCIfA (P362)
Independent Review:	Tracie Carmichael, BA, B.Ed. (R140)

Acknowledgements

Proponent Contacts:	Doug Schmidt – Supervisor, Environmental Planning Ken McCorkle – Manager, Indigenous Affairs
Ministry of Tourism, Culture and Sport:	Robert von Bitter – Archaeological Sites Database Coordinator
Ministry of Natural Resources and Forestry:	Lisa Casselman – Survey Records Clerk

1.0 PROJECT CONTEXT

1.1 DEVELOPMENT CONTEXT

Stantec Consulting Ltd. (Stantec) was retained by Enbridge Gas Inc. (Enbridge Gas) to complete a Stage 1 archaeological assessment for the Kirkwall – Hamilton Pipeline Project (the Project). Note: As of January 1, 2019, Union Gas Ltd. and Enbridge Gas Distribution have amalgamated into one utility with the legal name Enbridge Gas Inc. The Project Area, or study area, for the Stage 1 assessment of the Project comprises approximately 6,400 hectares of various Lots and Concessions, Geographic Townships of Beverly, West Flamborough, and East Flamborough, former Wentworth County, now City of Hamilton, Ontario (Figure 1). The Stage 1 archaeological assessment was conducted during the preliminary planning phase of the Project in accordance with the provisions of the *Ontario Heritage Act* (Government of Ontario 1990a) and the requirements of Section 4.3.4 of the Ontario Energy Board's (OEB) *Environmental Guidelines for the Location, Construction and Operation of Hydrocarbon Pipelines and Facilities in Ontario, 7th Edition* (OEB 2016).

To increase existing capacity and accommodate additional demand for natural gas, Enbridge is proposing to construct a new 48-inch diameter natural gas pipeline. The proposed Project will be constructed between Enbridge's existing Kirkwall valve site, located northeast of the intersection of Safari Road and Valens Road, and Enbridge's existing Hamilton valve site, located east of Highway 6 and north of Carlisle Road, generally paralleling three existing Enbridge pipelines. The length of the proposed pipeline will be determined by the final route chosen and will be approximately 10 to 14 kilometres in length (Figure 2). Construction activities related to the Project are anticipated to begin as early as Spring/Summer 2021 and be completed by the end of 2021.

As noted above, the final route and construction easement, including any temporary land use, for the Project will be determined at a later date. Thus, the current study area for the Stage 1 archaeological assessment is large and serves to capture a broad and generalized geographic area associated with the Project.

1.1.1 Objectives

The objectives of the Stage 1 archaeological assessment were to compile available information about the known and potential archaeological resources within the study area and to provide specific direction for the protection, management and/or recovery of these resources. In compliance with the provincial standards and guidelines set out in the Ministry of Tourism, Culture and Sport's (MTCS) 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011), the objectives of the Stage 1 Archaeological Overview/Background Study are as follows:

- To provide information about the study area's geography, history, previous archaeological fieldwork, and current land conditions;
- To evaluate the study area's archaeological potential which will support recommendations for Stage 2 survey for all or parts of the study area; and
- To recommend appropriate strategies for Stage 2 survey.

To meet these objectives, Stantec archaeologists employed the following research strategies:

- A review of relevant archaeological, historic, and environmental literature pertaining to the study area;
- A review of the land use history, including pertinent historic maps;
- A review of the *City of Hamilton Archaeology Management Plan* to identify predetermined areas of archaeological potential (City of Hamilton 2016); and,
- An examination of the *Ontario Archaeological Sites Database* to determine the presence of registered archaeological sites in and around the study area.

Permission for Stantec staff to enter the study area for the purposes of the Stage 1 archaeological assessment was not required.

1.2 HISTORICAL CONTEXT

1.2.1 Post-contact Indigenous Resources

"Contact" is typically used as a chronological benchmark in discussing Indigenous archaeology in Canada and describes the contact between Indigenous and European cultures. The precise moment of contact is a constant matter of discussion. Contact in what is now the province of Ontario is broadly assigned to the 16th century (Loewen and Chapdelaine 2016).

The post-contact Indigenous occupation of southern Ontario was heavily influenced by the dispersal of various Iroquoian-speaking communities by the New York State Iroquois and the subsequent arrival of Algonkian speaking groups from northern Ontario at the end of the 17th century and the beginning of the 18th century (Konrad 1981; Schmalz 1991). By 1690, Ojibwa speaking people had begun moving south into the lower Great Lakes basin. The Indigenous economy since the turn of the 18th century focused on fishing and the fur trade, supplemented by agriculture and hunting (Konrad 1981; Rogers 1978). Numerous Indigenous groups and communities are associated with the post-contact occupation of southern Ontario and the general area of the Project.

At the turn of the 17th century, the region of the study area was occupied by Iroquoian populations who are historically described as the *Neutre* Nations (by the French) or the *Attiwandaron* (by the Huron-Wendat); their autonym is not conclusively known (Birch 2015). Claude Bernou's 1680 map indicates the then dispersed *Attiragenga* (near modern day Hamilton) and *Antouaronon* (west of the Grand River along the Lake Erie north shore) Nations occupied the region of the study area (White 1978: Figure 2) and settlements dating to the 17th century have been identified in the Fairchild-Big Creeks, Upper Twenty Mile Creek, and Lower Grand River settlement clusters, near to the study area (Lennox and Fitzgerald 1990: Table 13.1). In 1649, the Seneca and the Mohawk led a campaign into southern Ontario and dispersed the Attiwandaron (Neutral) Nations and the Seneca established dominance over the region (Heidenreich 1978; Konrad 1981). By 1690, Ojibwa speaking people had begun moving south into the lower Great Lakes basin (Konrad 1981; Rogers 1978); particularly, the Mississauga Nations gained dominance in the region. The Indigenous economy since the turn of the 18th century focused on fishing and the fur trade, supplemented by agriculture and hunting.

The expansion of the fur trade led to increased interaction between European and Indigenous people, and ultimately intermarriage between European men and Indigenous women. During the 18th century the progeny of these marriages began to no longer identify with either their paternal or maternal cultures, but instead as Métis. The ethnogenesis of the Métis progressed with the establishment of distinct Métis communities along the major

waterways in the Great Lakes of Ontario. Métis communities were primarily focused around the upper Great Lakes and along Georgian Bay, however Métis people have historically lived throughout Ontario (Métis Nation of Ontario 2016; Stone and Chaput 1978:607-608).

The study area falls within the historic and traditional territory of a number of Indigenous communities, including but not limited to the Mississaugas of the Credit First Nation (Mississaugas of the New Credit First Nation n.d.), the Six Nations of the Grand River, and the Haudenosaunee Confederacy. Since contact with European explorers and immigrants, and, later, with the establishment of provincial and federal governments (the Crown), the lands within Ontario and the Geographic Townships of Beverly, West Flamborough, and East Flamborough have been included in various treaties, land claims, and land cessations. Though not an exhaustive list, Morris (1943) provides a general outline of some of the treaties within the Province of Ontario from 1783 to 1923. While it is difficult to exactly delineate treaty boundaries today, an approximate outline of the treaty lands described by Morris is provided in Figure 3 (1943). According to Morris (1943), the study area is situated within the described limits of the 1792 indenture of the 1784 Between the Lakes Purchase between the English government (referred to as “the Crown”) and the Mississaugas). This treaty:

> *...was made with the Mississa[ug]a Indians 7th December, 1792, though purchased as early as 1784. This purchase in 1784 was to procure for that part of the Six Nation Indians coming into Canada a permanent abode.*
>
> *The area included in this Treaty is, Lincoln County excepting Niagara Township; Saltfleet, Binbrook, Barton, Glanford and Ancaster Townships, in Wentworth County; Brantford, Onondaga, Tusc[a]r[o]ra, Oakland and Burford Townships in Brant County; East and West Oxford, North and South Norwich, and Dereham Townships in Oxford County; North Dorchester Township in Middlesex County; South Dorchester, Malahide and Bayham Township in Elgin County; all Norfolk and Haldimand Counties; Pelham, Wainfleet, Thorold, Cumberland and Humberstone Townships in Welland County ... .*
>
> (Morris 1943:17-18)

As demonstrated above, the nature of Indigenous settlement size, population distribution, and material culture shifted as European settlers encroached upon Indigenous territory. However, despite this shift, “written accounts of material life and livelihood, the correlation of historically recorded villages to their archaeological manifestations, and the similarities of those sites to more ancient sites have revealed an antiquity to documented cultural expressions that confirms a deep historical continuity to…systems of ideology and thought” (Ferris 2009:114). As a result, Indigenous peoples of southern Ontario have left behind archaeologically significant resources throughout the region which show continuity with past peoples, even if they have not been explicitly recorded in Euro-Canadian documentation.

1.2.2 Euro-Canadian Resources

At its inception, Upper Canada was only sparsely settled by Europeans and the land had not been officially surveyed to any great extent. Thus, there was an urgency, by the then Lieutenant Governor of Upper Canada John Graves Simcoe, to survey this new province in order to establish military roads and to prevent settlers from clearing and settling land not legally belonging to them. In 1791, the Provinces of Upper Canada and Lower Canada were created from the former Province of Quebec by an act of British Parliament (Craig 1963:17). At this time, Colonel John Graves Simcoe was appointed as the Lieutenant Governor of Upper Canada and was tasked with governing the new

province, directing its settlement and establishing a constitutional government modelled after that of Britain's (Coyne 1895). The change was affected at the behest of United Empire Loyalists who wished to live under the British laws and customs they were familiar with in Great Britain and the former 13 Colonies (Craig 1963:10-11). John Graves Simcoe had ambitious plans to create a model British society in North America, stating a desire to "inculcate British customs, manners, and principles in the most trivial, as well as most serious matters" in Upper Canada (Craig 1963:21). In 1792, Simcoe divided Upper Canada into 19 counties consisting of previously-settled lands, new lands opened for settlement, and lands not yet acquired by Crown. These new counties stretched from Essex in the west to Glengarry in the east.

1.2.2.1 Wentworth County

In 1792, at Simcoe's behest, the Eighth Act of the Upper Canada Parliament divided the province into four districts: Eastern, Midland, Home, and Western (Kernighan 1875:iii). The four districts were subdivided into 19 counties. The future location of Wentworth County was in the Home District, and was in parts of Haldimand, Lincoln, and York Counties. In 1816, the Gore District was created from lands in the Home and Niagara Districts, and the County of Wentworth was formed (Archives of Ontario 2015). Wentworth County was named in honour of John Wentworth, Royal Governor of New Hampshire from 1766-1775, and later a Lieutenant Governor of Nova Scotia (Johnston 1967:3-4). In 1849, the District System was abolished (Archives of Ontario 2015), and the Counties of Halton and Wentworth formed a single municipality. In 1853, the two counties were separated. Wentworth County totaled 272,000 acres (110,074.5 hectares) and comprised the City of Hamilton, Town of Dundas, and the Townships of Beverly, Binbrook, Barton, Ancaster, Saltfleet, East and West Flamborough (alternatively spelled Flamboro), and the Township of Glanford, where the study area is located (Kernighan 1875:iii-iv).

Early 19th century communities in Wentworth County included Dundas, Ancaster, and Hamilton. The completion of the Burlington Bay Canal in 1832 (Craig 1963:158) and the opening of the Great Western Railway in 1853, led to Hamilton's ascent as the dominant settlement and place of trade in the county (Kernighan 1875:v). Hamilton developed into a major manufacturing centre of Ontario, while the rest of the county was primarily agricultural. Wentworth County was especially known for its orchards and vineyards and was an important part of the Niagara Fruit Belt (Johnston 1967:209). Other crops grown in Wentworth County included wheat, barley, and tobacco (Johnston 1967:205-206).

At the turn of the 20th century, Hamilton had a population of 50,000 (Johnston 1967:247). The widespread adoption of the automobile opened rural portions of Wentworth County to suburban development. As a result, the population of Wentworth's townships began to increase and the City of Hamilton annexed portions of Barton, Ancaster, and Saltfleet Townships. By the 1950s, the population of Wentworth not within the city of Hamilton was about 60,000 (Johnston 1967:288-289). The population of Hamilton had grown to nearly 300,000 by 1966 (Dominion Bureau of Statistics 1967:10-12). In 1973, Wentworth County was amalgamated into the new Regional Municipality of Hamilton-Wentworth, which was restructured into the single-tier City of Hamilton in 2001 (Archives of Ontario 2015).

The Stage 1 study area for the Project comprises numerous lots and concessions in the Geographic Townships of Beverly, West Flamborough, and East Flamborough. Table 1 provides a summary of various lots and concessions within the Stage 1 study area.

Table 1: Summary of Lots and Concessions with the Study Area

Lot	Concession	Geographic Township
23 to 36	5	Beverly
24 to 36	6	
24 to 36	7	
24 to 36	8	
1 to 17	5	West Flamborough
1 to 17	6	
1 to 14	7	
1 to 10	8	
12 and 13	6	East Flamborough
12 and 13	7	
12 and 13	8	
12 and 13	9	
12 and 13	10	

1.2.2.2 Township of Beverly

Established in 1792, Beverly Township (alternatively spelled Beverley) took its name from the Town of Beverly, located in East Yorkshire, England. The first survey of the Township of Beverly was undertaken by Augustus Jones in 1794 and included Concessions 1 through 5. Large portions of the township were swampy and known as “Beverly Swamp”. The remaining concessions, i.e., 6 through 10, were initially surveyed in 1797 by John Stegman, but due to the challenging landscape and Beverly swamp, the survey was completed again in 1832 by James Kirkpatrick (Collins 2001:7). The township was laid out in relation to the survey of the Governor’s Road (Dundas Street), also completed by Jones from 1793 to 1795.

The majority of European settlement occurred after James Kirkpatrick’s survey in 1832. The first settlers in the Township of Beverly were Jacob Cope and George Jones, who arrived following the survey (Page & Smith 1875:x). The majority of early landowners in the township were absentee owners, which included merchants and officeholders in York (now Toronto), Niagara, and Montreal (Collins 2001:7).

Settlement in the Township of Beverly occurred primarily at road intersections and was influenced by the establishment of mills and railway development. In the 1820s, Governor’s Road, south of the study area, was planked through the township, influencing the location of the settlements of Lynden and Copetown. The Dundas and Waterloo Road was opened in the township in the early 19th century and planked in 1837 between the Desjardins Canal to the Village of Waterloo to the northeast. The roadway, west of the study area, allowed for the settlement of Rockton, Romulus, and Sheffield (Collins 2001:8). By 1859, the Dumfries and Beverly Road was planked and connected to the Dundas and Waterloo Road from the adjacent Township of North Dumfries, in the County of Brant.

Settlement in the township was slow due to the challenging terrain composed of rock, swamps, and forests. The township remained an unbroken forest until 1810, when a portion of land was cleared near Sheffield (Cornell 1967:8). By 1820, the township had only a population of 81, with 1,883 acres of cultivated land, out of a total 70,200 acres (Page & Smith 1875:x). In the 1830s, settlers from the British Isles began to arrive in the township and impact the population growth. The first settlements in the northern portion of the township in relation to the study area occurred in 1832 with the first settlers of John and William McKnight. They were followed soon after by John Valens, the Pentland, and the Macdonald families (Irwin & Co. 1883:37).

In the first few decades of the 19th century, the population grew steadily from 617 in 1824, to 2,382 in 1839. In 1837, the community of Kirkwall commenced to settle, with the majority of settlers being of Scottish decent. After 1840, the settlement of the township grew quickly and by 1850 there was very little unclaimed land (Page & Smith 1875:X). In 1846, the township had 52,159 acres taken up, with 16,332 under cultivation. William Henry Smith described the township that year as well settled, with fine farms, and two or three excellent mill streams (Smith 1846:15).

In relation to the study area, the closest early settlement in the township is Kirkwall, which was established to the west at the present-day intersection of Kirkwall Road and Concession Road 8. Kirkwall, also known as “Little Scotland,” was settled by six families from Scotland in 1832 (Collins 2001:35). A year later the settlers were joined by 12 additional families from Scotland, as well as an English family and four families from Northern Ireland (Collins 2001:35). Within three years of the arrival of the first European settlers, a log church was constructed to accommodate the growing congregation. In 1848, the log structure was replaced with a stone church (Collins 2001:35). In 1866, Kirkwall was a small post office village with a population of about 60. At the time the village had two stores, a church, a hotel, a blacksmith shop, and a boot and shoe shop (Mitchell 1866:343). Kirkwall remained a small village throughout the late 19th century, with a population of only 60 in 1886 (Irwin & Co. 1886:103).

The Great Western Railway (GWR) was constructed through the southern portion of the Township of Beverly from 1851 to 1853 (Page & Smith 1875:iv). The line opened in January 1854 operating between Windsor and Niagara Falls (Houghton 2008:88). Stations in the township were located in the hamlets of Lynden and Copetown. In 1883, the Township of Beverly reached a population of 4,890 (Irwin & Co. 1883:38). A portion of the 1859 map of Wentworth County featuring Beverly Township is illustrated in Figure 4 (Surtees 1859). A portion of the 1875 map of Beverly Township is illustrated in Figure 5 (Page & Smith 1875). The mid-to-late 19th century development of the study area within the Township of Beverly is illustrated on both maps with numerous landowners and structures depicted.

During the 20th century, the study area in the Township of Beverly continued to be part of a rural landscape, surrounded, primarily, by agricultural lands. The hamlets and villages in the township witnessed a decline in the early 20th century, influenced by the nearby larger markets and industries in Hamilton and Toronto. In 1974, with the creation of the Regional Municipality of Hamilton-Wentworth, the Township of Beverly was amalgamated with the Townships of West and East Flamborough, to form the Town of Flamborough. Later, in 2001, the Town of Flamborough was amalgamated into the new City of Hamilton (Hamilton Public Library 2017b).

1.2.2.3 Township of West Flamborough

The Township of West Flamborough was surveyed by Augustus Jones in 1793 using a single-front system. The township survey, similarly, to the Township of Beverly was also laid out in relation to the survey of the Governor's Road. The township was named after a small east coast village in Yorkshire, England. It was surveyed into west and east portions that remained administratively joined until 1854 (Hamilton Public Library 2017b). The west portion was laid out in the shape of a triangle with the Governor's Road serving as the base. It has 11 concessions running west to east that were numbered north from Governor's Road (Burkholder 1950). Laid out using the single-front system, each concession was composed of long and narrow lots that were approximately 200 acres in size. However, some lot sizes in the township are irregular, due to its triangular shape and Cootes Paradise along the southeast portion (Green *et al*. 2003:2).

As part of the survey of the township, Simcoe ordered that a 60-acre plot be set aside for the creation of a town plot. The town was surveyed in 1801 by Deputy Surveyor John Stegman and named Cootes Paradise (now Dundas) after Captain Thomas Cootes, a British Naval Officer who hunted waterfowl in the area in the 1780s (Royal Botanical Gardens n.d.). The town plot was laid out on a portion of Lot 17, Concession 1, in the Township of West Flamborough and a portion of Lot 53, Concession 1, in the Township of Ancaster (Page & Smith 1875:ix).

The first European settlers in the township were Ann Morden and her family, who were United Empire Loyalists that came to the township in 1787. When Jones surveyed the township, he noted the Morden family as squatters in the Dundas Valley (Woodhouse 1965:10). Other early European settlers prior to 1800 included: Andrew Vanevery, John Purbus, Isaac Durham, William Chrysler, David Vanevery, Frederick Schram, John Rosebrough, Peter Vanevery, Isaac Smith, John Showers, Michael Showers, William Frances, Harcar Lyons, and James Durand (Woodhouse 1965:12).

One of West Flamborough Township's main features is Spencer Creek. In the early 19th century, the water flow of the creek was sufficiently strong to power a number of mills; particularly in the Greensville area, where Honourable James Crooks established several mills of various types. The industrial and residential community came to be known as Crook's Hollow and included saw mills, grist mills, flour mills, and one of the first large-scale paper mills in Upper Canada at the time. Spencer Creek, as it flows through West Flamborough Township, provides the water for two of the region's most scenic waterfalls, Webster's Falls and Tew's Falls. Both waterfalls are located along the edge of the Niagara Escarpment, just downstream from the historic village of Bullock's Corners, location of the West Flamborough Township Hall.

Settlement in the Township of West Flamborough developed primarily along the waterways and road intersections. South of the study area, Edward Peer purchased 30 acres on Spencer Creek in 1801 and built the first mill in Dundas, known as Dundas Mills (Woodhouse 1965:14). Other mills developed along watercourses in the township and by 1823 the township had 11 grist mills and eight saw mills in operation (Page & Smith 1875:iii). The community of Dundas flourished in the 19th century as it was located at the junction of large roadways and on the shoreline of Coote's Paradise Marsh. The town developed into a trading and transportation centre in the township (Freeman 2001:21). The town received the first post office in the township in 1814 and was given the name Dundas after the main thoroughfare in the settlement, Dundas Street (Conservation Hamilton n.d.).

Growth within the township accelerated with the construction of the Desjardins Canal between 1826 and 1837. The canal was constructed along the mouth of Spencer Creek to connect Dundas with Burlington Bay. Dundas served as the location for company headquarters and offices, as well as a community for workers (Page & Smith 1875:ix). Following the construction of the Desjardins Canal, Dundas became a busy port on Lake Ontario (Freeman 2001:37). In the northern portion of the township, the opening of the Guelph to Dundas Road began in 1827, following the founding of the Town of Guelph by John Galt, north of the study area. Galt instigated the development of a roadway through the Township of Puslinch towards the Township of West Flamborough. The Guelph to Dundas Road, also known as Aboukir Road, was laid out following an Indigenous trail. Although it was an open route, the Guelph to Dundas Road remained a trail until the mid-19th century. In 1846, the Guelph and Dundas Road Company was established by a group of Guelph businessmen to further open the roadway. By 1850, the roadway was nearly completed running through the eastern portion of the study area (Clark 2016). The roadway is depicted as an open road on the 1859 map of Wentworth County forming the boundary between the townships of West and East Flamborough before heading south through the villages of Freelton and Strabane (see Figure 4).

Dundas was incorporated as a town on July 28, 1847 (Page & Smith 1875:ix). With the construction of the GWR in 1854, Dundas witnessed a shift from canal shipments to utilization of the railway for the shipment of goods. By the end of the 19th century, the Town of Dundas had become one of the major manufacturing towns in the province with industries producing such goods as flour, cotton, clothing, agricultural implements, and furniture (Page & Smith 1875:ix).

In relation to the study area, the closest early settlement in the township was Strabane, which developed at the intersection of Brock Road and Concession Road 8 West. It was first settled by Matthew Peebles in 1842 (Mitchell 1866:352). A post office was established at the intersection in 1851 with Peebles as the first postmaster (Library and Archives Canada 2014). By 1866, the village had a population of about 100, and included a hotel, two saw mills, a school, a church, and a boot and shoemaker (Mitchell 1866:352-353). Strabane remained a small community throughout the late 19th century, with a population in 1898 of only about 50 (Vernon 1898:149). A portion of the 1859 map of Wentworth County featuring West Flamborough Township is illustrated in Figure 4 (Surtees 1859). A portion of the 1875 map of West Flamborough Township is illustrated in Figure 5 (Page & Smith 1875). The mid-to-late 19th century development of the study area within the Township of West Flamborough is illustrated on both maps with numerous landowners and structures depicted.

At the turn of the 20th century, the Town of Dundas witnessed a change in settlement patterns as retired farmers began to move into the town from the surrounding township. The proximity of Dundas to the City of Hamilton also created the possibility for many town residents to work in Hamilton while maintaining their home in Dundas (Meyers 1954:42). Traffic between Dundas and Hamilton increased with the development of better roads and highways beginning in the 1920s. In 1920, the Department of Public Highways Ontario assumed roads from Hamilton to Owen Sound and established King's Highway 6 (Bevers 2019). The highway, situated within the study area, is now a busy commuter route in the City of Hamilton, with connections to Highways 401 and 403. In January 2001, the Towns of Flamborough and Dundas amalgamated with the City of Hamilton (Hamilton Public Library 2017a). Dundas remains a small suburban community within the City with a population of 24,710 in 2006 (Social Planning & Research Council of Hamilton 2008).

1.2.2.4 Township of East Flamborough

The Township of East Flamborough was surveyed in 1793 by Augustus Jones using a single-front system. Similar to the Township of West Flamborough, the Township of East Flamborough was laid out in relation to the Governor's Road. The Township of East Flamborough has fourteen concessions running south to north, with a broken front along Burlington Bay. Lots in the township are numbered east to west. Laid out using the single-front system, each concession comprises long and narrow lots that are approximately 200 acres in size.

The Township of East Flamborough was named after the Town of Flamborough in East Yorkshire, England. The first European settler to the Township of East Flamborough was David Fonger who arrived in 1783; he was followed by William Applegarth in 1791 (Green *et al*. 1997:5). Land grants were given beginning in 1796 in the lower portions of the township. One of the first grants was given to Alexander McDonnelll in 1796, which included 800 acres along Grindstone Creek (WEFCC 1967:12).

Settlement in the Township of East Flamborough developed primarily at road intersections and along the waterways, which acted as a source of power for mills. The first mill in the township was constructed on Grindstone Creek by William and John Applegarth (Green *et al*. 1997:5), followed in the early 1800s by a saw mill on the creek near the Great Falls. The settlement of Waterdown developed around Brown's mill, at the crossroads of Dundas Street and Mill Street (Green *et al*. 1997:18) and became the largest village in the township throughout the 19th century.

The southern portion of the township was first settled in the early 19th century, while the remaining portions of the township remained heavily wooded until the 1820s and 1830s. By 1846, 25,537 acres in the township had been taken up with 8,750 acres under cultivation. By this time, the township had two grist mills and nine saw mills (Smith 1846:59). In 1854, the Township of East Flamborough was incorporated as a separate township from West Flamborough (Hamilton Public Library 2017b).

In relation to the study area, the closest early settlement in the township is Carlisle, which was established to the east in 1828 by John Eaton. Eaton and his wife Catherine settled on 400 acres of land in Lots 8 and 9, Concession 8, in the Township of East Flamborough in 1828 (Lake and Reynolds Genealogy 2017). A small village plot, originally known as Eaton, was laid out on Eaton's property by his son Anson Eaton, along with Andrew Patton and George Abery (Mitchell 1866:335). Early European settlers to this hamlet included the Fords, Pattons, Kievels, Hamiltons, McColls, Crookers, Gunbys, Mordens, Adamsons, Binkleys, Hunts, Greens, Mills, and Bennetts (WEFCC 1967:35). A post office was established in the hamlet in 1851, with G.R. Lister as the first postmaster (Library and Archives Canada 2014). In 1853, the hamlet was renamed to Carlisle (WEFCC 1967:35). Also, in 1853, the Hamilton, Waterdown, and Carlisle Road was constructed from Hamilton to Carlisle. In 1866, Carlisle had a population of 150, with two general stores, several saw mills, two schools, and two churches (Mitchell 1866:335).

By 1867, all the lots in the township were taken up by residents or land speculators (Green *et al*. 1997:3). In 1883, the township reached a population of 2,377 with the villages of Aldershot, Carlisle, Clappison, Flamboro Centre, Mountsberg, and Waterdown (Irwin & Co. 1883:54). The largest village was Waterdown with a population of about 700, while Carlie had a population of 150 (Irwin & Co. 1883). A portion of the 1859 map of Wentworth County featuring East Flamborough Township is illustrated in Figure 4 (Surtees 1859). A portion of the 1875 map of East Flamborough Township is illustrated in Figure 5 (Page & Smith 1875). The mid-to-late 19th century development of the study area within the Township of East Flamborough is illustrated on both maps with numerous landowners and structures depicted.

At the beginning of the 20th century, the study area remained within a rural portion of the Township of East Flamborough, just west of the hamlet of Carlisle, and was surrounded by agricultural lands. Carlisle received a small period of growth with the construction in 1911 of the Canadian Pacific Railway (C.P.R.) between Hamilton and Guelph. Traffic surrounding the study area increased with the development of better roads and highways beginning in the 1920s. The Township of East Flamborough was similarly influenced by the development of Highway 6, which influenced the development of subdivisions in Carlisle following the Second World War (WEFCC 1967:37). In January 1974, the Township of East Flamborough became part of the Regional Municipality of Hamilton-Wentworth. In January 2001, the township was amalgamated into the new City of Hamilton (Hamilton Public Library 2017b). Carlisle remains a small community within the City, with a population in 2016 of 1,869 (Statistics Canada 2016).

1.2.2.5 Summary

As illustrated above, the historical context of the Stage 1 study area for the Project includes numerous examples of Indigenous and early Euro-Canadian resources. In discussing the late 19th century historical mapping it must be remembered that historical county atlases were produced primarily to identify factories, offices, residences and landholdings of subscribers and were funded by subscription fees. Landowners who did not subscribe were not always listed on the maps (Caston 1997:100). As such, all structures were not necessarily depicted or placed accurately (Gentilcore and Head 1984). Further, review of historic mapping, including treaty maps, also has inherent accuracy difficulties due to potential error in geo-referencing. Geo-referencing is conducted by assigning spatial coordinates to fixed locations and using these points to spatially reference the remainder of the map. Due to changes in “fixed” locations over time (e.g., road intersections), errors/difficulties of scale and the relative idealism of the historic cartography, historic maps may not translate accurately into real space points. This may provide obvious inconsistencies during the historic map review. Nonetheless, the majority of the study area has been subject to European-style agricultural practices for over 100 years, having been densely populated by Euro-Canadian farmers by the late 19th century. Portions of the study area have been cleared of woodlot and have had extensive drainage systems installed to reclaim swamp and marshland as agricultural field.

1.3 ARCHAEOLOGICAL CONTEXT

1.3.1 The Natural Environment

The Stage 1 study area for the Project includes portions of two broad physiographic regions: the Flamborough Plain and the Norfolk Sand Plain. The Flamborough Plain physiographic region consists of:

> *An isolated tract of shallow drift on the Niagara cuesta…It is an area of about 150 square miles, bounded on the northwest by the Galt Moraine, and on the south by the silts and sands of glacial Lake Warren. A few drumlins are found scattered over this limestone plain and swamps are plentiful. The limestone has been swept bare in places…what little overburden there is on the bedrock, apart from the drumlins, is either bouldery glacial till or sand and gravel…Good soil is not plentiful in the little region: the soil is either wet or stony and shallow.*
>
> (Chapman and Putnam 1984:129-130)

Generally, two streams, i.e., Spencer Creek and small tributaries of Bronte Creek, serve to drain the Flamborough Plains physiographic region. Portions of these two streams traverse the study area. Additional secondary and tertiary creeks and streams from these primary sources (i.e., Barlow Creek) are noted throughout the study area. Moreover, additional ancient and/or relic tributaries of water sources may have existed but are not identifiable today and are not indicated on historic mapping. As noted previously, much of the Geographic Township of Beverly comprises swampy soils. These swamps "serve as water reservoirs and produce cedar posts and other wood" (Chapman and Putnam 1984:130). Soils within the region are generally of poor quality as they are often wet or stony and shallow (Chapman and Putnam 1984:130). However, these soils would be suitable for Indigenous agricultural practices and, with 19th century tiling, would become suitable for large-scale agriculture.

The Norfolk Sand Plain physiographic region includes a large area of fine textured, water deposited sands laid down as part of the delta of the glacial Grand River (Chapman and Putnam 1984). Moreover:

> *The sands and silts of this region were deposited as a delta in glacial Lakes Whittlesy and Warren. A great discharge of meltwater from the Grand River area entered the lakes between the ice front and the moraines to the northwest, building the delta from west to east as the glacier withdrew.*
>
> (Chapman and Putnam 1984:154)

Much of the Norfolk Sand Plain physiographic region is located to the south of the study area, along the north shore of Lake Erie. Thus, much of the region's drainage occurs through small rivers and streams flowing directly to Lake Erie. However, a small portion of the northern part of the region drains through the Grand River via Otter Creek and Big Creek. The northern part of the region also drains to Lake Ontario via Grindstone Creek, which traverses the study area. Additional secondary and tertiary creeks and streams from these primary sources are noted throughout the study area. Moreover, additional ancient and/or relic tributaries of water sources may have existed but are not identifiable today and are not indicated on historic mapping. Generally, the soils within the region are suitable for Indigenous and non-Indigenous agricultural practices, with tobacco farming being the dominant practice in much of the region.

1.3.1.1 Recent Heritage Reports

A Cultural Heritage Assessment Report (CHAR) is being prepared by Stantec (*in press*) to identify the presence of heritage resources within the study area; understand the potential impacts of the Project on these resources; and, prepare mitigation strategies to minimize these impacts. The preliminary information from the CHAR suggests there are 26 cultural heritage resources situated within the study area for the Project. Once the preferred route for the proposed pipeline is determined, appropriate mitigation measures will be evaluated. Further information regarding heritage resources will be detailed in the CHAR once completed.

1.3.2 Pre-contact Indigenous Resources

It has been demonstrated that Indigenous people began occupying southern Ontario as the Laurentide glacier receded, as early as 9000 BCE (Ellis and Ferris 1990:13). Much of what is understood about the lifeways of these Indigenous peoples is derived from archaeological evidence and ethnographic analogy. In Ontario, Indigenous culture prior to the period of contact with European peoples has been distinguished into cultural periods based on observed changes in material culture. These cultural periods are largely based on observed changes to formal lithic tools, and

separated into the Early Paleo-Indian, Late Paleo-Indian, Early Archaic, Middle Archaic, Late Archaic and Terminal Archaic periods. Following the advent of ceramic technology in the Indigenous archaeological record, cultural periods are separated into the Early Woodland, Middle Woodland, and Late Woodland periods, based primarily on observed changes in formal ceramic decoration. It should be noted that these cultural periods do not necessarily represent specific cultural identities but are a useful paradigm for understanding changes in Indigenous culture through time. The current understanding of Indigenous archaeological culture is summarized in Table 2, based on Ellis and Ferris (1990). The provided time periods are based on the "Common Era" calendar notation system, i.e., Before Common Era (BCE) and Common Era (CE).

Table 2: Generalized Cultural Chronology of the Study Area

Period	Characteristics	Time Period	Comments
Early Paleo-Indian	Fluted Projectiles	9000 – 8400 BCE	spruce parkland/caribou hunters
Late Paleo-Indian	Hi-Lo Projectiles	8400 – 8000 BCE	smaller but more numerous sites
Early Archaic	Kirk and Bifurcate Base Points	8000 – 6000 BCE	slow population growth
Middle Archaic	Brewerton-like points	6000 – 2500 BCE	environment similar to present
Late Archaic	Narrow Points	2500 – 1800 BCE	increasing site size
	Broad Points	1800 – 1500 BCE	large chipped lithic tools
	Small Points	1500 – 1100 BCE	introduction of bow hunting
Terminal Archaic	Hind Points	1100 - 950 BCE	emergence of true cemeteries
Early Woodland	Meadowood Points	950 - 400 BCE	introduction of pottery
Middle Woodland	Dentate/Pseudo-Scallop Pottery	400 BCE – 500 CE	increased sedentism
	Princess Point	550 – 900 CE	introduction of corn
Late Woodland	Early Ontario Iroquoian	900 – 1300 CE	emergence of agricultural villages
	Middle Ontario Iroquoian	1300 – 1400 CE	long longhouses (100m +)
	Late Ontario Iroquoian	1400 – 1650 CE	tribal warfare and displacement
Contact Indigenous	Various Algonkian Groups	1650 – 1875 CE	early written records and treaties
Late Historic	Euro-Canadian	1796 CE – present	European settlement

Between 9000 and 8000 BCE, Indigenous populations were sustained by hunting, fishing, and foraging and lived a relatively mobile existence across an extensive geographic territory. Despite these wide territories, social ties were maintained between groups. One method of maintaining social ties was through gift exchange, evident through exotic lithic material documented on many sites (Ellis 2013:35-40).

By approximately 8000 BCE, evidence exists and becomes more common for the production of ground-stone tools such as axes, chisels, and adzes. These tools themselves are believed to be indicative specifically of woodworking. This evidence can be extended to indicate an increase in craft production and arguably craft specialization. This latter statement is also supported by evidence, dating to approximately 7000 BCE of ornately carved stone objects which would be laborious to produce and have explicit aesthetic qualities (Ellis 2013:41). This is indirectly indicative of changes in social organization which permitted individuals to devote time and effort to craft specialization. Since 8000 BCE, the Great Lakes basin experienced a low-water phase, with shorelines significantly below modern lake levels



(Stewart 2013: Figure1.1.C). It is presumed that the majority of human settlements would have been focused along these former shorelines. At approximately 6500 BCE the climate had warmed considerably since the recession of the glaciers and the environment had grown more similar to the present day. By approximately 4500 BCE, evidence exists from southern Ontario for the utilization of native copper (naturally occurring pure copper metal) (Ellis 2013:42). The known origin of this material along the north shore of Lake Superior indicates the existence of extensive exchange networks across the Great Lakes basin.

At approximately 3500 BCE, the isostatic rebound of the North American plate following the melt of the Laurentide glacier had reached a point which significantly affected the watershed of the Great Lakes basin. Prior to this, the Upper Great Lakes had drained down the Ottawa Valley via the French-Mattawa river valleys. Following this shift in the watershed, the drainage course of the Great Lakes basin had changed to its present course. This also prompted a significant increase in water-level to approximately modern levels (with a brief high-water period); this change in water levels is believed to have occurred catastrophically (Stewart 2013:28-30). This change in geography coincides with the earliest evidence for cemeteries (Ellis 2013:46). By 2500 BCE, the earliest evidence exists for the construction of fishing weirs (Ellis *et al.* 1990: Figure 4.1). Construction of these weirs would have required a large amount of communal labour and are indicative of the continued development of social organization and communal identity. The large-scale procurement of food at a single location also has significant implications for permanence of settlement within the landscape. This period is also marked by further population increase and by 1500 BCE evidence exists for substantial permanent structures (Ellis 2013:45-46).

By approximately 950 BCE, the earliest evidence exists for populations using ceramics. Populations are understood to have continued to seasonally exploit natural resources. This advent of ceramic technology correlated, however, with the intensive exploitation of seed foods such as goosefoot and knotweed as well as mast such as nuts (Williamson 2013:48). The use of ceramics implies changes in the social organization of food storage as well as in the cooking of food and changes in diet. Fish also continued to be an important facet of the economy at this time. Evidence continues to exist for the expansion of social organization (including hierarchy), group identity, ceremonialism (particularly in burial), interregional exchange throughout the Great Lakes basin and beyond, and craft production (Williamson 2013:48-54).

By approximately 550 CE, evidence emergences for the introduction of maize into southern Ontario. This crop would have initially only supplemented Indigenous people's diet and economy (Birch and Williamson 2013:13-14). Maize-based agriculture gradually became more important to societies and by approximately 900 CE permanent communities emerge which are primarily focused on agriculture and the storage of crops, with satellite locations oriented toward the procurement of other resources such as hunting, fishing, and foraging. By approximately 1250 CE, evidence exists for the common cultivation of historic Indigenous cultigens, including maize, beans, squash, sunflower and tobacco. The cultural affiliation of populations within the region of the study area at this time period is debated, whether they may have spoken a form of Iroquoian language or Algonquian (Murphy and Ferris 1990). The extant archaeological record demonstrates many cultural traits similar to historic Indigenous nations (Williamson 2013:55).

1.3.3 Known Archaeological Sites and Surveys

In Canada, archaeological sites are registered within the Borden system, a national grid system designed by Charles Borden in 1952 (Borden 1952). The grid covers the entire surface area of Canada and is divided into major units containing an area that is two degrees in latitude by four degrees in longitude. Major units are designated by upper case letters. Each major unit is subdivided into 288 basic unit areas, each containing an area of 10 minutes in latitude by 10 minutes in longitude. The width of basic units reduces as one moves north due to the curvature of the earth. In southern Ontario, each basic unit measures approximately 13.5 kilometres east-west by 18.5 kilometres north-south. In northern Ontario, adjacent to Hudson Bay, each basic unit measures approximately 10.2 kilometres east-west by 18.5 kilometres north-south. Basic units are designated by lower case letters. Individual sites are assigned a unique, sequential number as they are registered. These sequential numbers are issued by the MTCS who maintain the *Ontario Archaeological Sites Database*. The study area is located within Borden blocks AiHa and AiGx, with Borden block AhHa situated immediately to the south.

Information concerning specific site locations is protected by provincial policy and is not fully subject to the *Freedom of Information and Protection of Privacy Act* (Government of Ontario 1990b). The release of such information in the past has led to looting or various forms of illegally conducted site destruction. Confidentiality extends to all media capable of conveying location, including maps, drawings, or textual descriptions of a site location. The MTCS will provide information concerning site location to the party or an agent of the party holding title to a property, or to a licensed archaeologist with relevant cultural resource management interests.

An examination of the *Ontario Archaeological Sites Database* has shown that there are 14 registered archaeological sites within the broad Stage 1 study area (Government of Ontario 2019a); none are within 50 metres of the Preliminary Preferred or Alternate Route options. A further five registered archaeological sites are within one kilometre of the study area; however, none of these sites are located within 50 metres of the study area (Government of Ontario 2019a). Table 3 provides a summary of the previously registered archaeological sites. The locations of the registered archaeological sites related to the study area are illustrated in Tile 1 in the Supplementary Documentation for this report.

