

Enbridge Gas Inc.

2021/2022 Storage Enhancement Project – Environmental Report

Prepared by:

AECOM Canada Ltd.
201 – 45 Goderich Road
Hamilton, ON L8E 4W8
Canada

T: 905 578 3040
F: 905 578 4129
www.aecom.com

Prepared for:

Enbridge Gas Inc.
50 Keil Drive North
Chatham, ON N7M 5M1
Canada

T: 519-436-4600
www.enbridge.com

Date: September 2020

Project #: 60633149

Distribution List

# Hard Copies	PDF Required	Association / Company Name
0	✓	Ontario Pipeline Co-ordinating Committee
2	-	Ontario Energy Board
2	✓	Enbridge Gas Inc.
	✓	AECOM Canada Ltd.

Statement of Qualifications and Limitations

The attached Report (the “Report”) has been prepared by AECOM Canada Ltd. (“AECOM”) for the benefit of the Client (“Client”) in accordance with the agreement between AECOM and Client, including the scope of work detailed therein (the “Agreement”).

The information, data, recommendations and conclusions contained in the Report (collectively, the “Information”):

- is subject to the scope, schedule, and other constraints and limitations in the Agreement and the qualifications contained in the Report (the “Limitations”);
- represents AECOM’s professional judgement in light of the Limitations and industry standards for the preparation of similar reports;
- may be based on information provided to AECOM which has not been independently verified;
- has not been updated since the date of issuance of the Report and its accuracy is limited to the time period and circumstances in which it was collected, processed, made or issued;
- must be read as a whole and sections thereof should not be read out of such context;
- was prepared for the specific purposes described in the Report and the Agreement; and
- in the case of subsurface, environmental or geotechnical conditions, may be based on limited testing and on the assumption that such conditions are uniform and not variable either geographically or over time.

AECOM shall be entitled to rely upon the accuracy and completeness of information that was provided to it and has no obligation to update such information. AECOM accepts no responsibility for any events or circumstances that may have occurred since the date on which the Report was prepared and, in the case of subsurface, environmental or geotechnical conditions, is not responsible for any variability in such conditions, geographically or over time.

AECOM agrees that the Report represents its professional judgement as described above and that the Information has been prepared for the specific purpose and use described in the Report and the Agreement, but AECOM makes no other representations, or any guarantees or warranties whatsoever, whether express or implied, with respect to the Report, the Information or any part thereof.

Without in any way limiting the generality of the foregoing, any estimates or opinions regarding probable construction costs or construction schedule provided by AECOM represent AECOM’s professional judgement in light of its experience and the knowledge and information available to it at the time of preparation. Since AECOM has no control over market or economic conditions, prices for construction labour, equipment or materials or bidding procedures, AECOM, its directors, officers and employees are not able to, nor do they, make any representations, warranties or guarantees whatsoever, whether express or implied, with respect to such estimates or opinions, or their variance from actual construction costs or schedules, and accept no responsibility for any loss or damage arising therefrom or in any way related thereto. Persons relying on such estimates or opinions do so at their own risk.

Except (1) as agreed to in writing by AECOM and Client; (2) as required by-law; or (3) to the extent used by governmental reviewing agencies for the purpose of obtaining permits or approvals, the Report and the Information may be used and relied upon only by Client.

AECOM accepts no responsibility, and denies any liability whatsoever, to parties other than Client who may obtain access to the Report or the Information for any injury, loss or damage suffered by such parties arising from their use of, reliance upon, or decisions or actions based on the Report or any of the Information (“improper use of the Report”), except to the extent those parties have obtained the prior written consent of AECOM to use and rely upon the Report and the Information. Any injury, loss or damages arising from improper use of the Report shall be borne by the party making such use.

This Statement of Qualifications and Limitations is attached to and forms part of the Report and any use of the Report is subject to the terms hereof.

AECOM: 2015-04-13
© 2009-2015 AECOM Canada Ltd. All Rights Reserved.

Authors

Report Prepared By:



Jordan Witt
Environmental Planner
Jordan.Witt1@aecom.com

Report Reviewed By:



Kristan Washburn, MES
Senior Terrestrial Ecologist
Kristan.Washburn@aecom.com



Mark van der Woerd, MES, EP
Senior Environmental Planner
Mark.VanderWoerd@aecom.com

Table of Contents

	page
1. Introduction	1
1.1 Project Description	1
1.2 Project Study Area	1
2. Environmental Study Process	2
2.1 Environmental Study Process	2
3. Proposed Project Activities.....	4
3.1 Proposed NPS 24 Pipeline.....	4
3.1.1 Pipeline Evaluation Process	4
3.1.2 Potential Pipeline Routes	4
3.1.3 Evaluation of Potential Pipeline Routes	5
3.1.4 Preferred Pipeline Route	5
3.2 Other Infrastructure Works	6
4. Consultation Program	7
4.1 Project Contact Lists	7
4.1.1 Landowners Contact List	7
4.1.2 Indigenous Communities Contact List	7
4.1.3 Government Agencies and Other Stakeholders Contact List	7
4.2 Public Consultation.....	8
4.2.1 Letters and Notice of Project Commencement	8
4.2.2 Public Door-to-door Community Outreach	8
4.2.3 Feedback from the Public.....	8
4.3 Indigenous Communities.....	8
4.4 Agency and Stakeholder Consultation	8
5. Environmental and Socio-economic Features	9
5.1 Background Review	9
5.2 Physical Features.....	10
5.2.1 Bedrock Geology and Drift Thickness.....	10
5.2.2 Quaternary Geology	10
5.2.3 Physiography and Surficial Geology	11
5.2.3.1 Sekerton/Corunna PSA	11
5.2.3.2 Ladysmith PSA	11
5.2.4 Potential Geology Resources	11
5.2.5 Geological Hazards	11
5.2.6 Soil Resources	12
5.2.7 Agricultural Resources	13

5.2.8	Groundwater Resources.....	13
5.2.8.1	Hydrostratigraphy	13
5.2.8.2	Groundwater Use	13
5.2.8.3	Depth to Water Table	14
5.2.8.4	Regional Groundwater Flow	14
5.2.8.5	Well Head Protection Areas	14
5.2.8.6	Significant Groundwater Recharge Areas	14
5.2.8.7	Highly Vulnerable Aquifers	15
5.3	Biophysical Features	15
5.3.1	Designated Natural Areas	15
5.3.1.1	Watershed and Subwatershed	15
5.3.1.2	Significant Wetlands	16
5.3.1.3	Significant Woodlands	17
5.3.1.4	Significant Valleylands.....	17
5.3.1.5	Significant Wildlife Habitat	18
5.3.1.6	Areas of Natural and Scientific Interest	19
5.3.2	Fish and Fish Habitat	20
5.3.3	Habitat of Threatened and Endangered Species	23
5.4	Socio-economic Features.....	25
5.4.1	Population and Economic Profile.....	25
5.4.1.1	Population.....	25
5.4.1.2	Employment.....	25
5.4.2	Existing Land Uses.....	26
5.4.2.1	Agricultural Area	26
5.4.2.2	Gas Compressor Station	27
5.4.2.3	Petrochemical Industrial Land	27
5.4.3	Residents, Farms and Businesses	27
5.4.4	Indigenous Communities and Interests.....	27
5.4.5	Institutional Services and Facilities	28
5.4.6	Recreation and Tourism	28
5.4.7	Infrastructure	28
5.4.7.1	Local Roads.....	28
5.4.7.2	Railways	28
5.4.7.3	Electricity Infrastructure	28
5.4.7.4	Natural Gas Pipelines.....	28
5.4.7.5	Other Utilities	29
5.4.8	Archaeological Resources.....	29
5.4.9	Heritage Resources and Cultural Heritage Landscape	29
5.4.10	Contaminated Sites.....	29
5.4.11	Landfill/Waste Disposal Sites	30
6.	Effects Identification, Assessment and Mitigation.....	31
6.1	Project Activities.....	31
6.1.1	Construction	31
6.1.2	Operation and Maintenance	32
6.2	Potential Effects	32
6.2.1	Geological Resources	32
6.2.2	Soil Resources	33

6.2.3	Groundwater Resources.....	36
6.3	Biophysical Features	37
6.3.1	Aquatic Resources	37
6.3.1.1	Surface Water.....	37
6.3.1.2	Fish and Fish Habitat.....	39
6.3.1.3	Aquatic Species at Risk.....	40
6.3.1.4	Mitigation Measures	40
6.4	Species at Risk	41
6.4.1	Terrestrial Resources	41
6.4.1.1	Vegetation and Ecological Communities.....	41
6.4.1.2	Wildlife and Wildlife Habitat	43
6.4.1.3	Wildlife Species at Risk	45
6.5	Socio-economic Features.....	46
6.5.1	Economy and Employment.....	46
6.5.2	Residents, Farms, Businesses and Land Uses	47
6.5.3	Indigenous Communities and Interests.....	48
6.5.4	Institutional Services and Facilities	50
6.5.4.1	Mitigation Measures	50
6.5.5	Recreation and Tourism	50
6.5.6	Infrastructure	50
6.5.6.1	Railways	50
6.5.6.2	Local Roads.....	51
6.5.6.3	Electrical Infrastructure, Natural Gas Pipelines and other Utilities.....	51
6.5.7	Contaminated Soils and Waste Management.....	52
6.5.8	Archaeological Resources.....	53
6.5.9	Heritage Resources and Cultural Heritage Landscapes	53
7.	Cumulative Effects Assessment.....	54
7.1	Assessment of Cumulative Effects	55
8.	Environmental Monitoring and Contingency Measures	56
8.1	Sediment Erosion and Slope Stability	56
8.2	Water Wells.....	56
8.3	Accidental Contaminant Spills.....	56
8.4	Vegetation and Watercourses	56
8.5	Wildlife.....	57
8.6	Residences, Farms and Businesses	57
8.7	Archaeology	57
9.	Conclusion	58
10.	References.....	59

List of Figures

Figure 1-1:	Project Study Area
Figure 2-1:	Environmental Study Process
Figure 3-1:	Alternative Pipeline Routes
Figure 3-2:	Preferred Pipeline Route
Figure 3-3:	Proposed Works at Corunna Storage Pool
Figure 3-4:	Proposed Works at Seckerton Storage Pool
Figure 3-5:	Proposed Works at Ladysmith Storage Pool
Figure 3-6:	A-1 Observation Well (TC-8)
Figure 3-7:	Potential Crossover Station Area
Figure 5-1:	Bedrock Geology
Figure 5-2:	Drift Thickness
Figure 5-3:	Quaternary Geology
Figure 5-4:	Physiography Geology
Figure 5-5:	Surficial Geology
Figure 5-6:	Soil Classification and Agricultural Drains
Figure 5-7:	MECP Water Well Records, PTTW Records and EASR Registrations
Figure 5-8:	Groundwater Recharge Areas
Figure 5-9:	Biophysical Features Map
Figure 5-10:	Proportion of Employment by Industry Sector (Statistics Canada, 2017)
Figure 5-11:	Land Use Designation Map
Figure 5-12:	Socio-Economic Features

List of Tables

Table 3-1:	Summary of Potential Pipeline Routes.....	5
Table 5-1:	Quaternary Geology	10
Table 5-2:	Descriptions of Soil Classes Present in the Project Study Area	12
Table 5-3:	Summary of Soil Groups and Series	12
Table 5-4:	Summary of MECP Water Well Record Information	14
Table 5-5:	Water Features within the Study Area Determined through Desktop Review	15
Table 5-6:	Wetland Records for the Vicinity of the PSA.....	16
Table 5-7:	Species of Conservation Concern Records for the Vicinity of the PSA	18
Table 5-8:	Fish Species Known to Inhabit Talfourd Creek	20
Table 5-9:	Fish Species Known to Inhabit Clay Creek	21
Table 5-10:	Fish Species Known to Inhabit Bear Creek.....	21
Table 5-11:	Threatened and Endangered Species Records for the Vicinity of the PSA	23
Table 5-12:	Description of Threatened and Endangered Species at Risk with Potential Habitat for the Vicinity of the PSA	23
Table 5-13:	Population of St. Clair Township and the County of Lambton (2011 and 2016 Census of Population)	25
Table 6-1:	Potential Effects, Proposed Mitigation, and Net Effects on Soil Resources	33
Table 6-2:	Potential Effects, Proposed Mitigation, and Net Effects on Groundwater Resources	36
Table 6-3:	Potential Effects, Proposed Mitigation and Net Effects on Surface Water.....	38
Table 6-4:	Potential Effects, Proposed Mitigation and Net Effects on Fish and Fish Habitat	40
Table 6-5:	Potential Effects, Proposed Mitigation and Net Effects to Vegetation and Ecological Communities.....	42
Table 6-6:	Potential Effects, Proposed Mitigation and Net Effects to Wildlife and Wildlife Habitat	44

Table 6-7: Effects on Species at Risk and their Habitat during Construction.....	45
Table 6-8: Effects on Species at Risk and their Habitat during Operation	46
Table 6-9: Potential Effects, Proposed Mitigation and Net Effects on Land Uses, Residents and Businesses	48
Table 6-10: Potential Effects, Proposed Mitigation and Net Effects on Institutional Services and Facilities	50
Table 6-11: Potential Effects, Proposed Mitigation and Net Effects on Infrastructure	52
Table 6-12: Potential Effects, Proposed Mitigation and Net Effects due to Contaminated Soils and Improper Waste Disposal.....	53