Table 3: Registered Archaeological Sites

Borden #	Site Name	Site Type	Cultural Affiliation
AiHa-1	**Shaver Hill Ossuary**	**Ossuary**	**Indigenous**
AiHa-2	**Christianson**	**Village**	**Indigenous**
AiHa-3	**Dwyer Ossuary**	**Ossuary**	**Indigenous**
AiHa-5	**Hamilton / Hunter-Beaton**	**Village**	**Indigenous**
AiHa-7	Hood	Village / Burial	Indigenous
AiHa-8	**Mills**	**Village**	**Indigenous**
AiHa-9	MacDonald	Village	Indigenous
AiHa-10	**Bogle I**	**Hamlet**	**Indigenous**
AiHa-11	**Bogle II**	**Hamlet**	**Indigenous**
AiHa-12	**Robertson**	**Village**	**Indigenous**

Borden #	Site Name	Site Type	Cultural Affiliation
AiHa-14	**Freelton / Kynast**	**Village**	**Indigenous**
AiHa-18	**Kralt**	**Hamlet**	**Indigenous**
AiHa-23	**UG Kirkwall 1**	**Lithic scatter**	**Indigenous**
AiHa-29	**Groen**	**Camp**	**Indigenous**
AiHa-36	**Rutherford**	**Homestead**	**19th century Euro-Canadian**
AiGx-70	**Gamble**	**Indeterminate**	**Indigenous**
AiGx-232	MillGrove North	Homestead	19th century Euro-Canadian
AiGx-235	Abrey Zimmerman	Homestead	19th century Euro-Canadian
AhHa-322	Tract 1036, Location 1	Camp	Indigenous

Note: sites in **bold** are located within the Stage 1 study area

As noted, 14 registered archaeological sites are located within the broad Stage 1 study area (Government of Ontario 2019a). However, none of the registered sites are within 50 metres of the Preliminary Preferred or Alternate Route options for the Project. The potential for Project related construction activity to impact any of the registered archaeological sites within the study area will be re-evaluated as part of the Stage 2 archaeological assessment for the Project following confirmation of the selected route and delineation of any temporary construction easement.

Many of the registered archaeological sites within the study area are known only by their corresponding Site Record Form in the *Ontario Archaeological Sites Database* (Government of Ontario 2019a). As a result, detailed information regarding past archaeological activities and current status are not available for AiHa-5, AiHa-8, AiHa-10, AiHa-11, AiHa-12, AiHa-14, AiHa-18, AiHa-36, and AiGx-70. A summary of the information available from their respective Site Record Form is provided below.

AiHa-5 was registered in 1977 as the Hamilton site. The site was identified as an Indigenous village and was partially excavated by William Noble in 1972. Based on the artifacts recovered, the Hamilton site (AiHa-5) is affiliated with the historic Neutral. Later, in 1986, the same site was registered as the Hunter-Beaton site by William Finlayson and assigned Borden number AiHa-21. However, upon review of the site's locational data, it was determined that the two sites are the same and Borden number AiHa-21 was removed.

AiHa-8 was registered in 1977 as the Mills site. The site was identified as an Indigenous village located in a ploughed field. A small sample of artifacts was collected through excavation in 1971 by Ian Kenyon. The collected artifacts suggest the site is affiliated with the historic Neutral.

AiHa-10 was registered in 1977 as the Bogle I site. The site was identified as an Indigenous hamlet located in a ploughed field. A small sample of artifacts from the site was analyzed by Ian Kenyon. The sample of artifacts from the site suggest an affiliation with the historic Neutral.

AiHa-11 was registered in 1977 as the Bogle II site. The site was identified as an Indigenous hamlet located in a ploughed field. A small sample of artifacts from the site was analyzed by Ian Kenyon. The sample of artifacts from the site suggest an affiliation with the historic Neutral. The Bogle I (AiHa-10) and Bogle II (AiHa-11) sites are situated near each other.

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AiHa-12 was registered in 1977 as the Robertson site. A small sample of artifacts from the site was analyzed by Ian Kenyon. The sample of artifacts from the site suggest an affiliation with the historic Neutral. The site was identified as an Indigenous village near Spencer Creek. The Robertson site (AiHa-12) is located near the Dwyer Ossuary (AiHa-3).

AiHa-14 was registered in 1983 as the Freelton site and was also referred to as the Kynast site. Located within a hardwood forest, the site was identified as an Indigenous village. Test excavations were conducted at the site by William Fox in 1983. The test excavations suggest the site may retain a series of longhouses, possibly surround by a palisade. The artifacts recovered suggest a historic Neutral affiliation, with recovered trade goods indicating a period of use *circa* 1630 CE.

AiHa-18 was registered in 1983 as the Kralt site. The site was identified as an Indigenous hamlet located in a low land area near a swamp. A small sample of artifacts was collected from the surface of the site area. The sample of artifacts from the site suggest an affiliation with the historic Neutral, with recovered trade goods indicate a period of use in the early 1600s CE.

AiHa-36 was registered in 1992 as the Rutherford site. The site was identified as a Euro-Canadian homestead dating to *circa* 1840-1860 CE. A surface collection of artifacts, dominated by refined ceramics and glass, was retained. No further archaeological activities were planned for the site as it was to be protected with a 10 metre buffer around it.

The Shaver Hill Ossuary (Aiha-1) is associated with the Indigenous Christianson village (AiHa-2). Smith (1897:33) describes a large Indigenous settlement near Westover with numerous burial features. Though not named, the description of the site likely corresponds to the Christianson village (AiHa-2) and Shaver Hill Ossuary (AiHa-1). The period of use at the Christianson site (AiHa-2) and Shaver Hill Ossuary is between *circa* 1615 and 1632 CE (Fitzgerald 1982a). The Christianson site (AiHa-2) and Shaver Hill Ossuary have been the subject of numerous archaeological investigations (e.g., Fitzgerald 1981; Fitzgerald 1982b; Lennox and Fitzgerald 1990; Noble 1984; Stothers 1968; Stothers 1972).

The Dwyer Ossuary (AiHa-3) is associated with the Indigenous Robertson village (AiHa-12). The earliest recorded investigations at the Dwyer Ossuary occurred in 1938-1938 by Rutherford Smith. The Robertson site was surveyed by Ian Kenyon in 1971 (Sustainable Archaeology McMaster 2019). The period of use at the Robertson village (AiHa-12) and Dwyer Ossuary (AiHa-3) is between *circa* 1632 and 1651 CE (Fitzgerald 1982a; Fitzgerald 1982b). Few archaeological reports are available for the Robertson village (AiHa-12), while the Dwyer Ossuary (AiHa-3) has been the subject of previous archaeological investigations (e.g., Fitzgerald 1982b; Ridley 1961; Smith and Murphy 1939).

AiHa-23 was registered in 1988 as the UG Kirkwall 1 site. It was identified as a sparse surface scatter comprising four lithic artifacts: an end scraper, a wedge, a utilized flake, and an abrader. The site was identified by Mayer, Pihl, Poulton and Associates Incorporated (MPP) during the archaeological assessment for Union Gas' Kirkwall Ancaster Line (MPP 1988). The site would not be impacted by the preferred pipeline route and a Stage 3 archaeological assessment was not conducted.

AiHa-29 was registered in 1990 as the Groen site by Archaeological Research Associates Ltd. (ARA) during a property assessment for the Kirkwall Valve Site to Hamilton Take-off NPS 42 Pipeline Loop (ARA 1990a). The site was identified as an Indigenous camp and, later, a portion of the site was fully excavated, including mechanical topsoil removal (ARA 1990b). The partial excavation recovered lithic tools and flakes, as well as Indigenous pottery



and faunal remains. Several features and post moulds were also identified. The archaeological work was completed by Archaeological Research Associates Ltd. (ARA) in advance of proposed project impacts (ARA 1990b). The site is associated with the Neutral and dates to between 1620 and 1650 CE.

AiGx-70 was registered as the Gamble Site by Stew Leslie in the early 1970s. The site is identified as an Indigenous archaeological site, with Archaic and Woodland components. No information regarding site type or function is available.

Located outside of the study area, the MacDonald site (AiHa-9) was identified as an Indigenous village in 1838 (Smith 1897:31). The site was described as being between five and six acres in size and was protected by palisades (Smith 1897:31-32). The original identification of the MacDonald site (AiHa-9) confirmed the presence of "pipes, beads, wampum, totems and other mementos…[and] upwards of 300 iron tomahawks…" (Smith 1897:32). Similarly, the Hood site (AiHa-7) was identified outside of the study area in the early 1800s. The site was originally described as large and retained remnants of a palisade (Smith 1897:32). Burial pits had been identified and, from them, various items had been collected including "French axes, iron tomahawks, brass kettles, [and] brass arrow tips…" (Smith 1897:32). The Hood site (AiHa-7) was further described in Lennox (1978) and Fitzgerald (1979).

A query of the *Ontario Public Register of Archaeological Reports* identified several archaeological assessments which may document work within the broad Stage 1 study area or within 50 metres of it (Government of Ontario 2019b). Based on an examination of the queried reports, none document registered archaeological sites within 50 metres of the study area. Many of these reports represent archaeological assessments from the 1970s and 1980s when mapping and artifact recording standards were less precise than today's standards. As it relates to the current and broad Stage 1 study area for the Project, a detailed review of all possible early assessments and reports is not relevant. Rather, a summary of recent archaeological assessment work related to the study area is provided below. Despite some previous archaeological assessments overlapping with the current Stage 1 study area, Stantec has determined that illustrating all previously surveyed areas is not practical given the size and scale of the current study area. Following confirmation of the preferred route and delineation of any temporary construction easement required for the Project, the proximity of previous archaeological assessments and previously surveyed lands can be re-evaluated. Table 4 provides a summary of some of the relevant reports pertaining to previous archaeological work within the study area.

Table 4: Previous Archaeological Assessments

Year	Report	Author	PIF #
1984	*An Archaeological Resource Assessment of the Proposed Union Gas Loop of the NPS 34 Trafalgar Line, Brantford Take-Off to Kirkwall Valve Site, Waterloo and Hamilton-Wentworth Regional Municipalities*	MPP	Not applicable (Licence No. 1984-34)
1987	*Preliminary Report on the Archaeological Survey of Union Gas Pipeline, Kirkwell Valve to Hamilton Valves*	ARA	Not applicable
1988	*An Archaeological Resources Assessment of the Union Gas Pipeline from Kirkwall Valve Sites to the Hamilton Gate Station No. 3, Regional Municipality of Hamilton-Wentworth, Ontario*	MPP	Not applicable (Licence No. 86-92)

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Year	Report	Author	PIF #
1990a	*Archaeological Assessment. Groen Property – Phase II, NPS 42 Trafalgar Gasline, Kirkwell Valve to Hamilton Valve, Wentworth County, Ontario*	ARA	Not applicable (Licence No. 90-045)
1990b	*Archaeological Mitigation Groen Site (AiHa-29) NPS 42 Trafalgar Gasline Kirkwell Valve to Hamilton Valve*	ARA	Not applicable (Licence No. 90-045)
1999	*Stage 1 to 3 Archaeological Assessment of Highway 6, From Highway 5 to South of Concession Road 6W, Flamborough Township, Regional Municipality of Hamilton-Wentworth (W.P. 163-80-01)*	New Directions Archaeology	Not applicable (Licence No. 99-025)
2008	*Stage 1 Archaeological Assessment of the Proposed NPS 48 Brantford Take-Off to Kirkwall Valve Site Pipeline, Township of North Dumfries & City of Hamilton, Ontario*	D.R. Poulton & Associates Inc. (DPA)	P053-179-2018
2014a	*The 2013 Stage 1 Archaeological Assessment of the Proposed Enbridge Pipelines Inc. Line 11 Westover Segment Replacement Project, City of Hamilton, Regional Municipality of Hamilton-Wentworth, Ontario*	DPA	P316-198-2013
2014b	*The 2014 Stage 2 Archaeological Assessment of the Enbridge Pipelines Inc. Line 11 Westover Segment Replacement Project, City of Hamilton, Regional Municipality of Hamilton-Wentworth, Ontario*	DPA	P316-0278-2013
2014c	*The 2013-2014 Stage 2 Archaeological Assessment of Infrastructure Ontario Lands on the Proposed NPS 48 Brantford Take-Off to Kirkwall Valve Site Pipeline, Township of North Dumfries & City of Hamilton, Ontario*	DPA	P316-196-2013
2015a	*The 2013-2014 Stage 2 Archaeological Assessment of the Proposed NPS 48 Brantford Take-Off to Kirkwall Valve Site Pipeline, Township of North Dumfries & City of Hamilton, Ontario*	DPA	P316-0304-2014
2015b	*The 2015 Stage 1 Archaeological Assessment of the Proposed Enbridge Pipelines Inc. Line 10 Westover Segment Replacement Project, City of Hamilton, Ontario*	DPA	P316-0306-2015
2015	*Stage 2 Archaeological Assessment, Enbridge Pipelines Inc., Line 10 Westover Segment Replacement Project, Geotechnical Borehole Work Area and Access Routes, City of Hamilton, Ontario*	Timmins Martelle Heritage Consultants Inc. (TMHC)	P1075-0017-2015
2016	*Stage 2 Archaeological Assessment, Enbridge Pipelines Inc., Line 10 Westover Segment Replacement Project, 2015 Fieldwork, City of Hamilton, Ontario*	TMHC	P1075-0018-2016
2017	*Stage 2 Archaeological Assessment Enbridge Pipelines Inc. Line 10 Westover Segment Replacement Project Spring, Summer and Early Fall 2016 Fieldwork City of Hamilton, Ontario*	TMHC	P324-0098-2016
2018	*Stage 1 Archaeological Assessment Municipal Class EA Hydro One B5C/B6C Line Refurb Hydro One Refurb between the Burlington TS & Enbrg Westover SCTS Part of, Lots 28 & 29, Con 5-Lots 28 to 36, Con 6-Lots 28 to 30, Con 7, G.Twp. of Beverly Part of Lots 1 to 16, Con 6, G.Twp. of West Flamborough Part of, Lot 1, Con 1-Lots 1 to 3, Con 2-Lots 3 to 6, Con 3-Lots 5 to 8, Con 4-Lots 8 to 11, Con 5-*	TMHC	P1075-0039-2017

Year	Report	Author	PIF #
	Lots 11 to 13, Con 6-Lot 13, Con 7, G.Twp. of East Flamborough Former Wentworth County, Now City of Hamilton, ON Part of Brant's Block, G.Twp. of Nelson Former Halton County, Now City of Burlington, ON		

MPP completed an archaeological assessment for Union Gas' NPS 34 Trafalgar Line Brantford Take-Off to Kirkwall Valve Site (MPP 1984). This early assessment examined most of the pipeline corridor by pedestrian survey and test pit survey, however no specific ploughing of lands had occurred prior to pedestrian survey and the test pit survey interval was 10 metres. A small eastern portion of the study area corridor overlaps with the current study area for the Project. No archaeological resources were identified in the area of overlap by MPP (1984). Much of the study area corridor for the NPS 34 Trafalgar Line Brantford Take-Off to Kirkwall Valve Site was re-examined as part of a later assessment (see DPA 2008; DPA 2014c; DPA 2015).

In 1987, ARA completed an archaeological assessment for Union Gas' Kirkwell [*sic*] Valves to Hamilton Valves (ARA 1987). Much of the pipeline corridor for ARA (1987) is believed to follow Preliminary Preferred Route A of the current Project, however, a copy of the report could not be obtained for review (see Supplementary Documentation). A partial summary of the ARA (1987) is provided in Ecological Services for Planning Ltd.'s (ESP) *Kirkwall Valve Site to Hamilton Take-off NPS 42 Pipeline Loop Route Selection and Environmental Impact Assessment* (ESP 1987). The ESP (1987:59) report notes that archaeological staff "walked, surface inspected and test pitted areas of high potential." No mapping of the survey areas was provided in the ESP (1987) report and no detailed description of the archaeological survey methods was provided. Two archaeological sites, the Robertson Village (AiHa-12) and Dwyer Ossuary (AiHa-11), are located within the study corridor for the Kirkwall Valve Site to Hamilton Take-off NPS 42 Pipeline Loop (ESP 1987). However, no archaeological resources were identified during ARA's survey work between the Kirkwall Valve Site and Brock Road.

In association with the Kirkwall Valve Site to Hamilton Take-off NPS 42 Pipeline Loop, ARA completed an archaeological assessment of the Groen Property (ARA 1990a). One archaeological site, the Groen site (AiHa-29), was identified within the study corridor east of Brock Road. The site was identified as an Indigenous camp and, later, a portion of the site was fully excavated, including mechanical topsoil removal (ARA 1990b). The partial excavation recovered lithic tools and flakes, as well as Indigenous pottery and faunal remains. Several features and post moulds were also identified. The archaeological work was completed by ARA in advance of proposed project impacts (ARA 1990b). The site is associated with the Neutral and dates to between 1620 and 1650 CE.

In 1999, New Directions Archaeology (NDA) completed a Stage 1 to 3 archaeological assessment for approximately six kilometres of road improvements for Highway 6, from Highway 5 to 100 metres south of Concession Road 6 West (NDA 1999). The northern end of the NDA (1999) study area is located adjacent to the southern end of the current study area for the Project. NDA (1999) identified two archaeological sites, one of which, the Millgrove North site (AiGx-232), is located within one kilometre of the current study area. Neither site identified by NDA (1999), i.e., Red Tulip Site (AiGx-231) and Millgrove North Site (AiGx-232), are located within 50 metres of the current study area.

In 2008, DPA completed a Stage 1 archaeological assessment for Union Gas Limited's Proposed NPS 48 Brantford Take-Off to Kirkwall Valve Site Pipeline (DPA 2008). A Stage 2 for the project followed in 2013 and 2014 (DPA 2014c; DPA 2015). The easternmost portion of the Stage 2 study area (see BK31 and BK32) overlaps the current study area for the Project. During the Stage 2 survey, DPA (2015a) identified 17 archaeological locations. None of the

archaeological locations are located within the segment which overlaps the current study area. As part of the specific Stage 2 survey for Infrastructure Ontario Lands associated with the Proposed NPS 48 Brantford Take-Off to Kirkwall Valve Site Pipeline (DPA 2014c) an isolated findspot of Indigenous nature was identified and was not registered as an archaeological site. Similar archaeological assessments for proposed pipeline routes had been completed in the 1980s and early 1990s (e.g., MPP 1984; MPP 1989; DPA 1995).

In 2013, DPA completed a Stage 1 archaeological assessment for Enbridge Pipeline Inc.'s proposed Line 11 Westover Segment Replacement project (DPA 2014a). The northernmost portion of the Line 11 Westover Segment Replacement project, i.e., an approximate 280 metre gravel access road, overlaps with the southern end of the current study area. Stage 2 archaeological assessment was recommended in advance of proposed construction impacts and was completed by DPA (2014b). No archaeological resources within the current study area or within 50 metres of the current study area were identified during DPA's Stage 2 assessment (DPA 2014b).

Also, in 2013, DPA completed a Stage 1 archaeological assessment for Enbridge Pipeline Inc.'s proposed Line 10 Westover Segment Replacement project (DPA 2015b). Portions of Line 10 and 11 parallel each other in the same existing easement. The Stage 1 assessment determined that Stage 2 assessment is required in advance of proposed construction activities. The northernmost portion of the Line 10 Westover Segment Replacement projects, i.e., an approximate 280 metre gravel access road, overlaps with the southern end of the current study area. Stage 2 archaeological assessment was recommended in advance of proposed construction impacts. Various Stage 2 archaeological assessments for the Line 10 Westover Segment Replacement project have been completed by TMHC. In addition, numerous Stage 3 assessments and Stage 4 mitigations were completed by TMHC and other archaeological consultants in support of the Line 10 Westover Segment Replacement. However, no archaeological resources within the current study area or within 50 metres of the current study area were identified during the various Stage 2 assessments for the Line 10 Westover Segment Replacement project (e.g., TMHC 2015; TMHC 2016; TMHC 2017).

In 2017, TMHC completed a Stage 1 archaeological assessment for the 114-kiloVolt circuit B5C and B5C/B6C lines located between the Enbridge Westover Southern Consumer Transmission Station (SCTS), City of Hamilton and Burlington Transmission Station (TS), City of Burlington (TMHC 2018). The study area for TMHC (2018) follows the existing transmission line running through the current study area for the Project, specifically a portion of Alternate Route B. Stage 2 archaeological assessment was recommended for all lands retaining archaeological potential (TMHC 2018). Stantec understands that a Stage 2 archaeological assessment has not been completed for this project.

1.3.4 City of Hamilton's Archaeological Management Plan

The City of Hamilton's municipal archaeological management plan, entitled *The City of Hamilton Archaeology Management Plan* (AMP) was consulted and illustrates the study area as a locale of archaeological potential for Indigenous and Euro-Canadian archaeological resources (City of Hamilton 2016). To identify archaeological potential, an archaeological potential model was created using cultural and physiographic information, such as the presence of identified/registered sites or proximity to water. Generally, the AMP uses the following criteria to aid in the determination of archaeological potential of a property:

- 250 metre catchment area for registered archaeological sites;
- 250 metre catchment area for unregistered but known or reported archaeological sites;



- 300 metre catchment area for primary watercourses;
- 100 metre catchment area for historic activities;
- 100 metre catchment area for historic transportation corridors;
- 100 metre catchment area for unusual landforms;
- Areas within the historic urban boundary that have not been substantially disturbed;
- Rural historic settlements;
- Properties designated under the *Ontario Heritage Act*; and
- Modern and historic aerial photography.

Based on the criteria identified above, the AMP identifies the study area for the Project with general archaeological potential (City of Hamilton 2016).

1.3.5 Existing Conditions

The Stage 1 archaeological assessment was completed under PIF # P256-0564-2019 issued to Parker Dickson, MA, of Stantec, by the MTCS. The study area for the Stage 1 archaeological assessment of the Project comprises approximately 6,400 hectares of various Lots and Concessions, Geographic Townships of Beverly, West Flamborough, and East Flamborough, former Wentworth County, now City of Hamilton, Ontario (Figure 1 and Figure 2). The proposed Project will be constructed between Enbridge's existing Kirkwall valve site, located northeast of the intersection of Safari Road and Valens Road, and Enbridge's existing Hamilton valve site, located east of Highway 6 and north of Carlisle Road, generally paralleling three existing Enbridge pipelines. The length of the proposed pipeline will be determined by the final route and will be approximately 10 to 14 kilometres in length (Figure 2).

Broadly, much of the study area consists of active agricultural field with smaller pockets of sparse woodlot. The study area is also inundated with numerous water sources, municipal road ROWs, and municipally constructed drains, as well as the small communities of Westover, Flamborough, Harper Corners, Breezy's Corners, and Strabane. Existing Enbridge infrastructure, such as metering stations, pumping stations, and storage facilities, are located within the study area. For example, much of the Preliminary Preferred Route A parallels the existing Kirkwall Valve Site to Hamilton Take-off NPS 42 Pipeline, which, itself, parallels an existing line constructed in the early 1950s. The final route and construction easement, including any temporary land use, for the Project will be determined at a later date. Thus, the current study area for the Stage 1 archaeological assessment is large and serves to capture a broad and generalized geographic area associated with the Project. A property inspection was not completed in association with the Stage 1 archaeological assessment.

2.0 ANALYSIS AND CONCLUSIONS

Archaeological potential is established by determining the likelihood that archaeological resources may be present on a subject property. Stantec applied archaeological potential criteria commonly used by the MTCS (Government of Ontario 2011) to determine areas of archaeological potential within the region under study. These variables include proximity to previously identified archaeological sites, distance to various types of water sources, soil texture and drainage, glacial geomorphology, elevated topography, and the general topographic variability of the area. However, it is worth noting that extensive land disturbance can eradicate archaeological potential (Government of Ontario 2011).

Potable water is the single most important resource for any extended human occupation or settlement and since water sources in Ontario have remained relatively stable over time, proximity to drinkable water is regarded as a useful index for the evaluation of archaeological site potential. In fact, distance to water is one of the most commonly used variables for predictive modeling of archaeological site locations. Distance to modern or ancient water sources is generally accepted as the most important determinant of past human settlement patterns and, considered alone, may result in a determination of archaeological potential. However, any combination of two or more other criteria, such as well-drained soils or topographic variability, may also indicate archaeological potential.

When evaluating distance to water it is important to distinguish between water and shoreline, as well as natural and artificial water sources, as these features affect site location and type to varying degrees. The MTCS categorizes water sources in the following manner:

- Primary water sources: lakes, rivers, streams, creeks;
- Secondary water sources: intermittent streams and creeks, springs, marshes and swamps;
- Past water sources: glacial lake shorelines, relic river or stream channels, cobble beaches, shorelines of drained lakes or marshes; and
- Accessible or inaccessible shorelines: high bluffs, swamp or marshy lake edges, sandbars stretching into marsh.

Primary water sources are abundant within the Stage 1 study area. Transecting the study area are primary sources such as Spencer Creek, Fairchild Creek, Barlow Creek, Grindstone Creek, and Bronte Creek. Much of the Geographic Township of Beverly comprises swampy soils. These swamps “serve as water reservoirs and produce cedar posts and other wood” (Chapman and Putnam 1984:130). The swamps in the study area would have also provided faunal and floral resources for use. Additional ancient and/or relic tributaries of water sources may have existed but are not identifiable today and are not indicated on historic mapping.

Further examination of the study area’s natural environment identified soil conditions suitable for Indigenous and Euro-Canadian agriculture, especially in the 19th and 20th centuries following the implementation of municipal drainage systems and agricultural field tiling. The study area is situated within portions of two broad physiographic regions: the Flamborough Plain and the Norfolk Sand Plain. Both physiographic regions contain drumlins, eskers, and other landforms comprising elevated topography. Storck (1982) notes that archaeological sites, particularly Paleo-Indian sites, tend to be in situated in areas of elevated topography as these areas would possess better drainage and would provide a broad view of the surrounding terrain for game watching.

An examination of the *Ontario Archaeological Sites Database* has shown that there are 14 registered archaeological sites within the broad Stage 1 study area; of which, 13 are Indigenous. While no registered site is located within 50 metres of a Preliminary Preferred or Alternate Route option, it is important to recognize that several significant archaeological sites, such as Indigenous villages and ossuaries (i.e., Christianson Village [AiHa-2], Shaver Hill Ossuary [AiHa-1], Robertson Village [AiHa-12], and Dwyer Ossuary [AiHa-3]), are located within the study area and are of special significance to extant Indigenous communities in the region. A further three registered Indigenous archaeological sites are within one kilometre of the study area, including the Hood Village (AiHa-7) and MacDonald Village (AiHa-9).

For Euro-Canadian sites, archaeological potential can be extended to areas of early Euro-Canadian settlement, including places of military or pioneer settlements; early transportation routes; and properties listed on the municipal register or designated under the *Ontario Heritage Act* (Government of Ontario 1990a) or property that local histories or informants have identified with possible historical events, activities, or occupations. Historical mapping demonstrates that the study area includes early concession roads with structures illustrated as fronting these roads; particularly along major arterial roads, i.e., Dundas Street (Highway 5), Safari Road, Brock Road, and Highway 6. It is also worth noting that preliminary information from the CHAR for the Project suggests there are 26 cultural heritage / built heritage resources situated within the study area. Much of the established road and rail networks and agricultural settlement from the 19th century is still visible today.

The City of Hamilton's municipal archaeological management plan, entitled *The City of Hamilton Archaeology Management Plan* (AMP) was consulted and illustrates the study area as a locale of archaeological potential for Indigenous and Euro-Canadian archaeological resources (City of Hamilton 2016).

As noted above, extensive and deep land alteration can eradicate archaeological potential. Based on aerial imagery of the broad Stage 1 study area, there are likely to be pockets of modern disturbance from municipal road ROWs, and municipally constructed drains, buildings and structures associated with the communities of Westover, Flamborough, Harper Corners, Breezy's Corners, and Strabane, as well as rural properties. However, while a visual examination of the road surface, gravel shoulder, and adjacent ditching of municipal roads may be sufficient to confirm extensive disturbance and removal of archaeological potential, it may not be possible to confirm extensive disturbance of other portions of the municipal road ROWs, particularly those portions immediately adjacent to agricultural fields, through visual examination alone. Thus, these areas are judged to retain archaeological potential and require confirmation of disturbance through additional archaeological assessment.

Further to the above, existing Enbridge infrastructure (as well as other buried utility infrastructure), such as metering stations, pumping stations, and storage facilities, are located within the study area. For example, much of the Preliminary Preferred Route A parallels the existing Kirkwall Valve Site to Hamilton Take-off NPS 42 Pipeline, which, itself, parallels an existing line constructed in the early 1950s. However, a Stage 1 property inspection was not completed for the study area and these areas were not specifically examined for evidence of modern disturbance.

A cursory review of available previous archaeological assessments is provided in Section 1.3.3. Few recent surveys have been completed within the study area and those that have been completed did not identify any archaeological sites. Much of the Preliminary Preferred Route A parallels the existing Kirkwall Valve Site to Hamilton Take-off NPS 42 Pipeline and Brantford Take-Off to Kirkwall Valve Site Pipeline, which have been subject, to varying degrees, to archaeological survey (e.g., ARA 1987; ARA 1990a; DPA 2008; DPA 2014c; DPA 2015a; ESP 1987; MPP 1984; and MPP 1988). However, the survey work during the early assessments, e.g., those completed in the 1980s and 1990s,

may have only sampled “high potential” areas and used survey methods not consistent with the MTCS’ 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011). As such and given the difficulties in geo-referencing older survey maps, as well as the relatively close proximity of known Indigenous village and ossuaries, existing easements are judged to retain archaeological potential. Further, TMHC (2018) recently completed a Stage 1 archaeological assessment for a project which parallels the existing transmission line running through the current study area for the Project, specifically a portion of Alternate Route B. TMHC (2018) determined that their study area retained further archaeological potential and recommended a Stage 2 archaeological assessment.

In summary, it has been determined that the entirety of the study area retains potential for the identification of pre-contact Indigenous, post-contact Indigenous, and Euro-Canadian archaeological resources. As noted above, numerous farm complexes, residences, municipal ROWs, and other existing features of potential disturbance (i.e., existing roads, railways, residential and commercial complexes, and buried utilities and infrastructure) are located throughout the study area; however, they were not specifically examined as part of a Stage 1 property inspection and may still retain archaeological potential. Further, low and permanently wet areas and areas of steep slope may exist within the study area but were not specifically examined as part of a Stage 1 property inspection. As such, these areas have been included as part of the determination that the study area exhibits potential for the identification and recovery of archaeological resources. The final route and construction easement, including any temporary land use, for the Project will be determined at a later date. A refinement of archaeological potential specific to the Project’s anticipated impacts will be included as part of the Stage 2 archaeological assessment for the Project.

3.0 RECOMMENDATIONS

The Stage 1 archaeological assessment determined that the entirety of the study area for the Project retains potential for the identification and documentation of archaeological resources. In accordance with Section 1.3.1 and Section 7.7.4 of the MTCS' 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011), **Stage 2 archaeological assessment is required for any portion of the Project's anticipated construction activities which impacts an area of archaeological potential (Figure 6).**

The objective of the Stage 2 archaeological assessment will be to document any archaeological resources within the study area and to determine whether these archaeological resources require further assessment. The Stage 2 archaeological assessment will include the systematic walking of open ploughed fields as outlined in Section 2.1.1 of the MTCS' 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011). The MTCS standards further require that all agricultural land, both active and inactive, be recently ploughed and sufficiently weathered to improve the visibility of archaeological resources. Ploughing must be deep enough to provide total topsoil exposure, but not deeper than previous ploughing, and must provide at least 80% ground surface visibility.

Moreover, for areas inaccessible for ploughing, the Stage 2 archaeological assessment will include a test pit survey as outlined in Section 2.1.2 of the MTCS' 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011). The MTCS standards require that each test pit be approximately 30 centimetres in diameter, excavated to at least five centimetres in to subsoil, and have all soil screened through six millimetre hardware cloth to facilitate the recovery of any cultural material that may be present. Prior to backfilling, each test pit will be examined for stratigraphy, cultural features, or evidence of fill.

In addition to the above, the specific roadways and ROWs will require further archaeological assessment in accordance with Section 2.1.8 of Standard 2 of the MTCS' 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011). Any portion of the ROW within agricultural or accessible land may require ploughing and pedestrian survey in accordance with Section 2.1.1 of the MTCS' 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011), depending on the specific Project impact. Confirmation of disturbance will also be required for any anticipated Project impact to other existing features (i.e., existing roads, railways, farm complexes, residences, buried utilities and other infrastructure).

If the archaeological field team determines any lands to be low and wet, steeply sloped, or disturbed during the Stage 2 field work, those areas will not require survey, but will be photographically documented in accordance with Section 2.1 of the MTCS' 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011).

The MTCS is asked to review the results presented and to accept this report into the *Ontario Public Register of Archaeological Reports*. Archaeological sites recommended for further archaeological fieldwork remain subject to Section 48(1) of the *Ontario Heritage Act* (Government of Ontario 1990a) and may not be altered, or have artifacts removed, except by a person holding an archaeological license.

4.0 ADVICE ON COMPLIANCE WITH LEGISLATION

This report is submitted to the Minister of Tourism, Culture and Sport as a condition of licensing in accordance with Part VI of the *Ontario Heritage Act*, R.S.O. 1990, c O.18 (Government of Ontario 1990a). The report is reviewed to ensure that it complies with the standards and guidelines that are issued by the Minister, and that the archaeological fieldwork and report recommendations ensure the conservation, protection and preservation of the cultural heritage of Ontario. When all matters relating to archaeological sites within the study area of a development proposal have been addressed to the satisfaction of the MTCS, a letter will be issued by the ministry stating that there are no further concerns with regard to alterations to archaeological sites by the proposed development.

It is an offence under Sections 48 and 69 of the *Ontario Heritage Act* (Government of Ontario 1990a) for any party other than a licensed archaeologist to make any alteration to a known archaeological site or to remove any artifact or other physical evidence of past human use or activity from the site, until such time as a licensed archaeologist has completed fieldwork on the site, submitted a report to the Minister stating that the site has no further cultural heritage value or interest, and the report has been filed in the *Ontario Public Register of Archaeological Reports* referred to in Section 65.1 of the *Ontario Heritage Act* (Government of Ontario 1990a)

Should previously undocumented archaeological resources be discovered, they may be a new archaeological site and therefore subject to Section 48(1) of the *Ontario Heritage Act* (Government of Ontario 1990a) The proponent or person discovering the archaeological resources must cease alteration of the site immediately and engage a licensed consultant archaeologist to carry out archaeological fieldwork, in compliance with Section 48(1) of the *Ontario Heritage Act* (Government of Ontario 1990a)

The *Funeral, Burial and Cremation Services Act,* 2002, S.O. 2002, c.33 (Government of Ontario 2002), requires that any person discovering or having knowledge of a burial site shall immediately notify the police or coroner. It is recommended that the Registrar of Cemeteries at the Ministry of Government and Consumer Services is also immediately notified.

Archaeological sites recommended for further archaeological fieldwork remain subject to Section 48(1) of the *Ontario Heritage Act* (Government of Ontario 1990a) and may not be altered, or have artifacts removed, except by a person holding an archaeological license.

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Lots 28 & 29, Con 5-Lots 28 to 36, Con 6-Lots 28 to 30, Con 7, G.Twp. of Beverly Part of Lots 1 to 16, Con 6, G.Twp. of West Flamborough Part of, Lot 1, Con 1-Lots 1 to 3, Con 2-Lots 3 to 6, Con 3-Lots 5 to 8, Con 4-Lots 8 to 11, Con 5-Lots 11 to 13, Con 6-Lot 13, Con 7, G.Twp. of East Flamborough Former Wentworth County, Now City of Hamilton, ON Part of Brant's Block, G.Twp. of Nelson Former Halton County, Now City of Burlington, ON. Report on file, Toronto: Ministry of Tourism, Culture and Sport. PIF P1075-0039-2017.

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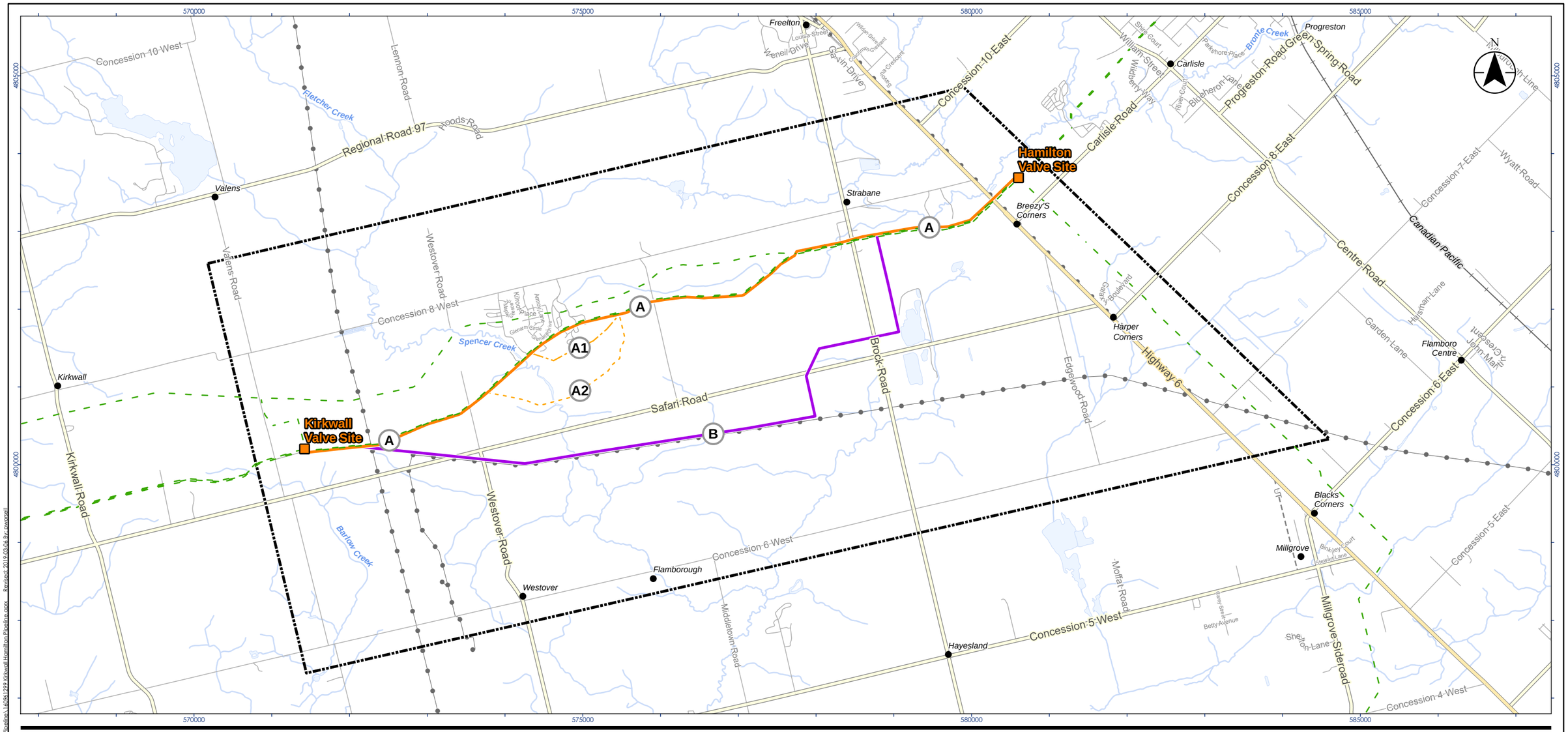
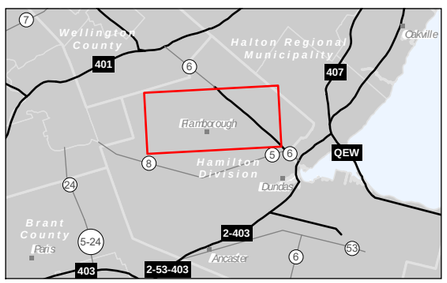
6.0 MAPS

General maps of the broad Stage 1 study area are provided on the following pages. Maps identifying exact archaeological site locations do not form part of this public report; they may be found in the Supplementary Documentation.





Legend

- Existing Enbridge Station
- A - Preliminary Preferred Route
- A1 - Route Deviation
- A2 - Route Deviation
- B - Alternate Route
- Existing Pipeline
- General Study Area
- Highway
- Major Road
- Minor Road
- Minor Road
- Railway
- Hydro Line
- UT Unknown Transmission Line
- Watercourse
- Waterbody

0 1 2 km

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Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
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Stantec

Project Location
City of Hamilton

160961299
Prepared by PW on 2019-03-06

Client/Project
ENBRIDGE GAS INC.
KIRKWALL-HAMILTON PIPELINE PROJECT
STAGE 1 ARCHAEOLOGICAL ASSESSMENT

Figure No.
1

Title
Location of the Project

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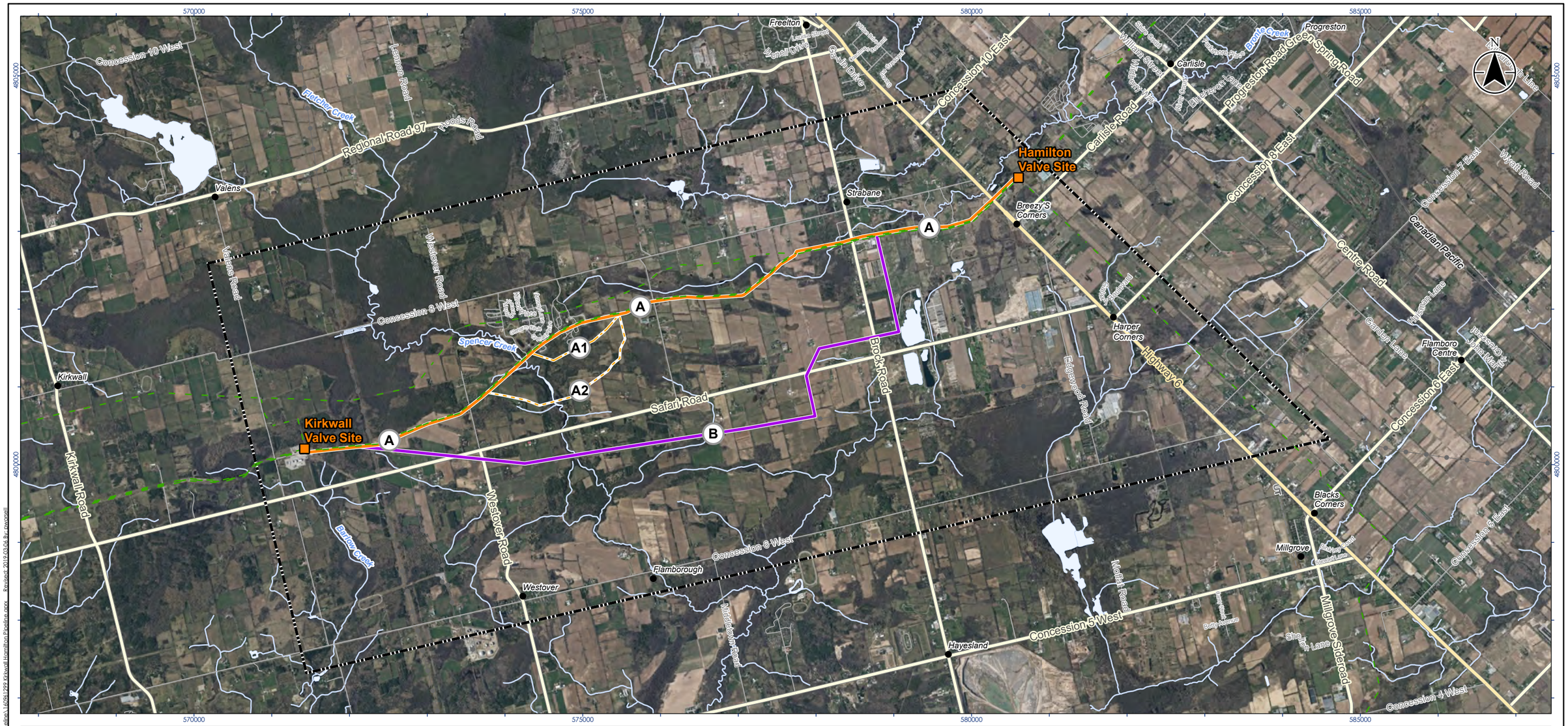

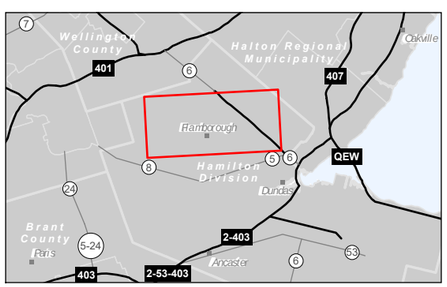

Legend

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City of Hamilton

160961299
Prepared by PW on 2019-03-06

Client/Project
ENBRIDGE GAS INC.
KIRKWALL-HAMILTON PIPELINE PROJECT
STAGE 1 ARCHAEOLOGICAL ASSESSMENT

Figure No.
2

Title
Location of the Study Area

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Stantec

Legend

★ Project Location

A Treaty No. 381, May 9th, 1781 (Mississauga and Chippewa)
AA Treaty No. 72, October 30th, 1854 (Chippewa)
AB Treaty No. 82, February 9th, 1857 (Chippewa)
AE Treaty No. 9, James Bay 1905, 1906 (Ojibway and Cree)
AG Williams Treaty, October 31st, 1923 (Chippewa)
A2 John Collins' Purchase, 1785 (Chippewa)
B Crawford's Purchase, October 9th, 1783 (Algonquin and Iroquois)
B1 Crawford's Purchase, October 9th, 1783 (Mississauga)
B2 Crawford's Purchase, 1783, 1787, 1788 (Mississauga)
C Treaty No. 2, May 19th, 1790 (Odawa, Chippewa, Pottawatomi, and Huron)
D Treaty No. 3, December 2nd, 1792 (Mississauga)
E Haldimand Tract: from the Crown to the Mohawk, 1793
F Tyendinaga: from the Crown to the Mohawk, 1793
G Treaty No. 3 3/4: from the Crown to Joseph Brant, October 24th, 1795
H Treaty No. 5, May 22nd, 1798 (Chippewa)
I Treaty No. 6, September 7th, 1796 (Chippewa)
J Treaty No. 7, September 7th, 1796 (Chippewa)
K Treaty No. 11, June 30th, 1798 (Chippewa)
L Treaty No. 13, August 1st, 1805 (Mississauga)
M Treaty No. 13A, August 2nd, 1805 (Mississauga)
N Treaty No. 16, November 18th, 1815 (Chippewa)
O Treaty No. 18, October 17th, 1818 (Chippewa)
P Treaty No. 19, October 28th 1818 (Chippewa)
Q Treaty No. 20, November 5th, 1818 (Chippewa)
R Treaty No. 21, March 9th, 1819 (Chippewa)
S Treaty No. 27, May 31st, 1819 (Mississauga)
T Treaty No. 27½, April 25th, 1825 (Ojibwa and Chippewa)
U Treaty No. 35, August 13th, 1833 (Wyandot or Huron)
W Treaty No. 45½, August 9th, 1836 (Saugeen)
X Treaty No. 57, June 1st, 1847 (Iroquois of St. Regis)
Y Treaty No. 60, Robinson, Superior, September 7th, 1850 (Ojibwa)
Z Treaty No. 61, Robinson, Huron, September 9th, 1850 (Ojibwa)

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Notes
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3. Treaty boundaries adapted from Morris 1943 (1964 reprint). For cartographic representation only.

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City of Hamilton

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Client/Project
ENBRIDGE GAS INC.
KIRKWALL-HAMILTON PIPELINE PROJECT
STAGE 1 ARCHAEOLOGICAL ASSESSMENT

Figure No.
3

Title
Treaties and Purchases (Adapted from Morris 1943)

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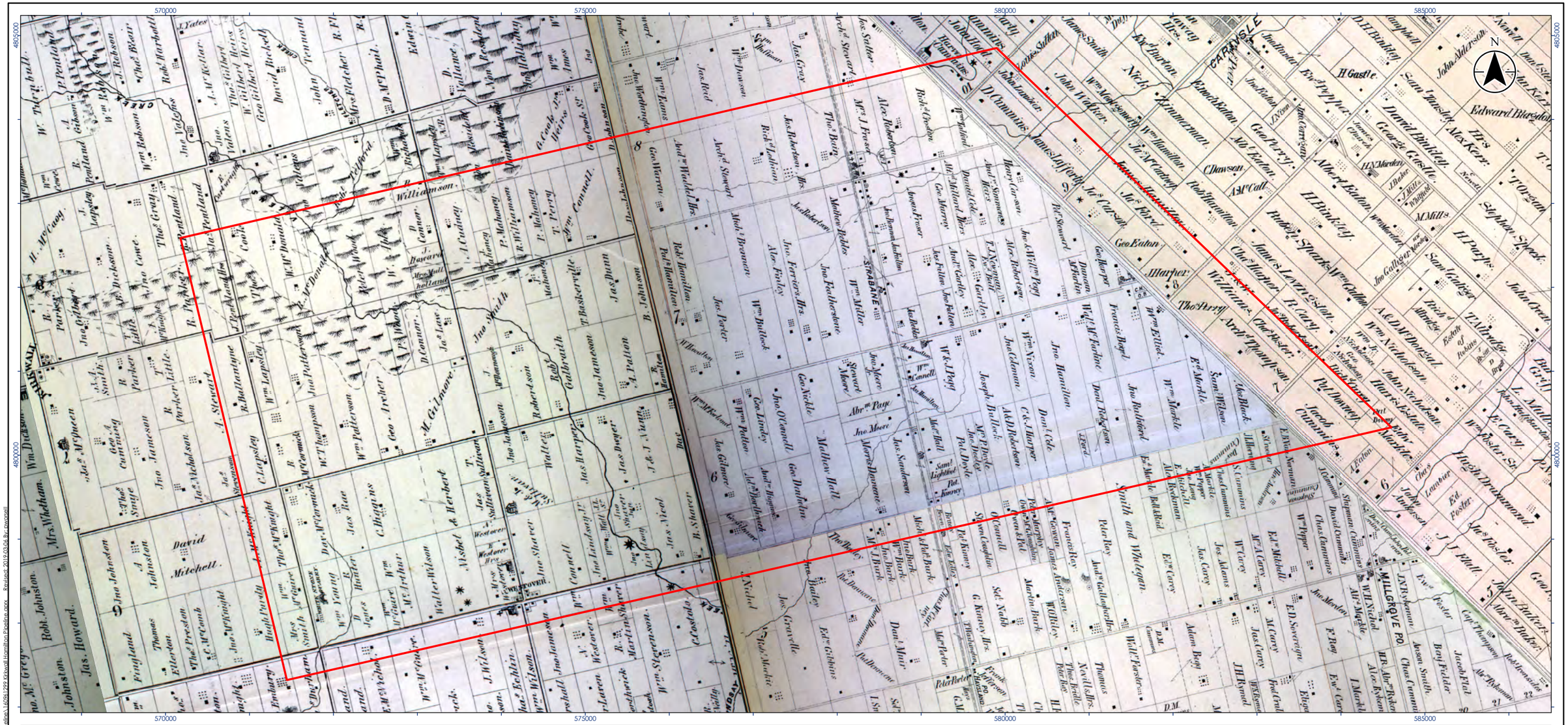
N
KIRKWALL
WAINUI
FREELTON
TOWN
LINE
GRAVEL ROAD
STRABANE
VILLAGE OF CARLISLE
WARD No 3
WARD No 4
HAMILTON, WATERDOWN & CARLISLE
Estate of William Smith
Geo Abery
Henry Sparks
Jas Morden
Wm Nicholson
Wm Foster
Wm Finlay
John Alderson
Donald Stuart
Wm Patterson
Wm Irvine
Wm Atridge
Henry Anderson
John Nicholson
Jacob Baker
John Cummings
Edw Evans
Glebe Land
Lewis Rose
Abram Bindley
William Bindley
John Featherstone
Hugh Green
Nelson Morden
Mark P Crooker
Dan Eaton
Henry Sparks
Jas Morden
Wm Nicholson
Wm Atridge
Henry Anderson
John Nicholson
Jacob Baker
John Cummings
Edw Evans
Glebe Land
Lewis Rose
William Bindley
John Featherstone
Abram Bindley
Hugh Green
Wm Foster
Wm Finlay
Henry Anderson
James Foster
MILLGROVE
WARD No 4
Harker Lyons
Abram
Jacob Baker
John Baker
John Cummings
Glebe Land
Edw Evans
Lewis Rose
John Featherstone
William Bindley
Abram Bindley
Hugh Green
Nelson Morden
Mark P Crooker
Dan Eaton
Henry Sparks
Jas Morden
Wm Nicholson
Wm Atridge
Henry Anderson
John Nicholson
Wm Foster
Wm Finlay
James Foster
Donald Stuart
John Alderson
Wm Patterson
Wm Irvine
Wm Campbell
Geo Hall
Rob Waddell
Jas Glasgow
Mrs Rathbone
Thomas Fletcher
George Tennant
David Bickle
Robert Hunter
Thos Foster
Wm Richardson
Jas Campbell
Wm Evans
Thos Connell
Wm Connell
Canada Co
Wm Miller
Wise
Wilson
Geo Grey
Martin Shelly
Walter Turnbull
Wm Robson
Robert D. Riddell
John Chambers
John Gilbert
Rob Parvis
Jas Howard
Geo Howe
Wm Forsyth
Adam Kerr
David Mitchell
Wm M'Combs
John M'Knight
Thos Preston
Hugh Parks
Archibald Stewart
Wm Crawford
Rob Johnston
Rob Parker
John Train
Wm M'Clares
Wm Patterson
Rob Ballantyne
Claude Lapsley
Rob Parker
John Patterson
Rob M'Donald
John Currun
Wallace M'Donald
Rob Parker
Thos Cook
Thos Grey
Rob Parker
Canada Co
Geo Aitcheson
Thos Poston
Capt Wm Johnstone
Jas Dunn
John Patton
Wm James
Geo Nickle
John Kelly
Geo Denham
Wm Raitt
Pat Kenny
Pat Doyle
John Doyle
Pat Doyle
John Colemore
Wm Organ
John Harper
Joseph Bullock
Pat Doyle
Wm Marble
Jas Morden
Sam Wilson
John Ross
Wm Hemming
Wm Cummings
Edw Pepper
Edw Markle
Jacob Cummings
Wm Curry
Canada Co
Joseph Adams
Jacob Rymal
Wm Curry Estates
Elijah Binkley
John Bigham
Wm Foster
Arthur Evans
Israel Markle
Jonathan Smith
Thomas Morden
Wm Crooker
John Pepper
Jacob Smith
Isaac A Smith
Jacob Carson
Wm Curry
Canada Co
Wm Crooker



Legend

General Study Area (Approximate)

Notes

1. Map is not to scale.
2. Historic map source:

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Project Location
City of Hamilton

160961299
Prepared by PW on 2019-03-06

Client/Project
ENBRIDGE GAS INC.
KIRKWALL-HAMILTON PIPELINE PROJECT
STAGE 1 ARCHAEOLOGICAL ASSESSMENT

Figure No.
5

Title
1875 County of Wentworth Map

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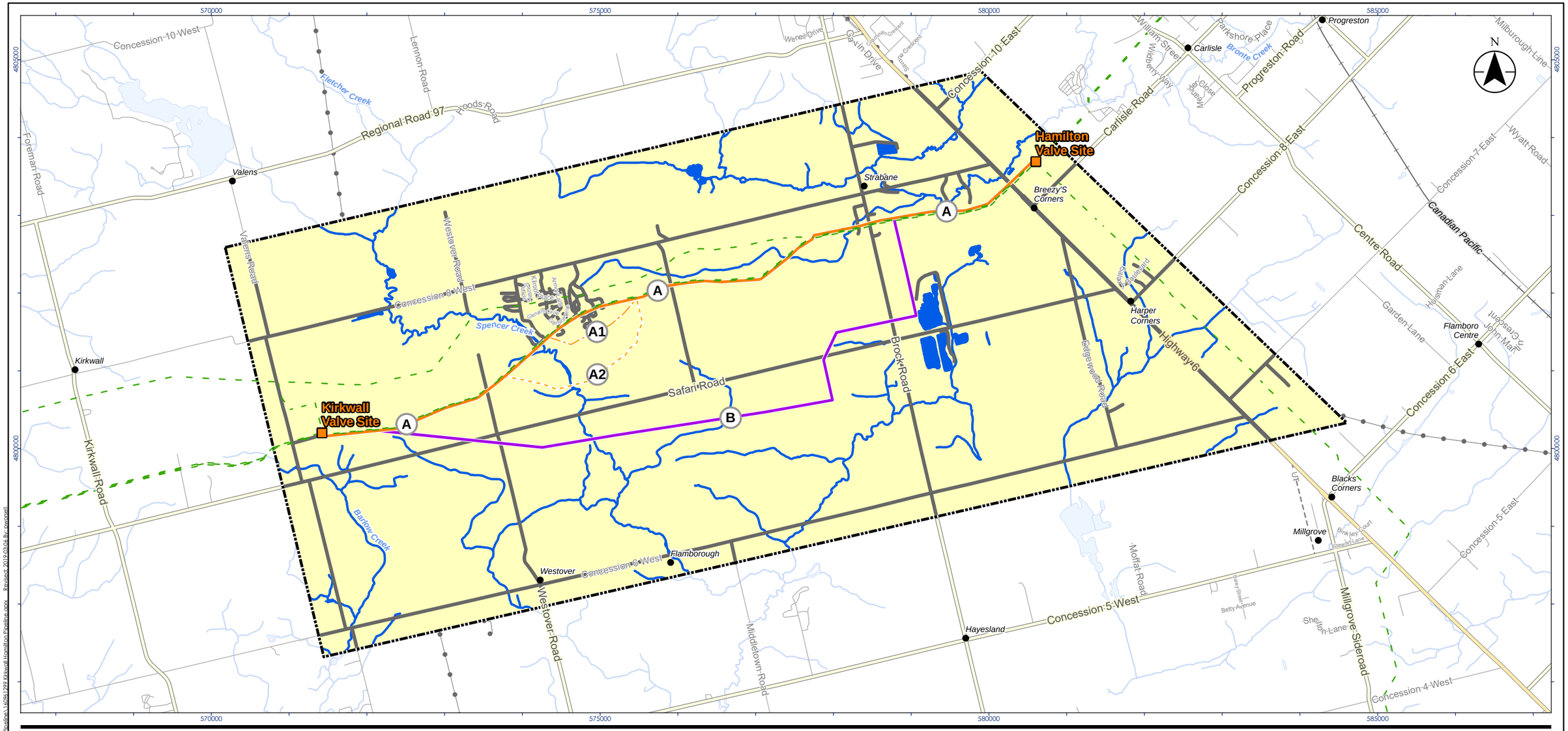

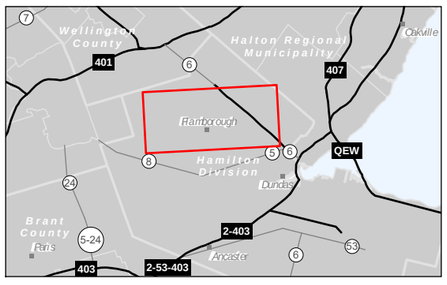

Legend

- Existing Enbridge Station
- A - Preliminary Preferred Route
- A1 - Route Deviation
- A2 - Route Deviation
- B - Alternate Route
- Existing Pipeline
- General Study Area
- Highway
- Major Road
- Minor Road
- Minor Road
- Railway
- Hydro Line
- Unknown Transmission Line
- Watercourse
- Waterbody

Stage 1 Archaeological Potential

- Retains Archaeological Potential; Stage 2 Assessment Required
- Municipal/Provincial Road ROW, May Retain Archaeological Potential; Stage 2 Assessment Required to Confirm Disturbance
- Low and Permanently Wet Areas, Low to No Archaeological Potential; Stage 2 Assessment Required to Confirm Presence

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Notes

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KIRKWALL-HAMILTON PIPELINE PROJECT
STAGE 1 ARCHAEOLOGICAL ASSESSMENT

Figure No.
6

Title
Archaeological Potential of the Study Area

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7.0 CLOSURE

This report documents work that was performed in accordance with generally accepted professional standards at the time and location in which the services were provided. No other representations, warranties or guarantees are made concerning the accuracy or completeness of the data or conclusions contained within this report, including no assurance that this work has uncovered all potential archaeological resources associated with the identified property.

All information received from the client or third parties in the preparation of this report has been assumed by Stantec to be correct. Stantec assumes no responsibility for any deficiency or inaccuracy in information received from others.

Conclusions made within this report consist of Stantec's professional opinion as of the time of the writing of this report and are based solely on the scope of work described in the report, the limited data available and the results of the work. The conclusions are based on the conditions encountered by Stantec at the time the work was performed. Due to the nature of archaeological assessment, which consists of systematic sampling, Stantec does not warrant against undiscovered environmental liabilities nor that the sampling results are indicative of the condition of the entire property.

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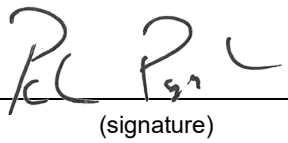
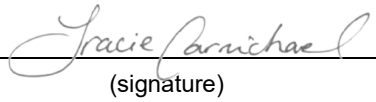
Quality Review 
(signature)

Peter Popkin, Associate, Senior Archaeologist

Independent Review 
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Tracie Carmichael, Managing Principal, Environmental Services

APPENDIX G:
CULTURAL HERITAGE ASSESSMENT REPORT

Dawn-Parkway System Expansion: Kirkwall-Hamilton Pipeline Section: Cultural Heritage Assessment Report

FINAL REPORT

June 18, 2019
File: 160961299

Prepared for:

Enbridge Gas Inc.
745 Richmond Street
Chatham, ON N7M 5J5

Prepared by:

Stantec Consulting Ltd.
600-171 Queens Avenue
London, ON N6A 5J7

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APPENDIX A CULTURAL HERITAGE RESOURCE INVENTORY

Executive Summary

As of January 1, 2019, Union Gas and Enbridge Gas Distribution have amalgamated into one utility with the legal name Enbridge Gas Inc. (Enbridge Gas). To increase existing capacity and accommodate additional demand for natural gas along its main natural gas transmission system, the Dawn Parkway System, Enbridge Gas is proposing to construct a new 48-inch diameter natural gas pipeline located within the City of Hamilton.

The proposed project will be constructed between Enbridge Gas' existing Kirkwall valve site, located northeast of the intersection of Safari Road and Valens Road and Enbridge Gas' existing Hamilton valve site, located east of Highway 6 and north of Carlisle Road. The proposed pipeline will parallel two existing Enbridge Gas pipelines from the Kirkwall valve site for approximately seven kilometres (km), then parallel three existing Enbridge Gas pipelines for approximately three km to the Hamilton valve site. The total length of the proposed pipeline will be approximately 10 km. If approved, construction of the pipeline could begin as early as spring/summer 2021 and be complete by the end of 2021.

Enbridge Gas retained Stantec Consulting Ltd. (Stantec) to conduct an environmental study for the construction and operation of the proposed pipeline and related facilities. The Ontario Energy Board's (OEB) *Environmental Guidelines for the Location, Construction and Operation of Hydrocarbon Pipelines and Facilities in Ontario, (2016)* (the *OEB Environmental Guidelines*) require that where the Project may affect known or potential heritage resources, further studies may be required. In order to identify the presence of heritage resources in the Study Area, understand the potential impacts of the Project on these resources, and prepare mitigation strategies to minimize these impacts, it was determined that a Cultural Heritage Assessment Report (CHAR) would be prepared.

The study methodology is broadly based on guidelines provided by Ministry of Tourism, Culture and Sport (MTCS) within InfoSheet #5 in *Heritage Resources in the Land Use Planning Process, Cultural Heritage and Archaeology Policies of the Ontario Provincial Policy Statement, 2005*. The OEB *Environmental Guidelines* make provisions for the consideration of heritage in the pipeline development planning stage of the Project and stipulate that pipeline proponents are responsible for demonstrating the appropriate level of due diligence regarding heritage resources. This involves identification of heritage resources and the assessment of impacts of the Project on these resources.

During the course of the field survey, 35 individual sites were identified as containing potential heritage resources within the Study Area of the proposed pipeline routes. The Study Area for this survey is delineated by property parcels within a 50 metre buffer of the Project Location. Where a potential heritage resource was identified in the Study Area, an evaluation of the cultural heritage value or interest of the property, or properties, was undertaken. Where cultural heritage value or interest was identified, a structure or landscape was assigned a cultural heritage resource (CHR) number and the property was determined to contain a heritage resource. Evaluations for each property are contained within Appendix A.



Where a heritage resource was identified within or across the Study Area, an assessment of potential impacts resulting from the Project was undertaken. The assessment of potential impacts was undertaken according to InfoSheet #5. Given the proposed undertaking, the evaluation of potential impacts was undertaken where a component or heritage attribute of the heritage resources was positioned within 50 metres of a proposed pipeline route.

Where potential impacts were identified, measures to mitigate the impact have been prepared. A total of 26 cultural heritage resources (CHRs) were determined to be situated within the Study Area of the proposed pipeline route alternatives (Route A and B). Route A was selected as the preferred route for the Project. A total of 13 CHRs were determined to be situated within the Study Area of the preferred route.

To prevent negative indirect Project impacts, these heritage resources should be isolated from Project activities. It is recommended that site plan controls be put in place prior to construction to prevent potential indirect impacts as a result of the Project. The site plan control methods shall be determined in advance of construction by the proponent to indicate where Project activities are restricted. As described in Section 6.3, site plan controls should include mapping heritage resources within the 50-metre buffer of Project activities on construction maps and physically demarcating these properties to communicate the presence of these properties to construction crews.

One cultural heritage resource, 750 Concession 8 West (CHR-11), is located within 50 metres of Project activities. This resource is at risk for indirect impacts resulting from construction-related ground vibration. It is recommended that Enbridge consult with a qualified building conditions specialist or geotechnical engineer with previous experience working with heritage structures to identify appropriate vibration mitigation measures in advance of construction. Mitigation measures for vibration may include developing an appropriate vibration setback distance, a vibration attenuation study, and/or a construction monitoring program.

Enbridge Gas' on-site inspection team should monitor the construction phase of this project so that construction activities do not occur within 50 metres of built heritage attributes of CHRs and that no cultural heritage landscape elements are impacted during construction. Monitoring for impacts should also be carried out by Enbridge Gas during post-construction rehabilitation.

To assist in the retention of historic information, copies of this report should be deposited with local libraries and municipalities. It is recommended that this report be deposited at the Hamilton Public Library, Central Library Branch and the Hamilton Municipal Heritage Committee.

The Executive Summary highlights key points from the report only; for complete information and findings, the reader should examine the complete report.



Project Personnel

Project Manager:	Michael Candido, B.Sc. (Env.)
Heritage Consultant:	Meaghan Rivard, MA, CAHP
Task Manager:	Laura Walter, MA
Report Writers:	Laura Walter, MA Frank Smith, MA
GIS Specialist:	Andrew White, BA, M.Sc.
Administrative Assistant:	Carol Naylor
Quality Reviewer:	Jeffrey Muir, BA, CAHP
Independent Reviewer:	Tracie Carmichael, BA, B.Ed.
Proponent Contact:	Ryan Park

Abbreviations

BHR	Built Heritage Resource
CHAR	Cultural Heritage Assessment Report
CHL	Cultural Heritage Landscape
CHR	Cultural Heritage Resource
CHVI	Cultural Heritage Value or Interest
CPR	Canadian Pacific Railway
GWR	Great Western Railway
km	kilometres
LACAC	Local Architectural Conservation Authority Committee
MTCS	Ministry of Tourism, Culture and Sport
OEB	Ontario Energy Board
OHA	*Ontario Heritage Act*
OHT	Ontario Heritage Trust
O. Reg.	Ontario Regulation
PPS	Provincial Policy Statement
PPV	Peak particle velocity
RoW	Right-of-Way

Glossary

Built Heritage Resource	(BHR) Refers to a single building, structure, monument, installation or remains determined to be of cultural heritage value or interest (CHVI) following evaluation according to Ontario Regulation (O. Reg.) 9/06. In addition, this includes properties protected under the *Ontario Heritage Act* (OHA) or listed by local, provincial or federal jurisdictions. This may include residences, barns, bridges, and similar features (based on definition provided in the 2014 Provincial Policy Statement [PPS] [Government of Ontario 2014]).
Cultural Heritage Landscape	(CHL) Refers to a defined geographical area modified by human activities and determined to be of CHVI following evaluation according to O. Reg. 9/06. In addition, this includes properties protected under the OHA or listed by local, provincial or federal jurisdictions. This may include grouping(s) of individual heritage features such as structures, spaces, archaeological sites and natural elements, which together form an important type of heritage form, distinctive from that of its constituent elements or parts (based on definition provided in the PPS [Government of Ontario 2014]).
Cultural Heritage Resource	(CHR) Refers to built or cultural resources where CHVI has been determined according to O. Reg. 9/06. Prior to evaluation, resources identified to be 40 years of age or older are considered to be *potential* heritage resources. There are two categories of heritage resources: Built Heritage Resources (BHR) and Cultural Heritage Landscapes (CHL).
Cultural Heritage Value or Interest	(CHVI) Refers to the O. Reg 9/06 criteria in which heritage value of a property is identified. The three criteria set out subsection two are design or physical value, historical or associative value, and contextual value.
Heritage attributes	Refers to the components of a heritage resource that define its CHVI. These may include, but are not limited to, principal features, characteristics, context, and appearance of a heritage resource (based on definition provided in the PPS [Government of Ontario 2014]).



Potential Heritage Resource	Refers to any property previously identified by municipal staff or provincial agencies as containing, or having the potential to contain, CHVI. This includes properties identified on municipal registers, lists, or inventories of potential heritage resources. It may also include properties identified during the site assessment that are over 40 years of age.
Project Location	Refers to any land in, on, over, or under which part of the proposed pipeline is situated. This includes constructible areas as well as proposed staging areas and land used for permanent or temporary project activity.
Protected Heritage Property	Refers to properties which are designated under, or subject to an easement made under, the OHA, as well as properties identified by provincial authorities and prescribed public bodies as a provincial heritage properties. In addition, protected heritage property includes those identified by federal or international authorities as such including, but not limited to, Parks Canada or UNESCO (based on definition provided in the PPS [Government of Ontario 2014]).
Study Area	Refers to all properties through which the Project Location is proposed to pass through plus a 50-metre area surrounding the Project components. Property parcel information was used to delineate the limits of the Study Area.

1.0 INTRODUCTION

1.1 PROJECT OVERVIEW

As of January 1, 2019, Union Gas and Enbridge Gas Distribution have amalgamated into one utility with the legal name Enbridge Gas Inc. (Enbridge Gas). To increase existing capacity and accommodate additional demand for natural gas, along its main natural gas transmission system, Enbridge Gas is proposing to construct a new 48-inch diameter natural gas pipeline located within the City of Hamilton.

The proposed project will be constructed between Enbridge Gas' existing Kirkwall valve site, located northeast of the intersection of Safari Road and Valens Road and Enbridge Gas' existing Hamilton valve site, located east of Highway 6 and north of Carlisle Road. The proposed pipeline will parallel two existing Enbridge Gas pipelines from the Kirkwall valve site for approximately seven kilometres (km), then parallel three existing Enbridge Gas pipelines for approximately three km to the Hamilton valve site. The total length of the proposed pipeline will be approximately 10 km. If approved, construction of the pipeline could begin as early as spring/summer 2021 and be complete by the end of 2021.

Route A, depicted on Figure 1, is the preliminary preferred route for the pipeline. Route A extends east between Safari Road and Concession 8 West, between the Kirkwall Valve Site and the Hamilton Valve Site. The route currently includes two additional proposed deviation routes, A1 and A2, between Westover Road and Middletown Road. These two deviation routes were proposed to avoid impacts to the properties at 1264 Concession 8 West (Atrium Glen Retirement Community) and 1218 Concession 8 West (Ponderosa Nature Resort). Route B is the proposed alternative route, and extends east between Safari Road and Concession 6 West until Brock Road where it extends north and joins with Route A.

1.2 STUDY PURPOSE AND OBJECTIVES

Enbridge Gas has retained Stantec Consulting Ltd. (Stantec) to undertake an environmental study of the construction and operation of the proposed pipeline and related facilities. 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)

As part of this study, Stantec identified the need to consider heritage resources as defined by Section 4.3.4 of the *Ontario Energy Board (OEB) Environmental Guidelines for the Location, Construction and Operation of Hydrocarbon Pipelines and Facilities in Ontario* (the *OEB Environmental Guidelines*) (OEB 2016). The *Guidelines* require that where the Project may affect known or potential heritage resources, further studies may be required. In order to identify the presence of heritage resources within the Study Area, understand the potential impacts of the Project on these resources, and prepare mitigation strategies to minimize these impacts, it was determined that a Cultural Heritage Assessment Report (CHAR) would be prepared.

To meet these objectives, the CHAR:

- Summarizes the historical context of the area surrounding the Project
- Identifies properties protected under the *Ontario Heritage Act* (OHA) through consultation with the local heritage planners and regulatory bodies
- Identifies and describes potential heritage resources situated on properties within the Study Area based on a windshield survey
- Evaluates the cultural heritage value or interest (CHVI) of potential heritage resources within the Study Area according to *Ontario Regulation* (O. Reg.) *9/06* to determine the presence of heritage resources (Government of Ontario 2006a)
- Identifies areas of potential impacts according to the Ministry of Tourism, Culture and Sport's (MTCS) InfoSheet #5 in *Heritage Resources in the Land Use Planning Process, Cultural Heritage and Archaeology Policies of the Ontario Provincial Policy Statement, 2005* (Government of Ontario 2006b)
- Establishes measures to mitigate negative direct or indirect impacts to heritage resources associated with construction and operation of the Project

1.3 ACTIVITY SUMMARY

1.3.1 Construction

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 right-of-way (RoW) and temporary work areas. Next, the RoW and temporary work areas are cleared of brush and trees (typically during winter, under frozen ground conditions). In the spring the fences that break up the linear RoW are braced and cut to permit an uninterrupted work area. 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 the required locations. Pre-tiling work is completed to accommodate agricultural drainage.
2. Grading and Stripping: The RoW is graded 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 trench. Existing landscaping is also removed, and dewatering undertaken, where necessary.
3. Stringing: Stringing is the process where pipe sections are delivered to the full length of the RoW, placed on wooded skids and generally parallel to where the trench will be excavated.
4. Pipe Fabrication: The pipe is bent as required and the welding crew welds the pipe into continuous lengths. The pipe welds are non-destructively tested (e.g., x-ray) and coated.
5. Trenching and Lowering: After the pipe is fabricated, a trenching machine or hydraulic hoe can begin excavating a new trench. In areas of shallow bedrock, hoe-ramming and/or blasting may be required. In agricultural areas, tiles that are cut during the trench excavation are flagged and repaired as quickly as practical. In some areas the pipeline cannot be installed by trenching due to obstacles such

as roads or watercourses. In these locations the pipeline is installed using a trenchless approach through a variety of different means. Laneways and driveways are left over the trench as long as feasible where requested by the landowner.

6. Backfilling: During backfilling the originally excavated subsoil is placed over the pipe in the trench. In stony areas, the pipe may be sand-padded to protect the coating. In shallow water table areas, the pipeline may be weighted to provide negative buoyancy. In agricultural areas, after the trench is backfilled, tiling is repaired that was disturbed or broken by construction. Landowners with tile drainage are given the opportunity to inspect tile repairs. Typically, a tile consultant is retained to oversee tile repairs and the design of a header tile system if required.

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 by permit from nearby water sources such as watercourses or lakes, if available. Municipal water may also be used for hydrostatic testing. Upon completion of the hydrostatic testing, the pipeline is drained and dried then put into service with natural gas.

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 and stone picking to maintain productivity. In natural areas, clean-up restores the environment including re-seeding of the RoW, returning the topography after grading, restoring ditch banks and watercourse crossings. Any erosion and sediment controls installed during construction are also removed. Clean-up will also restore landscaping, laneways and driveways.

1.3.2 Operation

Pipeline operation consists of pressurized natural gas 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.

Once the pipeline is operational, the following activities are undertaken to patrol and maintain the pipeline:

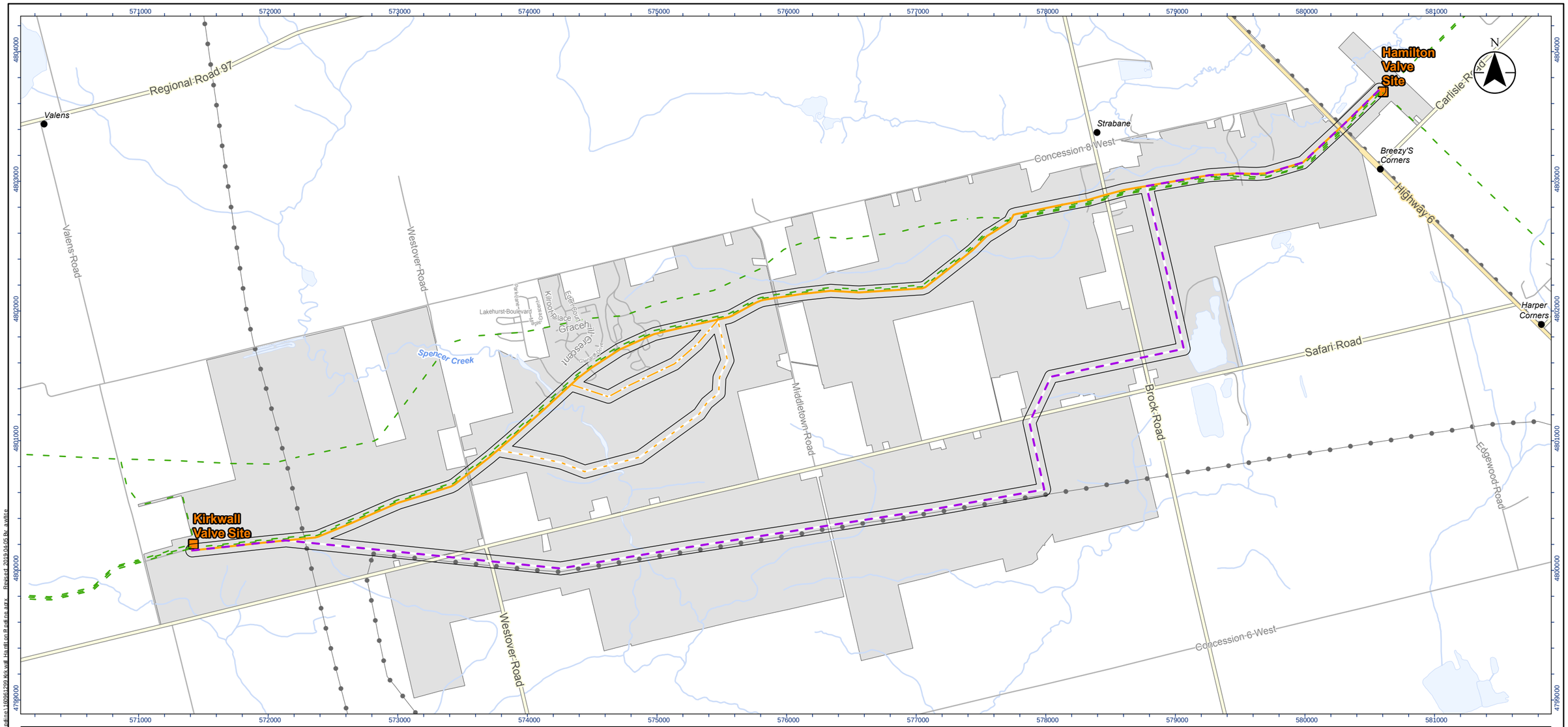
- Completing a “line walk” of the entire pipeline by Enbridge Gas personnel once a year to check for exposed pipelines, evidence of damage to aboveground equipment and piping, evidence of damage to underground piping and gas leaks, and identify any unassociated construction activity near the pipeline RoW

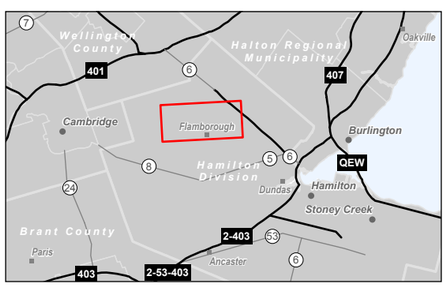
- Conducting fixed wing aerial patrols weekly from April 1 to December 31 and monthly from January 1 to March 31 to detect the presence of soil erosion and third-party structures or activities that could damage the pipeline

- Checking cathodic corrosion protection – an electric current that runs along the length of the pipeline to prevent the development of corrosion

- Reviewing operating conditions of pipeline facilities such as valve sites
- Completing depth of cover surveys, so that the amount of soil cover over the pipeline is maintained
- Performing periodic inspection by running electronic tools through the interior of the pipeline to assess for the presence of corrosion or dents and the need for repairs
- Completing class location surveys, adding all new buildings and structures to the Enbridge Gas mapping system.







Legend

- Study Area
- 50 m Buffer
- Preliminary Preferred Route (A)
- Route Deviation A1
- Route Deviation A2
- Route Alternative (B)
- Carto route halo
- Existing Enbridge Station
- Existing Pipeline
- Place_Names_gb Local Places
- Municipal Boundary, Lower
- Highway
- Major Road
- Minor Road
- Minor Road
- Hydro Line
- Watercourse
- Waterbody

0 0.5 1 km

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
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Stantec

Project Location
City of Hamilton

160961229

Client/Project
ENBRIDGE GAS INC.
KIRKWALL TO HAMILTON PIPELINE PROJECT

Figure No.
1

Title
Project Location

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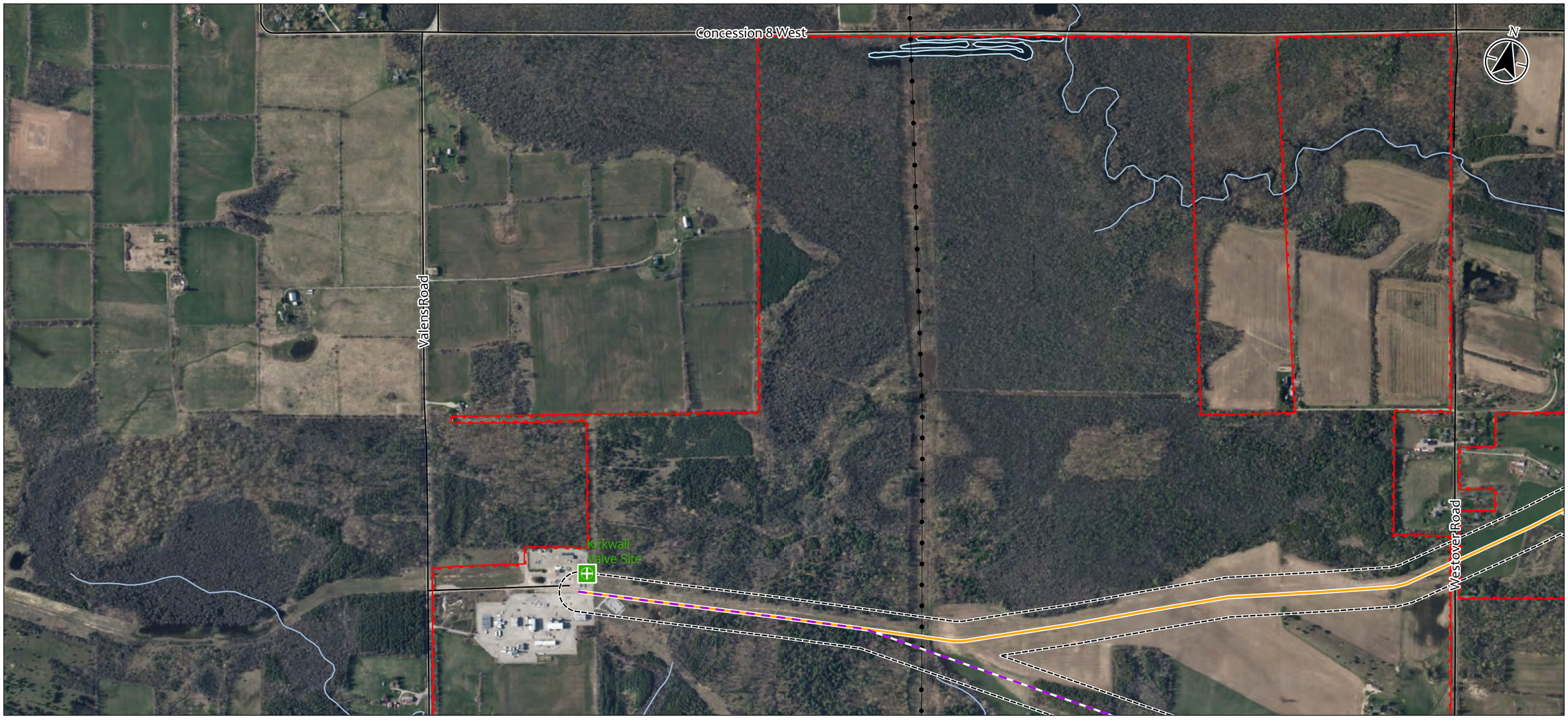

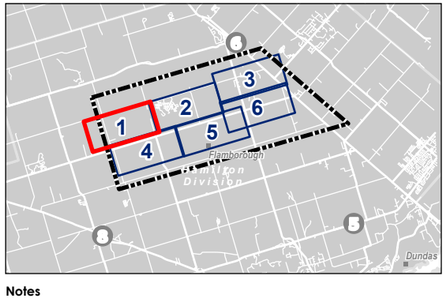

Legend

- Study Area
- 50 m Buffer
- Preliminary Preferred Route (A)
- Route Deviation A2
- Route Alternative (B)
- Station
- Road
- Hydro Line
- Waterbody
- Watercourse

0 100 200 400 m

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

Notes

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Stantec

Project Location
City of Hamilton

160961299
Prepared by AMW on 2019-04-08
Technical Review by ABC on yyyy-mm-dd

Client/Project
Enbridge Gas Inc.
Kirkwall to Hamilton Pipeline

Figure No.
2.1

Title
Study Area

\\Cd1220-f001.ca001.ad\GIS\Active\160961299\03_drawings\mxd\160961299_03_drawing_01.mxd Revised: 2019-04-08 By: mwhite

2.0 METHODOLOGY

2.1 REGULATORY REQUIREMENTS

The study methodology is broadly based on guidelines provided by MTCS within InfoSheet #5 (Government of Ontario 2006b). As discussed briefly in Section 1.0, the *OEB Environmental Guidelines* make provisions for the consideration of heritage resources in the pipeline development planning stage of the Project. The *OEB Environmental Guidelines* stipulate that pipeline proponents are responsible for demonstrating the appropriate level of due diligence regarding heritage resources. This involves both the identification of heritage resources and the assessment of impacts of the Project on these resources. According to the *OEB Environmental Guidelines*, due diligence should be exhibited by:

- *Recognizing cultural heritage resources that may be affected by pipeline development, identifying significant cultural heritage resources and understanding their cultural heritage value or interest*
- *Assessing the effects or impacts that could result from proposed pipeline development*
- *Protecting cultural heritage resources by appropriate conservation, avoidance and mitigation*

(OEB 2016: 31-32)

In addition to requirements outlined in the *OEB Environmental Guidelines*, provisions made under the revised 2014 *Provincial Policy Statement* (PPS) were also considered in the preparation of the study. Section 2.6 of the PPS addresses cultural heritage in the land use planning process and as such was considered. The applicable provisions include:

> *2.6.1 - Significant built heritage resources and significant cultural heritage landscapes shall be conserved.*
>
> *2.6.3 - Planning authorities shall not permit development and site alteration on adjacent lands to protected heritage property except where the proposed development and site alteration has been evaluated and it has been demonstrated that the heritage attributes of the protected heritage property will be conserved.*
>
> (Government of Ontario 2014: 29)

In response to requirements outlined within InfoSheet #5, the *OEB Environmental Guidelines*, and the PPS, Stantec has identified built heritage resources (BHR) and cultural heritage landscapes (CHL); evaluated the impacts of the proposed undertaking on the cultural heritage resources (CHR); and provided options to mitigate those impacts and to conserve protected properties, if applicable.