Appendices

Appendix A.	Figures
Appendix B.	Consultation
Appendix C.	MECP Water Well Records
Appendix D.	Stage 1 Archaeological Assessment Report
Appendix E.	Application of the MHSTCI Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes
Appendix F.	Summary of Potential Effects, Proposed Mitigation, Net Effects and Environmental Monitoring and Contingency Measures
Appendix G.	Enbridge Gas Inc Standards and Typical Drawings

Acronyms and Abbreviations

Acronym	Definition
ANSI	Area of Natural and Scientific Interest
BSC	Bird Studies Canada
CHR	Cultural Heritage Report
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
COSSARO	Committee on the Status of Species at Risk in Ontario
CSA	Canadian Standards Association
CWS	Canadian Wildlife Service
DBH	Diameter-at-breast-height
DFO	Fisheries and Oceans Canada
EASR	Environmental Activity and Sector Registry
EC	Environment Canada
ECCC	Environment and Climate Change Canada
ELC	Ecological Land Classification
END	Endangered
ENDM	Northern Development and Mines
ER	Environmental Report
ESA	<i>Endangered Species Act, 2007</i>
ESC	Erosion and Sediment Control
GIS	Geographic Information Systems
HVA	Highly vulnerable aquifer
IPZ	Intake protection zone

Acronym	Definition
LIO	Land Information Ontario
mASL	metres above sea level
MBCA	<i>Migratory Birds Convention Act</i>
mbgs	metres below ground surface
MHSTCI	Ministry of Heritage, Sport, Tourism, and Cultural Industries
MMAH	Ministry of Municipal Affairs and Housing
MNRF	Ministry of Natural Resources and Forestry
MECP	Ministry of the Environment, Conservation and Parks
MOECC	Ministry of the Environment and Climate Change
MOP	Maximum Operating Pressure
MTO	Ministry of Transportation
NHIC	Natural Heritage Information Centre
NPS	Nominal Pipe Size
OBA	Ontario Butterfly Atlas
OBBA	Ontario Breeding Bird Atlas
OEB	Ontario Energy Board
OGS	Ontario Geological Survey
OHT	Ontario Heritage Trust
OMAFRA	Ontario Ministry of Agriculture, Food and Rural Affairs
OPCC	Ontario Pipeline Co-ordinating Committee
ORAA	Ontario Reptile and Amphibian Atlas
OWES	Ontario Wetland Evaluation System
PPS	Provincial Policy Statement
PSA	Project Study Area
PSW	Provincially Significant Wetland
PTTW	Permit to Take Water
RSC	Record of Site Condition
ROW	right-of-way
SAR	Species at Risk
SARA	<i>Species at Risk Act</i>
SARO	Species at Risk in Ontario
SC	Special Concern
SCS	Site Condition Standards
SCRCA	St. Clair Region Conservation Authority
SGRAs	Significant Groundwater Recharge Areas
SOCC	Species of Conservation Concern
SWH	Significant Wildlife Habitat
THR	Threatened
TSSA	Technical Standards and Safety Authority
WHPA	Wellhead Protection Areas
ZOI	Zone of Influence

1. Introduction

1.1 Project Description

To serve a growing demand for natural gas, Enbridge Gas Inc. (Enbridge Gas) is proposing the 2021/2022 Storage Enhancement Project (the Project). The Project will allow Enbridge Gas to store additional natural gas and will increase the deliverability of Enbridge Gas's storage operations. The Project involves:

- Increasing the maximum operating pressure (MOP) of three existing natural gas storage pools (Ladysmith, Corunna and Seckerton);
- Re-entering the stratigraphic test well TL 9 in the Ladysmith Storage Pool and converting it to a horizontal natural gas storage well (TL 9H) and connecting the well to the gathering system;
- Drilling a new A-1 observation well (TL 8) in the Ladysmith Storage Pool;
- Drilling a new A-1 observation well (TC 8) outside of the Designated Storage Area boundary for the Corunna Storage Pool;
- Upgrading the existing gathering system at the Ladysmith Storage Pool from Nominal Pipe Size (NPS) 16 to NPS 20;
- Installation of NPS 16 Bi-directional valve and station piping within the Ladysmith Station;
- Connecting the existing Payne Storage Pool pipeline and the Ladysmith Storage Pool pipeline at a new Crossover Station; and
- Constructing approximately 2.2 kilometre (km) of NPS 24 natural gas pipeline to connect the Payne Storage Pool to the Corunna Compressor Station located on Tecumseh Road, in St. Clair Township, Ontario.

AECOM Canada Limited (AECOM) has been retained by Enbridge Gas to prepare this Environmental Report (ER) to assess the potential environmental and socio-economic effects that may result from the Project in accordance with the Ontario Energy Board's (OEB) *Environmental Guidelines for the Location, Construction and Operation of Hydrocarbon Pipelines and Facilities in Ontario (2016)*.

1.2 Project Study Area

The Project is located in St. Clair Township, in the County of Lambton. The Project Study Area (PSA), as shown in **Figure 1-1 of Appendix A**, was developed to identify the Preferred Pipeline Route and other infrastructure works associated with the Project and to develop the limits of analysis of background environmental and socio-economic baseline conditions to be assessed as part of the ER. The PSA is generally bounded approximately by Ladysmith Road to the west, Petrolia Line to the north, Tecumseh Road to the east and Courtright Line to the south. Further information relating to identification, evaluation and selection of the Project is provided in **Section 3**. Known physical, biophysical and socio-economic features within the PSA are described in **Section 5**.

2. Environmental Study Process

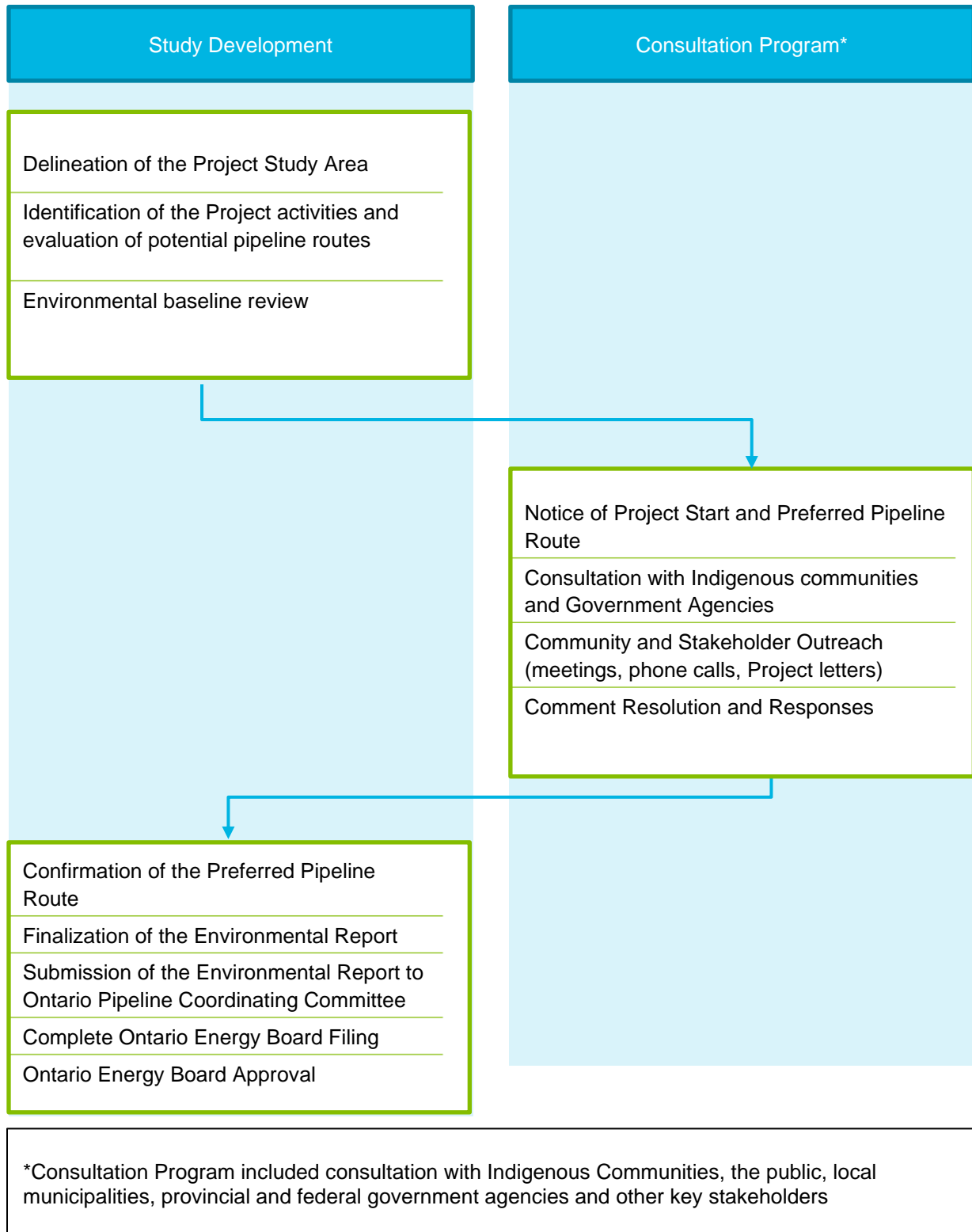
2.1 Environmental Study Process

As outlined in Section 90 of the *Ontario Energy Board Act, 1998 (OEB Act)*, any proponent planning to construct a hydrocarbon line within Ontario must apply to the OEB for approval to proceed prior to construction (*S.O. 1998 c.15 Sch B*). The OEB serves as an independent, quasi-judicial tribunal who, among other things, approves natural gas rates, pipeline construction and the designation of gas storage facilities. The *Environmental Guidelines (2016)* developed by the OEB are designed to provide direction to proponents in the preparation of an Environmental Report (ER) and to assist in determining how to identify, manage and document potential effects associated with their projects on the environment (OEB, 2016). It is important to note that to meet the intent of the *Environmental Guidelines (2016)* the term “environment” is defined to include natural, social, economic, cultural and built components.

The *Environmental Guidelines (2016)* are applicable to hydrocarbon pipelines and ancillary facilities that are required to apply to the Board for a Leave-to-Construct under the *OEB Act*. An ER must be prepared to meet the intent of the *Environmental Guidelines (2016)* as part of the environmental analysis and reporting requirements for hydrocarbon pipelines Leave-to-Construct applications under sections 90, 91, 95 and 98 of the *OEB Act*. The ER will also support Enbridge Gas’ application for a favourable report under section 40 of the *OEB Act* for the drilling of two new A-1 Observation Wells (TL 8 and TC 8) and re-entering stratigraphic test well TL9 and converting it to a horizontal natural gas storage well (TL9H) as well as a leave to vary request under section 38 of the *OEB Act* to increase the MOP of the Ladysmith, Corunna and Seckerton Storage Pools.

There were two main phases followed for the environmental study process. Step-by-step planning activities conducted during the preparation of the ER is shown in **Figure 2-1** below.

Figure 2-1: Environmental Study Process



3. Proposed Project Activities

As described above, the Project includes constructing a 2.2 kilometre (km) NPS 24 natural gas pipeline to connect the Payne Storage Pool to the Corunna Compressor Station located on Tecumseh Road, in St. Clair Township, Ontario. The evaluation of potential pipeline routes is described further in **Section 3.1** below.

The Project also includes drilling new observation wells in the Ladysmith Storage Pool and outside the boundary of the Designated Storage Area for the Corunna Storage Pool, changes to existing infrastructure associated to the Ladysmith, Corunna and Seckerton Storage pools, and construction of a new Crossover Station to connect the existing Payne Storage Pool Pipeline and Ladysmith Storage Pool Pipeline. This work is described below in **Section 3.2**.

3.1 Proposed NPS 24 Pipeline

3.1.1 Pipeline Evaluation Process

The OEB Environmental Guidelines outlines the need for establishing routing objectives to guide the planning process and identify important criteria used to evaluate the potential routes that exist within a study area. Routing objectives for the Project included:

- Parallel existing routes that house infrastructure (e.g., municipal roads, electrical transmission lines, and pipelines) to reduce environmental effects to existing land uses;
- Avoid environmental constraints such as wetlands, Areas of Natural and Scientific Interest (ANSIs) and woodlots, where possible, to avoid environmental effects;
- Avoid social constraints such as cultural features, major transportation corridors and residential areas to reduce disruption on the local community;
- Minimize the length of pipeline required by generating alternatives that have direct paths between endpoints and avoids turns/slopes, where possible; and
- Use existing lot and property lines where new easements are required to avoid or reduce effects to undisturbed environmental features, where feasible.

3.1.2 Potential Pipeline Routes

Figure 3-1 of Appendix A identifies the three potential pipeline routes that were identified and evaluated as part of the Project. The routes include:

- **Route 1**
Pipeline travels in a diagonal orientation east from the Payne Compressor Station across private property to the Corunna Compressor Station.
- **Route 2**
Pipeline travels North from the Payne Compressor Station on the property boundary along Ladysmith Road turning east and travelling along existing property lines in a perpendicular manner to the Corunna Compressor Station.

■ **Route 3**

Pipeline travels South from the Payne Compressor Station along Ladysmith Road within either the public Right-of-Way (ROW) or on private property along the property line turning east on Moore Line within the public ROW / private property before turning North on Tecumseh Road and travelling within the public ROW / private boundary to the Corunna Compressor Station.

3.1.3 Evaluation of Potential Pipeline Routes

As the routing objectives suggest, siting new infrastructure is a challenge and generally paralleling existing routes that house linear infrastructure or leveraging previously disturbed areas is preferred as those routes result in fewer physical, biophysical and socio-economic effects than entirely new routes. The table below provides a high-level overview of potential pipeline routes:

Table 3-1: Summary of Potential Pipeline Routes

Routing Objective	Route 1	Route 2	Route 3
Parallel Existing Routes that House Linear Infrastructure	<ul style="list-style-type: none"> Route is located entirely on private property used for agricultural purposes 	<ul style="list-style-type: none"> Route located on private property but adjacent to the public ROW and an existing pipeline along Ladysmith Road before turning east. The pipeline then travels along the property boundary to the station 	<ul style="list-style-type: none"> Pipeline located within the public ROW or on private property immediately adjacent to the ROW
Avoid Environmental Constraints	<ul style="list-style-type: none"> Majority of the land is used for agricultural purposes. Route would require crossing through a woodlot. 	<ul style="list-style-type: none"> Route is situated within and in parallel to previously disturbed areas (i.e., public ROW, existing infrastructure) 	<ul style="list-style-type: none"> Route is situated within or in parallel to previously disturbed areas (i.e., public ROW, existing infrastructure)
Avoid Socio-economic Constraints	<ul style="list-style-type: none"> Significant effects to existing agricultural practices during construction and operation 	<ul style="list-style-type: none"> Minor effects to existing agricultural practices during construction Nuisance (noise, dust, access) effects to adjacent residents 	<ul style="list-style-type: none"> Nuisance (noise, dust, access) effects to adjacent residents Disturbance to secondary road transportation patterns Potential conflict with future land use plans Effects to private property for temporary land use areas during construction
Minimize the Length of Pipeline	<ul style="list-style-type: none"> Shortest pipeline length Direct path between stations 	<ul style="list-style-type: none"> Single turn required to follow public ROW / property line Increased length of pipeline 	<ul style="list-style-type: none"> Two turns required to follow public ROW / property line Longest pipeline length
Use Existing Lot and Property Lines where New Easements are Required	<ul style="list-style-type: none"> Bisects private properties and requires new easements 	<ul style="list-style-type: none"> Uses existing lot and property lines, requires few new agreements 	<ul style="list-style-type: none"> Uses existing lot and property lines, requires many new agreements
Overall Route Evaluation	Least Preferred	Most Preferred	Moderately Preferred

3.1.4 Preferred Pipeline Route

As shown in the table above, Route 2 was selected as the Preferred Pipeline Route (**Figure 3-2 of Appendix A**). The Preferred Pipeline Route was selected because it best satisfies the routing objectives for the following reasons:

- The route parallels the public ROW, existing pipeline infrastructure and property boundaries avoiding the need for a new corridor which would disturb prime agricultural land and existing agricultural practices.
- The route being located directly parallel to existing infrastructure and property lines which helps avoid conflict with future land use, including but not limited to, future developments and use of property by private landowners.

- The route leverages areas that have likely already been disturbed reducing effects to natural features within the PSA, avoiding ANSI's other sensitive natural areas and results in no anticipated negative effects to socio-economic features.

To help evaluate and confirm the Preferred Pipeline Route, Enbridge sought feedback from Indigenous Communities, and the public, government agencies and other interested or potentially effected stakeholders by circulating notification letters and posting information about the Project in two local newspapers (Sarnia & Lambton Country This Week, 2020). During the consultation process, the Preferred Pipeline Route was confirmed as the most viable routing approach for connecting the Payne Storage Pool to the main Corunna Compressor Station.

3.2 Other Infrastructure Works

In addition to the installation of the new pipeline, the Project proposes additional work on land currently used by Enbridge Gas for their existing operations. The work includes drilling a new A-1 observation well in the Ladysmith Storage Pool (TL 8), drilling a new A-1 observation well outside of the boundary of the Designated Storage Area for the Corunna Storage Pool, re-entering the stratigraphic test well (TL 9) in the Ladysmith Storage Pool and converting it to a horizontal natural gas storage well (TL 9H), upgrading the existing gathering system at the Ladysmith Storage Pool from NPS 16 to NPS 20 and installing a NPS 16 bi-directional valve and station piping within the Ladysmith station. The maximum operating pressure (MOP) of three existing natural gas storage pools (Ladysmith, Corunna and Seckerton) will also be increased. In addition to the work described above, this work will involve upgrades and pressure tests to the following existing natural gas storage wells: TS 2, TS 3, TS 7, TS 9, TS 10, TS 11, TS 12, TS 13, TS 14, TS 15, TS 16, TS 19, TS 20, TS 21, TC 1, TC 2, TC 3, TC 5, TC 7, and TC 9H (pressure test only). The MOP increase work will also include pressure tests of the following existing oil wells: IS 10, IS 12, IUSN 5, IC 18, TC 12H, and TC 24H.

In order to complete this work, temporary roads and well pads will need to be established where they currently do not exist. Mapping outlining the location for this work is provided on **Figures 3-3 to 3-7 of Appendix A**.

Since the Project is proposing to improve or modify existing infrastructure, the well pads will need to be placed adjacent to the infrastructure they tie into. As such, no alternative locations were considered.

4. Consultation Program

Consultation is an important part of the environmental study process. Throughout the Project, consultation was carried out by following the key objectives listed below:

- **Open and Inclusive Communication:**
Providing accurate, accessible and timely information to and considering feedback received.
- **Transparency and Accountability:**
Ensuring the planning process was open and transparent. Making the best efforts to involve and hear from all those who may be affected by or interested in the Project.
- **Accessibility:**
Providing materials and information in an accessible format, upon request.

4.1 Project Contact Lists

Project contact lists were developed at the start of the Project to identify landowners, Indigenous communities, government agencies with jurisdiction in the PSA, and other stakeholders with a potential interest in the Project. Revisions to the contact lists were made based on input received during ongoing consultation.

4.1.1 Landowners Contact List

Section 3.2 of the *Environmental Guidelines* (2016) describes the landowners whose properties will be encroached upon by the Project as the directly affected landowners. Landowners that are affected by the Project adjacent to their property are referred to as indirectly affected landowners. A list of affected landowners was developed and updated throughout the Project based on the interest expressed by the residents through the consultation process. The landowner contact list is not included in this ER to protect privacy.

4.1.2 Indigenous Communities Contact List

In accordance with Section 3.3 of the *Environmental Guidelines* (2016), Enbridge consulted with the Ministry of Energy, Northern Development and Mines (ENDM) to obtain a list of the Indigenous communities that may be affected by or have an interest in the Project. On June 17, 2020 ENDM provided a list of Indigenous communities to be consulted (**Appendix B**). These communities include:

- Aamjiwnaang First Nation
- Bkejwanong (Walpole Island First Nation)
- Chippewas of the Thames First Nation
- Chippewas of Kettle and Stony Point
- Oneida Nation of the Thames

4.1.3 Government Agencies and Other Stakeholders Contact List

The agencies and stakeholders contact list (see **Appendix B**) included contact information of following:

- Elected officials;
- Staff from departments of local municipality and townships, OPCC members, provincial ministries and conservation authorities with jurisdiction in the PSA; and
- Utility companies.

4.2 Public Consultation

4.2.1 *Letters and Notice of Project Commencement*

A letter was mailed in August 2020 to residents/ landowners to inform them about the Project start and to invite them to participate in the planning process. The letter also informed the landowners that a Preferred Pipeline Route was selected for the Project. Letters were also mailed to Indigenous communities, and government Agencies and other interested stakeholders. A copy of each letter template is provided in **Appendix B**.

4.2.2 *Public Door-to-door Community Outreach*

Members of Enbridge's Lands & Right-of-Way group contacted directly affected landowners of the Project in July 2020 to provide them with an overview and to answer any Project-related questions. The same letter that was mailed to all of the other residents/landowners was also mailed to the directly affected landowners. A copy of the letter is provided in Appendix B.

4.2.3 *Feedback from the Public*

At the time of circulating the Environmental Report for OPCC review, no questions or comments have been received from the public regarding the Project.

4.3 Indigenous Communities

Enbridge has discussed the Project with Aamjiwnaang First Nation, Bkejwanong (Walpole Island First Nation), Chippewas of the Thames First Nation, Chippewas of Kettle and Stony Point and Oneida Nation of the Thames as per the direction from the ENDM. Enbridge also sent a letter and notice of Project commencement to the Haudenosaunee Development Institute. Enbridge will continue to engage with Indigenous communities as the Project progresses and this communication will be documented in the Indigenous Consultation Report that will form part of Enbridge's pre-filed evidence to the OEB.

4.4 Agency and Stakeholder Consultation

Information about the Project was shared with relevant government agencies and other stakeholders with a potential interest in the Project. To date, responses received have provided general information for potential inclusion in the ER and the identification of potential pre-construction permitting requirements.

A summary of agency and stakeholder input received during the environmental study process is provided in a table in **Appendix B**.

5. Environmental and Socio-economic Features

This section summarizes the physical, bio-physical and socio-economic features that are potentially affected by the Project in accordance with the *Environmental Guidelines* (2016).

5.1 Background Review

A background information review of physical, biophysical and socio-economic features located in the vicinity of the PSA was conducted using the following secondary sources, including:

- St. Clair Township Official Plan (2005);
- County of Lambton Official Plan (2019);
- Fisheries and Oceans Canada (DFO) online Aquatic Species at Risk Mapping (2020);
- Ontario Fish ON-Line, online mapping application (MNRF, 2020a);
- Natural Heritage Information Centre (NHIC) Rare Species Records (MNRF, 2020b);
- Ontario Breeding Bird Atlas (OBBA) Website (Bird Studies Canada [BSC] et al., 2006);
- Ontario Reptile and Amphibian Atlas (ORAA; Ontario Nature, 2019);
- Ontario Butterfly Atlas (OBA; Macnaughton et al., 2020);
- Bat Conservation International (BCI, 2020) and MNRF Species at Risk in Ontario (2019a; 2019b; 2019c; 2019d) Range Maps;
- Ministry of the Environment, Conservation and Parks (MECP Water Well Records (2020b);
- Published geological mapping and reports available from the Ontario Ministry of Energy, Northern Development and Mines Ontario Geological Survey (OGS, 1997; OGS, 2010; Chapman and Putnam, 2007), Natural Resources Canada (2010), Oil, Gas and Salt Resource Library (2018) and the MNRF (MNRF, 2020c);
- Soils mapping and agricultural tile drain information available from the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA, 2017) as well as Agriculture and Agri-Food Canada (2018);
- Statistics Canada Census data (Statistics Canada, 2017);
- Watershed Report Cards available from the SCRCA for the Lower Bear Creek Subwatershed and the St. Clair Tributaries Subwatershed (SCRCA, 2018a; SRCA, 2018b);
- St. Clair River Watershed Plan (SCRCA, 2009);
- St. Clair Region Conservation Authority Annual Report (SCRCA, 2019);
- MNRF's Land Information Ontario (LIO) database (MNRF, 2020c);
- The Atlas of Mammals of Ontario (Dobbyn, 1994), and MECP Recovery Strategies for SAR;
- Country of Lambton topographic map (2020) historical maps and aerial photography available online (i.e., 1880 Historical Atlas Map of Lambton County, National Topographic Maps of 1912, 1932 and 1936);
- St. Clair Township's online list of Heritage Plaques and Cairns;

- The online searchable databases on the Ontario Heritage Trust (OHT) website, The Ontario Heritage Plaque Program, and the OHT list of easement properties;
- Canadian Register of Historic Places
- Directory of Federal Heritage Designations
- list of National Historic Sites maintained by Parks Canada; and

During the background review, physical features within 120 m of the Study Area were characterized. However, the Cultural Heritage Assessment and Stage 1 Archaeological Assessment considered a 50 m buffer on either side of the Study Area, while the Socio-Economic assessment considered a 500 m buffer. These defining buffers in their respective sections below are herein referred to as the Study Area. The Study Areas are shown on **Figure 1-1 of Appendix A**.

5.2 Physical Features

5.2.1 *Bedrock Geology and Drift Thickness*

The overburden within the Seckerton/Corunna PSA overlies Upper Devonian aged shale of the Kettle Point Formation (OGS, 1991) (**Figure 5-1 of Appendix A**). The Kettle Point Formation can be described as brown to black, laminated, organic-rich shales and siltstones with minor green, bioturbated shales, siltstones and carbonate concretions in the lower part. The Kettle Point Formation outcrops to the north of the PSA along the shore of Lake Huron (Armstrong and Dodge, 2007).

The overburden within the Ladysmith PSA overlies the Kettle Point Formation on the southeast side of the area, the northwest side overlies Upper Devonian aged shale of the Port Lambton Group (OGS, 1991) (**Figure 5-1 of Appendix A**). The Port Lambton Group has been subdivided into three (3) formations in ascending order; the Bedford (grey shale), Berea (grey shale and sandstone, minor siltstones), and Sunbury (black shale). The Port Lambton Group is only mapped in western Lambton County (Armstrong and Dodge, 2007).