The CHAR was composed of a program of archival research focused on the Study Area. To familiarize the study team with the Study Area, local historical resources were consulted, archival documents were reviewed, and a summary of the historical background of the local area was prepared. Specifically, historical mapping was consulted to identify the presence of structures, settlements, and other potential

heritage resources in advance of the field program. Mapping from 1859, 1875, 1916, 1923, 1929, 1936, 1938, 1964, and 1975 was reviewed.

2.2 MUNICIPAL AND AGENCY CONSULTATION

Listings of provincially and locally designated properties, districts and easements were collected from the City of Hamilton, the Ontario Heritage Trust (OHT), and the MTCS. Consultation with agencies and the municipality within which the Project is proposed was undertaken to determine the presence of designated, listed, or registered heritage properties within the Study Area.

Recognition of protected properties varies greatly and is dependent on the level of CHVI identified or, in some cases, the level of investigation undertaken. For the purpose of this study, any property previously identified by municipal staff or provincial agencies as containing, or having the potential to contain, CHVI was determined to be a protected heritage property. Specific requirements pertaining to these properties are described within the *OEB Environmental Guidelines* which emphasize that early identification allows the proponent to consider the impact the Project may have on protected heritage properties.

2.3 FIELD PROGRAM

A vehicular windshield survey was conducted by Laura Walter, MA, and Frank Smith, MA, both Cultural Heritage Specialists with Stantec, on January 30, 2019 from publicly accessible roadways, unless specified otherwise. Since the survey was completed prior to the selection of Route A as the preferred route, the Study Area for Routes A and B were surveyed for potential heritage resources, including both potential built heritage resources and components of cultural heritage landscapes. Where identified, these were photographed, and their locations recorded. Characteristics of each potential heritage resource were noted while in the field and their locations recorded.

In general, buildings and structures of more than 40 years of age were screened during the survey for their potential to satisfy O. Reg. 9/06 criteria. The use of the 40-year threshold is generally accepted by both the federal and provincial authorities as a preliminary screening measure for cultural heritage interest or value. This practice does not imply that all buildings and structures more than 40 years of age are inherently of significant heritage value, nor does it exclude exceptional examples constructed within the past 40 years of being of significant cultural heritage value.

2.4 EVALUATION OF CULTURAL HERITAGE VALUE OR INTEREST

The criteria for determining CHVI are defined by O. Reg. 9/06. Each potential heritage resource was considered both as an individual structure and as cultural landscape. Where CHVI was identified, a property was assigned a CHR (Cultural Heritage Resource) number and the property was determined to contain a heritage resource. Evaluations for each property are contained within Appendix A.

2.4.1 Ontario Regulation 9/06

In order to identify cultural heritage value or interest at least one of the following criteria must be met:

1. The property has design value or physical value because it,

- *i. is a rare, unique, representative, or early example of a style, type, expression, material or construction method,*
- *ii. displays a high degree of craftsmanship or artistic merit, or*
- *iii. demonstrates a high degree of technical or scientific achievement.*

2. The property has historical value or associative value because it,

- *i. has direct associations with a theme, event, belief, person, activity, organization, or institution that is significant to a community,*
- *ii. yields, or has the potential to yield, information that contributes to an understanding of a community or culture, or*
- *iii. demonstrates or reflects the work or ideas of an architect, artist, builder, designer or theorist who is significant to a community.*

3. The property has contextual value because it,

- *i. is important in defining, maintaining, or supporting the character of an area,*
- *ii. is physically, functionally, visually, or historically linked to its surroundings, or*
- *iii. is a landmark.*

(Government of Ontario 2006a).

2.5 ASSESSMENT OF PROJECT IMPACTS

Where a heritage resource was identified within or across the Study Area, an assessment of potential impacts as a result of the Project was undertaken. The assessment of potential impacts was undertaken according to InfoSheet #5. Seven potential negative impacts have been identified, including, but not limited to:

- *Destruction of any, or part of any, significant heritage attributes or features*
- *Alteration that is not sympathetic, or is incompatible, with the historic fabric and appearance*
- *Shadows created that alter the appearance of a heritage attribute or change the viability of a natural feature or plantings, such as a garden*
- *Isolation of a heritage attribute from its surrounding environment, context or a significant relationship*



- *Direct or indirect obstruction of significant views or vistas within, from, or of built and natural features*
- *A change in land use such as rezoning a battlefield from open space to residential use, allowing new development or site alteration to fill in the formerly open spaces*
- *Land disturbances such as a change in grade that alters soils, and drainage patterns that adversely affect an archaeological resource*

(Government of Ontario 2006b)

Indirect impacts resulting from land disturbances apply to archaeological resources, which are beyond the scope of this assessment. An Archaeological Assessment has been prepared under separate cover, which addresses the archaeological potential of the Study Area and includes recommendations for further work (Stantec 2019). No further consideration to archaeological resources is provided in this report.

In addition to impacts discussed in InfoSheet #5, this CHAR also evaluated the potential for indirect impacts resulting from the vibrations of construction activities. Although the effect of construction vibrations on historic period structures is highly variable, research suggests that vibrations may be perceptible in buildings with a setback of less than 40 metres from project activity (Crispino and D'Apuzzo 2001; Ellis 1987; Rainer 1982; Wiss 1981).

2.6 MITIGATION STRATEGIES

Mitigation strategies were prepared based on guidelines provided by both the MTCS and the OEB. The MTCS suggest methods of minimizing or avoiding negative direct or indirect impacts including, but not limited to:

- *Alternative development approaches*
- *Isolating development and site alteration from significant built and natural features and vistas*
- *Design guidelines that harmonize mass, setback, setting, and materials*
- *Limiting height and density*
- *Allowing only compatible infill and additions*
- *Reversible alterations*
- *Buffer zones, site plan control, and other planning mechanisms*

(Government of Ontario 2006b)

3.0 HISTORICAL DEVELOPMENT

3.1 INTRODUCTION

The Study Area is located in the City of Hamilton, Ontario. The Study Area extends from the existing Kirkwall valve site at 1376 Valens Road east to the Hamilton valve site situated on the east side of Highway 6 (Figure 2). As mentioned in Section 2.3, since the vehicular wind shield survey was undertaken prior to the selection of the preferred route, the Study Area includes the original two alternative routes that span between the valve sites. Route A, now the preferred route, extends east between Safari Road and Concession 8 West, with two proposed route deviations, A1 and A2, between Westover Road and Middletown Road. The formerly proposed alternative Route B extends east between Safari Road and Concession 6 West until Brock Road where it extends north and joins with Route A.

The Study Area spans across the following historical lots and concessions within the former Township of Beverly, within the former County of Wentworth, now the City of Hamilton:

- Lots 29 to 36, Concession 6
- Lots 25 to 36, Concession 7

The Study Area then spans across the following historical lots and concessions within the former Township of West Flamborough, within the former County of Wentworth, now the City of Hamilton:

- Lots 1 to 5, Concession 6
- Lots 1 to 12, Concession 7

And the Study Area spans across the following historical lots and concessions within the former Township of East Flamborough, within the former County of Wentworth, now the City of Hamilton:

- Lots 12 to 13, Concession 9

The following sections outline the historical development of the Study Area from the period of settlement to the present.

3.2 PHYSIOGRAPHY

The Study Area is situated within the Flamborough Plain physiographic region, with a small section located within the Norfolk Sand Plain physiographic region, of southern Ontario (Chapman and Putnam 1984: 113). The physiography along the proposed pipeline route between the Kirkwall valve site and Westover Road is characterized by limestone plains and till plains (drumlinized). Between Westover Road and Middletown Road the physiography of proposed pipeline route consists of till plains (drumlinized) and areas of drumlins. Between Westover Road and Brock Road the physiography consists of till plains (drumlinized) and limestone plains. Between Brock Road and the Hamilton valve site the area is again



characterized by limestone plains with an area between Highway 6 and the Hamilton valve site on the boundary of limestone plains and sand plains. The soil in the region is generally poor and ranges from loam to muck; cultivated soil is mainly found on the drumlins and deeper gravel terraces (Chapman and Putnam 1984: 130).

3.3 SURVEY AND SETTLEMENT

3.3.1 Township of Beverly

The first survey of the Township of Beverly was undertaken by Augustus Jones in 1794. This survey included Concessions 1 through 5. The remaining concessions, 6 through 10, were initially surveyed in 1797 by John Stegman, but due to the challenging landscape and Beverly swamp, the survey had to be resurveyed in 1832 (Collins 2001: 7). The township survey was laid out in relation to the survey of the Governor's Road (Dundas Street), also completed by Jones from 1793 to 1795. A party of Queen's Rangers opened the road to serve as a military connection road between the Great Lakes and the St. Clair River. It was named by Governor John Graves Simcoe for Henry Dundas, Secretary of State for the British Home Department (Magel 1998: 30).

The township name of Beverly was chosen by Simcoe after the Town of Beverly, located in East Yorkshire, England (Hamilton Public Library 2017b). The township has 10 concessions running south to north from the Governor's Road, with lots numbered west to east. Laid out using the single-front system, each concession was comprised of long and narrow lots that were approximately 200 acres in size (Plate 1).



Plate 1: Single-Front System (Dean 1969)

The first European settlers in the Township of Beverly were Jacob Cope and George Jones, who arrived following the survey (Page & Smith 1875: x). The majority of early landowners in the township were absentee owners, which included merchants and officeholders in York (now Toronto), Niagara, and Montreal (Collins 2001: 7).

3.3.2 Township of West Flamborough

The Township of West Flamborough was surveyed in 1793 using a single-front system by District Provincial Land Surveyor Augustus Jones. The township survey, similar to the Township of Beverly, was also laid out in relation to the survey of the Governor's Road. The township name of Flamborough was chosen by Simcoe after a small east coast village in Yorkshire, England. It was surveyed into west and east portions that remained administratively joined until 1854 (Hamilton Public Library 2017b). The west portion was laid out in the shape of a triangle with the Governor's Road serving as the base. It has 11 concessions running west to east that were numbered north from Governor's Road (Burkholder 1950). Laid out using the single-front system, each concession was comprised of long and narrow lots that were approximately 200 acres in size (Plate 1). Lot sizes in the township are irregular, due to its triangular shape and Cootes Paradise along the southeast portion (Green *et al*. 2003: 2).

As part of the survey of the township, Simcoe ordered that a 60-acre plot be set aside for the creation of a town plot. The town was surveyed in 1801 by Deputy Surveyor John Stegman and named Cootes Paradise (now Dundas) after Captain Thomas Cootes, a British Naval Officer who hunted waterfowl in the area in the 1780s (Royal Botanical Gardens n.d.). The town plot was laid out on a portion of Lot 17, Concession 1, in the Township of West Flamborough and a portion of Lot 53, Concession 1, in the Township of Ancaster (Page & Smith 1875: ix).

The first settlers in the township were Ann Morden and her family, United Empire Loyalists, who settled in the township in 1787. When Jones surveyed the township, he noted the Morden family as squatters in the Dundas Valley (Woodhouse 1965: 10). Other early settlers prior to 1800 included Andrew Vanevery, John Purbus, Isaac Durham, William Chrysler, David Vanevery, Frederick Schram, John Rosebrough, Peter Vanevery, Isaac Smith, John Showers, Michael Showers, William Frances, Harcar Lyons, and James Durand (Woodhouse 1965: 12).

3.3.3 Township of East Flamborough

The Township of East Flamborough was surveyed in 1793 using a single-front system by District Provincial Land Surveyor Augustus Jones (Waterdown East Flamborough Centennial Committee [WEFCC] 1967: 11). Similar to the Township of West Flamborough, the Township of East Flamborough was laid out in relation to the Governor's Road and named by Simcoe. The Township of East Flamborough has fourteen concessions running south to north, with a broken front along Burlington Bay. Lots in the township are numbered east to west. Laid out using the single-front system, each concession was comprised of long and narrow lots that were approximately 200 acres in size (Plate 1).

The first settler in the Township of East Flamborough was David Fonger who arrived in 1783. He was followed by William Applegarth in 1791 (Green et al. 1997: 5). Land grants were given beginning in 1796,



in the lower portions of the township. One of the first grants was given to Alexander McDonnelll in 1796, including 800 acres on Grindstone Creek (WEFCC 1967: 12).

3.4 19TH CENTURY DEVELOPMENT

3.4.1 Township of Beverly

Settlement in the Township of Beverly developed primarily at road intersections and was influenced by the establishment of mills and railway development. In the 1820s, Governor's Road, south of the Study Area, was planked through the township, influencing the location of the settlements of Lynden and Copetown. The Dundas and Waterloo Road was opened in the township in the early 19th century and planked in 1837 between the Desjardins Canal to the Village of Waterloo to the northeast. The roadway, west of the Study Area, allowed for the settlement of Rockton, Romulus, and Sheffield (Collins 2001: 8). By 1859, the Dumfries and Beverly Road was planked and connected to the Dundas and Waterloo Road from the adjacent Township of North Dumfries, in the County of Brant.

Settlement in the township was slow due to the challenging terrain composed of rock, swamps, and forests. The township remained an unbroken forest until 1810, when a portion of land was cleared near Sheffield (Cornell 1967: 8). By 1820, the township had only a population of 81, with 1,883 acres of cultivated land, out of a total 70,200 acres (Page & Smith 1875: x). In the 1830s, settlers from the British Isles began to arrive in the township and the population increased. The first European settlements in the northern portion of the township in relation to the Study Area occurred in 1832 with the first settlers, John and William McKnight. They were followed soon after by John Valens, the Pentland family, and the Macdonald family (Irwin & Co. 1883: 37).

The first administration meeting of the Township of Beverly was held on January 4, 1836, with John Cornell as chairman (Cornell 1967: 196). By 1839, the population of the township had risen to 2,382. After 1840, the settlement of the township grew quickly, and by 1850 there was very little unclaimed land (Page & Smith 1875: x). In 1846, the township had 52,159 acres taken up, with 16,332 under cultivation. William Henry Smith described the township that year as well settled, with fine farms and two or three excellent mill streams (Smith 1846: 15). In 1850, the Township of Beverly was incorporated as a township following the *Municipal Corporations Act* (The Baldwin Act). The first meeting of the incorporated township was held on January 21, 1850, at Barlow's Inn in Rockton. Seth Holocomb was elected first reeve of the township (Cornell 1967: 196).

In relation to the Study Area, the closest settlement in the township to develop was Kirkwall, which was established to the west at the present-day intersection of Kirkwall Road and Concession Road 8. Kirkwall, also known as "Little Scotland," was settled by six families from Scotland in 1832 (Collins 2001: 35). A year later the settlers were joined by 12 additional families from Scotland as well as an English family and four families from Northern Ireland (Collins 2001: 35). Within three years of the arrival of the first settlers a log church was constructed to accommodate the growing congregation. In 1848, the log structure was replaced with a stone church (Collins 2001: 35). In 1866, Kirkwall was a small post office village with a population of about 60. The village also at the time had two stores, a church, a hotel, a blacksmith shop,



and a boot and shoe shop (Mitchell 1866: 343). Kirkwall remained a small village throughout the late 19th century, with a population of only 60 in 1886 (Irwin & Co. 1886: 103).

The Great Western Railway (GWR) was constructed through the southern portion of the Township of Beverly from 1851 to 1853 (Page & Smith 1875: iv). The line opened in January 1854, operating between Windsor and Niagara Falls (Houghton 2008: 88). Stations in the township were located in the hamlets of Lynden and Copetown. In 1883, the Township of Beverly reached a population of 4,890 (Irwin 1883: 38). The population of Sheffield decreased towards the end of the century, with a population of 150 in 1883 (Irwin 1883: 106).

3.4.2 Township of West Flamborough

Settlement in the Township of West Flamborough developed primarily along the waterways, which acted as a source of power for mills, and at road intersections. South of the Study Area, Edward Peer in 1801 purchased 30 acres on Spencer Creek and built the first mill in Dundas, known as Dundas Mills (Woodhouse 1965: 14). It was purchased by the Hatt brothers by 1808. Other mills developed along watercourses in the township and by 1823 the township had 11 grist mills and eight saw mills in operation (Page & Smith 1875: iii). The creek was renamed Spencer Creek in the 1830s, after Joseph Spencer who constructed a dam and mill on the watercourse in 1834 (Middleton 2004: 50).

The community of Dundas flourished in the 19th century as it was located at the junction of large roadways and on the shoreline of Cootes Paradise Marsh. The town developed around Hatt's mill, with inns and stores constructed to serve settlers while their grain was ground at the mill. It developed into a trading and transportation centre in the township (Freeman 2001: 21). The town received the first post office in the township in 1814 and was given the name Dundas after the main thoroughfare in the settlement, Dundas Street (Conservation Hamilton n.d.).

Growth accelerated with the construction of the Desjardins Canal between 1826 and 1837. The canal was constructed along the mouth of Spencer Creek to connect Dundas with Burlington Bay. Dundas served as the location for the Desjardins Canal Company headquarters and offices, as well as a community for workers (Page & Smith 1875: ix). Following the construction of the Desjardins Canal, Dundas became a busy port on Lake Ontario (Freeman 2001: 37).

In the north portion of the township, the opening of the Guelph to Dundas Road began in 1827, following the founding of the Town of Guelph by John Galt, north of the Study Area. Galt instigated the development of roadway through the Township of Puslinch towards the Township of West Flamborough. The Guelph to Dundas Road, also known as Aboukir Road, was laid out following an Indigenous trail. Although it was an open route, the Guelph to Dundas Road remained a trail until the mid-19th century. In 1846, the Guelph and Dundas Road Company was established by a group of Guelph businessmen to further open the roadway. Two years later at a Guelph and Dundas Road Company meeting on February 28, 1848, an application was made to the provincial government to establish the company as the administrator for the improvement of the roadway, with Thomas Rees Brock as the secretary. The roadway was renamed Brock Road, in honour of its first secretary. William Cook of Hamilton was awarded the contract for the road and a sod-turning ceremony was held on July 20, 1848. By 1850, the

roadway was nearly completed running through the east portion of the Study Area (Clark 2016). The roadway is depicted as an open road on the 1859 Map of the County of Wentworth, running the boundary of the townships of West and East Flamborough before heading south through the villages of Freelton and Strabane (Figure 3).

Dundas was incorporated as a town on July 28, 1847 (Page & Smith: ix). With the construction of the GWR in 1854, Dundas witnessed a shift from canal shipments to utilization of the railway for the shipment of goods. In the last quarter of the 19th century, the Town of Dundas had become one of the major manufacturing towns in the province with industries producing such goods as flour, cotton, clothing, agricultural implements, and furniture (Page & Smith 1875: ix).

In relation to the Study Area, the closest settlement in the township was Strabane. Strabane developed at the intersection of Brock Road and Concession Road 8 West. It was first settled by Matthew Peebles in 1842 (Mitchell 1866: 352). A post office was established at the intersection in 1851 with Peebles as the first postmaster (Library and Archives Canada 2014). By 1866, the post village had a population of about 100, and included a hotel, two saw mills, a school, a church, a boot and shoemaker (Mitchell 1866: 352-353). Strabane remained a small community throughout the late 19th century, with a population in 1898 of only about 50 (Vernon 1898: 149).

3.4.3 Township of East Flamborough

Settlement in the Township of East Flamborough developed primarily at road intersections and along the waterways, which acted as a source of power for mills. The first mill in the township was constructed on Grindstone Creek by William and John Applegarth (Green *et al*. 1997: 5), followed in the early 1800s by a saw mill on the creek near the Great Falls, constructed by Alexander Brown. The settlement of Waterdown developed around Brown's mill, at the crossroads of Dundas Street and Mill Street (Green et al. 1997: 18). Waterdown was the largest village in the township throughout the 19th century.

The southern portion of the township was first settled in the early 19th century, while the remaining portions of the township remained heavily wooded until the 1820s and 1830s. By 1846, 25,537 acres in the township had been taken up with 8,750 acres under cultivation. The township by this time had two grist mills and nine saw mills (Smith 1846: 59). In 1854, the Township of East Flamborough was incorporated as a separate township from West Flamborough (Hamilton Public Library 2017b).

In relation to the Study Area, the closest settlement in the township was Carlisle. Carlisle was established to the east of the Study Area in 1828 by John Eaton. Eaton and his wife Catherine settled on 400 acres of land, Lots 8 and 9, Concession 8, in the Township of East Flamborough in 1828 (Lake and Reynolds Genealogy 2017). A village, originally known as Eaton, was laid out on Eaton's property by his son Anson Eaton, along with Andrew Patton and George Abery (Mitchell 1866: 335). Early settlers to this hamlet included the Fords, Pattons, Kievels, Hamiltons, McColls, Crookers, Gunbys, Mordens, Adamsons, Binkleys, Hunts, Greens, Mills, and Bennetts (WEFCC 1967: 35).

A post office was established in the hamlet in 1851, with G.R. Lister as the first postmaster (Library and Archives Canada 2014). The hamlet was renamed in 1853 to Carlisle (WEFCC 1967: 35). In 1853, the Hamilton, Waterdown, and Carlisle Road was constructed from Hamilton to Carlisle. In 1866, Carlisle had

a population of 150, with two general stores, several saw mills, two schools, and two churches (Mitchell 1866: 335).

By 1867, all the lots in the township were taken up (Green et al. 1997: 3). In 1883, the township reached a population of 2,377, with the villages of Aldershot, Carlisle, Clappison, Flamboro Centre, Mountsberg, and Waterdown (Irwin 1883: 54). Carlisle's population remained stable in the last quarter of the century with a population in 1883 of 150 (Irwin 1883).

3.5 20TH CENTURY DEVELOPMENT

3.5.1 Township of Beverly

During the 20th century, the Study Area in the Township of Beverly continued to be part of a rural landscape, surrounded by primarily agricultural lands. The hamlets and villages in the township witnessed a decline in the early 20th century, influenced by the larger markets and industries in Hamilton and Toronto.

In the mid-20th century, following the Second World War, the Township of Beverly experienced renewed growth, following the construction of better highways and the development of the trucking industry. Farms in the township moved to a focus on dairy farming and by the 1960s hundreds of farmers prospered with milk contracts. There was also a shift in farming to specialized vegetables and fruits, as well as nursery operations (Collins 2001: 9).

In 1974, with the creation of the Regional Municipality of Hamilton-Wentworth, the Township of Beverly was amalgamated with the Townships of West and East Flamborough, to form the Town of Flamborough. In 2001, the Town of Flamborough became a part of the new City of Hamilton (Hamilton Public Library 2017b).

3.5.2 Township of West Flamborough

At the turn of the 20th century, the Town of Dundas witnessed a change in settlement patterns as retired farmers began to move into the town from the surrounding township. The proximity of Dundas to the City also created the possibility for many town residents to work in Hamilton while maintaining their home in Dundas (Meyers 1954: 42). Dundas had reached its industrial peak in the late 19th century, falling from 61 manufacturing industries in 1890 to 17 in 1901 (Meyers 1954: 25). Hamilton at this time was booming and offered more employment opportunities. Nonetheless, industries continued to play an important role in the Dundas economy. Large industries that attracted residents to Dundas included the Steel Company of Canada, Dominion Steel Castings Ltd. (Dofasco Inc.), National Steel Car Corporation, and Canadian Westinghouse (Bailey 1983: 81).

Traffic between Dundas and Hamilton increased with the development of better roads and highways beginning in the 1920s. In 1920, the Department of Public Highways Ontario assumed roads from Hamilton to Owen Sound and established King's Highway 6 (Bevers 2019). The highway, situated within the Study Area, is now a busy commuter route in the City of Hamilton, with connection to Highways 401 and 403.



In January 2001, the Town of Dundas became a part of the City of Hamilton (Hamilton Public Library 2017a). Dundas remains a small suburban community within the City with a population of 24,710 in 2006 (Social Planning & Research Council of Hamilton 2008).

3.5.3 Township of East Flamborough

At the beginning of the 20th century, the Study Area remained within a rural portion of the township, just west of the hamlet of Carlisle, and was surrounded by agricultural lands. Carlisle experienced a small period of growth with the construction in 1911 of the Canadian Pacific Railway (CPR) between Hamilton and Guelph. The CPR was constructed east of Carlisle, in the hamlet of Progreston, and brought passenger and freight trains through the area daily (WEFCC 1967: 37).

Traffic surrounding the Study Area increased with the development of better roads and highways beginning in the 1920s. The Township of East Flamborough was similarly influenced by the development of Highway 6, which influenced the development of subdivisions in Carlisle following the Second World War (WEFCC 1967: 37).

In January 1974, the Township of East Flamborough became part of the Regional Municipality of Hamilton-Wentworth. In January 2001, the township became part of the new City of Hamilton (Hamilton Public Library 2017b). Carlisle remains a small community within the City, with a population in 2016 of 1,869 (Statistics Canada 2016).

3.6 SITE HISTORY

A site history for portions of the Study Area was prepared for lots where a related potential heritage resource was identified in Section 4.3. The site history was written in consultation with historical mapping and the Directory and Biography sections of the *Illustrated Historical Atlas of the County of Wentworth* (Page & Smith 1875). The maps that were consulted included Hardy Gregory's 1859 *Map of the County of Wentworth, Canada West,* and Page & Smith's 1875 maps of the townships of Beverly, West Flamborough, and East Flamborough, which appeared in Page's *Illustrated Historical Atlas of the County of Wentworth* (Figure 3 and Figure 4). In discussing the late 19th century historical mapping it must be remembered that historical county atlases were produced primarily to identify factories, offices, residences, and landholdings of subscribers and were funded by subscription fees. Landowners who did not subscribe were not always listed on the maps (Caston 1997: 100). As such, all structures were not necessarily depicted or placed accurately, which is the case for Hardy Gregory's 1859 map (Gentilcore and Head 1984).

3.6.1 Lot 29, Concession 6, Township of Beverly

Lot 29, Concession 6 in the former Township of Beverly was granted from the Crown as a 200-acre patent in 1804 to Margaret Darby (Ontario Land Registry Access [ONLAND] 2018a). By 1859, the property had been sold as two separate north and south half parcels as depicted on Gregory's 1859 map (Figure 3). The north half is shown under the ownership of Mr. McLorey, while the south half is depicted under the ownership of Alexander Dunand. The southeast corner of Dunand's property has a small parceled section labelled "S.C.R." No structures are depicted on the lot. Page & Smith's 1875 map shows



the property ownership transferred to Nisbet & Herbert (Figure 4). A structure is depicted in the southwest corner of the property, with two adjacent mill sites. Nisbet & Herbert are listed on the property in Page & Smith's 1875 *Illustrated Historical Atlas of the County of Wentworth* as lumbermen (Page & Smith 1875: xxxvii).

3.6.2 Lot 32, Concession 6, Township of Beverly

Lot 32, Concession 6 in the former Township of Beverly was granted from the Crown in two separate parcels, with the south half, a 100-acre parcel to William Connell in 1847, and the northeast quarter, a 50-acre parcel to Robert Self in 1857 (ONLAND 2018a). By 1859, the south half of the lot was still under the ownership of William Connell, and the northeast quarter under the ownership of Robert Self (Figure 3). The northwest quarter is shown under the ownership of Frederick Miles. A structure is depicted on Connell's property in the southeast corner. Connell retained the property into the late 19th century as depicted on Page & Smith's 1875 map (Figure 4). A structure is depicted on Connell's portion of the lot in the southeast corner. The ownership of the northeast portion of the property transferred to Walter Robertson, and the northwest portion to M. & J. Sullivan. Two structures with adjacent orchards are depicted on Robertson's property fronting present-day Safari Road.

3.6.3 Lot 34, Concession 6, Township of Beverly

Lot 34, Concession 6 in the former Township of Beverly was granted from the Crown as a 200-acre patent in 1797 to William Oressey (ONLAND 2018a). By 1859, the property was divided into three separate parcels as depicted on Gregory's 1859 map (Figure 3). The north half is shown under the ownership of John Robertson, with a structure on the west portion of the property. The south half is spilt into two parcels, with owners J. Shaver and John Lyndsey. A grist mill is depicted on Lyndsey's property on Crooked Creek. The south half ownership remained the same into the late 19th century as depicted on Page & Smith's 1875 map (Figure 4). A structure and a mill are depicted on Lyndsey (Lindsay)'s property, and a structure with an adjacent orchard on Shaver's property. The ownership of the north half was transferred to James Dwyer. A structure is depicted on the north portion Dwyer's property.

3.6.4 Lot 35, Concession 6, Township of Beverly

Lot 35, Concession 6 in the former Township of Beverly was granted from the Crown in two separate 100-acre parcels, with the south half to George Ironside in 1849, and the north half to John Leslie in 1850 (ONLAND 2018a). By 1859, the ownership of the lot had changed, with the north half transferred to William Nunn, and the south half to James Nichol (Figure 3). No structures are depicted on the lot. The ownership remained the same into the late 19th century as shown on Page & Smith's 1875 map (Figure 4). A structure is depicted with an adjacent orchard on the south portion of Nichol's property, and on the north portion of Nunn's property.

3.6.5 Lot 30, Concession 7, Township of Beverly

Lot 30, Concession 7 in the former Township of Beverly was granted from the Crown as a 200-acre patent in 1798 to Samuel Jones (ONLAND 2018b). By 1859, the property had been sold as two separate

north and south half parcels as depicted on Gregory's 1859 map (Figure 3). The north half of the property is owned by Mr. Law, while the south half is owned by William Currie. No structures are depicted on the property at this time. Page & Smith's 1875 map shows that the Law family retained the property in the late 19th century (Figure 4). The north half is shown with the owner as James Law, with a structure and a surrounding orchard. Most of the south half of the lot changed ownership to M. Gilmore, who owned the adjacent Lot 29, Concession 7. A small section of the south half in the northeast corner was parceled out, with two structures fronting the present-day Westover Road. A structure is shown on Gilmore's portion fronting present-day Safari Road.

3.6.6 Lot 32, Concession 7, Township of Beverly

Lot 32, Concession 7 in the former Township of Beverly was granted from the Crown as a 200-acre patent to Mary Hodgkinson in 1808 (ONLAND 2018b). By 1859, the property had been sold as separate north and south half parcels as depicted on Gregory's 1859 map (Figure 3). The north half is shown under the ownership of John and James Smith, who also own the north half of Lot 31, Concession 7. The south half lists the owner as Walter Robertson. No structures are depicted on the maps. Crooked Creek is depicted crossing the mid-way through the lot. Page & Smith's 1875 map shows that the land ownership of the lot remained the same in the late 19th century (Figure 4). John Smith is listed as the owner of the north half with a structure and adjacent orchard in the southwest corner, south of the creek. Walter Robertson is listed as the owner on the south half with a structure and adjacent orchard in the north portion of the lot.

3.6.7 Lot 34, Concession 7, Township of Beverly

Lot 34, Concession 7 in the former Township of Beverly was granted from the Crown in two separate 100-acres parcels, with the south half to Thomas Dunkin in 1845, and the north half to Thomas Baskerville in 1862 (ONLAND 2018b). Gregory's 1859 map shows Thomas Duncan on the south half of the property and Thomas Baskerville on the north half (Figure 3). Page & Smith's 1875 map shows that the north half of the lot remained in the ownership of Baskerville and depicts a structure and adjacent orchard near the north portion of the lot fronting the present-day Concession 8 West (Figure 4). The ownership changed on the south half of the lot to John Jameson, with no structures depicted.

3.6.8 Lot 35, Concession 7, Township of Beverly

Lot 35, Concession 7 in the former Township of Beverly was granted from the Crown as a 200-acre patent to Hugh Mulholland in 1798 (ONLAND 2018b). By 1859, the property had been sold as separate north and south half parcels as depicted on Gregory's 1859 map (Figure 3). The north half is shown under the ownership of James Dunn and the south half under the ownership of John Patterson. No structures are depicted on the property. Page & Smith's 1875 map shows that the north half of the lot remained in the ownership of James Dunn, with a structure centrally situated on the property (Figure 4). The ownership changed on the south half of the lot to A. Patton. A structure is depicted on Patton's property in the southwest corner.

3.6.9 Lot 36, Concession 7, Township of Beverly

Lot 36, Concession 7 in the former Township of Beverly was granted from the Crown as a 400-acre patent to James Mulholland in 1798 (ONLAND 2018b). By 1859, the property had been sold and subdivided into three separate parcels as depicted on Gregory's 1859 map (Figure 3). The north portion of the property is owned by William Johnstone, the southwest portion by N. Wilson, and the southeast portion by T. Burns. Page & Smith's 1875 map shows, that the north portion of the property remained within the Johnstone (Johnson) family, although the property is divided in two, with B. Johnstone on the west half and William Johnstone on the east half (Figure 4). A structure is shown on William Johnstone's property fronting the present-day Middletown Road. Wilson's southwest portion of the property was sold to R. Hamilton, and Burn's southeast portion to A. Patton.

3.6.10 Lot 2, Concession 6, Township of West Flamborough

Lot 2, Concession 6 in the former Township of West Flamborough was granted from the Crown as a 200-acre patent to Sir Allan McNab in 1796 (ONLAND 2018c). McNab was a lieutenant in Lieutenant-Governor John Graves Simcoe's Second Corps of the Queen's Rangers and was granted the property for his service. McNab was later the father of Sir Allan Napier MacNab, an influential politician, lawyer, and businessman in Hamilton to the southeast (Baskerville 1976). By 1859, the property was divided into four parcels as depicted on Gregory's 1859 map (Figure 3). The northwest quarter is shown under the ownership of William Patton, the northeast quarter under Alexander Patton, the southwest quarter under Adam Borthwick, and the northeast quarter under Henry Higgins. No structures are depicted on the lot. Ownership of the south half of the property remained the same into the late 19th century as depicted on Page & Smith's 1875 map (Figure 4). A structure with an adjacent orchard is depicted set-back from the roadway on Borthwick's and Higgin's properties. The northwest quarter is still shown under the ownership of William Patton, with a structure and adjacent orchard fronting the present-day Safari Road. The northeast quarter was transferred to George Lindey. A structure and adjacent orchard are depicted on Lindey's property fronting the present-day Safari Road.

3.6.11 Lot 3, Concession 6, Township of West Flamborough

Lot 3, Concession 6 in the former Township of West Flamborough was granted from the Crown as a 200-acre patent to Louis Grant in 1797 (ONLAND 2018c). By 1859, the property had been sold as separate north and south half parcels as depicted on Gregory's 1859 map (Figure 3). The north half is owned by William James, and the south half by George Denham. No structures are depicted on the lot. The ownership of the south half remained the same into the late 19th century as depicted on Page & Smith's 1875 map (Figure 4). A structure is shown on Denham's property set back from the roadway. The ownership of the north half of the property by 1875 had transferred to John O'Connell. A structure is depicted on O'Connell's property fronting the present-day Safari Road.

3.6.12 Lot 4, Concession 6, Township of West Flamborough

Lot 4, Concession 6 in the former Township of West Flamborough was granted from the Crown in two separate 100-acre parcels to the Canada Company in 1832 (ONLAND 2018c). By 1859, the north half of

the property had been sold to George Nickle, and the south half to John Kelly (Figure 3). No structures are depicted on the lot. The ownership of the north half remained the same into the late 19th century as shown on Page & Smith's 1875 map (Figure 4). A structure is depicted on Nickle's property fronting the present-day Safari Road. By 1875 the south half of the property was owned by Matthew Hall.

3.6.13 Lot 5, Concession 6, Township of West Flamborough

Lot 5, Concession 6 in the former Township of West Flamborough was granted from the Crown as a 200-acre patent to Captain William Hamilton in 1798 (ONLAND 2018c). By 1859, the property had been divided into three separate parcels as depicted on Gregory's 1859 map (Figure 3). The north portion is owned by John Moore, the central portion by Abraham and Ann Page, and the south portion by John and James Sanderson. No structures are depicted on the lot. The ownership of the north portion remained in the Moore family into the late 19th century as depicted on Page & Smith's 1875 map (Figure 4). A structure and adjacent orchard are shown on Stewart Moore's property fronting the present-day Safari Road. The central portion of the property is shown on the 1875 map as divided into two parcels, with Abraham Page on the north portion, and John Moore on the south portion. The ownership of the south portion of the lot changed by 1875, with Morris Denneene depicted as the owner, with a structure and adjacent orchard on the south portion of the property.

3.6.14 Lot 1, Concession 7, Township of West Flamborough

Lot 1, Concession 7 in the former Township of West Flamborough was granted from the Crown as a 200-acre patent to Major David Shank in 1797 (ONLAND 2018d). Shank was a captain in Simcoe's Queen's Rangers and was granted the property for his service (The On-Line Institute for Advanced Loyalist Studies 2000). By 1859, the property was divided into three parcels as depicted on Gregory's 1859 map (Figure 3). The northwest portion is owned by Patrick Hamilton, the northeast portion by Robert Hamilton, and the south portion by W. Hamilton. No structures are depicted on the lot. The ownership remained the same into the late 19th century as depicted on Page & Smith's 1875 map (Figure 4). Each property is depicted with a structure and an adjacent orchard.

3.6.15 Lot 2, Concession 7, Township of West Flamborough

Lot 2, Concession 7 in the former Township of West Flamborough was granted from the Crown as a 150-acre patent to Thomas Nickle in 1863 (ONLAND 2018d). Nickle is depicted on the property prior to ownership on Gregory's 1859 map (Figure 3). The north portion of the property is shown under the ownership of W. Beryman. No structures are depicted on the lot. By the late 19th century, ownership changed on both portions of the lot as shown on Page & Smith's 1875 map (Figure 4). Nickle's property was owned by James Porter, and Beryman's property by the heirs of Andrew Waddel. A structure and orchard are shown on Porter's property, with the structure fronting the present-day Safari Road. Two structures are shown on Waddel's property fronting Concession 8 West.

3.6.16 Lot 5, Concession 7, Township of West Flamborough

Lot 5, Concession 7 in the former Township of West Flamborough was granted from the Crown as a 200-acre patent to the Canada Company in 1834 (ONLAND 2018d). By 1859, the property was owned by

Robert and Joseph Dixon (Figure 3). No structures are depicted on the lot. By 1875, the property was divided into two parcels, with the north portion under the ownership of James Robertson, and the south portion under John Featherstone (Figure 4). A structure and adjacent orchard are shown on Featherstone's property fronting the present-day Safari Road.