Bedrock topography generally decreases from approximately 170 metres above sea level (mASL) at the Ladysmith PSA to approximately 135 mASL at the Seckerton/Corunna PSA (OMNR&OGS, 1980). Enbridge well information confirms that the Ladysmith bedrock depth average is 133 mASL and the Seckerton/Corruna bedrock depth at the well is 155 mASL. Conversely, drift thickness tends to vary throughout the PSA, ranging from between approximately 60 m at the Ladysmith well to approximately 45 m at the Seckerton/Corunna well sites (**Figure 5-2 of Appendix A**).

5.2.2 *Quaternary Geology*

The mapped Quaternary units in the PSA are provided in **Table 5-1** and displayed on **Figure 5-3 of Appendix A** (OGS, 2003, OMAFRA, 2017). The Sekerton/Corunna PSA is overlain by St. Joseph Till, with the Ladysmith PSA overlain by Glaciolacustrine deposits.

Table 5-1: Quaternary Geology

Deposit	Description
St. Joseph Till	Silt to silty clay matrix, clay content increases southward, clast poor
Glaciolacustrine Deposits	Silt and clay, minor sand, basin and quiet water deposits

5.2.3 *Physiography and Surficial Geology*

According to Chapman and Putnam (1984), the PSA lies within the St. Clair Clay Plains physiographic region (**Figure 5-4 of Appendix A**). This region is dominated by relatively flat Bevelled Till Plains that were over-ridden by a glacial event following their initial deposition (Chapman and Putnam, 1984).

The topography within the PSA is generally flat to slightly undulating towards the St. Clair River and Lake Huron. Ground elevation ranges from approximately 207 mASL, near the Ladysmith PSA, to 185 mASL near the Sekerton/Corunna PSA.

Thick overburden sediments consisting of both fine textured glaciolacustrine deposits occur across both PSA areas. A full description of the native soil stratigraphy within each PSA is provided below in descending order of occurrence, as illustrated on **Figure 5-5 of Appendix A**.

5.2.3.1 *Sekerton/Corunna PSA*

This PSA is overlain by clayey/silty till that was deposited during the earliest widespread advance of the Huron-Georgian Bay lobe during the Port Bruce Stadial (Karrow, 1991). The thickness of this deposit generally ranges from 10 to 60 m but can be less than 10 m near the Lake Huron shore (Thames-Sydenham and Region Source Protection Committee [TSRSPC], 2015).

5.2.3.2 *Ladysmith PSA*

This PSA is overlain by fine-textured glaciolacustrine deposits comprised of silt and clay with minor sand and gravel. The deposit is considered to be massive and well-laminated. Thickness generally ranges from 10 to 60 m in depth (TSRSPC, 2015).

5.2.4 *Potential Geology Resources*

Bedrock-derived crushed stone and naturally formed sand and gravel constitute the primary mineral aggregates that are used in Ontario's road and construction industries. These materials are non-renewable resources that can only be exploited from fixed locations in which they occur.

According to the Aggregate Resource Inventory (OGS, 2020), the PSA for both Sekerton/Corunna and Ladysmith are primarily clay in nature and not listed as possible locations for resource protection and/or development. Surficial soils are not viable for aggregate operations.

Possible bedrock derived aggregate resources were identified by the Ontario Geological Survey (OGS, 2020) as bedrock overlain by less than 15 m of unconsolidated overburden. Since the average overburden thickness within the PSA ranges between approximately 50 and 70 m, the bedrock underlying the PSA is not considered suitable for aggregate extraction.

5.2.5 *Geological Hazards*

Seismic hazard is quantified by determining the probability of expected ground motion within an area. The OGS is responsible for evaluating regional seismic hazards and preparing seismic hazard maps based on statistical analysis of past earthquakes and from knowledge of Canada's tectonic and geological structure. The National Building Code uses seismic hazard maps and earthquake load guidelines to design and construct buildings to be as resilient to earthquake damage as possible. According to the 2010 Seismic Hazard Map, prepared by Natural Resources Canada (2015), the PSA is situated within a low relative seismic hazard area.

5.2.6 Soil Resources

There are a variety of different agricultural potential soil classes and series present within the two PSAs. The two classes that are present are described in **Table 5-2** and shown on **Figure 5-6 of Appendix A**.

Table 5-2: Descriptions of Soil Classes Present in the Project Study Area

Canada Land Inventory Soil Class	Description
2	Soils in this class have moderate limitations that reduce the choice of crops, or require moderate conservation practices
3	Soils in this class have moderately severe limitations that reduce the choice of crops or require special conservation practices

Source: OMAFRA, 2017

Dark-Grey Gleysolic soils and Grey-Brown Podzolic soils are the dominant soil groups within the PSA. These groups typically are differentiated based on the processes of soil development. Dark-Grey Gleysolic soils are typically poorly drained and have developed under the presence of a high-water table during most of the year. Conversely, Grey-Brown Podzolic soils typically have good drainage.

According to the Soil Survey Report for the County of Lambton (Richards and Wicklund, 1957), there are 35 different soil series within the PSA; these are provided below in **Table 5-3**. Soils are grouped into series based on soil materials, drainage, topography, and surface stoniness. Some of the best agricultural soil series in Southern Ontario are present within the County of Lambton but not within either PSA and include: the Guelph series; Huron series, Fox series, and Burford series. These soils are dominantly well-drained Grey-Brown Podzolic soils. Agricultural successes on soils that are imperfectly drained depend upon the application of tile drainage. Soils that typically require the implementation of tile drains within the PSA include: the Perth series, Caistor series, Brady series, Brisbane series, Berrien series, and Lambton series.

Organic soils (muck), alluvial soils and regosol soils are present within the County of Lambton but not the two PSAs.

Table 5-3: Summary of Soil Groups and Series

Soil Group	Series Names	Drainage
Dark-Grey Gleisolic	Brookston Till	Poor
	Granby Silt Loam	Poor
	Gilford Silt Loam	Poor
	Colwood Silt Loam	Poor
	Toledo Silt Loam	Poor
	Clyde Silt Loam	Poor
	Grey-Brown Podzolic	Perth Till
Caistor Till		Imperfect
Brady Silt Loam		Imperfect
Brisbane Silt Loam		Imperfect
Berrien Silt Loam		Imperfect
Lambton Till		Imperfect
Guelph Loam		Good
Huron Loam		Good
Fox Loam		Good
Burford Loam		Good
Bog	Muck	Very Poor
	Marsh & Peat	Very Poor
Alluvial	Blackwell	Poor
Regosol	Plainfield	Well
	Shashawandah	Well

5.2.7 Agricultural Resources

Land use across the PSAs is dominated by a mixture of crop cultivation and livestock agriculture, which has been made possible by the installation of dredged ditches and tile under-drains to provide satisfactory moisture conditions within the imperfectly drained soils. As illustrated in **Figure 5-6 of Appendix A**, approximately 75 percent of the Sekerton/Corunna PSA and 30 percent of the Ladysmith PSA includes agricultural land with tile drains.

5.2.8 Groundwater Resources

The geology and physiography of the County of Lambton provides a foundation to characterize the general hydrostratigraphy of the PSAs. Hydrostratigraphy is the classification of various major stratigraphic units into aquifers and aquitards, with some simplification or combination of units with similar properties. Previous groundwater resource studies, published by the Thames-Sydenham and Region Source Protection Committee (TSRSPC), provide a generalized framework to characterize groundwater resources, flow and quality within the County of Lambton. A review of the TSRSPC documents and other available secondary source information was used to prepare the summary presented below.

5.2.8.1 Hydrostratigraphy

An aquifer is classically defined as a geological unit that is sufficiently permeable to permit the extraction of a useable supply of water, while an aquitard is a zone that restricts the flow of groundwater between aquifers. Dominant surficial sediments within the Sekerton/Corunna and Ladysmith PSAs consist of clay till and fine-textured glaciolacustrine deposits. The till deposits typically possess low hydraulic conductivity and a limited ability to transmit groundwater; however, heterogeneities, secondary porosity, permeability features and fractures may locally permit a low yield, and/or provide groundwater recharge-discharge pathways.

The following defines the local surficial sediments into hydrostratigraphic units:

- Till (clay and silty-textured till) – Aquitard; and
- Fine-textured glaciolacustrine deposits (silt and clay) – Aquitard.

A review of local MECP water well records was completed for the purpose of characterizing the hydrostratigraphy of the PSA beneath the surficial sediments. In general, the PSA is underlain by a thick layer of fine-textured glaciolacustrine clay that extends to bedrock, a depth of approximately 10 m to 60 m. Many MECP water well records indicate that local private water supply is obtained from the upper shale bedrock. These records indicate that this unit has a moderate aquifer potential (1-12 GPM).

5.2.8.2 Groundwater Use

Within the County of Lambton, water for municipal supply is provided by surface water intake locations within Lake Huron and along the St. Clair River (TSRSPC, 2011). Currently, the residences around the PSA are supplied by municipal water. Select residents within the PSA use groundwater supplied by individual private water wells as their primary water supply.

Figure 5-7 of Appendix A depicts the locations of MECP water well records within a 500 m search radius of the PSAs, primary use of the wells, and distinguishes between bedrock and overburden wells. Review of the MECP database has identified approximately 88 well records within the search radius (MECP, 2020b). As shown on **Figure 5-7 of Appendix A**, available well records indicate that approximately 22% of groundwater wells in the PSA are used for agricultural purposes (irrigation or livestock uses) with 33% used for monitoring or as test holes. Domestic supply use accounts for 9% of the MECP water well records, followed by public use (1%). Approximately 22% of MECP water well records did not specify the well use and therefore are classified as 'Unknown'. Approximately, 1% of the MECP water well records indicate the well is no longer in use, accounting for

decommissioning records and dry wells. A complete record of MECP Water Wells within the search radius is provided in **Appendix C**.

Table 5-4: Summary of MECP Water Well Record Information

Primary Water Use	Number of Well Records	Percent of Wells in PSAs	Well Depth (m)	Primary Well Type
Domestic	8	9%	42 to 48 m	Bedrock Wells
Monitoring and Test Hole	29	33%	3 to 16.5 m	
Livestock	19	22%	40 to 88 m	17 Bedrock Wells, 2 Overburden Wells
Public	1	1%	45 m	Bedrock Well
Abandoned	22	25%	42 to 62 m	9 Bedrock, 3 Overburden
Unknown	9	10%		

As shown on **Figure 5-7 of Appendix A**, three (3) Permit to Take Water (PTTW) records for groundwater and surface water sources were identified within the search radius. None of these PTTWs are currently active. A review of MECP Environmental Activity and Sector Registry (EASR) found one (1) record within the search radius, the majority of the records are registered to Enbridge Gas.

5.2.8.3 Depth to Water Table

The lack of shallow MECP overburden wells, sourcing water from an unconfined aquifer, presents difficulty in characterizing the depth to the water table within the PSAs. Two (2) shallow overburden MECP water well records exist in the PSAs and have a static water levels ranging between 2.7 and 9.8 metres below ground surface (mbgs). Fluctuations in the groundwater level may occur due to seasonal changes and variations in precipitation. Bedrock static water levels range from 7 to 20 mbgs based on 35 MECP water well records.

5.2.8.4 Regional Groundwater Flow

According to Thames – Sydenham and Region Conceptual Model Report (Schlumberger Water Services Inc., 2011), in the surficial aquifer, the groundwater flow direction is assumed to be strongly controlled by the surface drainages and the topography. The regional flow direction is likely towards Lake Huron with local variability in the vicinity of the surficial agricultural drains. The general groundwater flow direction in bedrock was reported to be northwest.

5.2.8.5 Well Head Protection Areas

Areas that are vulnerable to contamination have been delineated for active municipal wells and are known as Wellhead Protection Areas (WHPA). A WHPA is the area or capture zone surrounding the wellhead where land use activities have the greatest potential to affect the quality of groundwater within the aquifer from which the well derives its source. According to the Thames-Sydenham and Region Source Protection Plan there are no WHPAs within the PSAs.

5.2.8.6 Significant Groundwater Recharge Areas

Surface water received from precipitation will percolate or infiltrate into the ground until it reaches the water table. This occurs in surficial sediments that are permeable and allow for easy movement of water through its pore spaces. Areas such as these are known as recharge areas (**Figure 5-8 of Appendix A**). Significant Groundwater Recharge Areas (SGRAs) are characterized by high permeable soils at surface, such as sand and/or gravel, which allows water to readily pass from the ground surface to an aquifer. These areas are considered significant when they aid in maintaining the water level in an aquifer that provides water for potable means or supplies groundwater to a cold-water ecosystem.

There are no SGRAs within the Sekerton/Corunna and Ladysmith PSAs, the surficial intake protection zone (IPZ) closest to the PSAs is the St. Clair River. These areas are associated with the coarse-textured surficial sediments that primarily exist within the central portion of the PSA. SGRAs are not associated with restrictions pertaining to the construction and operation of petroleum pipelines.

5.2.8.7 Highly Vulnerable Aquifers

A highly vulnerable aquifer (HVA) is one that is susceptible to contamination due to its location near ground surface or the type of material found in the ground around the aquifer. Aquifers that are near the ground surface and have less of a barrier between the ground surface and water below the ground are considered to be HVA.

According to the Thames-Sydenham and Region Source Protection Plan, HVA within the PSA are confined to the ice-contact stratified deposits that transect the central portion of the PSA. No areas designated as HVA were noted to occur, based on Upper Thames River Conservation Authority.

5.3 Biophysical Features

5.3.1 Designated Natural Areas

5.3.1.1 Watershed and Subwatershed

The Study Area is within the St. Clair Region which is divided into 14 tertiary subwatersheds. The St. Clair Region includes the Sydenham River watershed and smaller watersheds that drain directly into southern Lake Huron, the St. Clair River, and northeastern Lake St. Clair (SCRCA, 2019).

Many of the watercourses within the Study Area fall within the St. Clair River Tributaries subwatershed and in smaller areas within the Lower Bear Subwatershed. All water bodies are within the jurisdictional areas of the SCRCA and the Ministry of Natural Resources and Forestry (MNRF), Aylmer District. Based on air photo interpretation, the Study Area is within an area of dynamic agriculturally dominant land use and thus there is an extensive network of field and field edge drainage ditches designed to lower water levels in the surrounding agricultural fields. These drainage ditches and flow conveyance features can potentially contain or support fish habitat but may periodically change configuration through regular farming and maintenance practices.

The legal status of all the drains listed in **Table 5-5** are Municipal. LIO data (MNRF, 2020c) indicates that 90% of the drain reaches within the Study Area are open and all are connected to fish bearing watercourses (further discussed in **Section 5.3.2. below**), thus the above listed drains are likely to support direct fish habitat.

Table 5-5: Water Features within the Study Area Determined through Desktop Review

Connecting Watercourse	Drain Name	Feature ID	Sub-watershed	Thermal Regime
Talfourd Creek	Wellington Drain	Drain 1	St. Clair River Tributaries	LIO (2020) data indicates that Talfourd Creek is a warmwater watercourse. Thermal regime for drain will be confirmed with MNRF.
	Lapier Drain	Drain 2	St. Clair River Tributaries	LIO (2020) data indicates that Talfourd Creek is a warmwater watercourse. Thermal regime for drain will be confirmed with MNRF.
Marsh Creek (drains into)	Allingham Drain	Drain 3	St. Clair River Tributaries	LIO (2020) data indicates that Talfourd Creek is a warmwater watercourse. Thermal regime for drain will be confirmed with MNRF.

Connecting Watercourse	Drain Name	Feature ID	Sub-watershed	Thermal Regime
Talfourd Creek)	McClemens Drain	Drain 4	St. Clair River Tributaries	LIO (2020) data indicates that Talfourd Creek is a warmwater watercourse. Thermal regime for drain will be confirmed with MNRF.
Clay Creek	Cameron Drain	Drain 5	St. Clair River Tributaries	LIO (2020) data indicates that Clay Creek is a warmwater watercourse. Thermal regime for drain will be confirmed with MNRF.
	Coyle Drain	Drain 6	St. Clair River Tributaries	LIO (2020) data indicates that Clay Creek is a warmwater watercourse. Thermal regime for drain will be confirmed with MNRF.
	Cruickshank Drain	Drain 8	St. Clair River Tributaries	LIO (2020) data indicates that Clay Creek is a warmwater watercourse. Thermal regime for drain will be confirmed with MNRF.
Bear Creek	Jarvis Drain	Drain 9	Lower Bear	LIO (2020) data indicates that Bear Creek is a warmwater watercourse. Thermal regime for drain will be confirmed with MNRF.

5.3.1.2 Significant Wetlands

Wetlands are defined under the Provincial Policy Statement (PPS; MMAH, 2020) and the Ontario Wetland Evaluation System (OWES; MNRF, 2014) as follows:

“...lands that are seasonally or permanently covered by shallow water, as well as lands where the water table is close to or at the surface. In either case the presence of abundant water has caused the formation of hydric soils and has favoured the dominance of either hydrophytic plants or water tolerant plants.”

The PPS, implemented under the *Planning Act* (1990), protects Provincially Significant Wetlands (PSWs) from development and site alteration while regulations under the *Conservation Authorities Act* (1990) prohibit certain activities within wetlands (MNRF, 2010). The PPS further specifies that a wetland is considered provincially significant if evaluated as such through the Ontario Wetland Evaluation System (OWES; MNRF, 2014). Until categorized by MNRF, wetlands are classified as “unevaluated”.

PSWs are designated as ‘Environmental Protection’ or other suitable designation in the St. Clair Township Official Plan (2005) and a ‘Group A feature’ in the County of Lambton Official Plan (2019).

Two (2) evaluated wetlands were identified within 120 m of the PSA. The Bickford Oak Woods Wetland Complex and Ladysmith Wetland Complex have both been evaluated as PSWs and are described in **Table 5-6**. No wetlands are located within or immediately adjacent to the proposed preferred pipeline or other infrastructure described above.

Table 5-6: Wetland Records for the Vicinity of the PSA

Wetland Name	Significance	Proximity to the Project
Bickford Oak Woods Wetland Complex	Provincially Significant Wetland	Located directly adjacent to the south of the Ladysmith Storage Pool area.
Ladysmith Wetland Complex	Provincially Significant Wetland	Located directly adjacent to the north and has slight overlap in the northwest corner of the Ladysmith Storage Pool area.

5.3.1.3 Significant Woodlands

Within the County of Lambton, Woodlands are defined as land that is at least one (1) ha or more in area, not including cultivated fruit/nut orchards or Christmas tree plantations, that meet one of the following criteria (County of Lambton, 2012):

- 1000 trees, of any size, per hectare;
- 750 trees, measuring over five (5) centimetres diameter-at-breast-height (DBH), per hectare;
- 500 trees, measuring over twelve (12) centimetres DBH, per hectare; or
- 250 trees, measuring over twenty (20) centimetres DBH, per hectare.

Whereas, woodlots are defined as lands at least 0.2 ha in area, and not more than 1 ha, with numbers at least comparable to the above outlined for woodlands. Cultivated fruit/nut orchards or Christmas tree plantations are also not considered woodlots (County of Lambton, 2019).

Significant woodlands refer to treed areas that provide environmental and economic benefits in an area that is ecologically important in terms of features such as species composition, age of trees and stand history, ecological function, and/or the amount of remaining forest cover in the general landscape (MNRF, 2010). Significant woodlands within the County of Lambton are identified based on Policies 8.4.1 and 8.4.2 of the Official Plan (County of Lambton, 2019). These criteria include, but are not limited to, the size of woodland and its interior, proximity to other natural heritage features, and species composition and diversity (County of Lambton, 2019).

Significant woodlands are designated as 'Environmental Protection' or other suitable designation in the St. Clair Township Official Plan (2005) and a 'Group B feature' in the County of Lambton Official Plan (2019). Further, woodlots other than significant woodlands are designated as 'Group C features' in the County of Lambton Official Plan (2019).

A number of woodlot/woodland patches and significant woodlands, including overlap with a PSW and other natural heritage features, are located within the Study Area, as shown on **Figure 5-9 of Appendix A**. Specifically, woodlots and potentially significant woodlands are located adjacent to project infrastructure works, including installation of the 2.2 km natural gas pipeline connecting the Payne Storage Pool to the Corunna Compressor Station.

5.3.1.4 Significant Valleylands

Valleylands are defined under the PPS (MMAH, 2020) as follows:

"...a natural area that occurs in a valley or other landform depression that has water flowing through or standing for some period of the year."

Significant valleylands are designated as 'Environmental Protection' or other suitable designation in the St. Clair Township Official Plan (2005) and a 'Group B feature' in the County of Lambton Official Plan (2019).

A valleyland is considered significant within the County of Lambton if the lands have a slope of 10 percent or more over a sustained area (County of Lambton, 2019). There is potential for significant valleylands in the vicinity of the PSA; however, significant valleylands have not been comprehensively assessed for the County of Lambton and are not specifically designated on Map 2 of the Official Plan (County of Lambton, 2019). It is possible that significant valleylands occur within the Study Area but likely overlap with other natural heritage features of equal or greater significance (i.e., Group A or Group B features such as PSWs, or significant woodlots).

5.3.1.5 Significant Wildlife Habitat

Wildlife habitat is defined under the PPS (MMAH, 2020) as follows:

“...areas where plants, animals and other organisms live, and find adequate amounts of food, water, shelter and space needed to sustain their populations. Specific wildlife habitats of concern may include areas where species concentrate at a vulnerable point in their annual or life cycle; and areas which are important to migratory or nonmigratory species.”

The PPS further specifies that wildlife habitat is considered significant as follows:

“...ecologically important in terms of features, functions, representation or amount, and contributing to the quality and diversity of an identifiable geographic area or natural heritage system. Criteria for determining significance are recommended by the Province, but municipal approaches that achieve or exceed the same objective may also be used.”

Significant Wildlife Habitat (SWH) is designated as ‘Environmental Protection’ or other suitable designation in the St. Clair Township Official Plan (2005) and a ‘Group B feature’ in the County of Lambton Official Plan (2019).

As the PSA falls within Lake Erie – Lake Ontario Ecoregion 7E, the criteria for determining SWH is outlined in the Significant Wildlife Technical Guide (MNR 2000) and the Significant Wildlife Habitat Criteria Schedules for Ecoregion 7E (MNR 2015). SWH includes habitat for Species of Conservation Concern (SOCC). SOCC includes species designated as Special Concern (MNR 2015) under the *Endangered Species Act, 2007* (ESA), which are not afforded species or habitat protection under the ESA.

In addition to Special Concern species, SOCC includes flora and fauna provincially ranked by the Natural Heritage Information Centre (NHIC) as extremely rare in Ontario (S1), very rare in Ontario (S2) or rare to uncommon in Ontario (S3). SOCC are also considered species listed under Schedule 1 of the federal Species at Risk Act (SARA; 2002). Several Ontario natural heritage databases exist that can be accessed to conduct a screening for existing SOCC records in a given area. The resources outlined in **Section 5.1** above were reviewed to identify SOCC within the vicinity of the PSA. A total of five SOCC were identified for the PSA and are presented in **Table 5-7**.

Table 5-7: Species of Conservation Concern Records for the Vicinity of the PSA

Common Name	Scientific Name	Taxonomic Group	S-Rank ¹	COSEWIC (SARA) Status ²	COSSARO (ESA) Status ³
Silver Lamprey ⁹	<i>Ichthyomyzon unicuspis</i>	Fish	S3	SC	SC
Eastern Wood-pewee ^{4,5,8}	<i>Contopus virens</i>	Bird	S4B	SC	SC
Wood Thrush ^{4,5,8}	<i>Hylocichla mustelina</i>	Bird	S4B	THR	SC
Snapping Turtle ⁶	<i>Chelydra serpentina</i>	Reptile	S3	SC	SC
Monarch ⁷	<i>Danaus plexippus</i>	Insect	S2NS4B	END	SC

Notes: ¹ S-rank: The natural heritage provincial ranking system (provincial S-rank) is used by the MNR Natural Heritage Information Centre (NHIC) to set protection priorities for rare species and natural communities. The following status definitions were taken from NatureServe Explorer’s (2020) National and Subnational Conservation Status Definitions available at <https://explorer.natureserve.org/AboutTheData/Statuses>:

SX - Presumed Extirpated—Species or community is believed to be extirpated from the province. Not located despite intensive searches of historical sites and other appropriate habitat, and virtually no likelihood that it will be rediscovered.

SH - Possibly Extirpated (Historical)—Species or community occurred historically in the province, and there is some possibility that it may be rediscovered. Its presence may not have been verified in the past 20-40 years. A species or community could become SH without such a 20-40-year delay if the only known occurrences in a province were destroyed or if it had been extensively and unsuccessfully looked for.

- S1 - Critically Imperiled—Critically imperiled in the province because of extreme rarity (often 5 or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the province.*
- S2-Imperiled—Imperiled in the province because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the province.*
- S3 - Vulnerable—Vulnerable in the province due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.*
- S4 - Apparently Secure—Uncommon but not rare; some cause for long-term concern due to declines or other factors.*
- S5 - Secure—Common, widespread, and abundant in the nation or state/province.*
- SNR - Unranked—Province conservation status not yet assessed.*
- SU - Unrankable—Currently unrankable due to lack of information or due to substantially conflicting information about status or trends.*
- SNA - Not Applicable—A conservation status rank is not applicable because the species is not a suitable target for conservation activities.*
- S#S# - Range Rank—A numeric range rank (e.g., S2S3) is used to indicate any range of uncertainty about the status of the species or community. Ranges cannot skip more than one rank (e.g., SU is used rather than S1S4).*

²COSEWIC *The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) provides the Canadian government with advice regarding wildlife species that are nationally at risk of extinction or extirpation. Species assessed and designated at risk by COSEWIC may qualify for legal protection and recovery under the SARA. The following are categories of at risk:*

EXT (Extirpated) – A species that no longer exists in the wild in Canada but exists elsewhere.

END (Endangered) – A species facing imminent extirpation or extinction in Canada.

THR (Threatened) – A species that is likely to become an endangered through all or a large portion of its Canadian range if limiting factors are not reversed.

SC (Special Concern) – A species that may become threatened or endangered due to a combination of biological characteristics and identified threats.

NAR (Not at Risk) – A species that has been evaluated and found to be not at risk.

³ESA *The Endangered Species Act, 2007 (ESA) protects species listed as Threatened and Endangered on the Species at Risk in Ontario (SARO) List on provincial and private land. The Minister lists species on the SARO list based on recommendations from the Committee on the Status of Species at Risk in Ontario (COSSARO), which evaluates the conservation status of species occurring in Ontario. The following are the categories of at risk:*

END (Endangered) – A species facing imminent extinction or extirpation in Ontario.