3.6.17 Lot 7, Concession 7, Township of West Flamborough

Lot 7, Concession 7 in the former Township of West Flamborough was granted from the Crown as a 200-acre patent to John Steffle in 1801 (ONLAND 2018d). By 1859, Lot 7 was divided into five separate parcels influenced by the development of the hamlet of Strabane and Brock Road (Figure 3). Four of the parcels are within the Peebles family, with owners M., R., and J. Peebles. The remaining parcel is shown under the ownership of W. Brenan. The northwest corner of M. Peeble's property is shown as subdivided into small narrow lots, and a saw mill is depicted on the east portion of the property. A post office is also depicted on M. Peebles' parcel towards the south end of the lot. Strabane was first settled by Matthew Peebles in 1842, who established a post office as postmaster in 1849 (Mitchell 1866: 352). Page & Smith's 1875 map shows the increased development of Strabane at the northwest corner of the lot, and along Brock Road (Figure 4). The lot is still shown as divided into five parcels, with owners from north to south as Matthew Peebles, John Brenan, James Fulton, Matthew Peebles, and James Peebles. Matthew Peeble's north portion of the lot is depicted with seven structures, a blacksmith shop, and a mill. Brenan's property includes a structure and an adjacent orchard. Fulton's property is shown with two structures and an orchard. Matthew Peebles' south parcel is shown with three structures including the Strabane post office, and James Peebles' property is shown with a structure and adjacent orchard.

3.6.18 Lot 8, Concession 7, Township of West Flamborough

Lot 8, Concession 7 in the former Township of West Flamborough was granted from the Crown as a 200-acre patent to the James Macaulay in 1796 (ONLAND 2018d). By 1859, the lot was divided into three parcels as depicted on Gregory's 1859 map (Figure 3). The north portion is shown under the ownership of Mrs. J. Fraser, the central portion under James Fulton, and the south portion under John Fulton. The three parcels remained under the same family ownership into the late 19th century as depicted on Page & Smith's 1875 map (Figure 4). The north portion is shown with Angus Fraser as the owner, with two structures and a mill near Concession 8 West. James Fulton's property is shown with a structure and adjacent orchard, while John Fulton's property is depicted with two structures fronting the present-day Safari Road.

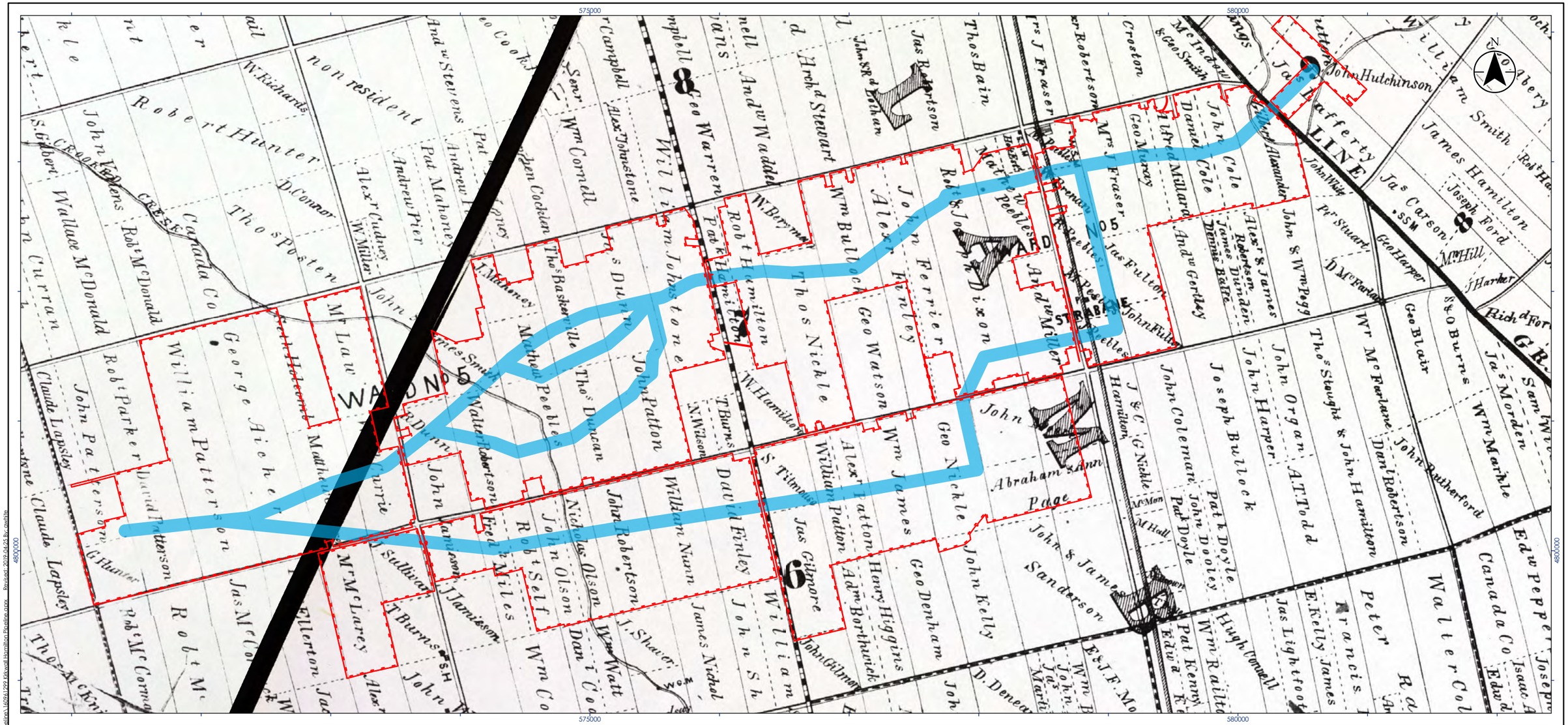
3.6.19 Lot 9, Concession 7, Township of West Flamborough

Lot 9, Concession 7 in the former Township of West Flamborough was granted by the Crown in three separate patents: the south half as a 100-acre parcel to Edward Gilchrist in 1854, the northeast quarter as a 50-acre parcel to Alfred Millard in 1855, and the northwest quarter as a 50-acre parcel to Mary J. A[rmo]ur in 1875 (ONLAND 2018d). Millard is depicted as the owner of the northeast quarter on Gregory's 1859 map (Figure 3). The northwest quarter is shown under the ownership of George Murray, and the south half under Andrew Gertley. No structures are depicted on the lot. The three parcels remained under the same family ownership into the late 19th century as depicted on Page & Smith's 1875

map (Figure 4). A structure is shown on Murray's property fronting Concession 8 West. A structure with an adjacent orchard is shown set back far back from Concession 8 West on the property of Alfred Millard's heirs. The south half of the property is shown as divided into two parcels, with Andrew Gartley on the west quarter, and Alexander Gartley on the east quarter. Structures with adjacent orchards are depicted on both Gartley properties.

3.6.20 Lot 10, Concession 7, Township of West Flamborough

Lot 10, Concession 7, in the former Township of West Flamborough was granted from the Crown as a 200-acre patent to Samuel Le[ose] in 1801 (ONLAND 2018d). By 1859, the lot had been divided into five separate parcels as shown on Gregory's 1859 map (Figure 3). The northwest portion is owned by Daniel Cole, the northeast portion by John Cole, the southwest portion is split between Dennis Balfe and James Dunden, and the southeast portion by Alexander and James Robertson. No structures are depicted on the lot. Daniel Cole remained the owner of the northwest portion into the late 19th century (Figure 4). Page & Smith's 1875 map depicts a structure and orchard on Cole's property set far back from Concession 8 West. By 1875 the northeast portion was owned by the heirs of Andrew Simmons. A structure with an orchard is similarly depicted on the Simmons property set far back from Concession 8 West. The southwest portion of the property remained in the Balfe family, with Edward Balfe listed as the owner with a structure fronting present-day Safari Road. On the adjacent property, T.J. Newman is the owner with a structure and orchard. The southeast portion of the lot remained under the ownership of Alexander Robertson, with a structure depicted on the south portion of the property.



Legend

- Study Area (approximate)
- 50 m Buffer (approximate)

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2019.

Stantec

Project Location
City of Hamilton

160961229

Client/Project
ENBRIDGE GAS INC.
KIRKWALL TO HAMILTON PIPELINE PROJECT

Figure No.
3

Title
1859 County of Wentworth Map

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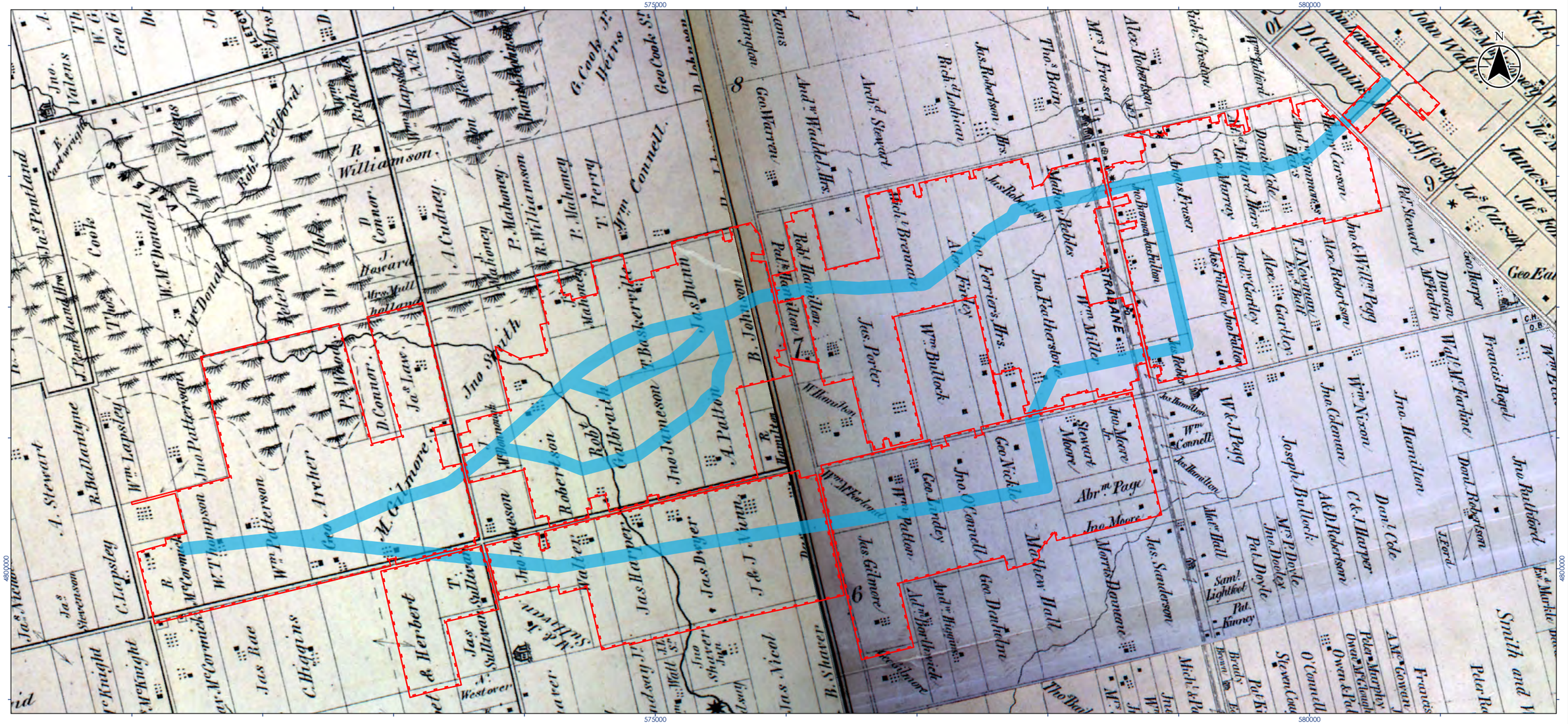

Legend

- 50 m Buffer
- Study Area (approximate)

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2019.

Stantec

Project Location
City of Hamilton

160961229

Client/Project
ENBRIDGE GAS INC.
KIRKWALL TO HAMILTON PIPELINE PROJECT

Figure No.
4

Title
1875 County of Wentworth Map

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4.0 RESULTS

4.1 AGENCY AND MUNICIPAL CONSULTATION

In order to identify heritage resources, the MTCS, OHT, and the City of Hamilton were consulted. The Study Area map that was distributed to the agencies and the municipality included a larger Study Area boundary that extended west to east from Valens Road to just east of Highway 6, and north to south from north of Concession 8 West to south of Concession 6 West. As a result of the consultation, 76 protected properties were identified (Figure 5). Upon further inspection, 20 of the protected properties were determined to be situated within the CHAR Study Area.

At the provincial level, Karla Barboza, Team Lead, Heritage at the MTCS, responded that to date, there are no provincial heritage properties within the Study Area, and no properties that have been designated by the Minister. Kevin De Mille, Heritage Planner with the OHT, responded that there is one OHT archaeological easement in the larger Study Area. The site is an early historic Neutral indigenous archaeological site called Freelton. Freelton is outside this CHAR Study Area by over 10 kilometres to the northwest.

At the municipal level, staff were consulted to determine the presence of municipally protected properties. Miranda Brunton, Cultural Heritage Planner with the City of Hamilton, responded with a listing of 75 heritage properties within and adjacent to the larger Study Area. The majority of the heritage properties identified in the City of Hamilton are not listed or designated but were inventoried in the 1991 Local Architectural Conservation Authority Committee's (LACAC) inventory. One designated property under Part IV of the *Ontario Heritage Act* is located within the larger Study Area, Strabane United Church at 1565 Brock Road (Plate 2). The church is located approximately 400 metres north of the Study Area.



Plate 2: Strabane United Church looking northwest

Table 1: Identified and Protected Heritage Resources in Relation to the Study Area

Agency/Municipality	Location/Municipal Address	Level of Recognition	Relationship to the CHAR Study Area
OHT	Lot 3, Concession 8, former Township of Beverly	Archaeological Easement	Outside of Study Area
Hamilton	1336 Westover Road	LACAC Inventory	Outside of Study Area
Hamilton	1289 Safari Road	LACAC Inventory	Within the Study Area
Hamilton	1427 Safari Road	LACAC Inventory	Outside the Study Area
Hamilton	1261 Safari Road	LACAC Inventory	Outside the Study Area
Hamilton	1248 Concession 8 West	LACAC Inventory	Outside the Study Area
Hamilton	1622 Westover Road	LACAC Inventory	Outside the Study Area
Hamilton	1414 Safari Road	LACAC Inventory	Within the Study Area
Hamilton	1213 Safari Road	LACAC Inventory	Within the Study Area
Hamilton	1286 Safari Road	LACAC Inventory	Within the Study Area
Hamilton	1213 Concession 8 West	Listed	Outside of Study Area
Hamilton	1172 Concession 8 West	LACAC Inventory	Within the Study Area
Hamilton	1212 Safari Road	LACAC Inventory	Within the Study Area
Hamilton	1496 Valens Road	LACAC Inventory	Outside of Study Area
Hamilton	1207 Concession 8 West	LACAC Inventory	Outside of Study Area
Hamilton	1540 Safari Road	LACAC Inventory	Outside of Study Area
Hamilton	1437 Middletown Road	LACAC Inventory	Within the Study Area
Hamilton	1166 Safari Road	LACAC Inventory	Within the Study Area
Hamilton	1171 Concession 8 West	LACAC Inventory	Outside of Study Area
Hamilton	1121 Safari Road	LACAC Inventory	Outside of Study Area
Hamilton	1376 Valens Road	LACAC Inventory	Outside of Study Area
Hamilton	1515 Concession 8 West	LACAC Inventory	Outside of Study Area
Hamilton	1590 Safari Road	LACAC Inventory	Outside of Study Area
Hamilton	1658 Valens Road	LACAC Inventory	Outside of Study Area
Hamilton	1286 Valens Road	LACAC Inventory	Outside of Study Area
Hamilton	1420 Middletown Road	LACAC Inventory	Within the Study Area

Table 1: Identified and Protected Heritage Resources in Relation to the Study Area

Agency/Municipality	Location/Municipal Address	Level of Recognition	Relationship to the CHAR Study Area
Hamilton	1359 Valens Road	LACAC Inventory	Outside of Study Area
Hamilton	1569 Middletown Road	LACAC Inventory	Outside of Study Area
Hamilton	1081 Safari Road	LACAC Inventory	Outside of Study Area
Hamilton	1412 Middletown Road	LACAC Inventory	Within the Study Area
Hamilton	1267 Valens Road	LACAC Inventory	Outside of Study Area
Hamilton	1413 Brock Road	LACAC Inventory	Outside of Study Area
Hamilton	1407 Brock Road	LACAC Inventory	Outside of Study Area
Hamilton	919 Safari Road	LACAC Inventory	Within the Study Area
Hamilton	1539 Brock Road	Listed	Outside of Study Area
Hamilton	1322 Brock Road	LACAC Inventory	Outside of Study Area
Hamilton	1538 Brock Road	Listed	Outside of Study Area
Hamilton	878 Concession 8 West	LACAC Inventory	Outside of Study Area
Hamilton	1554 Brock Road	LACAC Inventory	Outside of Study Area
Hamilton	1553 Brock Road	LACAC Inventory	Outside of Study Area
Hamilton	951 Safari Road	LACAC Inventory	Outside of Study Area
Hamilton	955 Safari Road	LACAC Inventory	Outside of Study Area
Hamilton	783 Concession 8 West	LACAC Inventory	Outside the Study Area
Hamilton	750 Concession 8 West	LACAC Inventory	Within the Study Area
Hamilton	902 Safari Road	LACAC Inventory	Within the Study Area
Hamilton	866 Safari Road	LACAC Inventory	Outside of Study Area
Hamilton	979 Safari Road	LACAC Inventory	Outside of Study Area
Hamilton	713 Safari Road	LACAC Inventory	Outside of Study Area
Hamilton	877 Concession 8 West	LACAC Inventory	Outside of Study Area
Hamilton	792 Safari Road	Listed	Outside of Study Area
Hamilton	917 Concession 8 West	LACAC Inventory	Outside of Study Area
Hamilton	753 Concession 8 West	LACAC Inventory	Outside of Study Area

Table 1: Identified and Protected Heritage Resources in Relation to the Study Area

Agency/Municipality	Location/Municipal Address	Level of Recognition	Relationship to the CHAR Study Area
Hamilton	1000 Concession 8 West	LACAC Inventory	Outside of Study Area
Hamilton	700 Concession 8 West	LACAC Inventory	Within the Study Area
Hamilton	954 Safari Road	LACAC Inventory	Within the Study Area
Hamilton	961 Concession 8 West	LACAC Inventory	Outside of Study Area
Hamilton	1035 Safari Road	LACAC Inventory	Within the Study Area
Hamilton	1525 Highway 6	LACAC Inventory	Outside of Study Area
Hamilton	653 Safari Road	LACAC Inventory	Outside of Study Area
Hamilton	1042 Concession 8 West	LACAC Inventory	Outside of Study Area
Hamilton	994 Safari Road	LACAC Inventory	Within the Study Area
Hamilton	995 Safari Road	LACAC Inventory	Outside of Study Area
Hamilton	1032 Safari Road	LACAC Inventory	Within the Study Area
Hamilton	1412 Middletown Road	LACAC Inventory	Within the Study Area
Hamilton	1433 Highway 6	LACAC Inventory	Outside of Study Area
Hamilton	1490 Highway 6	LACAC Inventory	Within the Study Area
Hamilton	1458 Highway 6	LACAC Inventory	Outside of Study Area
Hamilton	698 Safari Road	LACAC Inventory	Outside of Study Area
Hamilton	1426 Highway 6	LACAC Inventory	Outside of Study Area
Hamilton	1087 Concession 8 West	LACAC Inventory	Outside of Study Area
Hamilton	662 Safari Road	LACAC Inventory	Outside of Study Area
Hamilton	1075 Concession 8 West	LACAC Inventory	Outside of Study Area
Hamilton	632 Safari Road	LACAC Inventory	Outside of Study Area
Hamilton	1121 Safari Road	LACAC Inventory	Outside of Study Area
Hamilton	1345 Highway 6	LACAC Inventory	Outside of Study Area
Hamilton	1565 Brock Road	Designated	Outside the Study Area

4.2 FIELD PROGRAM

As described in Section 2.3, a windshield survey of the Study Area was undertaken to identify potential heritage resources situated within the Study Area and confirm the presence of previously identified protected properties. Where identified, the site was photographically documented from publicly accessible roadways.

During the course of the survey, 35 individual sites were identified as containing potential heritage resources (Figure 5). Of those identified, 17 had been previously identified on the LACAC 1991 Inventory. A summary of these potential heritage resources is contained in Figure 6 and Appendix A.

The majority of potential heritage resources identified were constructed in the mid- to late 19th century, prior to 1875, as determined through historic mapping. The Study Area also includes some potential heritage resources that date to the early 20th century, and mid- to late 20th century. The late 19th century structures are of a similar Ontario vernacular architecture style. Most of the structures from this period are similar one and a half storey residences, with a side gable roof, and have a gabled dormer. The predominant architectural style influence is Gothic Revival, while there are two examples of the Georgian style, one example of the Edwardian style, and one example of the Queen Anne Revival style. Most of the structures have been modified with the addition of vinyl cladding or modern windows and doors. The majority of the potential heritage resources identified are farmsteads comprised of a residential structure and associated farm outbuildings.

4.2.1 OEB *Environmental Guideline* Indicators

Based on the field program, resources representing five of the indicators of CHVI according to Section 4.3.4 of the *OEB Environmental Guidelines* were identified (Table 2). Where potential heritage resources are identified, evaluation of the CHVI according to O. Reg. 9/06 is required to confirm the presence of heritage resources. Where heritage resources are identified, the impacts of the Project on these resources must be assessed.

Table 2: Indicators of CHVI According to Section 4.3.4 of the *OEB Environmental Guidelines*

Indicators	Identified within the Study Area
Property designated under Part IV of the OHA	Not identified
A bridge on Ontario Heritage Bridge List	Not identified
Property within a Heritage Conservation District designated under Part V of the OHA	Not identified
Property with an OHT or municipal heritage conservation easement	Not identified
Property with a provincial or federal plaque	Not identified
A National Historic Site	Not identified

Table 2: Indicators of CHVI According to Section 4.3.4 of the *OEB Environmental Guidelines*

Indicators	Identified within the Study Area
Property containing a registered archaeological site	Not Applicable*
Property with archaeological potential	Not Applicable*
Property listed on a municipal heritage register or provincial heritage register	Identified
Property adjacent to an identified heritage property	Identified
Property that has buildings or structures over 40 years old	Identified
Property within a Canadian Heritage River watershed	Not identified
Property associated with a renowned architect or builder	Not identified
Property containing or adjacent to a burial site or cemetery	Not identified
Parkland	Not identified
Land with distinctive landforms or geographic features	Identified
Historic transportation corridors (such as navigational canals, rail lines or trails, traditional Métis portage routes, etc.)	Not Identified
Other human-made alterations to natural landscapes (such as earthworks, plantings, etc.)	Identified

*An Archaeological Assessment has been undertaken under separate cover. Archaeological potential is considered beyond the scope of the current study.

4.3 EVALUATION OF CULTURAL HERITAGE VALUE OR INTEREST

Where a potential heritage resource was identified within the Study Area, an evaluation of the CHVI of the property was undertaken. Detailed evaluations are contained within Appendix A. As described in Section 2.4, each potential heritage resource was screened according to O. Reg. 9/06, the criteria for determining CHVI. There were 35 potential heritage resources identified, 26 of which were determined to contain cultural heritage resources (Figure 7). Table 3 summarizes the findings.

Table 3: Potential Cultural Heritage Resources

Municipal Address	Previous Heritage Recognition	Resource Type	Photograph	Identified Attributes	CHVI	CHR Number	Relationship to Project Location
1422 Westover Road	No	Farmstead		None identified	No	N/A	Inside the Project Location
1399 Safari Road	No	Farmstead		Residence: one and a half storey structure, high-pitched side gable roof, high-pitched gable dormer, red brick exterior, buff brick detailing seen in quoins, and voussoirs, front entry transom, and covered full-width porch. Barn: gable roof, vertical wood cladding, and stone foundation. Landscape: tree allée laneway, mature Norway Spruce, and stone wall.	Yes	CHR-1	Inside the Project Location

Table 3: Potential Cultural Heritage Resources

Municipal Address	Previous Heritage Recognition	Resource Type	Photograph	Identified Attributes	CHVI	CHR Number	Relationship to Project Location
1441 Safari Road	No	Residence		None identified	No	N/A	Inside the Project Location
1289 Safari Road	Yes	Farmstead		Residence: two storey structure, medium-pitched hip roof, symmetrical exterior, three-bay front façade, and central entrance. Barn: side gable roof.	Yes	CHR-2	Inside the Project Location
1172 Concession 8 West	Yes	Undetermined		Contextual: connection to other late 19th century properties in the surrounding rural area.	Yes	CHR-3	Inside the Project Location

Table 3: Potential Cultural Heritage Resources

Municipal Address	Previous Heritage Recognition	Resource Type	Photograph	Identified Attributes	CHVI	CHR Number	Relationship to Project Location
1437 Middletown Road	Yes	Farmstead		Residence: one and a half storey structure, medium-pitched cross gable roof, medium-pitched gable dormer, and L-shaped plan. Barn: timber frame structure, cross gable roof, and ventilators.	Yes	CHR-4	Outside the Project Location
1412 Middletown Road	No	Residence		Residence: one and a half storey structure, high-pitched cross gable roof, T-shaped plan, high-pitched gable dormers, and brick exterior.	Yes	CHR-5	Outside the Project Location
1006 Concession 8 West	No	Farmstead		None identified	No	N/A	Within the Project Location

Table 3: Potential Cultural Heritage Resources

Municipal Address	Previous Heritage Recognition	Resource Type	Photograph	Identified Attributes	CHVI	CHR Number	Relationship to Project Location
1035 Safari Road	Yes	Farmstead		Residence: one and a half storey structure, and medium-pitched side gable roof. Barn: timber frame structure, and side gable roof. Landscape: long laneway, mature spruce trees, and surrounding agricultural lands.	Yes	CHR-6	Within the Project Location
1470 Brock Road	No	Residence		Residence: one and a half storey structure, medium-pitch cross gable roof, medium-pitched gabled dormers (west and east elevations), 2/2 wood windows, and T-shaped plan.	Yes	CHR-7	Outside the Project Location
1512 Brock Road	No	Residence		None identified	No	N/A	Inside the Project Location

Table 3: Potential Cultural Heritage Resources

Municipal Address	Previous Heritage Recognition	Resource Type	Photograph	Identified Attributes	CHVI	CHR Number	Relationship to Project Location
1514 Brock Road	No	Residence		None identified	No	N/A	Outside the Project Location
964 Concession 8 West	No	Barn		None identified	No	N/A	Inside the Project Location

Table 3: Potential Cultural Heritage Resources

Municipal Address	Previous Heritage Recognition	Resource Type	Photograph	Identified Attributes	CHVI	CHR Number	Relationship to Project Location
812 Concession 8 West	No	Farmstead		Residence: one and a half storey structure, high-pitched cross gable roof, high-pitched gabled dormer, and covered partial wood porch. Barn: timber frame structure with side gable roof.	Yes	CHR-8	Inside the Project Location
919 Safari Road	Yes	Farmstead		Residence: two storey structure, medium-pitched side gable roof, bookend chimneys, symmetrical three-bay front (south) façade, central entrance with transom, stone lintel, and sidelights, stone lintels and sills. Barn: timber frame structure with side gable roof. Landscape: long straight laneway, mature spruce trees, and crop fields.	Yes	CHR-9	Inside the Project Location

Table 3: Potential Cultural Heritage Resources

Municipal Address	Previous Heritage Recognition	Resource Type	Photograph	Identified Attributes	CHVI	CHR Number	Relationship to Project Location
794 Concession 8 West	No	Barn		Barn: timber frame structure, gable roof, and stone foundation. Landscape: mature trees and wood picket fence.	Yes	CHR-10	Inside the Project Location
780 Concession 8 West	No	Commercial		None identified	No	N/A	Inside the Project Location

Table 3: Potential Cultural Heritage Resources

Municipal Address	Previous Heritage Recognition	Resource Type	Photograph	Identified Attributes	CHVI	CHR Number	Relationship to Project Location
750 Concession 8 West	Yes	Farmstead		Contextual: connection to other late 19th century properties in the surrounding rural area.	Yes	CHR-11	Inside the Project Location
716 Concession 8 West	No	Farmstead		Residence: One and a half storey structure, medium-pitched side gable roof, and three-bay front (west) façade with central entrance. Barn: timber frame bank barn structure with a side gable roof. Landscape: Stone piers, wood fencing, and gently rolling topography.	Yes	CHR-12	Inside the Project Location

Table 3: Potential Cultural Heritage Resources

Municipal Address	Previous Heritage Recognition	Resource Type	Photograph	Identified Attributes	CHVI	CHR Number	Relationship to Project Location
700 Concession 8 West	Yes	Farmstead		Residence: one and a half storey structure, steeply-pitched side gable roof, steeply-pitched gabled dormer, and covered partial porch. Barn: timber frame structure with a side gable roof.	Yes	CHR-13	Inside the Project Location
1490 Highway 6	Yes	Residence		Residence: one and a half storey structure, and high-pitched gambrel roof.	Yes	N/A	Outside the Project Location

Table 3: Potential Cultural Heritage Resources

Municipal Address	Previous Heritage Recognition	Resource Type	Photograph	Identified Attributes	CHVI	CHR Number	Relationship to Project Location
1213 Safari Road	Yes	Farmstead		Residence: one and a half storey structure, high-pitched side gable roof, brick chimneys, multiple gable peaks, covered wrap-around wood porch, brick voussoirs with keystones and label stops. Barn: timber frame structure, side gable roof, stone foundation, and wood frame windows.	Yes	CHR-14	Inside the Project Location
1414 Safari Road	Yes	Farmstead		Residence: one and a half storey structure and medium pitched front facing gable roof.	Yes	CHR-15	Outside the Project Location

Table 3: Potential Cultural Heritage Resources

Municipal Address	Previous Heritage Recognition	Resource Type	Photograph	Identified Attributes	CHVI	CHR Number	Relationship to Project Location
1286 Safari Road	Yes	Farmstead		Residence: One and a half storey structure, medium-pitched cross gable roof, brick chimneys, high-pitched gabled dormers with bargeboard (north and east elevations), stone lintels, three-bay front (east) façade with central entrance, recessed front entry with wood panels. Landscape: mature trees.	Yes	CHR-16	Inside the Project Location
1212 Safari Road	Yes	Residence		Residence: two storey structure, medium-pitched hip roof, red brick exterior, segmental arch window openings, brick voussoirs, and concrete windowsills. Landscape: mature spruce trees.	Yes	CHR-17	Inside the Project Location

Table 3: Potential Cultural Heritage Resources

Municipal Address	Previous Heritage Recognition	Resource Type	Photograph	Identified Attributes	CHVI	CHR Number	Relationship to Project Location
1166 Safari Road	Yes	Farmstead		Residence: One and a half storey structure, steeply-pitched side gable roof, and steeply-pitched gable dormer. Barn: timber frame structure and gable roof. Landscape: mature trees and gently rolling topography.	Yes	CHR-18	Inside the Project Location
1126 Safari Road	No	Undetermined		None identified	No	N/A	Inside the Project Location

Table 3: Potential Cultural Heritage Resources

Municipal Address	Previous Heritage Recognition	Resource Type	Photograph	Identified Attributes	CHVI	CHR Number	Relationship to Project Location
1032 Safari Road	Yes	Farmstead		Residence: two and a half storey structure, steeply-pitched hip roof, steeply-pitched gabled dormer with bargeboard, tall brick chimney, red brick exterior, brick voussoirs, and keystones. Barn: timber frame bank barn structure and gambrel roof.	Yes	CHR-19	Inside the Project Location
1054 Safari Road	No	Outbuildings		Barn(s): side gable roof.	Yes	CHR-20	Inside the Project Location

Table 3: Potential Cultural Heritage Resources

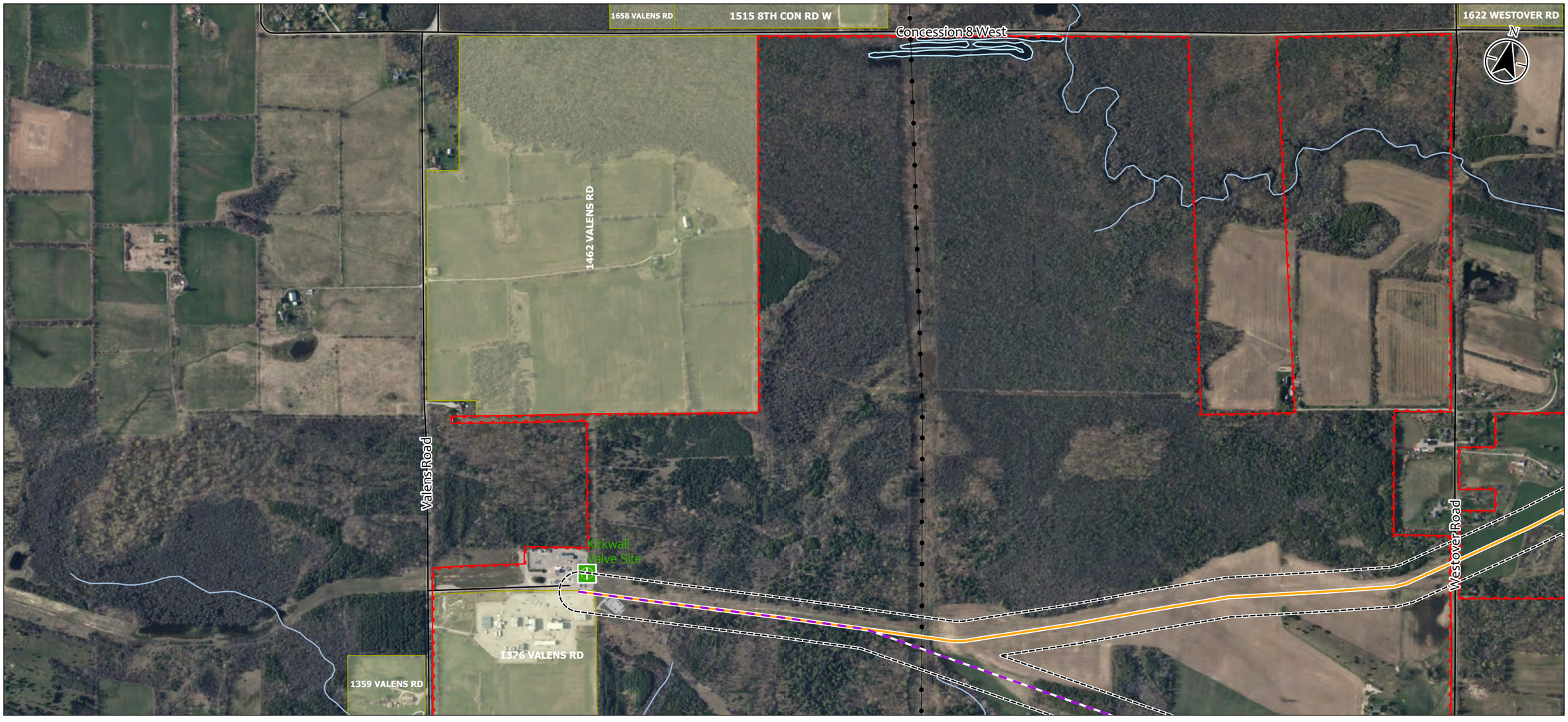
Municipal Address	Previous Heritage Recognition	Resource Type	Photograph	Identified Attributes	CHVI	CHR Number	Relationship to Project Location
994 Safari Road	Yes	Residence and outbuildings		Undetermined (structures were not visible from the roadway, cultural heritage value or interest based on property's inclusion in 1991 LACAC Inventory)	Yes	CHR-21	Inside the Project Location
954 Safari Road	Yes	Barn		Barn: timber frame structure, cross gable roof, and lightning rods.	Yes	CHR-22	Inside the Project Location

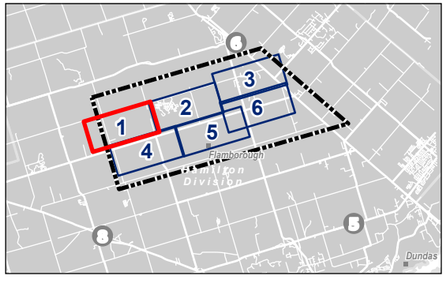
Table 3: Potential Cultural Heritage Resources

Municipal Address	Previous Heritage Recognition	Resource Type	Photograph	Identified Attributes	CHVI	CHR Number	Relationship to Project Location
902 Safari Road	Yes	Residence and outbuilding		Residence: one and a half storey structure, medium-pitched side gable roof, and covered partial porch. Landscape: mature trees.	Yes	CHR-23	Inside the Project Location
875 Safari Road	No	Farmstead		Residence: one and a half storey structure, medium-pitched side gable roof, brick chimney, and brick exterior. Mature spruce and deciduous trees.	Yes	CHR-24	Inside the Project Location

Table 3: Potential Cultural Heritage Resources

Municipal Address	Previous Heritage Recognition	Resource Type	Photograph	Identified Attributes	CHVI	CHR Number	Relationship to Project Location
1436 Brock Road	No	Residence		Residence: one and a half storey structure, medium-pitched cross gable roof, steeply-pitched gabled dormer, pointed arch window, segmental and semi-circular wood frame window openings, brick exterior, brick voussoirs, keystone, and covered partial porch. Landscape: mature trees and wood white picket fence.	Yes	CHR-25	Inside the Project Location
1157 Safari Road	No	Farmstead		Barn: timber frame structure, gable roof, smaller gable roof and shed roof outbuilding additions. Landscape: mature trees and rolling topography.	Yes	CHR-26	Inside the Project Location





Legend

- Study Area
- 50 m Buffer
- Inventoried Heritage Property - Not Designated
- Existing Enbridge Station
- Preliminary Preferred Route (A)
- Route Deviation A2
- Route Alternative (B)
- Road
- Hydro Line
- Waterbody
- Watercourse

0 100 200 400 m

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Notes

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Stantec

Project Location
City of Hamilton

160961299
Prepared by AMW on 2019-04-10
Technical Review by ABC on yyyy-mm-dd

Client/Project
Enbridge Gas Inc.
Kirkwall to Hamilton Pipeline

Figure No.
5.1

Title
Previously Identified Heritage Properties

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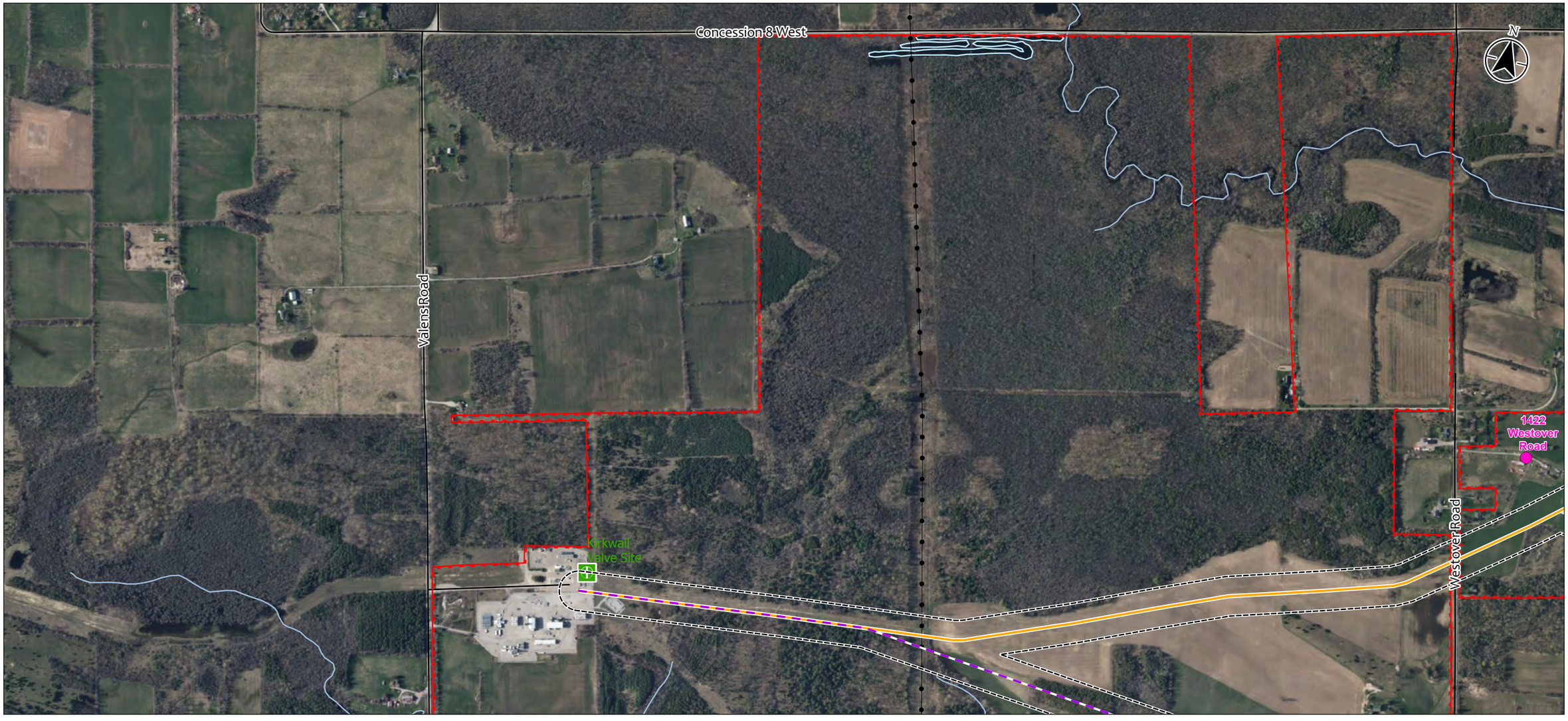

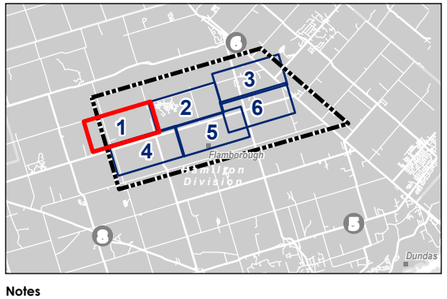

Legend

- Study Area
- 50 m Buffer
- Potential Heritage Resource
- Existing Enbridge Station
- Preliminary Preferred Route (A)
- Route Deviation A2
- Route Alternative (B)
- Road
- Hydro Line
- Waterbody
- Watercourse

0 100 200 400 m

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Stantec

Project Location
City of Hamilton

160961299
Prepared by AMW on 2019-04-08
Technical Review by ABC on yyyy-mm-dd

Client/Project
Enbridge Gas Inc.
Kirkwall to Hamilton Pipeline

Figure No.
6.1

Title
Potential Heritage Properties

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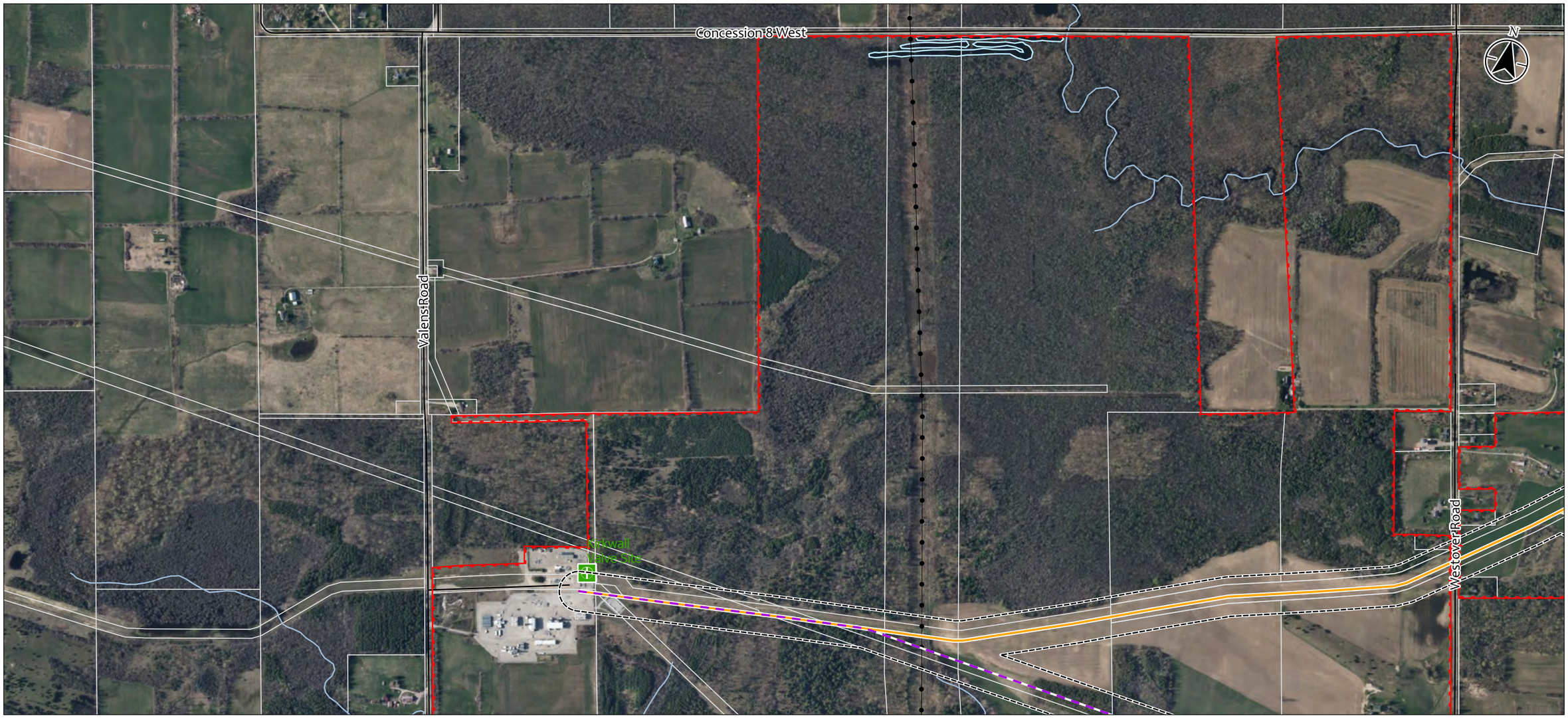

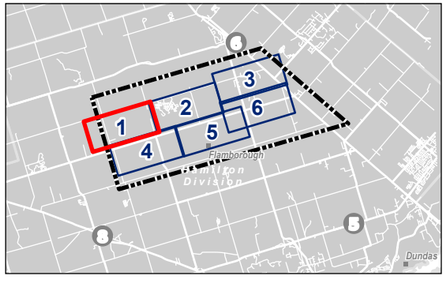

Legend

- Study Area
- 50 m Buffer
- Preliminary Preferred Route (A)
- Route Deviation A2
- Route Alternative (B)
- Existing Enbridge Station
- Road
- Hydro Line
- Property Boundary
- Waterbody
- Watercourse

0 100 200 400 m

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Stantec

Project Location
City of Hamilton

160961299
Prepared by AMW on 2019-04-10
Technical Review by ABC on yyyy-mm-dd

Client/Project
Enbridge Gas Inc.
Kirkwall to Hamilton Pipeline

Figure No.
7.1

Title
Identified Cultural Heritage Resources

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5.0 EVALUATION OF ANTICIPATED IMPACTS AND MITIGATION OPTIONS

5.1 DESCRIPTION OF UNDERTAKING

Route A has been selected as the preferred route for the Project. The final construction footprint and technique will be determined during detailed design. As described in Section 1.3, the pipeline construction process involves the following activities:

- Constructing the Proposed Pipeline
  - Site Preparation and clearing
  - Grading and Stripping
  - Stringing
  - Pipe Fabrication
  - Trenching and Lowering
  - Backfilling
  - Hydrostatic Testing
  - Clean-Up and Restoration

5.2 RELATIONSHIP TO PROJECT

Given the proposed undertaking, the evaluation of potential impacts was undertaken where an identified heritage attribute of a built heritage resource or cultural heritage landscape was positioned within the Study Area of Route A. No impacts are anticipated to identified heritage resources beyond the 50-metre buffer and so these are not considered further in the impact assessment presented below in Section 5.3. The positions of heritage resources are outlined in relation to the Project Location in Table 3 and on Figure 7.