THR (Threatened) – Any native species that, on the basis of the best available scientific evidence, is at risk of becoming endangered throughout all or a large portion of its Ontario range if the limiting factors are not reversed.

SC (Special Concern) – A species that may become threatened or endangered due to a combination of biological characteristics and identified threats.

NAR (Not at Risk) – A species that has been evaluated and found to be not at risk.

⁴ Record obtained from MNRF's Make-a-Map: Natural Heritage Areas Application (2020).

⁵ Record obtained from the OBBA (BSC et al., 2006).

⁶ Record obtained from the ORAA (Ontario Nature, 2019).

⁷ Record obtained from the OBA (Macnaughton et al., 2020).

⁸ Record obtained from the NHIC database (2020).

⁹ Record obtained from the DFO Aquatic Species at Risk Mapping (2020).

5.3.1.6 Areas of Natural and Scientific Interest

ANSIs are areas of land and/or water containing unique natural landscapes or features. These features have been scientifically identified as having life (biological) or earth (geological) science values related to protection, scientific study, and/or education. Life Science ANSIs are dynamic ecosystems that are representative examples of the biodiversity and natural landscapes in Ontario (e.g., forests, valleys, prairies, savannahs, alvars, and wetlands, along with their native flora/fauna and supporting environment; MNRF, 2010).

ANSIs are evaluated for significance by the MNRF and are classified as being provincially, regionally, or locally significant (MNRF, 2010). No ANSIs were identified within the Study Area.

5.3.2 Fish and Fish Habitat

There are nine (9) watercourses located within the Study Area including two (2) drains to Talfourd Creek (Wellington Drain and Lapier Drain), two (2) drains to Marsh Creek (Allingham Drain and McClemens Drain), three (3) drains to a Tributary to Clay Creek (Cameron Drain, Coyle Drain and Cruickshank Drain) and Jarvis Drain to Bear Creek.

Talfourd Creek

Wellington Drain and Lapier Drain have reaches within the Corunna and Seckerton Storage Pools. Wellington Drain has its origin in the wooded area within the Seckerton Storage Pool Area, drains north to Petrolia Line, follows roadside drainage west to Ladysmith Road and continues to flow north as roadside drainage until its confluence with Talfourd Creek. Lapier Drain enters from the west into the northeast corner of the Corunna Storage Pool Area as roadside drainage along Petrolia Line. Lapier Drain then follows the roadside drainage north along Tecumseh Road, then east along Lasalle Line to its confluence with a tributary to Talfourd Creek.

Allingham Drain and McClemens Drain (to Marsh Creek), within the Seckerton Storage Pool Area, are drainage features that merge within the Water Treatment centre and continue to flow through the Treatment Centre until draining into a channelized reach of Marsh Creek. Marsh Creek then drains north to its confluence with Talfourd Creek.

LIO data (MNRF, 2020c) indicates that Talfourd Creek as a warmwater watercourse (based on water temperature data) that supports a fish community assemblage of warmwater and coolwater species (refer to **Table 5-8**).

Table 5-8: Fish Species Known to Inhabit Talfourd Creek

Common Name	Scientific Name	Talfourd Creek	Allingham Drain
Black Bullhead ¹	<i>Ameiurus melas</i>	X	
Blackside Darter ¹	<i>Percina maculata</i>	X	
Bluegill ¹	<i>Lepomis macrochirus</i>	X	X
Bluntnose Minnow ¹	<i>Pimephales notatus</i>		X
Brook Stickleback ^{1 2}	<i>Culaea inconstans</i>	X	X
Central Mudminnow ^{1 2}	<i>Umbra limi</i>	X	X
Common Carp ¹	<i>Cyprinus carpio</i>	X	
Common Shiner ^{1 2}	<i>Luxilus cornutus</i>	X	
Creek Chub ^{1 2}	<i>Semotilus atromaculatus</i>	X	X
Emerald Shiner ¹	<i>Notropis atherinoides</i>	X	
Fathead Minnow ^{1 2}	<i>Pimephales promelas</i>	X	
Golden Shiner ¹	<i>Notemigonus crysoleucas</i>	X	
Green Sunfish ¹	<i>Lepomis cyanellus</i>		X
Johnny Darter ²	<i>Etheostoma nigrum</i>	X	
Northern Redbelly Dace ²	<i>Phoxinus oreas</i>	X	
Northern Pike ¹	<i>Esox lucius</i>	X	X
Pumpkinseed ¹	<i>Lepomis gibbosus</i>	X	X
Rock Bass ¹	<i>Ambloplites rupestris</i>	X	
Rosyface Shiner ¹	<i>Notropis rubellus</i>	X	
Round Goby ¹	<i>Neogobius melanostomus</i>	X	
River Chub ¹	<i>Nocomis micropogon</i>	X	
Sand Shiner ¹	<i>Notropis stramineus</i>	X	
Spotfin Shiner ¹	<i>Catostomus commersonii</i>	X	
White Sucker ^{1 2}	<i>Catostomus commersoni</i>	X	
Yellow Bullhead ¹	<i>Ameiurus natalis</i>	X	

Note: 1. LIO data (MNRF, 2020c)
2. SCRCA, 2009

Tributary to Clay Creek

Cameron Drain has its origin within the Seckerton Storage Pool Area and drains west, parallel to Rokeby Line, through the Study Area into Coyle Drain. Cruickshank Drain runs east to west, parallel to Proposed NPS 24 Pipeline and drains into Coyle Drain. Coyle Drain drains south parallel to the east-west alignment of the Proposed NPS 24 Pipeline, as roadside drainage to Ladysmith Road, and continues south to run parallel to the west boundary of the Ladysmith Storage Pool Area. Coyle Drain then flows through the Bickford Oak Woods Wetland Complex (ANSI) into Clay Creek approximately 4.5 km downstream of the southwest corner of the Ladysmith Storage Pool Area.

LIO data (MNRF, 2020c) indicates that Clay Creek is a warmwater watercourse (based on fish species present) that supports a fish community assemblage of warmwater and coolwater species (refer to **Table 5-9**).

Table 5-9: Fish Species Known to Inhabit Clay Creek

Common Name	Scientific Name
Black Crappie ¹	<i>Pomoxis nigromaculatus</i>
Bluegill ¹	<i>Lepomis macrochirus</i>
Brown Bullhead ¹	<i>Ameiurus nebulosus</i>
Central Mudminnow ^{1 2}	<i>Umbra limi</i>
Common Carp ¹	<i>Cyprinus carpio</i>
Common Shiner ¹	<i>Luxilus cornutus</i>
Fathead Minnow ¹	<i>Pimephales promelas</i>
Freshwater Drum ¹	<i>Aplodinotus grunniens</i>
Freshwater Tubenose Goby ¹	<i>Proterorhinus semilunaris</i>
Golden Shiner ²	<i>Notemigonus crysoleucas</i>
Green Sunfish ¹	<i>Lepomis cyanellus</i>
Largemouth Bass ¹	<i>Micropterus salmoides</i>
Northern Pike ^{1 2}	<i>Esox lucius</i>
Pumpkinseed ¹	<i>Lepomis gibbosus</i>
Rosyface Shiner ¹	<i>Notropis photogenis</i>
Spotfin Shiner ^{1 2}	<i>Cyprinella spiloptera</i>
Spotail Shiner ¹	<i>Notropis hudsonius</i>
Tadpole Madtom ¹	<i>Noturus gyrinus</i>
White Sucker ^{1 2}	<i>Catostomus commersonii</i>

Notes: 1. LIO data, 2020
2. SCRCA, 2009

Bear Creek

Jarvis Drain has its origin east of the Seckerton Storage Pool Area and runs south parallel to Tecumseh Road as roadside drainage to the Ladysmith Storage Pool Area. Jarvis Drain continues along the east side of Tecumseh Road, past the Study Area to its confluence with Bear Creek approximately 7.5 km downstream from the southeast corner of the Ladysmith Storage Pool Area.

LIO data (MNRF, 2020c) indicates that Bear Creek is a warmwater watercourse (based on water temperature data) that supports a fish community assemblage of warmwater and coolwater species (refer to **Table 5-10**).

Table 5-10: Fish Species Known to Inhabit Bear Creek

Common Name	Scientific Name
Bluegill ¹	<i>Lepomis macrochirus</i>
Black Bullhead ¹	<i>Ameiurus melas</i>

Common Name	Scientific Name
Blackside Darter ¹	<i>Percina maculata</i>
Blackstripe Topminnow ¹	<i>Fundulus notatus</i>
Brook Stickleback ¹	<i>Culaea inconstans</i>
Channel Catfish ¹	<i>Ictalurus punctatus</i>
Pumpkinseed ¹	<i>Lepomis gibbosus</i>
Fathead Minnow ¹	<i>Pimephales promelas</i>
Green Sunfish ¹	<i>Lepomis cyanellus</i>
Johnny Darter ¹	<i>Etheostoma nigrum</i>
Logperch ¹	<i>Percina caprodes</i>
Redfin Shiner ¹	<i>Lythrurus umbratilis</i>
Rock Bass ¹	<i>Ambloplites rupestris</i>
Tadpole Madtom ¹	<i>Noturus gyrinus</i>
White Crappie ¹	<i>Pomoxis annularis</i>
White Sucker ¹	<i>Catostomus commersonii</i>
Yellow Bullhead ¹	<i>Ameiurus natalis</i>
Yellow Perch ²	<i>Perca flavescens</i>

Note: 1. LIO data (MNRF, 2020c)
2. SCRCA, 2018

Agriculture and Roadside Drainage

DFO drainage classification was reviewed to assess habitat sensitivity within the numerous drains that transect the Study Area. Drainage classification is determined by a combination of flow periodicity (i.e., permanent vs. intermittent), thermal regime, fish community assemblage, time since last clean out (i.e., naturalization factor) (DFO, 2017). The classification system provides an indication of fish habitat sensitivity in the drain and the level of approval required for drainage maintenance. For the purposes of this Project, reference to drainage classification is intended to infer if a drain is classified as direct fish habitat and if sensitive habitat is present in the drain. Wellington, McClemens and Cameron Drains were classified as Class F. Class F drains have intermittent flow regimes, may provide indirect or seasonal fish habitat and requires, no authorization if work can be done when drain is dry, frozen, or there is no flow (DFO, 2017). However, in-water work that occurs during a period of flow (e.g., spring), a site-specific review would be required (DFO, 2017). Coyle Drain and Jarvis Drain were classified as Class E. Class E drains have permanent flow regime, warmwater thermal regime, is direct fish habitat and may have sensitive fish species present (DFO, 2017).

Aquatic Species at Risk

According to DFO's aquatic SAR mapping (DFO, 2020), there are records for Silver Lamprey within the Coyle and Cruickshank Drain within the Study Area. Silver Lamprey is designated as Special Concern under both the provincial ESA and the federal SARA. Federally, Silver Lamprey is listed under Schedule 1. Species that are listed as Special Concern under Schedule 1 of SARA receive management initiatives under SARA to prevent them from becoming Endangered and Threatened, but do not receive individual or habitat protection. Additionally, Special Concern species are not provided species or habitat protection under the provincial ESA.

Although, Bear Creek contains records for several aquatic SAR, DFO mapping does not apply these records upstream into Jarvis Drain. However, DFO drainage classification lists Jarvis Drain as a Class E drain which indicates that there may be sensitive fish species present. Continued agency correspondence and fish habitat assessments are required to confirm the likelihood of aquatic SAR presence.

5.3.3 Habitat of Threatened and Endangered Species

Under the ESA, species listed as Threatened or Endangered receive individual species and habitat protection and are referred to as SAR. Habitat of Threatened and Endangered Species are designated as ‘Environmental Protection’ or other suitable designation in the St. Clair Township Official Plan (2005) and a ‘Group A feature’ in the County of Lambton Official Plan (2019).

The review of SAR records identified the potential for ten (10) SAR within the vicinity of the PSA, which are outlined in **Table 5-11**.

Table 5-11: Threatened and Endangered Species Records for the Vicinity of the PSA

Common Name	Scientific Name	Family	S-Rank ¹	COSEWIC (SARA) Status ²	COSSARO (ESA) Status ³
Barn Swallow ⁴	<i>Hirundo rustica</i>	Bird	S4B	THR	THR
Bobolink ⁴	<i>Dolichonyx oryzivorus</i>	Bird	S4B	THR	THR
Eastern Meadowlark ⁴	<i>Sturnella magna</i>	Bird	S4B	THR	THR
Butler’s Gartersnake ⁵	<i>Thamnophis butleri</i>	Reptile	S2	END	END
Eastern Foxsnake (Carolinian Population) ⁵	<i>Pantherophis gloydi</i>	Reptile	S2	END	END
Massasauga (Carolinian Population) ⁶	<i>Sistrurus catenatus</i>	Reptile	S1	END	END
Eastern Small-footed Myotis ⁷	<i>Myotis leibii</i>	Mammal	S2S3	N/A	END
Little Brown Myotis ⁸	<i>Myotis lucifugus</i>	Mammal	S3	END	END
Northern Myotis ⁸	<i>Myotis septentrionalis</i>	Mammal	S3	END	END
Tri-colored Bat ⁷	<i>Perimyotis subflavus</i>	Mammal	S3	END	END

Notes: ¹⁻³ See notes under **Table 5-7** in **Section 5.3.1.5**.
⁴Record obtained from the OBBA (BSC et al., 2006).
⁵ Record obtained from the ORAA (Ontario Nature, 2019).
⁶Record obtained from the NHIC database (2020).
⁷Record obtained from the Species at Risk in Ontario Recovery Strategy Range Maps.
⁸ obtained from the Bat Conservation International Range Maps (BCI 2020).

The record for Massasauga (Carolinian Population) outlined in **Table 5-11** occurred in 1962 and is therefore considered historical; it is unlikely that this species persists within the vicinity of the PSA. Although the historical range was much larger, Massasaugas (Carolinian Population) can now only be found at the Ojibway Prairie in Windsor/LaSalle and at Wainfleet Bog near Port Colborne (COSEWIC, 2012). Descriptions of all ten (10) threatened or endangered SAR identified through the background review are outlined in **Table 5-12** below.

Table 5-12: Description of Threatened and Endangered Species at Risk with Potential Habitat for the Vicinity of the PSA

Threatened or Endangered Species	Species Description
Barn Swallow	Barn Swallows often live in close association with humans, building their cup-shaped mud nests almost exclusively on human-made structures such as open barns, under bridges, and in culverts. The species is attracted to open structures that include ledges where they can build their nests, which are often re-used from year to year (COSEWIC, 2011a). This species can typically be associated with the following ELC (Lee et al., 1998) communities: TPO, CUM1, MAM, MAS, OAO, SAS1, SAM1, SAF1; containing or adjacent structures that are suitable for nesting. The Barn Swallow may be found throughout southern Ontario and can range as far north as Hudson Bay, wherever suitable locations for nests occur (COSEWIC, 2011a).

Threatened or Endangered Species	Species Description
Bobolink	Historically, Bobolinks lived in North American tallgrass prairie and other open meadows. With the clearing of native prairies, Bobolinks moved to living in hayfields. Bobolinks often build their small nests on the ground in dense grasses. Both parents usually tend to their young, sometimes with a third Bobolink helping (COSEWIC, 2010a). This species can typically be associated with the following ELC (Lee <i>et al.</i> , 1998) communities: TPO, TPS, CUM1 and MAM2. The Bobolink breeds across North America. In Ontario, it is widely distributed throughout most of the province south of the boreal forest, although it may be found in the north where suitable habitat exists (COSEWIC, 2010a).
Eastern Meadowlark	Eastern Meadowlarks breed primarily in moderately tall grasslands, such as pastures and hayfields, but are also found in alfalfa fields, weedy borders of croplands, roadsides, orchards, airports, shrubby overgrown fields, or other open areas (COSEWIC, 2011b). Small trees, shrubs, or fence posts are used as elevated song perches (COSEWIC, 2011b). This species can typically be associated with the following ELC (Lee <i>et al.</i> , 1998) communities: TPO, TPS, CUM1, CUS, and MAM2 with elevated song perches. In Ontario, the Eastern Meadowlark is primarily found south of the Canadian Shield, but it also inhabits the Lake Nipissing, Timiskaming, and Lake of the Woods areas (COSEWIC, 2011b).
Butler's Gartersnake	The Butler's Gartersnake prefers open, moist habitats, such as dense grasslands and old fields, with small wetlands where it can feed on leeches and earthworms (COSEWIC, 2010b). Burrows made by small mammals and even crayfish are sometimes used as hibernation sites, called hibernacula. This species is also commonly found in rock piles or old stone walls (COSEWIC, 2010b). This species can typically be associated with the following ELC (Lee <i>et al.</i> , 1998) communities: CUM and MAM. The only place in the world where Butler's Gartersnake is found is in the lower Great Lakes region. In Ontario, this snake is concentrated in two areas, within 10 kilometres of the Detroit River, Lake St. Clair, the St. Clair River, and Lake Huron from Amherst Point to Errol, in Essex and Lambton counties, and Luther Marsh, in Dufferin and Wellington counties (COSEWIC, 2010b).
Eastern Foxsnake (Carolinian Population)	Eastern Foxsnakes in the Carolinian population are usually found in old fields, marshes, along hedgerows, drainage canals, and shorelines (COSEWIC, 2008). Females lay their eggs in rotting logs, manure, or compost piles, which naturally incubate the eggs until they hatch (COSEWIC, 2008). During the winter, Eastern Foxsnakes hibernate in groups in deep cracks in the bedrock and in some man-made structures (COSEWIC, 2008). The Eastern Foxsnake is only found in Ontario, Michigan, and Ohio. Ontario contains 70% of their range in two distinct populations: the Carolinian population in southwestern Ontario and the eastern Georgian Bay population. Within Ontario, the species' distribution is highly disjunct, occupying three discrete regions along the Lake Erie-Lake Huron waterway shoreline (COSEWIC, 2008).
Eastern Small-footed Myotis	Individuals of this species may roost alone or in small maternity colonies (Humphrey, 2017). This species is one of the rarest bats in eastern North America and was one of the rarest even prior to the introduction of White Nose Syndrome (MNR, 2019a). As such, summer habitat use by this species in Ontario is poorly understood, but elsewhere in its range it primarily roosts in open, sunny rock habitats, including cracks and crevices in cliffs and boulders, in talus slopes, beneath stones on rock barrens and in rock outcrops containing crevices as well as, occasionally, in buildings (Humphrey, 2017). Similar to other bat SAR, Eastern Small-footed Myotis mate during the late summer/fall swarming period at or near their hibernacula (Humphrey, 2017). This species hibernates in caves and abandoned mines, preferring colder, drier sites (MNR, 2019a).
Little Brown Myotis	During daylight hours in the spring and summer, Little Brown Myotis roosts in cavities of canopy trees in forests, in rock crevices, as well as anthropogenic structures such as barns, attics of buildings, and under bridges (COSEWIC, 2013). Individuals may roost alone, but females typically congregate to give birth and raise pups in maternity colonies (COSEWIC, 2013). This species is most active in the few hours after dusk, when it emerges from its roost to forage for insects (MNR, 2018b) in open habitats, such as ponds and open canopy forests (Environment Canada (EC), 2015). Little Brown Myotis swarm during the late summer and fall in and around hibernacula, during which mating occurs (COSEWIC, 2013; EC, 2015). This species hibernates from October or November through March or April, most often in caves or abandoned mines that are humid and remain above freezing (MNR, 2019b).
Northern Myotis	This species is primarily forest-dwelling (Owen <i>et al.</i> , 2002). It is often associated with old growth mixed or coniferous forests and is known to form day and maternity colonies under loose bark or in tree cavities (COSEWIC, 2013; MNR, 2019c). Unlike other bats, this species rarely roosts in anthropogenic structures (COSEWIC, 2013). This species typically forages in gaps or edges or over streams within or along forests (EC, 2015). Breeding occurs during late summer/fall swarming periods,

Threatened or Endangered Species	Species Description
	and during winter (COSEWIC, 2013). This species hibernates most often in caves or abandoned mines beginning in October or November until March or April (MNRF, 2019c).
Tri-colored Bat	This species is rare and has a scattered distribution in southern Ontario (MNRF, 2019d). Tri-colored Bat is known to roost in clusters of dead leaves that have accumulated on limb crotches or on broken branches of live or recently dead oak (<i>Quercus</i> spp.) or maple (<i>Acer</i> spp.) trees (Perry and Thill, 2007) within forested habitats and occasionally in anthropogenic structures (MNRF, 2019d). The Tri-colored Bat forages over water and along streams in the forest where it eats flying insects and spiders (MNRF, 2019d). At the end of the summer, individual bats swarm to an overwintering location generally underground or in a cave (MNRF, 2019d). Similar to other bat SAR, mating occurs during swarming in late summer/fall that typically occurs at or near hibernacula (EC, 2015; Randall and Broders, 2014). Individual overwintering bats typically roost by themselves rather than as part of a group (MNRF, 2019d); they often roost in the deepest part of the cave where temperature is the least variable (COSEWIC, 2013; EC, 2015).

5.4 Socio-economic Features

5.4.1 Population and Economic Profile

5.4.1.1 Population

Table 5-13 provides a snapshot of the population in St. Clair Township in comparison to the County of Lambton.

Table 5-13: Population of St. Clair Township and the County of Lambton (2011 and 2016 Census of Population)

	Population, 2011	Population, 2016	Population Percentage Change, 2011 to 2016
St. Clair Township	14,515	14,086	-3.0
County of Lambton	126,199	126,638	0.3

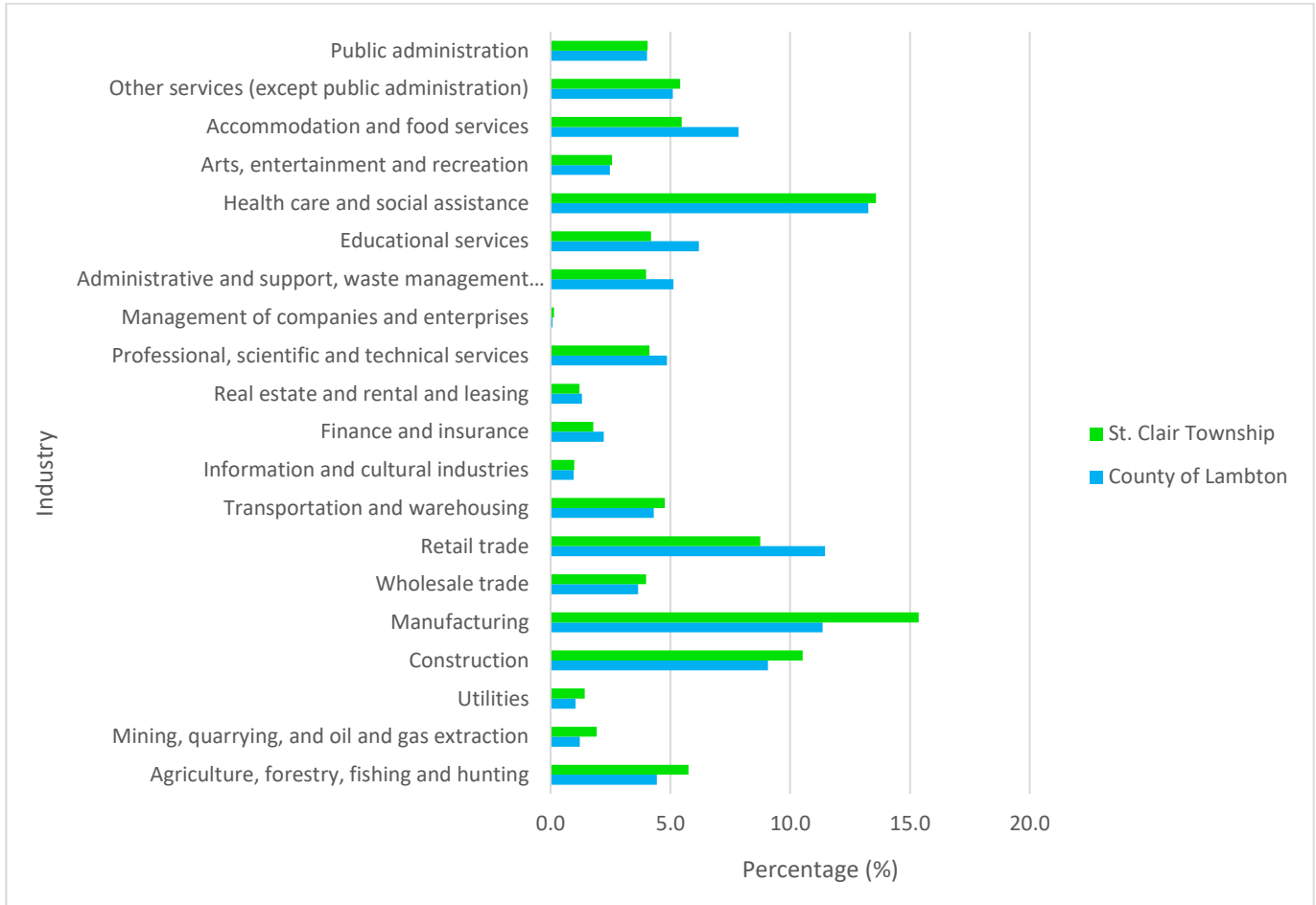
Source: Statistics Canada, 2016 Census of Population

A report published by the County of Lambton's Infrastructure and Development Services Office noted a population increase of 178 people in St. Clair Township in 2019 from 2018, which brought the estimated population total to 14,755. This is a 4.7% increase compared to the 2016 population noted in **Table 5-13** above. This population growth rate is higher than the 3.7% population increase projected for the County of Lambton as a whole to 2041 (Ontario Ministry of Finance, 2019).

5.4.1.2 Employment

Figure 5-10 illustrates the proportion of employment by industry sector for St. Clair Township as compared to the County of Lambton in 2016. For the most part, the total employment among the major industry sectors within St. Clair Township and the County of Lambton are very similar and comparable. Manufacturing, healthcare and social assistance, construction and retail trade are major employment sectors within St. Clair Township (15.4%, 13.6%, 10.5%, 8.7%, respectively) and the County of Lambton (11.4%, 13.3%, 9.1% and 11.5%, respectively). The proportion of total employment in the management of companies and enterprises and information and cultural industries is small for both St. Clair Township and the County of Lambton (0.1% and 1%, respectively).