5.3 ANTICIPATED IMPACTS

No removals of built heritage resources (e.g., residences or barns) or cultural heritage landscape elements (e.g., tree lined driveways or historic fence rows) are planned. This will need to be confirmed once final construction drawings are available for the project.

Where a heritage resource was determined to be situated within the Study Area of the preferred Route A, the impacts of the proposed Project on identified heritage attributes were evaluated. The impacts, both direct and indirect, were evaluated according to InfoSheet #5 (Government of Ontario 2006b). See Section 2.5 for further discussion of the impacts assessed.

Within Table 4, the following acronyms denote the assessment of impacts: NA = Not Anticipated, A = Anticipated Impact, P = Potential Impact.

Table 4: Evaluation of Potential Impacts

Address	Direct Impact		Indirect Impact					Discussion
	Destruction	Alteration	Shadows	Isolation	Obstruction	Change in Land Use	Land Disturbances	
1289 Safari Road (CHR-2)	NA	NA	NA	NA	NA	NA	NA	Route A is located north of the farmstead. Project components are proposed more than 50 metres south of the identified heritage attributes associated with the built structures. **Therefore, mitigation measures are not required.**
1172 Concession 8 West (CHR-3)	NA	NA	NA	NA	NA	NA	NA	Route A is located south of the structures and transverses the property. Project components are proposed more than 50 metres south of the identified heritage attributes associated with the built structures. **Therefore, mitigation measures are not required.**
1437 Middletown Road (CHR-4)	NA	NA	NA	NA	NA	NA	NA	Route A is located north of the farmstead. Project components are proposed more than 50 metres from the identified heritage attributes associated with the built structures. **Therefore, mitigation measures are not required.**
1412 Middletown Road (CHR-5)	NA	NA	NA	NA	NA	NA	NA	Route A is located north of the residence. Project components are proposed more than 50 metres from the identified heritage attributes associated with the residence. **Therefore, mitigation measures are not required.**
1035 Safari Road (CHR-6)	NA	NA	NA	NA	NA	NA	NA	Route A is located north of the farmstead. Project components are proposed more than

Table 4: Evaluation of Potential Impacts

Address	Direct Impact		Indirect Impact					Discussion
	Destruction	Alteration	Shadows	Isolation	Obstruction	Change in Land Use	Land Disturbances	
								50 metres from the identified heritage attributes associated with the farmstead. **Therefore, mitigation measures are not required.**
812 Concession 8 West (CHR-8)	NA	NA	NA	NA	NA	NA	NA	Route A is located south of the farmstead. Project components are proposed more than 50 metres from the identified heritage attributes associated with the farmstead. **Therefore, mitigation measures are not required.**
794 Concession 8 West (CHR-10)	NA	NA	NA	NA	NA	NA	NA	Route A is located south of the residence and barn. Project components are proposed more than 50 metres from the identified heritage attributes associated with the barn and the landscape. **Therefore, mitigation measures are not required.**
750 Concession 8 West (CHR-11)	NA	NA	NA	NA	NA	NA	P	Route A crosses mid-way through the property. There is one structure related to the farmstead that is situated within 50 metres of project components. All other structures related to the farmstead are situated south of Route A, more than 50 metres. The position of the structure within 50 metres of the Project Location has the potential for indirect impacts resulting from land disturbance during construction activities. **Therefore, mitigation measures must be prepared to mitigate potential indirect impacts**.

Table 4: Evaluation of Potential Impacts

Address	Direct Impact		Indirect Impact					Discussion
	Destruction	Alteration	Shadows	Isolation	Obstruction	Change in Land Use	Land Disturbances	
716 Concession 8 West (CHR-12)	NA	NA	NA	NA	NA	NA	NA	Route A crosses directly south of the farmstead structures through the equestrian yard. Project components are proposed more than 50 metres from the identified heritage attributes associated with the farmstead. **Therefore, mitigation measures are not required.**
700 Concession 8 West (CHR-13)	NA	NA	NA	NA	NA	NA	NA	Route A is located south of the farmstead. Project components are proposed more than 50 metres from the identified heritage attributes associated with the farmstead. **Therefore, mitigation measures are not required.**
1213 Safari Road (CHR-14)	NA	NA	NA	NA	NA	NA	NA	Route A is located north of the farmstead. Project components are proposed more than 50 metres from the identified heritage attributes associated with the farmstead. **Therefore, mitigation measures are not required.**
1157 Safari Road (CHR-26)	NA	NA	NA	NA	NA	NA	NA	Route A is located north of the farmstead. Project components are proposed more than 50 metres from the identified heritage attributes associated with the barn. **Therefore, mitigation measures are not required.**

5.3.1 Summary of Impacts

Following the assessment of impacts presented in Table 4, one property was determined to be situated within 50 metres of planned construction activities and is at risk for indirect, vibration-related impacts:

- 750 Concession 8 West (CHR-11)

5.4 MITIGATION OPTIONS

Where potential impacts are identified, either direct or indirect, measures to mitigate them have been prepared. The impetus for avoidance of impacts comes from two sources, the *OEB Environmental Guidelines* and the PPS (see Section 2.1). The former requires that cultural heritage resources be protected by "appropriate conservation, avoidance and mitigation," while the latter requires conservation of "significant" heritage resources as well as the "heritage attributes of the protected heritage property" (see Section 2.1 for full excerpts of requirements). When combined, precautions are required to conserve heritage resources through avoidance and mitigation where the potential for a Project to impact heritage resources has been identified. Therefore, the below mitigation options have been developed to provide for the conservation of heritage attributes of the heritage resources. These are based on mitigation or avoidance measures developed by the MTCS and contained within InfoSheet #5 (Government of Ontario 2006b). See Section 2.6 for further discussion of the mitigation methods assessed.

The proposed undertaking involves installation of a pipeline within municipal RoWs, Enbridge Gas property, and private property. As the land will be returned to its current state as much as possible, the anticipated impacts are related to the construction phase of the Project. Where potential impacts have been identified for CHR-11, components of the heritage resources are positioned within the 50-metre buffer but outside the direct Project Location. As a result, a preventive approach to mitigation measures will contribute to a reduction in risk of indirect impacts. contains a summary of the evaluation of mitigation options.

Table 5: Evaluation of Mitigation and Avoidance Options

Methods	Discussion
Alternative Development	The current approach involves minimal land disturbance. Therefore, alternative developments are not required.
Isolation of Development	Isolation of Project construction activities from the CHRs will prevent unanticipated direct and indirect impacts.
Harmonization of Design Guidelines	The Project will not introduce any above ground features and will return the landscape to current conditions. Therefore, no additional design guidelines are required.
Limitation of Construction	The Project will not introduce any above ground features and will return the landscape to current conditions. Therefore, no limitations on height or density of construction are required.
Compatible Additions	The Project will not introduce any above ground features and will return the landscape to current conditions. Therefore, compatible additions are not required.
Reversible Alterations	The Project is not anticipated to introduce any above ground features. It is anticipated that any alterations to the identified laneway and crop fields will be returned to its current conditions.
Planning Mechanisms	Various planning mechanisms have been introduced to the Project to evaluate impacts of the Project on multiple aspects of the surrounding environment. As these mechanisms pertain to heritage resources, the use of a 50-metre buffer surrounding the Project Location is the most significant planning mechanism. The use of buffer zones on construction maps to indicate where a heritage resource is positioned within the Project Location will indicate to construction crews the need for complete avoidance of construction activities in the vicinity of the resource. The depiction of buffer zones on construction mapping should be used only where a heritage resource has been identified



Methods	Discussion
	within the 50-metre zone. Where this occurs, physical markers will be used during Project activities to demarcate the appropriate buffer zone.

6.0 RECOMMENDATIONS

6.1 AVOIDANCE OF CULTURAL HERITAGE RESOURCES

Staging areas and construction activities associated with preferred Route A should be planned and undertaken in a manner to avoid the heritage attributes of the identified CHRs. Should future work require an expansion of the current Study Area for Route A and/or the development of other alternatives, then a qualified heritage consultant should be consulted.

6.2 SITE PLAN CONTROLS

A total of 13 cultural heritage resources was determined to be situated within the Study Area of the preferred Route A. In order to prevent negative indirect Project Impacts, these heritage resources should be isolated from construction-related activities. It is recommended that site plan controls be put in place prior to construction to prevent potential impacts as a result of the Project. These controls should be indicated on all construction mapping and communicated to the construction team leads.

As described in Section 5.4, site plan controls should include mapping heritage resources within 50 metres of Project activities on construction maps and physically demarcating these properties to communicate the presence of these properties to construction crews. Physical protective measures should include at a minimum the installation of temporary fencing around CHRs. Depending on the proximity or Project activities, additional measures may be required such as stabilization of built heritage attributes in close proximity to construction work.

6.2.1 Condition Surveys and Vibration Monitoring

One cultural heritage resource, 750 Concession 8 West (CHR-11), is located within 50 metres of Project activities. This resource is at risk for indirect impacts resulting from construction-related ground vibration. It is recommended that Enbridge consult with a qualified building conditions specialist or geotechnical engineer with previous experience working with heritage structures to identify appropriate vibration mitigation measures in advance of construction. Mitigation measures for vibration may include developing an appropriate vibration setback distance, a vibration attenuation study, and/or a construction monitoring program.

6.3 ENVIRONMENTAL MONITORING AND REPORTING

Enbridge Gas' on-site inspection team should monitor the construction phase of this project so that construction activities do not occur within 50 metres of built heritage attributes of CHRs and that no cultural heritage landscape elements are impacted during construction. Monitoring for impacts should also be carried out by Enbridge Gas during post-construction rehabilitation. It is anticipated that, as a condition of Project approval, the Ontario Energy Board will require post-construction monitoring reports; such reports will document the implementation and effectiveness of environmental mitigation and protective measures, including the installation and maintenance of site plan controls.



6.4 DEPOSIT COPIES

To assist in the retention of historic information, copies of this report should be deposited with local repositories of historic material and municipalities. Therefore, it is recommended that this report be deposited at the following locations:

Hamilton Public Library – Central Library
55 York Boulevard
Hamilton, ON
L8N 4E4

Hamilton Municipal Heritage Committee
71 Main Street West
Hamilton, ON
L8P 4Y5

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We trust this report meets your current requirements. Please do not hesitate to contact us should you require further information or have additional questions about any facet of this report.

Yours truly,

STANTEC CONSULTING LTD.

Jeffrey Muir, BA, CAHP
Project Archaeologist
Phone: 905-381-3209
Jeff.Muir@stantec.com

Tracie Carmichael, BA, B.Ed.
Managing Principal, Environmental Services
Phone: 519-675-6603
Tracie.Carmichael@stantec.com

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APPENDIX A
Cultural Heritage Resource Inventory

Municipal Address: 1422 Westover Road

Former Township: Township of Beverly

Lot, Concession: 31, 7

Municipality: City of Hamilton

Resource Type: Farmstead

Associated Dates: 1950-1975

Relationship to Project: Within the Project Location



Description: This property contains a farmstead with outbuildings and a residence. The farmstead is set back from the roadway off a long laneway.

Views of the residence are obscured by distance from the public roadway. The residence is a one storey structure with a medium-pitched side gable roof.

The main outbuilding is a gable roof structure with metal cladding. Its windows and entrance are boarded with plywood on the west and north elevations. Immediately to the south of this building is a small shed roof outbuilding clad with metal. The property contains split rail fencing, post and wire fencing, and metal fencing. The landscape includes deciduous trees, shrubs, and a rolling topography.

Indicators of Cultural Heritage Value or Interest from O. Reg. 9/06:

	Yes	No
1. The property has design value or physical value because it,		
i. Is a rare, unique, representative or early example of a style, type, expression, material or construction method,		✓
ii. Displays a high degree of craftsmanship or artistic merit, or		✓
iii. Demonstrates a high degree of technical or scientific achievement.		✓
2. The property has historical value or associative value because it,		
i. Has direct associations with a theme, event, belief, person, activity organization or institution that is significant to a community,		✓
ii. Yields, or has the potential to yield, information that contributes to an understanding of a community of culture, or		✓
iii. Demonstrates or reflects the work or ideas of an architect, artist, builder, designer or theorist who is significant to a community.		✓
3. The property has contextual value because it,		
i. Is important in defining, maintaining or supporting the character of an area,		✓
ii. Is physically, functionally, visually or historically linked to its surroundings, or		✓
iii. Is a landmark.		✓

Draft Statement of Cultural Heritage Value or Interest: N/A

Identified Heritage Attributes: None Identified.

Identification of CHVI: No	**Cultural Heritage Resource Number:** N/A
Completed by (name): Frank Smith	**Date Completed:** January 30, 2019.

Municipal Address: 1399 Safari Road

Former Township: Township of Beverly

Lot, Concession: 30, 7

Municipality: City of Hamilton

Resource Type: Farmstead

Associated Dates: Prior to 1875

Relationship to Project: Within the Project Location



Description: This property contains a farmstead with a residence and outbuildings. The farmstead is set far back from the roadway by way of a long tree allée laneway. Near the roadway the laneway is lined with a stone wall.

The residence is a one and a half storey structure with a high-pitched side gable roof with asphalt shingles. The front (south) façade has a central high-pitched gable dormer. The residence has a red brick exterior with buff brick details seen in voussoirs and quoins. The three-bay front façade has a covered full width wooden porch. The central entrance has a transom window. The residence has a rear gable roof addition. The foundation of the residence is not visible from the roadway.

The property contains a gable roof barn clad in metal with a stone foundation. The property is landscaped with mature Norway spruce trees, mature deciduous trees, and shrubs. The property has a gently rolling topography and a pond.

Indicators of Cultural Heritage Value or Interest from O. Reg. 9/06:

	Yes	No
1. The property has design value or physical value because it,		
i. Is a rare, unique, representative or early example of a style, type, expression, material or construction method,	✓	
ii. Displays a high degree of craftsmanship or artistic merit, or		✓
iii. Demonstrates a high degree of technical or scientific achievement.		✓
2. The property has historical value or associative value because it,		
i. Has direct associations with a theme, event, belief, person, activity organization or institution that is significant to a community,		✓
ii. Yields, or has the potential to yield, information that contributes to an understanding of a community of culture, or		✓
iii. Demonstrates or reflects the work or ideas of an architect, artist, builder, designer or theorist who is significant to a community.		✓
3. The property has contextual value because it,		
i. Is important in defining, maintaining or supporting the character of an area,	✓	
ii. Is physically, functionally, visually or historically linked to its surroundings, or	✓	
iii. Is a landmark.		✓

Draft Statement of Cultural Heritage Value or Interest: The construction of this farmstead dates prior to 1875, determined through historical mapping. The residence has design value as an Ontario vernacular structure with Gothic Revival design influences expressed through its one and a half storey massing and central gable dormer. The barn is a representative late 19th century Ontario vernacular barn. This property supports the late 19th century rural character of the area and is physically and historically linked to its surroundings.

Identified Heritage Attributes: Residence: one and a half storey structure, high-pitched side gable roof, high-pitched gable dormer, red brick exterior, buff brick detailing seen in quoins, and voussoirs, front entry transom, and covered full-width porch. Barn: gable roof, vertical wood cladding, and stone foundation. Landscape: tree allée laneway, mature Norway Spruce, and stone wall.

Identification of CHVI: Yes	**Cultural Heritage Resource Number:** CHR-1
Completed by (name): Frank Smith	**Date Completed:** January 30, 2019.

Municipal Address: 1441 Safari Road

Former Township: Township of Beverly

Lot, Concession: 29, 7

Municipality: City of Hamilton

Resource Type: Residence

Associated Dates: 1955-1975

Relationship to Project: Within the Project Location

Description: This property contains a residence.



The residence is a one storey structure with a medium pitched hip roof that is clad in metal. The exterior of the residence is clad in buff brick and stone. The residence has a modern bay window and modern casement windows on the front (south) façade. The main entrance has a modern door with modern sidelights. The residence has an attached single-car garage and a concrete foundation. The property is landscaped with intermediate deciduous trees, intermediate spruce trees, small spruce trees, shrubs, and foundation plantings.

Indicators of Cultural Heritage Value or Interest from O. Reg. 9/06:

	Yes	No
1. The property has design value or physical value because it,		
i. Is a rare, unique, representative or early example of a style, type, expression, material or construction method,		✓
ii. Displays a high degree of craftsmanship or artistic merit, or		✓
iii. Demonstrates a high degree of technical or scientific achievement.		✓
2. The property has historical value or associative value because it,		
i. Has direct associations with a theme, event, belief, person, activity organization or institution that is significant to a community,		✓
ii. Yields, or has the potential to yield, information that contributes to an understanding of a community of culture, or		✓
iii. Demonstrates or reflects the work or ideas of an architect, artist, builder, designer or theorist who is significant to a community.		✓
3. The property has contextual value because it,		
i. Is important in defining, maintaining or supporting the character of an area,		✓
ii. Is physically, functionally, visually or historically linked to its surroundings, or		✓
iii. Is a landmark.		✓

Draft Statement of Cultural Heritage Value or Interest: N/A

Identified Heritage Attributes: None identified.

Identification of CHVI: No	**Cultural Heritage Resource Number:** N/A
Completed by (name): Frank Smith	**Date Completed:** January 30, 2019.

Municipal Address: 1289 Safari Road

Former Township: Township of Beverly

Lot, Concession: 32, 7

Municipality: City of Hamilton

Resource Type: Farmstead

Associated Dates: 1875-1900

Relationship to Project: Within the Project Location

Description: The property contains a farmstead set far back from the roadway by way of a long laneway. The residence is set within the slope of the property and is surrounded by trees. The view of the residence and outbuildings is obstructed by set-back and vegetation.

The residence is a two-storey structure with a medium-pitched hip roof. The structure has a rectangular plan. The symmetrical three-bay front façade (south) has a central entrance. The property also contains a gable roof barn.

The property is listed on the 1991 Local Architectural Conservation Authority Committee's (LACAC) inventory for the City of Hamilton.





Indicators of Cultural Heritage Value or Interest from O. Reg. 9/06:

	Yes	No
1. The property has design value or physical value because it,		
i. Is a rare, unique, representative or early example of a style, type, expression, material or construction method,	✓	
ii. Displays a high degree of craftsmanship or artistic merit, or		✓
iii. Demonstrates a high degree of technical or scientific achievement.		✓
2. The property has historical value or associative value because it,		
i. Has direct associations with a theme, event, belief, person, activity organization or institution that is significant to a community,		✓
ii. Yields, or has the potential to yield, information that contributes to an understanding of a community of culture, or		✓
iii. Demonstrates or reflects the work or ideas of an architect, artist, builder, designer or theorist who is significant to a community.		✓
3. The property has contextual value because it,		
i. Is important in defining, maintaining or supporting the character of an area,	✓	
ii. Is physically, functionally, visually or historically linked to its surroundings, or	✓	
iii. Is a landmark.		✓

Draft Statement of Cultural Heritage Value or Interest: The construction of this farmstead dates to 1875 to 1900, determined through historical mapping and the LACAC Inventory. The residence has design value as an Ontario vernacular structure with Georgian style design influences expressed through its symmetrical three-bay front façade with central entrance. This property supports the late 19th century rural character of the area and is physically and historically linked to its surroundings.

Identified Heritage Attributes: Residence: two storey structure, medium-pitched hip roof, symmetrical exterior, three-bay front façade, and central entrance. Barn: side gable roof.

Identification of CHVI: Yes	**Cultural Heritage Resource Number:** CHR-2
Completed by (name): Frank Smith	**Date Completed:** January 30, 2019.

Municipal Address: 1172 Concession 8 West

Former Township: Township of Beverly

Lot, Concession: 35, 7

Municipality: City of Hamilton

Resource Type: Undetermined

Associated Dates: Prior to 1875

Relationship to Project: Within the Project Location

Description: This property contains structures set far back from the roadway by way of a long straight tree lined laneway. The view of the structures is not visible from the roadway.

The property is listed on the 1991 LACAC inventory for the City of Hamilton.



A residence is depicted on the property on the 1875 Township of Beverly map in *Illustrated Historical Atlas of the County of Wentworth* (Figure 4). The residence on the historic map is situated in relation to the current structure on the property. The map depicts the property owner as George Cook Sr.

Indicators of Cultural Heritage Value or Interest from O. Reg. 9/06:

	Yes	No
1. The property has design value or physical value because it,		
i. Is a rare, unique, representative or early example of a style, type, expression, material or construction method,	✓	
ii. Displays a high degree of craftsmanship or artistic merit, or		✓
iii. Demonstrates a high degree of technical or scientific achievement.		✓
2. The property has historical value or associative value because it,		
i. Has direct associations with a theme, event, belief, person, activity organization or institution that is significant to a community,		✓
ii. Yields, or has the potential to yield, information that contributes to an understanding of a community of culture, or		✓
iii. Demonstrates or reflects the work or ideas of an architect, artist, builder, designer or theorist who is significant to a community.		✓
3. The property has contextual value because it,		
i. Is important in defining, maintaining or supporting the character of an area,	✓	
ii. Is physically, functionally, visually or historically linked to its surroundings, or	✓	
iii. Is a landmark.		✓

Draft Statement of Cultural Heritage Value or Interest: The construction of the structures on the property date prior to 1875, determined through historical mapping and the LACAC Inventory. This property supports the late 19th century rural character of the area and is physically and historically linked to its surroundings.

Identified Heritage Attributes: Contextual: connection to other late 19th century properties in the surrounding rural area.

Identification of CHVI: Yes	**Cultural Heritage Resource Number:** CHR-3
Completed by (name): Frank Smith	**Date Completed:** January 30, 2019.

Municipal Address: 1437 Middletown Road

Former Township: Township of Beverly

Lot, Concession: 36, 7

Municipality: City of Hamilton

Resource Type: Farmstead

Associated Dates: Residence: Prior to 1875, Barn: 1880-1930

Relationship to Project: Within the Study Area



Description: This property contains a farmstead named "Hunter Hills Stables" with a residence and barn. Hunter Hills stables provides services for the horse racing industry.

The residence is a one and a half storey structure with a medium-pitched cross gable roof that has asphalt shingles. The residence has an L-shaped plan. The south elevation has a medium-pitched gable dormer. The exterior is clad in modern board and batten siding and has modern windows. The residence has a modern door set with an enclosed partial porch. The entry has a portico with a gable roof. The foundation of the residence is not visible.

The timber frame barn has a cross gable roof with ventilators. The barn has concrete foundation with horizontal sliding windows. The property is landscaped with mature deciduous trees, mature spruce trees, metal fencing, and areas for equestrian use bounded by wooden fencing.

The property is listed on the 1991 LACAC inventory for the City of Hamilton. A structure is depicted on the property on the 1875 Township of Beverly map in the *Illustrated Historical Atlas of Wentworth* (Figure 4). The owner depicted on the property is William Johnson (Johnstone).

Indicators of Cultural Heritage Value or Interest from O. Reg. 9/06:

	Yes	No
1. The property has design value or physical value because it,		
i. Is a rare, unique, representative or early example of a style, type, expression, material or construction method,	✓	
ii. Displays a high degree of craftsmanship or artistic merit, or		✓
iii. Demonstrates a high degree of technical or scientific achievement.		✓
2. The property has historical value or associative value because it,		
i. Has direct associations with a theme, event, belief, person, activity organization or institution that is significant to a community,		✓
ii. Yields, or has the potential to yield, information that contributes to an understanding of a community of culture, or		✓
iii. Demonstrates or reflects the work or ideas of an architect, artist, builder, designer or theorist who is significant to a community.		✓
3. The property has contextual value because it,		
i. Is important in defining, maintaining or supporting the character of an area,	✓	
ii. Is physically, functionally, visually or historically linked to its surroundings, or	✓	
iii. Is a landmark.		✓

Draft Statement of Cultural Heritage Value or Interest: The construction of this residence dates between prior to 1875, determined through historical mapping. The residence is representative of a late 19th century Ontario vernacular structure. This property supports the late 19th century rural character of the area and is physically and historically linked to its surroundings.

Identified Heritage Attributes: Residence: one and a half storey structure, medium-pitched cross gable roof, medium-pitched gable dormer, and L-shaped plan. Barn: timber frame structure, cross gable roof, and ventilators.

Identification of CHVI: Yes	**Cultural Heritage Resource Number:** CHR-4
Completed by (name): Frank Smith	**Date Completed:** January 30, 2019.

Municipal Address: 1412 Middletown Road

Former Township: Township of West Flamborough

Lot, Concession: 1, 7

Municipality: City of Hamilton

Resource Type: Residence

Associated Dates: Prior to 1875

Relationship to Project: Within the Study Area

Description: This property contains a residence and outbuildings. The residence is setback far back from the roadway by way of a long laneway. The residence is set on the slope of the property and is surrounded by trees. The view of the residence is obscured by set back and vegetation.

The residence is a one and a half storey structure with a high-pitched cross gable roof with asphalt shingles and brick chimney. The front (south) and west elevation of the roofline has high-pitched gabled dormers. The residence has a red brick exterior, a T-shaped plan, and a covered partial porch on its west elevation. The foundation was not visible from the roadway.

The property has a gently rolling topography and mature trees.

The property is listed on the 1991 LACAC inventory for the City of Hamilton.





Indicators of Cultural Heritage Value or Interest from O. Reg. 9/06:

	Yes	No
1. The property has design value or physical value because it,		
i. Is a rare, unique, representative or early example of a style, type, expression, material or construction method,	✓	
ii. Displays a high degree of craftsmanship or artistic merit, or		✓
iii. Demonstrates a high degree of technical or scientific achievement.		✓
2. The property has historical value or associative value because it,		
i. Has direct associations with a theme, event, belief, person, activity organization or institution that is significant to a community,		✓
ii. Yields, or has the potential to yield, information that contributes to an understanding of a community of culture, or		✓
iii. Demonstrates or reflects the work or ideas of an architect, artist, builder, designer or theorist who is significant to a community.		✓
3. The property has contextual value because it,		
i. Is important in defining, maintaining or supporting the character of an area,	✓	
ii. Is physically, functionally, visually or historically linked to its surroundings, or	✓	
iii. Is a landmark.		✓

Draft Statement of Cultural Heritage Value or Interest: The construction of this residence dates prior to 1875, determined through historical mapping. The residence is representative of a late 19th century Ontario vernacular residence with Gothic Revival design influences seen in its one and a half storey massing and gabled dormers. This property supports the late 19th century rural character of the area and is physically and historically linked to its surroundings.

Identified Heritage Attributes: Residence: one and a half storey structure, high-pitched cross gable roof, T-shaped plan, high-pitched gable dormers, and brick exterior.

Identification of CHVI: Yes	**Cultural Heritage Resource Number:** CHR-5
Completed by (name): Frank Smith	**Date Completed:** January 30, 2019.

Municipal Address: 1006 Concession 8 West

Former Township: Township of West Flamborough

Lot, Concession: 3, 7

Municipality: City of Hamilton

Resource Type: Farmstead

Associated Dates: *circa* 1950-1964

Relationship to Project: Within the Project Location



Description: This property contains a farmstead with residence and outbuildings. The residence fronts the roadway, while the outbuildings are located to the rear. The farm is known as Dutchman's Gold Inc. and sells honey and maple syrup.

The residence is a one storey structure with a medium-pitched cross gable roof with a brick chimney. The roof cladding was obscured by snow cover. The exterior of the residence is clad in modern siding and has 1/1 and horizontal sliding windows. The residence has a concrete foundation.

The property contains multiple modern outbuildings associated with farm operations. The property is landscaped with mature spruce trees, mature and intermediate deciduous trees, and foundation plantings.

Indicators of Cultural Heritage Value or Interest from O. Reg. 9/06:

	Yes	No
1. The property has design value or physical value because it,		
i. Is a rare, unique, representative or early example of a style, type, expression, material or construction method,		✓
ii. Displays a high degree of craftsmanship or artistic merit, or		✓
iii. Demonstrates a high degree of technical or scientific achievement.		✓
2. The property has historical value or associative value because it,		
i. Has direct associations with a theme, event, belief, person, activity organization or institution that is significant to a community,		✓
ii. Yields, or has the potential to yield, information that contributes to an understanding of a community of culture, or		✓
iii. Demonstrates or reflects the work or ideas of an architect, artist, builder, designer or theorist who is significant to a community.		✓
3. The property has contextual value because it,		
i. Is important in defining, maintaining or supporting the character of an area,		✓
ii. Is physically, functionally, visually or historically linked to its surroundings, or		✓
iii. Is a landmark.		✓

Draft Statement of Cultural Heritage Value or Interest: N/A

Identified Heritage Attributes: None Identified.

Identification of CHVI: No	**Cultural Heritage Resource Number:** N/A
Completed by (name): Frank Smith	**Date Completed:** January 30, 2019.

Municipal Address: 1035 Safari Road

Former Township: Township of West Flamborough

Lot, Concession: 2, 7

Municipality: City of Hamilton

Resource Type: Farmstead

Associated Dates: Prior to 1875

Relationship to Project: Within the Project Location



Description: The property contains a farmstead and a modern residence. The farmstead is set far back from the roadway and is accessed by way of a long laneway. The farmstead is set on the slope of the property.

The residence is a one and a half storey structure with a medium-pitched side gable roof that is clad in metal and has a metal chimney. The three-bay front (south) façade has been altered with the addition of modern windows. The structure is clad in modern siding. The foundation is not visible from the roadway.

The property contains a timber frame barn with a side gable roof that is clad in metal. The foundation of the barn is not visible from the roadway. Adjacent to the barn are metal silos and an outbuilding. The outbuilding has a side gable roof that is clad in metal. Its exterior is clad in metal and has a concrete block foundation. Adjacent to the residence is a detached single-car garage. Adjacent to the modern residence is a few small outbuildings, including one side gable roof structure with a vertical wood exterior. The property has mature spruce trees, cedar trees, and agricultural fields.

The property is listed on the 1991 LACAC inventory for the City of Hamilton. A structure is depicted on the property on the 1875 Township of West Flamborough Map, in the *Illustrated Historical Atlas of the County of Wentworth* (Figure 4). The map lists the property owner as James Porter.

Indicators of Cultural Heritage Value or Interest from O. Reg. 9/06:

	Yes	No
1. The property has design value or physical value because it,		
i. Is a rare, unique, representative or early example of a style, type, expression, material or construction method,	✓	
ii. Displays a high degree of craftsmanship or artistic merit, or		✓
iii. Demonstrates a high degree of technical or scientific achievement.		✓
2. The property has historical value or associative value because it,		
i. Has direct associations with a theme, event, belief, person, activity organization or institution that is significant to a community,		✓
ii. Yields, or has the potential to yield, information that contributes to an understanding of a community of culture, or		✓
iii. Demonstrates or reflects the work or ideas of an architect, artist, builder, designer or theorist who is significant to a community.		✓
3. The property has contextual value because it,		
i. Is important in defining, maintaining or supporting the character of an area,	✓	
ii. Is physically, functionally, visually or historically linked to its surroundings, or	✓	
iii. Is a landmark.		✓

Draft Statement of Cultural Heritage Value or Interest: The construction of this residence dates prior to 1875, determined through historical mapping. The residence is representative of a mid to late 19th century Ontario vernacular residence with Ontario Cottage design influences seen in its one and a half storey

massing, with former three-bay front façade. This property supports the late 19th century rural character of the area and is physically and historically linked to its surroundings.

Identified Heritage Attributes: Residence: one and a half storey structure, and medium-pitched side gable roof. Barn: timber frame structure, and side gable roof. Landscape: long laneway, mature spruce trees, and surrounding agricultural lands.

Identification of CHVI: Yes	**Cultural Heritage Resource Number:** CHR-6
Completed by (name): Frank Smith	**Date Completed:** January 30, 2019.

Municipal Address: 1470 Brock Road

Former Township: Township of West Flamborough

Lot, Concession: 7, 7

Municipality: City of Hamilton

Resource Type: Residence

Associated Dates: Prior to 1875

Relationship to Project: Within the Study Area



Description: This property contains a residence.

The residence is a one and a half storey structure with a medium-pitched cross gable roof with asphalt shingles, and a metal chimney. The front (west) and south elevations of the roofline have medium-pitched gabled dormers. The exterior of the residence is clad in modern siding and has 2/2 wood windows with wood window surrounds. The residence has a balcony and enclosed porch with modern windows. The residence has a T-shaped plan, and the foundation is not visible from the roadway.

The property is landscaped with mature deciduous trees, shrubs, and blue spruce trees

Indicators of Cultural Heritage Value or Interest from O. Reg. 9/06:

	Yes	No
1. The property has design value or physical value because it,		
i. Is a rare, unique, representative or early example of a style, type, expression, material or construction method,	✓	
ii. Displays a high degree of craftsmanship or artistic merit, or		✓
iii. Demonstrates a high degree of technical or scientific achievement.		✓
2. The property has historical value or associative value because it,		
i. Has direct associations with a theme, event, belief, person, activity organization or institution that is significant to a community,		✓
ii. Yields, or has the potential to yield, information that contributes to an understanding of a community of culture, or		✓
iii. Demonstrates or reflects the work or ideas of an architect, artist, builder, designer or theorist who is significant to a community.		✓
3. The property has contextual value because it,		
i. Is important in defining, maintaining or supporting the character of an area,	✓	
ii. Is physically, functionally, visually or historically linked to its surroundings, or	✓	
iii. Is a landmark.		✓

Draft Statement of Cultural Heritage Value or Interest: The construction of this residence dates to prior to 1875, determined through historical mapping. The residence is representative of a late 19th century Ontario vernacular residence. This property supports the late 19th century rural character of the area and is physically and historically linked to its surroundings.

Identified Heritage Attributes: Residence: one and a half storey structure, medium-pitch cross gable roof, medium-pitched gabled dormers (west and east elevations), 2/2 wood windows, and T-shaped plan.

Identification of CHVI: Yes	**Cultural Heritage Resource Number:** CHR-7
Completed by (name): Frank Smith	**Date Completed:** January 30, 2019.

Municipal Address: 1512 Brock Road

Former Township: Township of West Flamborough

Lot, Concession: 7, 7

Municipality: City of Hamilton

Resource Type: Residence

Associated Dates: 1950-1964

Relationship to Project: Within the Project Location



Description: This property contains a residence and outbuilding.

The residence is a one storey structure with a medium-pitched hip roof with a brick chimney, metal chimney, and asphalt shingles. The exterior of the residence is clad in modern siding and has a modern windows and doors. The residence has a concrete foundation. The outbuilding is a detached two-car garage with a gable roof and modern siding.

The property is landscaped with mature Norway spruce trees, mature cedar trees, shrubs, and deciduous trees, including a birch tree.

Indicators of Cultural Heritage Value or Interest from O. Reg. 9/06:

	Yes	No
1. The property has design value or physical value because it,		
i. Is a rare, unique, representative or early example of a style, type, expression, material or construction method,		✓
ii. Displays a high degree of craftsmanship or artistic merit, or		✓
iii. Demonstrates a high degree of technical or scientific achievement.		✓
2. The property has historical value or associative value because it,		
i. Has direct associations with a theme, event, belief, person, activity organization or institution that is significant to a community,		✓
ii. Yields, or has the potential to yield, information that contributes to an understanding of a community of culture, or		✓
iii. Demonstrates or reflects the work or ideas of an architect, artist, builder, designer or theorist who is significant to a community.		✓
3. The property has contextual value because it,		
i. Is important in defining, maintaining or supporting the character of an area,		✓
ii. Is physically, functionally, visually or historically linked to its surroundings, or		✓
iii. Is a landmark.		✓

Draft Statement of Cultural Heritage Value or Interest: N/A

Identified Heritage Attributes: None Identified.

Identification of CHVI: No	**Cultural Heritage Resource Number:** N/A
Completed by (name): Frank Smith	**Date Completed:** January 30, 2019.

Municipal Address: 1514 Brock Road

Former Township: Township of West Flamborough

Lot, Concession: 7, 7

Municipality: City of Hamilton

Resource Type: Residence

Associated Dates: 1950-1964

Relationship to Project: Within the Study Area

Description: This property contains a residence.



The residence is a one storey structure with a medium-pitched side gable roof with a brick chimney. The roof cladding was obscured by snow cover. The exterior of the residence is clad in modern siding and has a modern picture window, modern horizontal sliding windows, and modern 1/1 windows. The residence has modern entrance doors and a partial wood porch. The foundation of the residence is concrete.

The property is landscaped with mature spruce trees and mature deciduous trees.

Indicators of Cultural Heritage Value or Interest from O. Reg. 9/06:

	Yes	No
1. The property has design value or physical value because it,		
i. Is a rare, unique, representative or early example of a style, type, expression, material or construction method,		✓
ii. Displays a high degree of craftsmanship or artistic merit, or		✓
iii. Demonstrates a high degree of technical or scientific achievement.		✓
2. The property has historical value or associative value because it,		
i. Has direct associations with a theme, event, belief, person, activity organization or institution that is significant to a community,		✓
ii. Yields, or has the potential to yield, information that contributes to an understanding of a community of culture, or		✓
iii. Demonstrates or reflects the work or ideas of an architect, artist, builder, designer or theorist who is significant to a community.		✓
3. The property has contextual value because it,		
i. Is important in defining, maintaining or supporting the character of an area,		✓
ii. Is physically, functionally, visually or historically linked to its surroundings, or		✓
iii. Is a landmark.		✓

Draft Statement of Cultural Heritage Value or Interest: N/A

Identified Heritage Attributes: None Identified.

Identification of CHVI: No	**Cultural Heritage Resource Number:** N/A
Completed by (name): Frank Smith	**Date Completed:** January 30, 2019.

Municipal Address: 964 Concession 8 West

Former Township: Township of West Flamborough

Lot, Concession: 4, 7

Municipality: City of Hamilton

Resource Type: Barn

Associated Dates: 1938-1975

Relationship to Project: Within the Project Location

Description: This property contains a barn.

The barn has a gambrel roof that is clad in metal. The exterior of the bar is clad in vertical wood and has wood entrance doors. The foundation of the barn is concrete block. The barn is partially surrounded by a split rail fence. The property is landscaped with mature deciduous trees.



Indicators of Cultural Heritage Value or Interest from O. Reg. 9/06:

	Yes	No
1. The property has design value or physical value because it,		
i. Is a rare, unique, representative or early example of a style, type, expression, material or construction method,		✓
ii. Displays a high degree of craftsmanship or artistic merit, or		✓
iii. Demonstrates a high degree of technical or scientific achievement.		✓
2. The property has historical value or associative value because it,		
i. Has direct associations with a theme, event, belief, person, activity organization or institution that is significant to a community,		✓
ii. Yields, or has the potential to yield, information that contributes to an understanding of a community of culture, or		✓
iii. Demonstrates or reflects the work or ideas of an architect, artist, builder, designer or theorist who is significant to a community.		✓
3. The property has contextual value because it,		
i. Is important in defining, maintaining or supporting the character of an area,		✓
ii. Is physically, functionally, visually or historically linked to its surroundings, or		✓
iii. Is a landmark.		✓

Draft Statement of Cultural Heritage Value or Interest: N/A

Identified Heritage Attributes: None identified.

Identification of CHVI: No	**Cultural Heritage Resource Number:** N/A
Completed by (name): Frank Smith	**Date Completed:** January 30, 2019.

Municipal Address: 812 Concession 8 West

Former Township: Township of West Flamborough

Lot, Concession: 8, 7

Municipality: City of Hamilton

Resource Type: Farmstead

Associated Dates: Prior to 1875

Relationship to Project: Within the Project Location



Description: The property contains a farmstead, with a residence, barn, and outbuildings. The structures are not visible from the public roadway, as they are set back off a long laneway. The view is obscured by set back and vegetation.

The farmstead is operated as Cedarbrook Farm Bed & Breakfast. A description of the farmstead was taken from the photographs on the Bed & Breakfast website (BedBreakfast Home 2011). The residence is a one and a half storey structure with a high-pitched cross gable roof. The front (north) elevation has a high-pitched gabled dormer with a central placed pointed arch window. The front façade has a covered partial wood porch.

The property contains a timber frame barn with a side gable roof that is clad in metal. The property also contains a coach house, and drive shed. The property is landscaped with mature cedar trees and deciduous trees. The property contains a tree lined laneway with a post and wire fence on the south side.

Structures are depicted on the property on the 1875 Township of West Flamborough map in the *Illustrated Historical Atlas of the County of Wentworth* (Figure 4). The structure south of creek is situated in relation to the current residence on the property. The owner depicted on the 1875 map is Angus Fraser.

Indicators of Cultural Heritage Value or Interest from O. Reg. 9/06:

	Yes	No
1. The property has design value or physical value because it,		
i. Is a rare, unique, representative or early example of a style, type, expression, material or construction method,	✓	
ii. Displays a high degree of craftsmanship or artistic merit, or		✓
iii. Demonstrates a high degree of technical or scientific achievement.		✓
2. The property has historical value or associative value because it,		
i. Has direct associations with a theme, event, belief, person, activity organization or institution that is significant to a community,		✓
ii. Yields, or has the potential to yield, information that contributes to an understanding of a community of culture, or		✓
iii. Demonstrates or reflects the work or ideas of an architect, artist, builder, designer or theorist who is significant to a community.		✓
3. The property has contextual value because it,		
i. Is important in defining, maintaining or supporting the character of an area,	✓	
ii. Is physically, functionally, visually or historically linked to its surroundings, or	✓	
iii. Is a landmark.		✓

Draft Statement of Cultural Heritage Value or Interest: The construction of this residence dates to prior to 1875, determined through historical mapping. The residence is representative of a late 19th century Ontario vernacular residence. This property supports the late 19th century rural character of the area and is physically and historically linked to its surroundings.

Identified Heritage Attributes: Residence: one and a half storey structure, high-pitched cross gable roof, high-pitched gabled dormer, and covered partial wood porch. Barn: timber frame structure with side gable roof.

Identification of CHVI: Yes	**Cultural Heritage Resource Number:** CHR-8
Completed by (name): Frank Smith	**Date Completed:** January 30, 2019.

Municipal Address: 919 Safari Road

Former Township: Township of Beverly

Lot, Concession: 5, 7

Municipality: City of Hamilton

Resource Type: Farmstead

Associated Dates: Prior to 1875

Relationship to Project: Within the Project Location



Description: This property contains a farmstead, with a residence, barn, silo, and outbuildings. The structures are set back from the roadway off a long straight laneway. They are set on the slope of the property.

The residence is a two storey structure with a medium-pitched side gable roof that is clad in metal and has bookend chimneys. The structure has a symmetrical three-bay front (south) façade with a central entrance. The entrance has a transom, stone lintel, and sidelights. The residence has modern windows with stone sills and lintels. The foundation is not visible from the roadway.

The barn is a timber frame structure with a side gable roof that is clad in metal. The structure has a concrete foundation. Northeast of the barn is a cast-in-place concrete silo and stone ruins of a former barn. The structures are surrounded by crop fields. Adjacent to the residence are mature spruce trees.

The property is listed on the 1991 LACAC inventory for the City of Hamilton.

Indicators of Cultural Heritage Value or Interest from O. Reg. 9/06:

	Yes	No
1. The property has design value or physical value because it,		
i. Is a rare, unique, representative or early example of a style, type, expression, material or construction method,	✓	
ii. Displays a high degree of craftsmanship or artistic merit, or		✓
iii. Demonstrates a high degree of technical or scientific achievement.		✓
2. The property has historical value or associative value because it,		
i. Has direct associations with a theme, event, belief, person, activity organization or institution that is significant to a community,		✓
ii. Yields, or has the potential to yield, information that contributes to an understanding of a community of culture, or		✓
iii. Demonstrates or reflects the work or ideas of an architect, artist, builder, designer or theorist who is significant to a community.		✓
3. The property has contextual value because it,		
i. Is important in defining, maintaining or supporting the character of an area,	✓	
ii. Is physically, functionally, visually or historically linked to its surroundings, or	✓	
iii. Is a landmark.		✓

Draft Statement of Cultural Heritage Value or Interest: The construction of this residence dates to prior to 1875, determined through historical mapping. The residence is representative of a late 19th century Ontario vernacular residence with Georgian Revival design influences seen in its two storey structure, and symmetrical three-bay front (south) façade. This property supports the late 19th century rural character of the area and is physically and historically linked to its surroundings.

Identified Heritage Attributes: Residence: two storey structure, medium-pitched side gable roof, bookend chimneys, symmetrical three-bay front (south) façade, central entrance with transom, stone

lintel, and sidelights, stone lintels and sills. Barn: timber frame structure with side gable roof. Landscape: long straight laneway, mature spruce trees, and crop fields.

Identification of CHVI: Yes	**Cultural Heritage Resource Number:** CHR-9
Completed by (name): Frank Smith	**Date Completed:** January 30, 2019.

Municipal Address: 794 Concession 8 West

Former Township: Township of West Flamborough

Lot, Concession: 8, 7

Municipality: City of Hamilton

Resource Type: Residence

Associated Dates: Residence: 1900-1930; Barn: Prior to 1875

Relationship to Project: Within the Project Location

Description: This property contains a farmstead named "Field Mouse Farm".





The residence is a one storey structure with a medium-pitched side gable roof. The roof cladding was obscured by snow cover. The residence has modern siding, modern 1/1 windows with shutters, and a modern entrance door. The residence has a modern addition on the north façade with board and batten siding. The foundation of the residence is poured concrete.

The driveshed is a one storey structure with a side gable roof. The roof cladding of this outbuilding was obscured by snow cover. The exterior of this outbuilding is vertical wood siding.

The bank barn is a timber frame structure with a side gable roof that is clad with metal and has ventilators and a brick chimney. The exterior of the barn has modern windows. The barn has a stone foundation. The barn has been converted into a residential or commercial space. The property contains mature deciduous and coniferous trees, and a wood picket fence.

Indicators of Cultural Heritage Value or Interest from O. Reg. 9/06:

	Yes	No
1. The property has design value or physical value because it,		
i. Is a rare, unique, representative or early example of a style, type, expression, material or construction method,	✓	
ii. Displays a high degree of craftsmanship or artistic merit, or		✓
iii. Demonstrates a high degree of technical or scientific achievement.		✓
2. The property has historical value or associative value because it,		
i. Has direct associations with a theme, event, belief, person, activity organization or institution that is significant to a community,		✓
ii. Yields, or has the potential to yield, information that contributes to an understanding of a community of culture, or		✓
iii. Demonstrates or reflects the work or ideas of an architect, artist, builder, designer or theorist who is significant to a community.		✓
3. The property has contextual value because it,		
i. Is important in defining, maintaining or supporting the character of an area,	✓	
ii. Is physically, functionally, visually or historically linked to its surroundings, or	✓	
iii. Is a landmark.		✓

Draft Statement of Cultural Heritage Value or Interest: The construction of this barn dates to the late 19th century, determined through historical mapping and construction materials. The barn is

representative of a later 19th century Ontario vernacular barn. This property supports the late 19th century rural character of the area and is physically and historically linked to its surroundings.

Identified Heritage Attributes: Barn: timber frame structure, gable roof, and stone foundation. Landscape: mature trees and wood picket fence.

Identification of CHVI: No	**Cultural Heritage Resource Number:** CHR-10
Completed by (name): Frank Smith	**Date Completed:** January 30, 2019.

Municipal Address: 780 Concession 8 West

Former Township: Township of West Flamborough

Lot, Concession: 9, 7

Municipality: City of Hamilton

Resource Type: Commercial

Associated Dates: Outbuilding 1938-1964

Relationship to Project: Within the Project Location



Description: Views of this potential resource are obscured by vegetation and setback from publicly accessibly roadway. The property has a metal fence and gate with an automated access panel. The gate has a sign for “Green Relief”, a cannabis manufacturing company.

The property contains an outbuilding that dates between 1938 and 1964 determined through topographic mapping. The outbuilding is not visible from the roadway. The remaining structures on the property are modern.

The property is landscaped with mature and intermediate deciduous and coniferous trees and a rolling topography.

Indicators of Cultural Heritage Value or Interest from O. Reg. 9/06:

	Yes	No
1. The property has design value or physical value because it,		
i. Is a rare, unique, representative or early example of a style, type, expression, material or construction method,		✓
ii. Displays a high degree of craftsmanship or artistic merit, or		✓
iii. Demonstrates a high degree of technical or scientific achievement.		✓
2. The property has historical value or associative value because it,		
i. Has direct associations with a theme, event, belief, person, activity organization or institution that is significant to a community,		✓
ii. Yields, or has the potential to yield, information that contributes to an understanding of a community of culture, or		✓
iii. Demonstrates or reflects the work or ideas of an architect, artist, builder, designer or theorist who is significant to a community.		✓
3. The property has contextual value because it,		
i. Is important in defining, maintaining or supporting the character of an area,		✓
ii. Is physically, functionally, visually or historically linked to its surroundings, or		✓
iii. Is a landmark.		✓

Draft Statement of Cultural Heritage Value or Interest: N/A

Identified Heritage Attributes: None Identified.

Identification of CHVI: No	**Cultural Heritage Resource Number:** N/A
Completed by (name): Frank Smith	**Date Completed:** January 30, 2019.

Municipal Address: 750 Concession 8 West

Former Township: Township of West Flamborough

Lot, Concession: 9, 7

Municipality: City of Hamilton

Resource Type: Farmstead

Associated Dates: Prior to 1875

Relationship to Project: Within the Project Location



Description: The property contains a farmstead that is set far back from the roadway. Structures on the property are accessed by way of a long winding driveway. No structures are visible from the roadway.

A structure is depicted on the property on the 1875 Township of West Flamborough map in the *Illustrated Historical Atlas of Wentworth* (Figure 4). It is shown in relation to the current structure on the property. Structures are also depicted in relation to the residence in early 20th century topographic mapping.

The property is listed on the 1991 LACAC inventory for the City of Hamilton.

Indicators of Cultural Heritage Value or Interest from O. Reg. 9/06:

	Yes	No
1. The property has design value or physical value because it,		
i. Is a rare, unique, representative or early example of a style, type, expression, material or construction method,		✓
ii. Displays a high degree of craftsmanship or artistic merit, or		✓
iii. Demonstrates a high degree of technical or scientific achievement.		✓
2. The property has historical value or associative value because it,		
i. Has direct associations with a theme, event, belief, person, activity organization or institution that is significant to a community,		✓
ii. Yields, or has the potential to yield, information that contributes to an understanding of a community of culture, or		✓
iii. Demonstrates or reflects the work or ideas of an architect, artist, builder, designer or theorist who is significant to a community.		✓
3. The property has contextual value because it,		
i. Is important in defining, maintaining or supporting the character of an area,	✓	
ii. Is physically, functionally, visually or historically linked to its surroundings, or	✓	
iii. Is a landmark.		✓

Draft Statement of Cultural Heritage Value or Interest: The construction of this farmstead dates to prior to 1875, determined through historic mapping. This property supports the late 19th century rural character of the area and is physically and historically linked to its surroundings.

Identified Heritage Attributes: Contextual: connection to other late 19th century properties in the surrounding rural area.

Identification of CHVI: Yes	**Cultural Heritage Resource Number:** CHR-11
Completed by (name): Frank Smith	**Date Completed:** January 30, 2019.

Municipal Address: 716 Concession 8 West

Former Township: Township of West Flamborough

Lot, Concession: 10, 7

Municipality: City of Hamilton

Resource Type: Farmstead

Associated Dates: Prior to 1875

Relationship to Project: Within the Project Location



Description: The property contains a farmstead. The property contains a barn, outbuildings, and a residence. The structures associated with the farmstead are set far back from the roadway off a long driveway. Views of the structures are obstructed by set back and vegetation.

The residence is a one and a half storey structure with a medium-pitched side gable roof. The structure has a three-bay front (west) façade with a central entrance. The residence has multiple rear additions.

The bank barn is a timber frame structure with a side gable roof that is clad in metal. The property has additional outbuildings related to equestrian facilities. Additional details about these outbuildings are obscured by distance from roadway and vegetation. The property contains split rail fencing, small, intermediate, and mature deciduous and coniferous trees, and a gently rolling topography. The driveway entry has stone piers.

Indicators of Cultural Heritage Value or Interest from O. Reg. 9/06:

	Yes	No
1. The property has design value or physical value because it,		
i. Is a rare, unique, representative or early example of a style, type, expression, material or construction method,	✓	
ii. Displays a high degree of craftsmanship or artistic merit, or		✓
iii. Demonstrates a high degree of technical or scientific achievement.		✓
2. The property has historical value or associative value because it,		
i. Has direct associations with a theme, event, belief, person, activity organization or institution that is significant to a community,		✓
ii. Yields, or has the potential to yield, information that contributes to an understanding of a community of culture, or		✓
iii. Demonstrates or reflects the work or ideas of an architect, artist, builder, designer or theorist who is significant to a community.		✓
3. The property has contextual value because it,		
i. Is important in defining, maintaining or supporting the character of an area,	✓	
ii. Is physically, functionally, visually or historically linked to its surroundings, or	✓	
iii. Is a landmark.		✓

Draft Statement of Cultural Heritage Value or Interest: The construction of this farmstead dates prior to 1875, determined through historic mapping. The residence and barn are representative of late 19th century Ontario vernacular structures. This property supports the late 19th century rural character of the area and is physically and historically linked to its surroundings.

Identified Heritage Attributes: Residence: one and a half storey structure, medium-pitched side gable roof, and three-bay front (west) façade with central entrance. Barn: timber frame bank barn structure with a side gable roof. Landscape: Stone piers, wood fencing, and gently rolling topography.

Identification of CHVI: Yes	**Cultural Heritage Resource Number:** CHR-12
Completed by (name): Frank Smith	**Date Completed:** January 30, 2019.

Municipal Address: 700 Concession 8 West

Former Township: Township of West Flamborough

Lot, Concession: 10, 7

Municipality: City of Hamilton

Resource Type: Farmstead

Associated Dates: Prior to 1875

Relationship to Project: Within the Project Location



Description: The property contains a farmstead, with a residence, barn, and outbuildings. The structures are set back from the roadway off a long laneway. Bronte Creek crosses the property, with the structures set on a rise on the south side of the creek. Views of the structures are obstructed from the roadway by set back and vegetation.

The residence is a one and a half storey structure with a steeply-pitched side gable roof with asphalt shingles. The north elevation has a steeply-pitched gabled dormer. The residence has modern 1/1 windows and a covered partial porch. The foundation is not visible from the roadway.

The barn is a timber frame structure with a side gable roof that is metal clad. The property is landscaped with mature Norway spruce trees, mature deciduous trees, mature cedar trees, and intermediate and mature deciduous trees. The property has a split rail fence and a rolling topography.

The property is listed on the 1991 LACAC inventory for the City of Hamilton.

Indicators of Cultural Heritage Value or Interest from O. Reg. 9/06:

	Yes	No
1. The property has design value or physical value because it,		
i. Is a rare, unique, representative or early example of a style, type, expression, material or construction method,	✓	
ii. Displays a high degree of craftsmanship or artistic merit, or		✓
iii. Demonstrates a high degree of technical or scientific achievement.		✓
2. The property has historical value or associative value because it,		
i. Has direct associations with a theme, event, belief, person, activity organization or institution that is significant to a community,		✓
ii. Yields, or has the potential to yield, information that contributes to an understanding of a community of culture, or		✓
iii. Demonstrates or reflects the work or ideas of an architect, artist, builder, designer or theorist who is significant to a community.		✓
3. The property has contextual value because it,		
i. Is important in defining, maintaining or supporting the character of an area,	✓	
ii. Is physically, functionally, visually or historically linked to its surroundings, or	✓	
iii. Is a landmark.		✓

Draft Statement of Cultural Heritage Value or Interest: The construction of this farmstead dates prior to 1875, determined through historic mapping. The residence and barn are representative of late 19th century Ontario vernacular structures. This property supports the late 19th century rural character of the area and is physically and historically linked to its surroundings.

Identified Heritage Attributes: Residence: one and a half storey structure, steeply-pitched side gable roof, steeply-pitched gabled dormer, and covered partial porch. Barn: timber frame structure with a side gable roof.

Identification of CHVI: Yes	**Cultural Heritage Resource Number:** CHR-13
Completed by (name): Frank Smith	**Date Completed:** January 30, 2019.

Municipal Address: 1490 Highway 6

Former Township: Township of East Flamborough

Lot, Concession: 13, 9

Municipality: City of Hamilton

Resource Type: Residence

Associated Dates: 1929-1936

Relationship to Project: Adjacent to the Study Area

Description: The property contains a residence and modern outbuildings.



The residence is a one and a half storey structure with a high-pitched gambrel roof that is clad in asphalt shingles. The residence has been heavily modified with modern siding and modern windows and doors. The front (west) elevation has an enclosed front porch with a gabled entry. The residence has a rear addition and a concrete foundation.

The property is listed on the 1991 LACAC inventory for the City of Hamilton.

Indicators of Cultural Heritage Value or Interest from O. Reg. 9/06:

	Yes	No
1. The property has design value or physical value because it,		
i. Is a rare, unique, representative or early example of a style, type, expression, material or construction method,	✓	
ii. Displays a high degree of craftsmanship or artistic merit, or		✓
iii. Demonstrates a high degree of technical or scientific achievement.		✓
2. The property has historical value or associative value because it,		
i. Has direct associations with a theme, event, belief, person, activity organization or institution that is significant to a community,		✓
ii. Yields, or has the potential to yield, information that contributes to an understanding of a community of culture, or		✓
iii. Demonstrates or reflects the work or ideas of an architect, artist, builder, designer or theorist who is significant to a community.		✓
3. The property has contextual value because it,		
i. Is important in defining, maintaining or supporting the character of an area,		✓
ii. Is physically, functionally, visually or historically linked to its surroundings, or		✓
iii. Is a landmark.		✓

Draft Statement of Cultural Heritage Value or Interest: This residence dates between 1929 to 1936 determined through topographic mapping. The residence is representative of an early 20th century Ontario vernacular residence.

Identified Heritage Attributes: Residence: one and a half storey structure, and high-pitched gambrel roof.

Identification of CHVI: No	**Cultural Heritage Resource Number:** N/A
Completed by (name): Frank Smith	**Date Completed:** January 30, 2019.

Municipal Address: 1213 Safari Road

Former Township: Township of Beverly

Lot, Concession: 34, 7

Municipality: City of Hamilton

Resource Type: Farmstead

Associated Dates: 1875-1916

Relationship to Project: Within the Project Location



Description: The property contains a farmstead, with a residence, barn, and outbuildings. The structures are set back from the roadway off a long laneway. The structures are set lower than the roadway within a valley area.

The residence is a one and a half storey structure with a high-pitched side gable roof with asphalt shingles and a brick chimney. The residence has multiple gable peaks. The residence has a red brick exterior and a covered wrap-around wood porch. Some of the exterior windows have brick voussoirs, with a central keystone and label stops. All windows have concrete sills. The structure has projecting bay window on its west elevation, and rear additions. The foundation is not visible from the roadway.

The timber frame barn has a side gable roof that is clad in metal. The structure has a concrete foundation and wood frame windows. The structures are surrounded by agricultural fields. The property also contains a garden, and a mixture of deciduous and coniferous trees.

The property is listed on the 1991 LACAC inventory for the City of Hamilton.

Indicators of Cultural Heritage Value or Interest from O. Reg. 9/06:

	Yes	No
1. The property has design value or physical value because it,		
i. Is a rare, unique, representative or early example of a style, type, expression, material or construction method,	✓	
ii. Displays a high degree of craftsmanship or artistic merit, or		✓
iii. Demonstrates a high degree of technical or scientific achievement.		✓
2. The property has historical value or associative value because it,		
i. Has direct associations with a theme, event, belief, person, activity organization or institution that is significant to a community,		✓
ii. Yields, or has the potential to yield, information that contributes to an understanding of a community of culture, or		✓
iii. Demonstrates or reflects the work or ideas of an architect, artist, builder, designer or theorist who is significant to a community.		✓
3. The property has contextual value because it,		
i. Is important in defining, maintaining or supporting the character of an area,	✓	
ii. Is physically, functionally, visually or historically linked to its surroundings, or	✓	
iii. Is a landmark.		✓

Draft Statement of Cultural Heritage Value or Interest: The construction of this farmstead dates to between 1875 to 1916, determined through historic and topographic mapping. The residence and barn are representative of late 19th century Ontario vernacular structures. This property supports the late 19th to early 20th century rural character of the area and is physically and historically linked to its surroundings.

Identified Heritage Attributes: Residence: one and a half storey structure, high-pitched side gable roof, brick chimneys, multiple gable peaks, covered wrap-around wood porch, brick voussoirs with keystones and label stops. Barn: timber frame structure, side gable roof, stone foundation, and wood frame windows.

Identification of CHVI: Yes	**Cultural Heritage Resource Number:** CHR-14
Completed by (name): Frank Smith	**Date Completed:** January 30, 2019.

Municipal Address: 1414 Safari Road

Former Township: Township of Beverly

Lot, Concession: 29, 6

Municipality: City of Hamilton

Resource Type: Farmstead

Associated Dates: 1875-1916

Relationship to Project: Within the Study Area

Description: The property contains a farmstead, with two residences, a barn, and outbuildings.





The westernmost residence is a one and a half storey residence with a medium-pitched front facing gable roof. The roof cladding was obscured by snow cover. The exterior of the residence is clad in modern siding and contains modern 1/1 and horizontal sliding windows. The foundation is not visible from the roadway.

The easternmost residence is a modern two storey structure with a medium-pitched side gable roof. The exterior is clad in brick and siding and has 1/1 windows and a modern bay window on the front façade (north elevation). The residence has an attached two car garage.

The property contains a side gable roof barn. Views to the barn are obscured by distance and vegetation. Adjacent to the barn is a cast-in-place concrete silo. East of the barn are modern outbuildings and silos.

The property is landscaped with mature deciduous and coniferous trees, a lawn, a meadow, and a gravel driveway. The property has a gently rolling topography.

The property is listed on the 1991 LACAC inventory for the City of Hamilton.

Indicators of Cultural Heritage Value or Interest from O. Reg. 9/06:

	Yes	No
1. The property has design value or physical value because it,		
i. Is a rare, unique, representative or early example of a style, type, expression, material or construction method,	✓	
ii. Displays a high degree of craftsmanship or artistic merit, or		✓
iii. Demonstrates a high degree of technical or scientific achievement.		✓
2. The property has historical value or associative value because it,		
i. Has direct associations with a theme, event, belief, person, activity organization or institution that is significant to a community,		✓
ii. Yields, or has the potential to yield, information that contributes to an understanding of a community of culture, or		✓
iii. Demonstrates or reflects the work or ideas of an architect, artist, builder, designer or theorist who is significant to a community.		✓
3. The property has contextual value because it,		
i. Is important in defining, maintaining or supporting the character of an area,	✓	
ii. Is physically, functionally, visually or historically linked to its surroundings, or	✓	
iii. Is a landmark.		✓

Draft Statement of Cultural Heritage Value or Interest: The construction of this farmstead dates to between 1875 and 1916, determined through historical and topographic mapping. The west residence has design value as a representative Ontario vernacular structure. This property supports the late 19th century rural character of the area and is physically and historically linked to its surroundings.

Identified Heritage Attributes: Residence: one and a half storey structure and medium pitched front facing gable roof. Barn: side gable roof.

Identification of CHVI: Yes	**Cultural Heritage Resource Number:** CHR-15
Completed by (name): Frank Smith	**Date Completed:** January 30, 2019.

Municipal Address: 1286 Safari Road

Former Township: Township of Beverly

Lot, Concession: 32, 6

Municipality: City of Hamilton

Resource Type: Farmstead

Associated Dates: Prior to 1875

Relationship to Project: Within the Project Location

Description: The property contains a residence and outbuildings.





The residence is a one and a half storey structure with a medium-pitched cross gable roof with asphalt shingles, and two brick chimneys. The front (east) and north elevations have high-pitched gabled dormers with bargeboard and a centrally placed pointed arch window opening. The three-bay front façade has a central recessed entrance with wood panelling. The entry door and transom are modern. The stone exterior has modern 6/6 windows with stone lintels. The front and west elevations contain a covered a wrap verandah. The foundation of the residence is not visible from the roadway.

East of the residence the property contains a small gable roof outbuilding clad in metal with wood siding and windows. Adjacent to the outbuilding is a small modern shed roof outbuilding. West of the residence are modern outbuildings. The property is landscaped with mature trees, a split rail fence, and post and wire fence.

The property is listed on the 1991 LACAC inventory for the City of Hamilton.

Indicators of Cultural Heritage Value or Interest from O. Reg. 9/06:

	Yes	No
1. The property has design value or physical value because it,		
i. Is a rare, unique, representative or early example of a style, type, expression, material or construction method,	✓	
ii. Displays a high degree of craftsmanship or artistic merit, or		✓
iii. Demonstrates a high degree of technical or scientific achievement.		✓
2. The property has historical value or associative value because it,		
i. Has direct associations with a theme, event, belief, person, activity organization or institution that is significant to a community,		✓
ii. Yields, or has the potential to yield, information that contributes to an understanding of a community of culture, or		✓
iii. Demonstrates or reflects the work or ideas of an architect, artist, builder, designer or theorist who is significant to a community.		✓
3. The property has contextual value because it,		
i. Is important in defining, maintaining or supporting the character of an area,	✓	
ii. Is physically, functionally, visually or historically linked to its surroundings, or	✓	
iii. Is a landmark.		✓

Draft Statement of Cultural Heritage Value or Interest: The construction of this residence dates prior to 1875 determined through historical mapping. The residence is representative of a late 19th century

Ontario vernacular residence with Gothic Revival design influences seen in its gabled dormer with bargeboard and centrally placed pointed arch window. This property supports the late 19th century rural character of the area and is physically and historically linked to its surroundings.

Identified Heritage Attributes: Residence: one and a half storey structure, medium-pitched cross gable roof, brick chimneys, high-pitched gabled dormers with bargeboard (north and east elevations), stone lintels, three-bay front (east) façade with central entrance, recessed front entry with wood panels, Landscape: mature trees.

Identification of CHVI: Yes	**Cultural Heritage Resource Number:** CHR-16
Completed by (name): Frank Smith	**Date Completed:** January 30, 2019.

Municipal Address: 1212 Safari Road

Former Township: Township of Beverly

Lot, Concession: 34, 6

Municipality: City of Hamilton

Resource Type: Residence

Associated Dates: Prior to 1875

Relationship to Project: Within the Project Location



Description: The property contains a residence and outbuildings. The residence is set back from the roadway on a rise.

The residence is a two-storey structure with a medium-pitched hip roof with asphalt shingles and a brick chimney. The red brick exterior has segmental arch window openings with modern windows, a modern fanlight window and a flat-headed window with a semi-circular transom. The windows have brick voussoirs and concrete sills. The residence has a modern gable roof addition on the south elevation with a metal chimney. The foundation is not visible from the roadway.

The outbuilding is obscured by distance from roadway and elevation but appears to have a side gable roof. The property is landscaped with mature spruce trees along the driveway and mature deciduous, coniferous trees. The property has a post and wire fence and split rail fence.

The property is listed on the 1991 LACAC inventory for the City of Hamilton.

Indicators of Cultural Heritage Value or Interest from O. Reg. 9/06:

	Yes	No
1. The property has design value or physical value because it,		
i. Is a rare, unique, representative or early example of a style, type, expression, material or construction method,	✓	
ii. Displays a high degree of craftsmanship or artistic merit, or		✓
iii. Demonstrates a high degree of technical or scientific achievement.		✓
2. The property has historical value or associative value because it,		
i. Has direct associations with a theme, event, belief, person, activity organization or institution that is significant to a community,		✓
ii. Yields, or has the potential to yield, information that contributes to an understanding of a community of culture, or		✓
iii. Demonstrates or reflects the work or ideas of an architect, artist, builder, designer or theorist who is significant to a community.		✓
3. The property has contextual value because it,		
i. Is important in defining, maintaining or supporting the character of an area,	✓	
ii. Is physically, functionally, visually or historically linked to its surroundings, or	✓	
iii. Is a landmark.		✓

Draft Statement of Cultural Heritage Value or Interest: The construction of this two storey residence dates prior to 1875, determined through historical mapping. The residence has design value as a representative Ontario vernacular structure. The property supports the rural 19th century character of the area. The residence is visually connected to its surroundings through its set-back location on the property rise.

Identified Heritage Attributes: Residence: two storey structure, medium-pitched hip roof, red brick exterior, segmental arch window openings, brick voussoirs, and concrete windowsills. Landscape: mature spruce trees.

Identification of CHVI: Yes	**Cultural Heritage Resource Number:** CHR-17
Completed by (name): Frank Smith	**Date Completed:** January 30, 2019.

Municipal Address: 1166 Safari Road

Former Township: Township of Beverly

Lot, Concession: 35, 6

Municipality: City of Hamilton

Resource Type: Farmstead

Associated Dates: Prior to 1875

Relationship to Project: Within the Project Location

Description: The property contains a farmstead, with a residence, barn, and outbuildings.





The residence is a one and a half storey structure with a steeply-pitched side gable roof with asphalt shingles. The front (north) elevation has a central steeply-pitched gable dormer. The exterior of the residence is clad in modern siding and stone and has modern 1/1 windows. The three-bay front façade has a central entrance. The residence contains a covered wrap-around verandah and a modern rear addition. The foundation of the residence is not visible from the roadway.

The timber frame barn has a cross gable roof with ventilators and metal roof cladding. The exterior of the barn is clad in timber. Adjacent to the barn is a concrete block silo.

The property is landscaped with deciduous trees and coniferous trees, a lawn, meadows, and has a gently rolling topography.

The property is listed on the 1991 LACAC inventory for the City of Hamilton.

Indicators of Cultural Heritage Value or Interest from O. Reg. 9/06:

	Yes	No
1. The property has design value or physical value because it,		
i. Is a rare, unique, representative or early example of a style, type, expression, material or construction method,	✓	
ii. Displays a high degree of craftsmanship or artistic merit, or		✓
iii. Demonstrates a high degree of technical or scientific achievement.		✓
2. The property has historical value or associative value because it,		
i. Has direct associations with a theme, event, belief, person, activity, organization or institution that is significant to a community,		✓
ii. Yields, or has the potential to yield, information that contributes to an understanding of a community of culture, or		✓
iii. Demonstrates or reflects the work or ideas of an architect, artist, builder, designer or theorist who is significant to a community.		✓
3. The property has contextual value because it,		
i. Is important in defining, maintaining or supporting the character of an area,	✓	
ii. Is physically, functionally, visually or historically linked to its surroundings, or	✓	
iii. Is a landmark.		✓

Draft Statement of Cultural Heritage Value or Interest: The construction of this farmstead dates prior to 1875, determined through historical mapping. The residence is a representative Ontario vernacular structure with Gothic Revival design influences expressed through its one and a half storey massing and central gable dormer. The barn is a representative of a later 19th century Ontario vernacular barn. This property supports the late 19th century rural character of the area and is physically and historically linked to its surroundings.

Identified Heritage Attributes: Residence: one and a half storey structure, steeply-pitched side gable roof, and steeply-pitched gable dormer. Barn: timber frame structure and gable roof. Landscape: mature trees and gently rolling topography.

Identification of CHVI: Yes	**Cultural Heritage Resource Number:** CHR-18
Completed by (name): Frank Smith	**Date Completed:** January 30, 2019.

Municipal Address: 1126 Safari Road

Former Township: Township of Beverly

Lot, Concession: 36, 6

Municipality: City of Hamilton

Resource Type: Undetermined

Associated Dates: 1938-1964

Relationship to Project: Within the Project Location



Description: This property contains structures set far back from the roadway by way of a long tree lined laneway. The view of the structures is not visible from the roadway. The property is landscaped with mature deciduous and spruce trees and contains a laneway.

Structures do not appear on the 1938 topographic map of Galt, Ontario, but the driveway layout and three structures are shown on the 1964 topographic map of Westover, Ontario.

Indicators of Cultural Heritage Value or Interest from O. Reg. 9/06:

	Yes	No
1. The property has design value or physical value because it,		
i. Is a rare, unique, representative or early example of a style, type, expression, material or construction method,		✓
ii. Displays a high degree of craftsmanship or artistic merit, or		✓
iii. Demonstrates a high degree of technical or scientific achievement.		✓
2. The property has historical value or associative value because it,		
i. Has direct associations with a theme, event, belief, person, activity organization or institution that is significant to a community,		✓
ii. Yields, or has the potential to yield, information that contributes to an understanding of a community of culture, or		✓
iii. Demonstrates or reflects the work or ideas of an architect, artist, builder, designer or theorist who is significant to a community.		✓
3. The property has contextual value because it,		
i. Is important in defining, maintaining or supporting the character of an area,		✓
ii. Is physically, functionally, visually or historically linked to its surroundings, or		✓
iii. Is a landmark.		✓

Draft Statement of Cultural Heritage Value or Interest: N/A

Identified Heritage Attributes: None identified.

Identification of CHVI: No	**Cultural Heritage Resource Number:** N/A
Completed by (name): Frank Smith	**Date Completed:** January 30, 2019.

Municipal Address: 1032 Safari Road

Former Township: Township of West Flamborough

Lot, Concession: 2, 6

Municipality: City of Hamilton

Resource Type: Farmstead

Associated Dates: Prior to 1875

Relationship to Project: Within the Project Location

Description: The property contains a farmstead, with a residence, barn, and outbuildings.





The residence is a two and a half storey structure with a steeply-pitched hip roof with metal cladding and a tall brick chimney. The front (north) elevation has a high-pitched gabled dormer with bargeboard and a centrally placed semi-circular window. The red brick asymmetrical exterior has fixed flat-headed windows with semi-circular transoms. The windows have brick voussoirs and keystones. The front façade has an enclosed front porch, with an upper entry way. The residence has a one storey gable roof addition on its west elevation. The foundation of the residence is not visible from the roadway.

The timber frame bank barn has a gambrel roof clad with a metal, and two ventilators. Adjacent to the barn is a cast-in-place concrete silo.

The property is landscaped with a laneway, mature deciduous trees, mature coniferous trees, a meadow, a lawn, and wooden fencing.

The property is listed on the 1991 LACAC inventory for the City of Hamilton.

Indicators of Cultural Heritage Value or Interest from O. Reg. 9/06:

	Yes	No
1. The property has design value or physical value because it,		
i. Is a rare, unique, representative or early example of a style, type, expression, material or construction method,	✓	
ii. Displays a high degree of craftsmanship or artistic merit, or		✓
iii. Demonstrates a high degree of technical or scientific achievement.		✓
2. The property has historical value or associative value because it,		
i. Has direct associations with a theme, event, belief, person, activity organization or institution that is significant to a community,		✓
ii. Yields, or has the potential to yield, information that contributes to an understanding of a community of culture, or		✓
iii. Demonstrates or reflects the work or ideas of an architect, artist, builder, designer or theorist who is significant to a community.		✓
3. The property has contextual value because it,		
i. Is important in defining, maintaining or supporting the character of an area,	✓	
ii. Is physically, functionally, visually or historically linked to its surroundings, or	✓	
iii. Is a landmark.		✓

Draft Statement of Cultural Heritage Value or Interest: The construction of this farmstead dates to prior to 1875, determined through historical mapping. The residence has design value as a representative Ontario vernacular structure with Queen Anne Revival design influences. The barn is a representative late 19th century Ontario vernacular barn. This property supports the late 19th century rural character of the area and is physically and historically linked to its surroundings.

Identified Heritage Attributes: Residence: two and a half storey structure, steeply-pitched hip roof, steeply-pitched gabled dormer with bargeboard, tall brick chimney, red brick exterior, brick voussoirs, and keystones. Barn: timber frame bank barn structure and gambrel roof.

Identification of CHVI: Yes	**Cultural Heritage Resource Number:** CHR-19
Completed by (name): Frank Smith	**Date Completed:** January 30, 2019.

Municipal Address: 1054 Safari Road

Former Township: Township of West Flamborough

Lot, Concession: 2, 6

Municipality: City of Hamilton

Resource Type: Outbuildings

Associated Dates: Prior to 1875

Relationship to Project: Within the Project Location



Description: The property contains a modern residence and outbuildings. Structures are set far back from the roadway by way of a long tree lined gravel laneway. Views to the structures are obstructed by distance and vegetation.

To the rear of the residence are two to three barn structures with side gable roofs. A structure is depicted on the property in relation to the outbuildings on the 1875 Township of West Flamborough Map, in the *Illustrated Historical Atlas of the County of Wentworth* (Figure 4). The owner listed on the map is William Patton. Structures are also depicted on the property in relation to the outbuildings on the 1916 topographic map of Galt, Ontario.

The property is landscaped with mature trees, wooden fencing, post and wire fencing, and agricultural fields.

Indicators of Cultural Heritage Value or Interest from O. Reg. 9/06:

	Yes	No
1. The property has design value or physical value because it,		
i. Is a rare, unique, representative or early example of a style, type, expression, material or construction method,	✓	
ii. Displays a high degree of craftsmanship or artistic merit, or		✓
iii. Demonstrates a high degree of technical or scientific achievement.		✓
2. The property has historical value or associative value because it,		
i. Has direct associations with a theme, event, belief, person, activity organization or institution that is significant to a community,		✓
ii. Yields, or has the potential to yield, information that contributes to an understanding of a community of culture, or		✓
iii. Demonstrates or reflects the work or ideas of an architect, artist, builder, designer or theorist who is significant to a community.		✓
3. The property has contextual value because it,		
i. Is important in defining, maintaining or supporting the character of an area,	✓	
ii. Is physically, functionally, visually or historically linked to its surroundings, or		✓
iii. Is a landmark.		✓

Draft Statement of Cultural Heritage Value or Interest: The barns on the property date to the late 19th century determined through historical and topographic mapping. The barn structures are potentially representative of late 19th century Ontario vernacular barns. They potentially support the late 19th century character of the area.

Identified Heritage Attributes: Barn(s): side gable roof.

Identification of CHVI: Yes	**Cultural Heritage Resource Number:** CHR-20
Completed by (name): Frank Smith	**Date Completed:** January 30, 2019.

Municipal Address: 994 Safari Road

Former Township: Township of West Flamborough

Lot, Concession: 3, 6

Municipality: City of Hamilton

Resource Type: Residence and outbuildings

Associated Dates: 1900-1923

Relationship to Project: Within the Project Location (residence is more than 300 metres from Project Location)



Description: The property contains a residence and outbuildings that are setback from the roadway by a long laneway. The view of the residence is obstructed by distance and vegetation. The property contains mature deciduous and coniferous trees.

A structure is depicted on the property in relation to the current residence on the 1923 topographic map of Galt, Ontario. As the property is listed on the 1991 LACAC inventory for the City of Hamilton, there is potential cultural heritage value or interest. Additional assessment is required for the property's evaluation against O. Reg. 9/06. The following indicators of cultural heritage value or interest are based on the potential cultural heritage value from the LACAC inventory and topographic mapping.

Indicators of Cultural Heritage Value or Interest from O. Reg. 9/06:

	Yes	No
1. The property has design value or physical value because it,		
i. Is a rare, unique, representative or early example of a style, type, expression, material or construction method,	✓	
ii. Displays a high degree of craftsmanship or artistic merit, or		✓
iii. Demonstrates a high degree of technical or scientific achievement.		✓
2. The property has historical value or associative value because it,		
i. Has direct associations with a theme, event, belief, person, activity organization or institution that is significant to a community,		✓
ii. Yields, or has the potential to yield, information that contributes to an understanding of a community of culture, or		✓
iii. Demonstrates or reflects the work or ideas of an architect, artist, builder, designer or theorist who is significant to a community.		✓
3. The property has contextual value because it,		
i. Is important in defining, maintaining or supporting the character of an area,	✓	
ii. Is physically, functionally, visually or historically linked to its surroundings, or		✓
iii. Is a landmark.		✓

Draft Statement of Cultural Heritage Value or Interest: Undetermined.

Identified Heritage Attributes: Undetermined

Identification of CHVI: Undetermined	**Cultural Heritage Resource Number:** CHR-21
Completed by (name): Frank Smith	**Date Completed:** January 30, 2019.

Municipal Address: 954 Safari Road

Former Township: Township of West Flamborough

Lot, Concession: 4, 6

Municipality: City of Hamilton

Resource Type: Barn

Associated Dates: Barn 1938-1964

Relationship to Project: Within the Project Location



Description: The property contains a modern residence, a barn, and outbuildings.

The timber frame barn has a cross gable roof with lightning rods and metal cladding. The exterior of the barn is clad in timber and the foundation of the barn is concrete block.

The property contains two modern gable roof outbuildings with metal roof cladding and metal exterior cladding. The property also contains a modern silo.

The property is landscaped with mature trees, a meadow, and contains a gravel laneway.

The property is listed on the 1991 LACAC inventory for the City of Hamilton.

Indicators of Cultural Heritage Value or Interest from O. Reg. 9/06:

	Yes	No
1. The property has design value or physical value because it,		
i. Is a rare, unique, representative or early example of a style, type, expression, material or construction method,	✓	
ii. Displays a high degree of craftsmanship or artistic merit, or		✓
iii. Demonstrates a high degree of technical or scientific achievement.		✓
2. The property has historical value or associative value because it,		
i. Has direct associations with a theme, event, belief, person, activity organization or institution that is significant to a community,		✓
ii. Yields, or has the potential to yield, information that contributes to an understanding of a community of culture, or		✓
iii. Demonstrates or reflects the work or ideas of an architect, artist, builder, designer or theorist who is significant to a community.		✓
3. The property has contextual value because it,		
i. Is important in defining, maintaining or supporting the character of an area,	✓	
ii. Is physically, functionally, visually or historically linked to its surroundings, or		✓
iii. Is a landmark.		✓

Draft Statement of Cultural Heritage Value or Interest: The barn on the property dates between 1938 and 1964 determined through topographic mapping. The barn is representative of an early to mid 20th century Ontario vernacular barn. The barn supports the early to mid-20th century rural character of the area.

Identified Heritage Attributes: Barn: timber frame structure, cross gable roof, and lightning rods.

Identification of CHVI: Yes	**Cultural Heritage Resource Number:** CHR-22
Completed by (name): Frank Smith	**Date Completed:** January 30, 2019.

Municipal Address: 902 Safari Road

Former Township: Township of West Flamborough

Lot, Concession: 5, 6

Municipality: City of Hamilton

Resource Type: Residence

Associated Dates: Prior to 1875

Relationship to Project: Within the Project Location

Description: The property contains a residence and an outbuilding.



This property contains a one and a half storey residence with a medium-pitched side gable roof. The exterior of the residence is clad in modern siding and has modern 1/1 windows. The front (north) façade has a covered partial porch. The east elevation has a modern hip roof addition. The foundation of the residence is not visible from the roadway.

The barn is a gambrel roof structure with a shed roof dormer. The barn is clad in metal. Additional details about the barn are obscured by distance from roadway.

The property is landscaped with mature deciduous and spruce trees, a lawn, and the residence is surrounded by foundation plantings.

The property is listed on the 1991 LACAC inventory for the City of Hamilton.

Indicators of Cultural Heritage Value or Interest from O. Reg. 9/06:

	Yes	No
1. The property has design value or physical value because it,		
i. Is a rare, unique, representative or early example of a style, type, expression, material or construction method,	✓	
ii. Displays a high degree of craftsmanship or artistic merit, or		✓
iii. Demonstrates a high degree of technical or scientific achievement.		✓
2. The property has historical value or associative value because it,		
i. Has direct associations with a theme, event, belief, person, activity organization or institution that is significant to a community,		✓
ii. Yields, or has the potential to yield, information that contributes to an understanding of a community of culture, or	✓	
iii. Demonstrates or reflects the work or ideas of an architect, artist, builder, designer or theorist who is significant to a community.		✓
3. The property has contextual value because it,		
i. Is important in defining, maintaining or supporting the character of an area,	✓	
ii. Is physically, functionally, visually or historically linked to its surroundings, or	✓	
iii. Is a landmark.		✓

Draft Statement of Cultural Heritage Value or Interest: The construction of this residence dates prior to 1875, determined through historical mapping. The residence has design value as an Ontario vernacular residence. This property supports the late 19th century rural character of the area and is physically and historically linked to its surroundings.

Identified Heritage Attributes: Residence: one and a half storey structure, medium-pitched side gable roof, and covered partial porch. Landscape: mature trees.

Identification of CHVI: Yes	**Cultural Heritage Resource Number:** CHR-23
Completed by (name): Frank Smith	**Date Completed:** January 30, 2019.

Municipal Address: 875 Safari Road

Former Township: Township of West Flamborough

Lot, Concession: 6, 7

Municipality: City of Hamilton

Resource Type: Residence

Associated Dates: 1916-1923

Relationship to Project: Within the Project Location

Description: The property contains a residence and outbuildings.



The residence is a one and a half storey structure with a medium-pitched side gable roof with asphalt shingles and a brick chimney. The front (south) façade has a medium-pitched gable dormer with modern windows. The exterior of the residence is clad in brick. The asymmetrical front entry has a stone surround. The residence has modern windows and doors. The front façade has a covered full width porch. The foundation is not visible from the roadway.

The property is landscaped with mature and intermediate deciduous and spruce trees and has a pond.

Indicators of Cultural Heritage Value or Interest from O. Reg. 9/06:

	Yes	No
1. The property has design value or physical value because it,		
i. Is a rare, unique, representative or early example of a style, type, expression, material or construction method,	✓	
ii. Displays a high degree of craftsmanship or artistic merit, or		✓
iii. Demonstrates a high degree of technical or scientific achievement.		✓
2. The property has historical value or associative value because it,		
i. Has direct associations with a theme, event, belief, person, activity organization or institution that is significant to a community,		✓
ii. Yields, or has the potential to yield, information that contributes to an understanding of a community of culture, or		✓
iii. Demonstrates or reflects the work or ideas of an architect, artist, builder, designer or theorist who is significant to a community.		✓
3. The property has contextual value because it,		
i. Is important in defining, maintaining or supporting the character of an area,	✓	
ii. Is physically, functionally, visually or historically linked to its surroundings, or		✓
iii. Is a landmark.		✓

Draft Statement of Cultural Heritage Value or Interest: The construction of this residence dates to between 1916 and 1923, determined through topographic mapping. The residence has design value as an early 20th century an Ontario vernacular structure. The property supports the rural early 20th century character of the area.

Identified Heritage Attributes: Residence: one and a half storey structure, medium-pitched side gable roof, brick chimney, and brick exterior. Landscape: Mature spruce and deciduous trees.

Identification of CHVI: Yes	**Cultural Heritage Resource Number:** CHR-24
Completed by (name): Frank Smith	**Date Completed:** January 30, 2019.

Municipal Address: 1436 Brock Road

Former Township: Township of West Flamborough

Lot, Concession: 7, 7

Municipality: City of Hamilton

Resource Type: Residence

Associated Dates: Prior to 1875

Relationship to Project: Within the Project Location



Description: The property contains a residence.

The residence is a one and a half storey structure with a medium-pitched cross gable roof with asphalt shingles. The front (west) façade has a steeply-pitched gable dormer with central pointed arch window. The red brick exterior has segmental and semi-circular wood frame windows with brock voussoirs and stone sills. The front lower storey window has a brick voussoir with central keystone. The front façade has a covered partial porch. The foundation is not visible from the roadway.

The property is landscaped with mature Norway spruce trees, mature deciduous trees, a white picket fence and a lawn.

Indicators of Cultural Heritage Value or Interest from O. Reg. 9/06:

	Yes	No
1. The property has design value or physical value because it,		
i. Is a rare, unique, representative or early example of a style, type, expression, material or construction method,	✓	
ii. Displays a high degree of craftsmanship or artistic merit, or		✓
iii. Demonstrates a high degree of technical or scientific achievement.		✓
2. The property has historical value or associative value because it,		
i. Has direct associations with a theme, event, belief, person, activity organization or institution that is significant to a community,		✓
ii. Yields, or has the potential to yield, information that contributes to an understanding of a community of culture, or		✓
iii. Demonstrates or reflects the work or ideas of an architect, artist, builder, designer or theorist who is significant to a community.		✓
3. The property has contextual value because it,		
i. Is important in defining, maintaining or supporting the character of an area,	✓	
ii. Is physically, functionally, visually or historically linked to its surroundings, or	✓	
iii. Is a landmark.		✓

Draft Statement of Cultural Heritage Value or Interest: The construction of this residence dates to prior to 1875, determined through historical mapping. The residence is representative of a late 19th century Ontario vernacular residence. This property supports the late 19th century rural character of the area and is physically and historically linked to its surroundings.

Identified Heritage Attributes: Residence: one and a half storey structure, medium-pitched cross gable roof, steeply-pitched gabled dormer, pointed arch window, segmental and semi-circular wood frame window openings, brick exterior, brick voussoirs, keystone, and covered partial porch. Landscape: mature trees and wood white picket fence.

Identification of CHVI: Yes	**Cultural Heritage Resource Number:** CHR-25
Completed by (name): Frank Smith	**Date Completed:** January 30, 2019.

Municipal Address: 1157 Safari Road

Former Township: Township of Beverly

Lot, Concession: 35, 7

Municipality: City of Hamilton

Resource Type: Farmstead

Associated Dates: Prior to 1875

Relationship to Project: Within the Project Location



Description: The property contains a residence, a barn, and outbuildings. Views of the residence are obscured by vegetation and distance from the roadway.

The barn is a timber frame structure with a gable roof that is clad in metal. The barn has a timber exterior. Attached to the barn are smaller outbuildings. Two are timber have side gable roofs clad with metal, and one is a shed roof clad with metal.

The property is landscaped with mature deciduous and coniferous trees, meadows, and a post and wire fence on a rolling topography.

Indicators of Cultural Heritage Value or Interest from O. Reg. 9/06:

	Yes	No
1. The property has design value or physical value because it,		
i. Is a rare, unique, representative or early example of a style, type, expression, material or construction method,	✓	
ii. Displays a high degree of craftsmanship or artistic merit, or		✓
iii. Demonstrates a high degree of technical or scientific achievement.		✓
2. The property has historical value or associative value because it,		
i. Has direct associations with a theme, event, belief, person, activity organization or institution that is significant to a community,		✓
ii. Yields, or has the potential to yield, information that contributes to an understanding of a community of culture, or		✓
iii. Demonstrates or reflects the work or ideas of an architect, artist, builder, designer or theorist who is significant to a community.		✓
3. The property has contextual value because it,		
i. Is important in defining, maintaining or supporting the character of an area,	✓	
ii. Is physically, functionally, visually or historically linked to its surroundings, or	✓	
iii. Is a landmark.		✓

Draft Statement of Cultural Heritage Value or Interest: The construction of this farmstead dates prior to 1875, determined through historical mapping. The barn is a representative of a late 19th century Ontario vernacular barn. This property supports the late 19th century rural character of the area and is physically and historically linked to its surroundings.

Identified Heritage Attributes: Barn: timber frame structure, gable roof, smaller gable roof and shed roof outbuilding additions. Landscape: mature trees, and rolling topography.

Identification of CHVI: Yes	**Cultural Heritage Resource Number:** CHR-26
Completed by (name): Frank Smith	**Date Completed:** January 30, 2019.

APPENDIX H:
PHOTOMOSAIC



Natural Features	12
Infrastructure	1
Aquatic Features	
Floodplain/ Regulated Area	4 (HCA)
Landuse	15
Cultural Resources	8
Geologic Features	16



Notes
1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2019.
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Legend

- Preferred Route
- Project Development Area
- Proposed Easement
- Existing Enbridge Station
- Existing Enbridge Pipeline
- Water Well
- Water Well (100 m Buffer)
- Monitoring Well
- Contaminated Site
- Potential Source of Contamination (areas)
- Regulated Area
- Floodplain
- Conservation Authority Admin Boundary
- Hydro Line
- Watercourse (Permanent)
- ANSI, Life Science
- Potential for Shallow Bedrock
- Wetland, Provincially Significant
- Parcel Boundary (ARN)

Construction Mitigation Notes:
Note 1: Crossing permit required from third party power or hydrocarbon transmitter. Refer to Section 4.4.4 Infrastructure of the ER.
Note 2: Groundwater wells present – Refer to Section 4.2.3 Hydrogeology of the ER.
Note 3: Water well monitoring program recommended. Refer to Section 6.1.2 Monitoring - Water Wells of the ER.
Note 4: Permit from HCA, CH or GRCA required. Refer to Section 4.2.8 of the ER.
Note 5: Crossing permissions required from Provincial and Municipal Road authorities. Refer to Section 4.4.4 Infrastructure of the ER.
Note 6: Access to businesses and residences. Maintain emergency egress. Refer to Section 4.4.4 Infrastructure of the ER.
Note 7: Construction adjacent to rural residental areas. Refer to Section 4.4.4 Infrastructure, Section 4.4.5 Air and Noise and Section 4.4.7 Waste Management of the ER.
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Note 13: Overall Benefit Permit under the Endangered Species Act, 2007 from the MECP may be required if the species, or protected habitat, are impacted by project activities.Refer to Section 4.3.2 Designated Natural Areas and Vegetation, Section 4.3.3 Wildlife, Wildlife Habitat and Species at Risk of the ER.
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Note 15: Construction accross active agricultural lands. Refer to Section 4.2.5 Soil and Soil Capability and Section 4.2.6 Agricultural Tile Drains of the ER.
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Acronyms List:
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Stantec

Project Location
City of Hamilton

160961299 REVA
Prepared by AMW on 2020-02-25
Technical Review by RR on 2020-02-18

Client/Project
ENBRIDGE GAS INC.
KIRKWALL-HAMILTON PIPELINE PROJECT

Figure No.
1.1

Title
Mitigation Photomosaic

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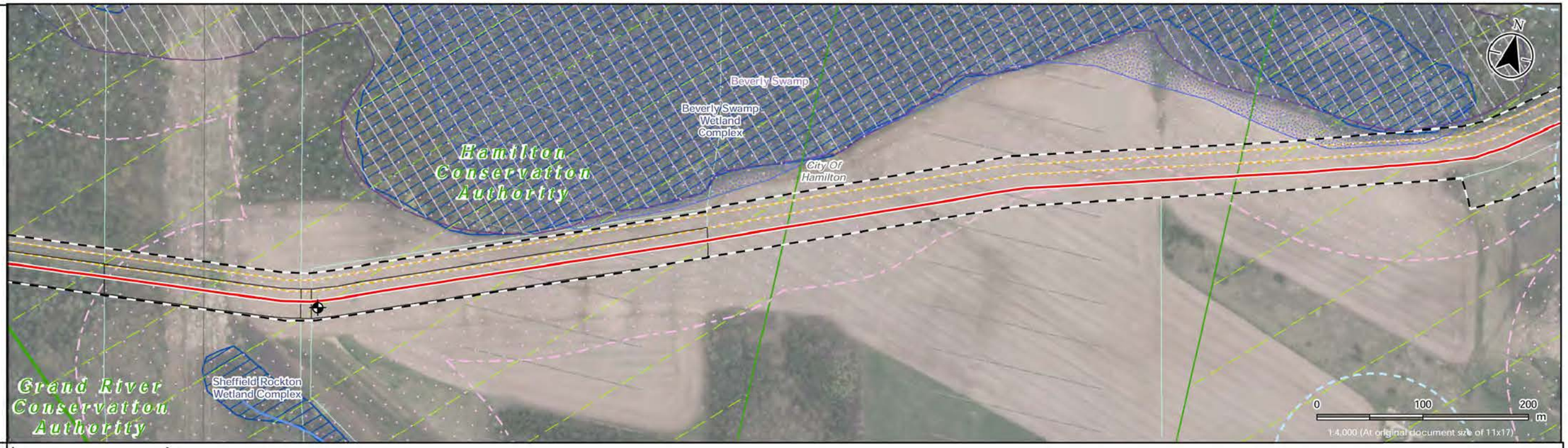

Natural Features	12
Infrastructure	1
Aquatic Features	
Floodplain/ Regulated Area	4 (HCA)
Landuse	15
Cultural Resources	8
Geologic Features	16 ; 16



Notes
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Legend
- Preferred Route
- Project Development Area
- Proposed Easement
- Existing Enbridge Pipeline
- Water Well (100 m Buffer)
- Monitoring Well
- Regulated Area
- Floodplain
- Conservation Authority Admin Boundary
- Hydro Line
- Watercourse (Permanent)
- ANSI, Life Science
- Potential for Shallow Bedrock
- Wetland, Provincially Significant
- Parcel Boundary (ARN)

Construction Mitigation Notes:
Note 1: Crossing permit required from third party power or hydrocarbon transmitter. Refer to Section 4.4.4 Infrastructure of the ER.
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Stantec

Project Location
City of Hamilton

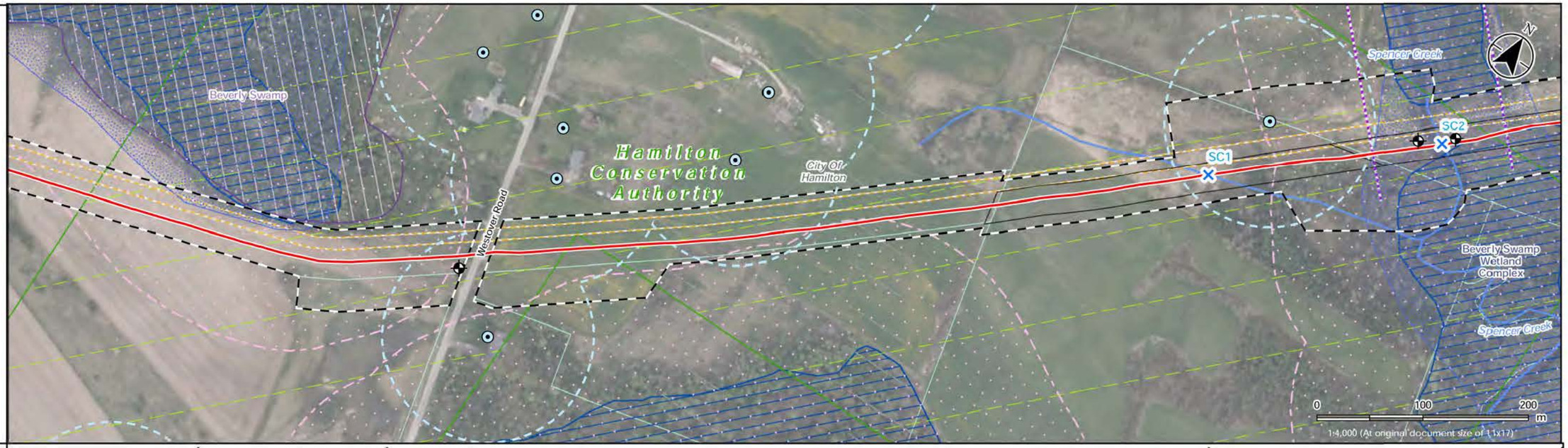
160961299 REVA
Prepared by AMW on 2020-02-25
Technical Review by RR on 2020-02-18

Client/Project
ENBRIDGE GAS INC.
KIRKWALL-HAMILTON PIPELINE PROJECT

Figure No.
1.2

Title
Mitigation Photomosaic

\\Cd1220-f02\01609\active\160961299\03_drawing\gis_cad\gis\mxds\APC\Report\Figures\Mitigation_Photomosaic\160961299_R01_mitphoto_fig01_Mitigation_Photomosaic.mxd Revised: 2020-02-25 by: AWhite


Beverly Swamp
Hamilton Conservation Authority
City Of Hamilton
Westover Road
Spencer Creek
SC1
SC2
Beverly Swamp Wetland Complex
Spencer Creek
N
0
100
200
m
1:4,000 (At original document size of 11x17)

| | | |


Spencer Creek
13
Kells Lane
Glenariff Drive
SC2
SC1
Bushmill Circle
City Of Hamilton
Conservation Halton
Hamilton Conservation Authority
Beverly Swamp Wetland Complex
Spencer Creek
N
0
100
200
m
1:4,000 (At original document size of 11x17)

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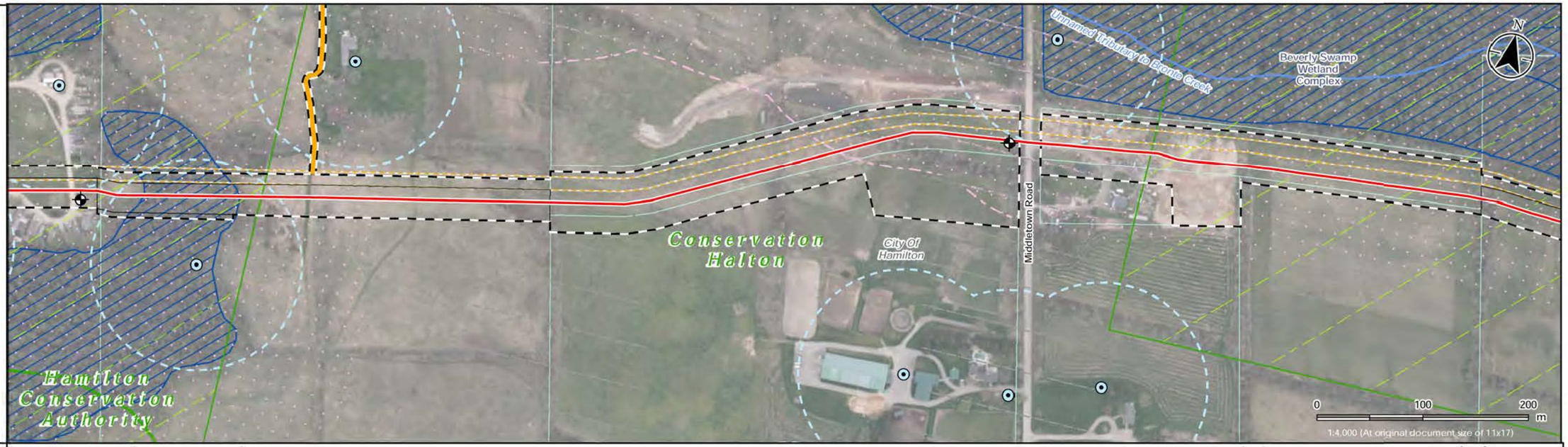

Natural Features	12																					12	12
Infrastructure	5	5	2, 3																			5	2, 3
Aquatic Features																							
Floodplain/ Regulated Area	4 (CH)																					4 (CH)	
Landuse	6		15																			15	
Cultural Resources	7		8																			7	
Geologic Features	16																					16	



Notes
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Legend
- Preferred Route
- AccessLanewaysOptiona...
- Project Development Area
- Proposed Easement
- Existing Enbridge Pipeline
- Water Well
- Water Well (100 m Buffer)
- Monitoring Well
- Regulated Area
- Conservation Authority Admin Boundary
- Watercourse (Permanent)
- Potential for Shallow Bedrock
- Wetland, Provincially Significant
- Parcel Boundary (ARN)

Construction Mitigation Notes:
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Stantec

Project Location
City of Hamilton

160961299 REVA
Prepared by AMW on 2020-02-25
Technical Review by RR on 2020-02-18

Client/Project
ENBRIDGE GAS INC.
KIRKWALL-HAMILTON PIPELINE PROJECT

Figure No.
1.5

Title
Mitigation Photomosaic

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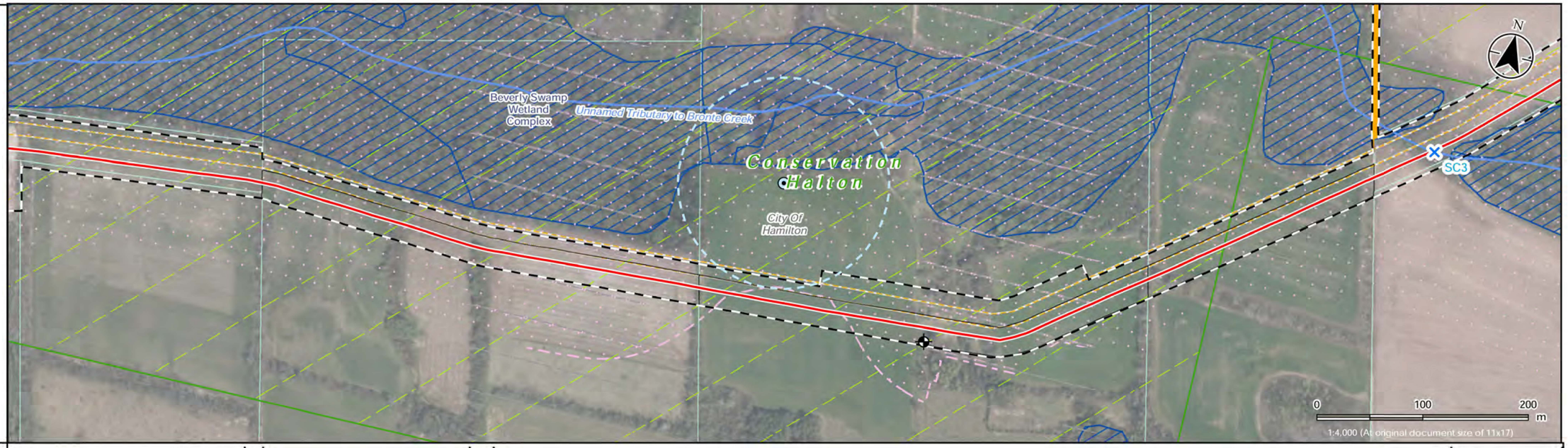
Beverly Swamp Wetland Complex
Unnamed Tributary to Bronte Creek
Conservation Halton
City Of Hamilton
SC3
N
0
100
200
m
1:4,000 (At original document size of 11x17)

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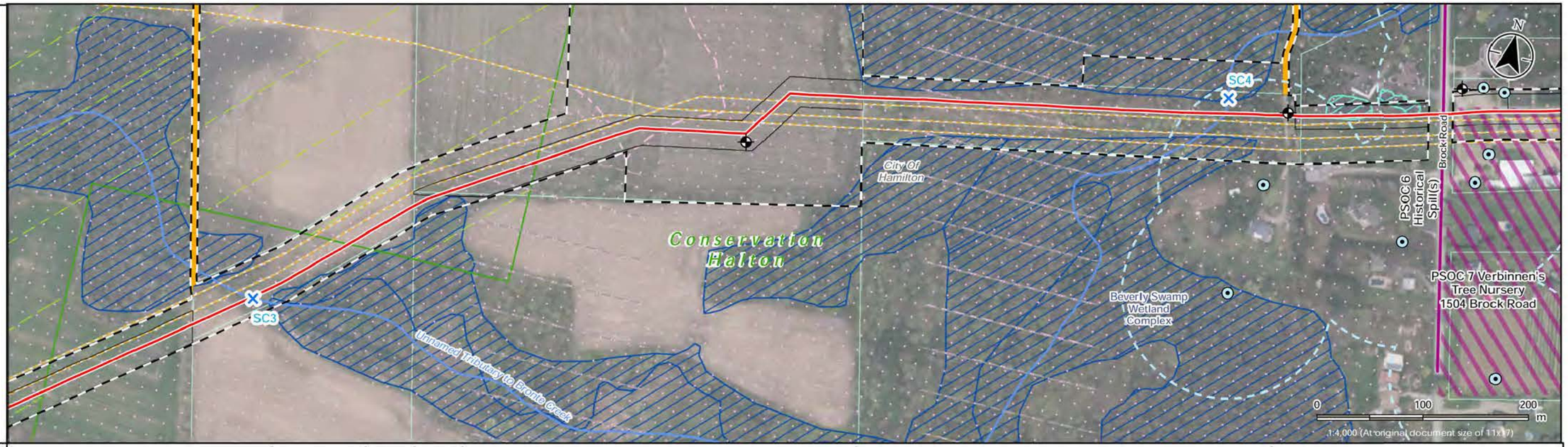

Natural Features	12 · 12 · 12
Infrastructure	2, 3 · 5
Aquatic Features	9 · 9 · 9 · 9
Floodplain/ Regulated Area	4 (CH)
Landuse	15 · 6, 7
Cultural Resources	8
Geologic Features	16 · 16



Notes
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2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2019.
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Legend
- Preferred Route
- AccessLanewaysOptiona...
- Project Development Area
- Proposed Easement
- Existing Enbridge Pipeline
- Watercourse Crossing
- Water Well
- Water Well (100 m Buffer)
- Monitoring Well
- Historic Spill
- Potential Source of Contamination (areas)
- Regulated Area
- Conservation Authority Admin Boundary
- Watercourse (Permanent)
- Potential for Shallow Bedrock
- Wetland, Provincially Significant
- Wetland, Not evaluated per OWES
- Parcel Boundary (ARN)

Construction Mitigation Notes:
Note 1: Crossing permit required from third party power or hydrocarbon transmitter. Refer to Section 4.4.4 Infrastructure of the ER.
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Stantec

Project Location
City of Hamilton

160961299 REVA
Prepared by AMW on 2020-02-25
Technical Review by RR on 2020-02-18

Client/Project
ENBRIDGE GAS INC.
KIRKWALL-HAMILTON PIPELINE PROJECT

Figure No.
1.7

Title
Mitigation Photomosaic

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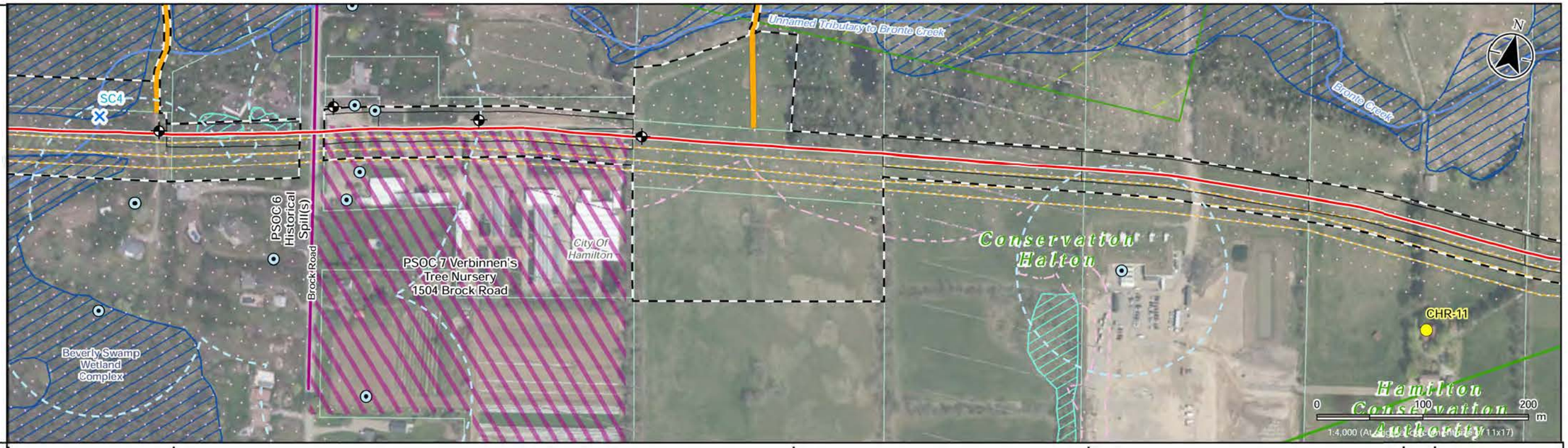

Natural Features	12		12	12
Infrastructure	2, 3	5	2, 3	
Aquatic Features				
Floodplain/ Regulated Area	4 (CH)	4 (CH)	4 (CH)	4 (CH)
Landuse	6		15	
Cultural Resources	7		6, 7	
Geologic Features	8			



Notes
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Legend
- Preferred Route
- AccessLanewaysOptiona...
- Project Development Area
- Proposed Easement
- Existing Enbridge Pipeline
- Cultural Heritage Resource
- Watercourse Crossing
- Water Well
- Water Well (100 m Buffer)
- Monitoring Well
- Historic Spill
- Potential Source of Contamination (areas)
- Regulated Area
- Conservation Authority Admin Boundary
- Watercourse (Intermittent)
- Watercourse (Permanent)
- Potential for Shallow Bedrock
- Wetland, Provincially Significant
- Wetland, Not evaluated per OWES
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Construction Mitigation Notes:
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Stantec

Project Location
City of Hamilton

160961299 REVA
Prepared by AMW on 2020-02-25
Technical Review by RR on 2020-02-18

Client/Project
ENBRIDGE GAS INC.
KIRKWALL-HAMILTON PIPELINE PROJECT

Figure No.
1.8

Title
Mitigation Photomosaic

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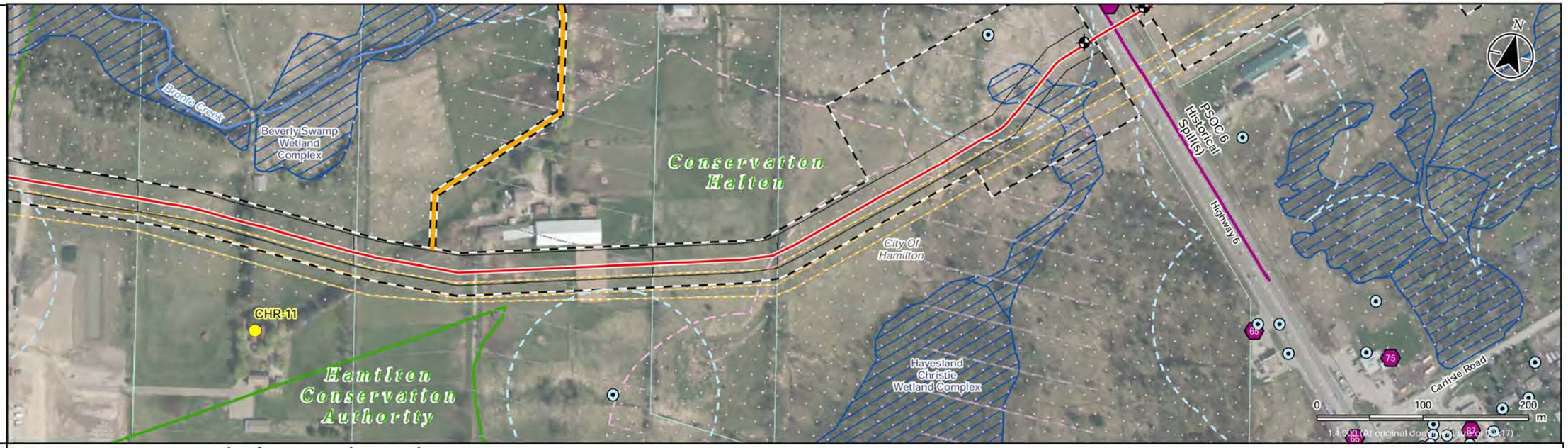
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Beverly Swamp Wetland Complex
Conservation Halton
City Of Hamilton
PSOC 6 Historical Spill(s)
Highway 6
N
CHR-11
Hamilton Conservation Authority
Hayesland Christie Wetland Complex
Carlisle Road
0
100
200
m
1:4,000 (At original document size of 8.5x11)

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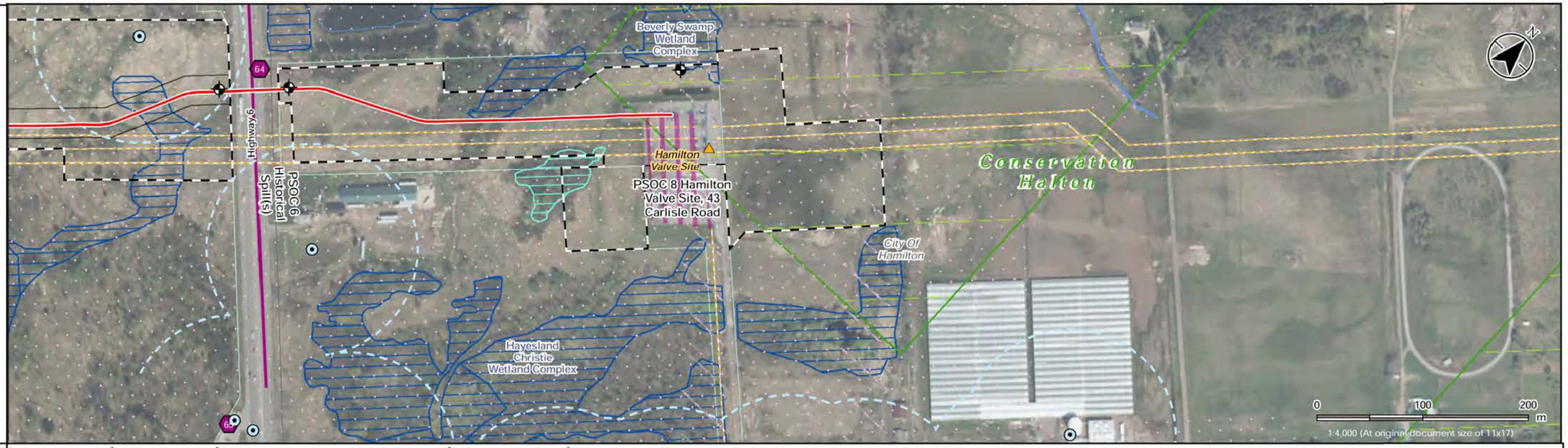

Natural Features	12 12
Infrastructure	2, 3 5 1 2, 3
Aquatic Features	14
Floodplain/ Regulated Area	4 (CH)
Landuse	
Cultural Resources	8 8
Geologic Features	16



Notes
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Legend
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Note 3: Water well monitoring program recommended. Refer to Section 6.1.2 Monitoring - Water Wells of the ER.
Note 4: Permit from HCA, CH or GRCA required. Refer to Section 4.2.8 of the ER.
Note 5: Crossing permissions required from Provincial and Municipal Road authorties. Refer to Section 4.4.4 Infrastructure of the ER.
Note 6: Access to businesses and residences. Maintain emergency egress. Refer to Section 4.4.4 Infrastructure of the ER.
Note 7: Construction adjacent to rural residental areas. Refer to Section 4.4.4 Infrastructure, Section 4.4.5 Air and Noise and Section 4.4.7 Waste Management of the ER.
Note 8: Potential to encounter cultural heritage and/or archaeological resources. Refer to Section 4.4.9 Archaeological Resouces and 4.4.10 Cultural Heritage Resouces and 6.2.3 Unexpected Finds: Archaeological or Heritage Resources and Unknown Contaminated Soils of the ER.
Note 9: Open Cut water course crossing construction method. Refer to Section 4.3.1 Aquatic Features, 6.1.3 Monitoring - Watercourse Crossings and 6.3 Watercourse Sedimentation of the ER.
Note 10: Coldwater watercourse crossing - In-water work permitted from July 1 to September 15. Refer to Section 4.3.1 Aquatic Features of the ER.
Note 11: Warmwater watercourse crossing - In-water work permitted from July 1 to March 14. Refer to Section 4.3.1 Aquatic Features of the ER.
Note 12: No clearing activities during the migratory breeding bird restricted activity period (April 1 – August 31) without preconstruction nesting surveys. Refer to Section 4.3.3 Wildlife, Wildlife Habitat and Species at Risk and Section 6.1.4 Monitoring - Vegetation and Wetlands of the ER.
Note 13: Overall Benefit Permit under the Endangered Species Act, 2007 from the MECP may be required if the species, or protected habitat, are impacted by project activities.Refer to Section 4.3.2 Designated Natural Areas and Vegetation, Section 4.3.3 Wildlife, Wildlife Habitat and Species at Risk of the ER.
Note 14: Potential for encountering Potential Sources of Contamination (PSOC).Refer to Section 4.4.6 Contamination and 6.2.3 Unexpected Finds: Archaeological or Heritage Resources and Unknown Contaminated Soils of the ER.
Note 15: Construction accross active agricultural lands. Refer to Section 4.2.5 Soil and Soil Capability and Section 4.2.6 Agricultural Tile Drains of the ER.
Note 16: Potential to encounter shallow bedrock that may require blasting during construction. Refer to Section 4.2.1 Bedrock Geology of the ER.
Acronyms List:
ER: Environmental Report (Stantec 2019). HCA: Hamilton Conservation Authority. CH: Conservation Halton. GRCA: Grand River Conservation Authority. MECP: Ministry of Environment, Conservation and Parks.

Stantec

Project Location
City of Hamilton

160961299 REVA
Prepared by AMW on 2020-02-25
Technical Review by RR on 2020-02-18

Client/Project
ENBRIDGE GAS INC.
KIRKWALL-HAMILTON PIPELINE PROJECT

Figure No.
1.10

Title
Mitigation Photomosaic

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