Figure 5-10: Proportion of Employment by Industry Sector (Statistics Canada, 2017)



5.4.2 Existing Land Uses

The County of Lambton Official Plan (2019) was reviewed to determine the land use designations within 500 m of the Project. Land use within the Study Area include “Agricultural Area,” “Gas Compressor Station” and “Petrochemical Industrial Land” (**Figure 5-11 of Appendix A**). These land use designations are further separated in the Zoning By-laws of St. Clair Township. While the zoning designations generally restrict land use to agricultural, industrial and environmental protection, Section 4.1.5 and 4.1.6 of Zoning By-law 17 of 2003 permits the uses of pipelines and petroleum wells within all zoning designations (St. Clair Township, 2003).

5.4.2.1 Agricultural Area

Lands designated as Agricultural Area contain the lands most suitable for agricultural production and the majority of agricultural designated land in Lambton is recognized as prime agricultural lands. The primary land use activity within this policy area is agricultural uses of all sizes, types and intensities. Proposals to change the use of land to non-agricultural uses will be restricted in accordance with the policies of the Official Plan. However, aggregate, oil and gas extraction and accessory uses are permitted in the Agricultural Area in accordance with Provincial Policy and Legislation, and the Mineral Resource Policies of the Official Plan (County of Lambton, 2019).

St. Clair Township zoning designations within Agricultural Area lands in the Study Area include:

- Agricultural (A1 and A1-3); and
- Environmental Protection – Woodlot (EP-WD).

5.4.2.2 Gas Compressor Station

Lands designated as Gas Compression Station contain land that supports the continued operation of natural gas compressor facilities associated with natural gas storage and transmission and allows for expansion or compatible uses. The primary activities permitted within this policy area are those related to the storage, regulation of flow and transmission and distribution of natural gas (County of Lambton, 2019). The County of Lambton Official Plan (2019) advises that new or expanding uses shall be compatible with the natural heritage policies of the plan and that facilities are designed to minimize the amount of agricultural land taken out of production.

St. Clair Township zoning designations within Gas Compressor Station lands in the Study Area include:

- Agricultural Industrial (M5-1, M5-2 and M5-4).

5.4.2.3 Petrochemical Industrial Land

The Petrochemical Industrial Land designation recognizes the role to accommodate the demand for industrial land by major petrochemical companies that require sites with locational and other advantages while keeping with the overall economic development strategy of the County of Lambton. Petrochemical Industrial Lands are intended to accommodate existing and future large-scale industrial uses that are inappropriate elsewhere and are within close proximity to a range of transportation corridors (County of Lambton, 2019). The County of Lambton Official Plan (2019) encourages local municipalities to permit other land uses that may be compatible with this type of land designation (i.e., manufacturing, office development, industrial, etc.) where appropriate.

St. Clair Township zoning designations within Petrochemical Industrial Lands in the Study Area include:

- Agricultural (A1 and A1-ND8);
- Environmental Protection – Woodlot (EP-WD); and
- Industrial Type 3 (M3).

5.4.3 Residents, Farms and Businesses

The majority of properties adjacent to the Project are currently being used for rural residential and farming/agriculture (soybean fields, animal production, grain farms, etc.) purposes. There are also industrial petrochemical operations adjacent to the west of the Seckerton Storage Pool.

5.4.4 Indigenous Communities and Interests

The Ontario First Nations Map and Treaties Map (Ministry of Indigenous Affairs, 2017) were reviewed to identify any Indigenous reserves, settlements and treaties within the Study Area. No reserves or settlements were identified within the Study Area; however, the Project is located within the limits of Treaty No. 29 on July 10, 1827 between the Crown and the Chippewa Nation.

5.4.5 Institutional Services and Facilities

There are no institutional services and facilities, including schools or religious institutions located within the Study Area.

5.4.6 Recreation and Tourism

There are no recreational or tourism facilities, including protected areas, Crown Lands, Provincial Parks or Conservation Reserves/Areas located within the Study Area.

5.4.7 Infrastructure

Existing infrastructure within the Study Area is illustrated on **Figure 5-12 of Appendix A**.

5.4.7.1 Local Roads

The roads within the Study Area are a mix of narrow gravel roads and paved two-lane roads. While the paved two-lane roads appear to be significant transportation routes linking the small rural communities around the Study Area together, the gravel roads do not appear to be significant transportation routes. The roads can be subdivided into three categories: Ministry of Transportation (MTO) Roads, County Roads and Township Roads. According to the County of Lambton Official Plan (2019), the minimum width for all County Roads is 30 m and according to the St. Clair Township Official Plan (St. Clair Township, 2005), the minimum width for Township Roads varies between 20-30 m depending on the classification of Township Roads (i.e., arterial, collector, local).

5.4.7.2 Railways

There are no railways crossed by the Preferred Pipeline Route or in proximity to other infrastructure works in the Study Area.

5.4.7.3 Electricity Infrastructure

Based on electricity infrastructure layers available, Hydro One transmission lines and easements are present in the PSA. The proposed works at TL9H will require a drill rig to cross under large tower transmission lines to access the site. Approval from Hydro One may be required. Further, current discussions with the landowner are ongoing to determine a suitable location for a permanent laneway crossing under hydro transmission lines at TL8. In addition, the Preferred Pipeline Route will cross through a Hydro One easement in which a crossing agreement may also be required. Lastly, the proposed works for the Crossover Station may encroach in an existing Hydro One easement, however, while at the time of writing this report, the design details for this site have not determined the encroachment level.

5.4.7.4 Natural Gas Pipelines

There are numerous existing natural gas pipelines within or adjacent to the Study Area. A natural gas pipeline exists perpendicular to the Preferred Pipeline Route and Corunna Compressor Station and also extends north and south through the Corunna Storage Pool. Two natural gas pipelines also extend east and west through the southern portion of the Seckerton Storage Pool. Further, a network of natural gas pipelines exists south of the Preferred Pipeline Route and north of the Ladysmith Storage Pool with one branch of the pipeline network intersecting the Proposed Crossover Station.

5.4.7.5 Other Utilities

A variety of buried and overhead utilities (i.e., phone lines, fibre optic cables, watermains) may be located within to the Study Area. Enbridge will locate buried and overhead utilities prior to construction.

5.4.8 Archaeological Resources

A Stage 1 archaeological assessment was conducted to meet the requirements of the MHSTCI's *Standards and Guidelines for Consultant Archaeologists* in accordance with the *Ontario Heritage Act*, R.S.O. 1990, c. 0.18. The Stage 1 background study identified known archaeological sites, areas subject to previous assessments and evaluated the potential for archaeological resources to be present on undisturbed land according to provincial criteria.

The Stage 1 archaeological assessment involved:

- review of relevant archaeological literature and assessment reports pertaining to the Study Area,
- examination of the Provincial Archaeological Sites Database; and
- review of historic maps, literature and archival materials as they relate to possible archaeological concerns.

A Stage 1 archaeological assessment report was written and submitted to the Ontario MHSTCI for review and acceptance into the register of archaeological reports (see **Appendix D**). This document provides the results of the background study, property inspection and evaluation of archaeological potential. The report concluded with a recommendation of a Stage 2 archaeological assessment and advised of the appropriate Stage 2 assessment strategy as well as indicated what areas are cleared of archaeological concerns.

The Stage 1 archaeological assessment has identified there are five (5) previously registered archaeological sites within 1 km of the Study Area boundaries, including three (3) Euro-Canadian, one (1) pre-contact, and one multi-component site.

AECOM's Stage 1 background study for the Enbridge 2021/2022 Storage Enhancement Project has determined that the potential for the recovery of both First Nation and 19th century Euro-Canadian archaeological resources within the current Study Area is high. Based on these findings, Stage 2 archaeological assessment is recommended for all areas of potentially undisturbed land within the Study Area limits.

5.4.9 Heritage Resources and Cultural Heritage Landscape

A preliminary screening for cultural heritage resources within 50 m of the Project Study Area was undertaken. The background historical research, including a preliminary historic map review, consultation with St. Clair Township, and completion of the MHSTCI's *Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes, a Checklist for the Non-Specialist* (2016; hereafter MHSTCI Checklist), indicates that the Study Area does not contain Listed or Designated Part IV cultural heritage resources.

5.4.10 Contaminated Sites

A Record of Site Condition (RSC) summarizes the environmental condition of a property, based on the completion of environmental site assessments (MECP, 2019). Environmental site assessments help identify any contaminants or potentially contaminating activity on a property when compared to the applicable Site Condition Standards (SCS). In preparation for the Storage Enhancement Project work, AECOM reviewed the MECP's Environmental Site Registry to determine whether any RSC's have been filed in the area of the proposed work during the time

periods of October 1, 2004 and June 30, 2011 (MECP, 2017a) and since July 1, 2011 (MECP, 2017b). No RSCs were identified within the PSA.

AECOM also reviewed the Federal Contaminated Sites Inventory (Treasury Board of Canada Secretariat, 2018) and no federal contaminated sites were identified within the PSA.

5.4.11 Landfill/Waste Disposal Sites

The MECP's map of large landfills in Ontario (MECP, 2020a) was reviewed to identify any landfill/waste disposal sites within the PSA. No large landfill sites were identified in the Study Area. A review of MECP's list of small landfill sites (MECP, 2018) indicated that there are five small landfill sites in St. Clair Township with an 'Open' status. It is unknown if there are any small landfill sites in the Study Area because the street address of the sites is unavailable. Additionally, it is currently unknown whether any of the small landfill sites identified in St. Clair Township will receive contaminated soils.

6. Effects Identification, Assessment and Mitigation

6.1 Project Activities

6.1.1 Construction

Construction of the Project is anticipated to be complete in Fall of 2022. The pipeline construction process generally followed by Enbridge includes the following activities:

1. A pre-construction crew prepares the site by pruning and/or removing trees and shrubs as required from the construction areas before the breeding bird nesting period (April 1st -August 31st) with the intent of limiting the clearing as much as feasible. Tree and shrub removal typically occur during the winter of the year of construction to avoid the breeding and nesting period.
2. The construction area gets prepped for the construction work by installing environmental (silt fencing) and safety fencing (orange construction fence) at the required locations. Aspects of any traffic management plans such as signage installation and the establishment of alternative vehicle/pedestrian access are also implemented at this time.
3. Topsoil stripping/grading and storage occurs to prevent mixing will commence prior to trench excavation.
4. The trench for the pipeline is excavated. Laneway and driveway access are maintained as requested and where feasible.
5. The pipe is laid adjacent to the trench. Then various segments of the pipeline are welded together before they are lowered into the trench.
6. The installed pipeline is backfilled with suitable material.
7. The pipeline is tested hydrostatically with surface water from nearby sources or water trucked to the site. Once hydrostatic testing has been completed, the water is drained to a suitable area, and according to permitting requirements, the pipeline is dried, purged of air and then filled with natural gas.
8. Re-establishment of pre-construction conditions, including clean-up and repairs to roads, driveways, fences; disposal of debris; and seeding disturbed areas, ditch banks and drainage to feature crossings.
9. Post-construction monitoring to ensure that mitigation measures have been successful, including additional mitigation measures as necessary to correct any issues.

The construction process for drilling storage wells typically includes the following activities:

1. A pre-construction crew typically prepares the site by pruning and/or removing trees and shrubs, if required, from the construction areas before the breeding bird nesting period (April 1st -August 31st) with the intent of limiting the clearing as much as feasible. Tree and shrub removal typically occur during the winter of the year of construction to avoid the breeding and nesting period.
2. The construction area gets prepped for the construction work by installing environmental (silt fencing) and safety fencing (orange construction fence) at the required locations. Aspects of any

traffic management plans such as signage installation and the establishment of alternative vehicle/pedestrian access are also implemented at this time.

3. Once the location of the well is determined and if it is located in an undisturbed area, topsoil is stripped in areas needed for access roads (either permanent or temporary) or drilling pads (see **Appendix G**). Following topsoil stripping, the entire work area is overlain with geotextile and granular material to ensure the site has adequate equipment bearing capabilities.
4. During drilling, several vehicles must service the rig, including cement trucks, water trucks and other service vehicles.
5. Rotary Drilling Rigs will be used for well drilling. A typical well site layout for Rotary Drilling Rigs is shown in **Appendix G**.
6. When drilling has been completed, the rig is moved off-site, the granular drilling pad is reduced to approximately 12 m by 12 m surrounding the wellhead, and the native topsoil reinstalled. Areas disturbed by drilling are restored by chisel ploughing, disking or subsoiling during dry conditions.

For upgrades and pressure tests to existing natural gas storage wells and oil wells, existing laneways and work areas will be used. If no laneway is present, steel plates will be installed to provide access to existing work areas and will be removed after upgrades and pressure tests are completed.

6.1.2 Operation and Maintenance

The Project is planned to be in service by 2022. Once the Project components have been put into service, the following maintenance activities are undertaken:

- Regularly scheduled surveys and/or air surveillance are conducted to determine the presence of soil erosion and third-party structures or activities that could damage the pipeline.
- Protective systems will be maintained to prevent and mitigate corrosion along the pipeline or new storage wells.
- The stations and valves will be inspected and maintained regularly.
- Inline inspections of the pipeline and wells will be completed to ensure continued safe and reliable operation.

6.2 Potential Effects

6.2.1 Geological Resources

Potential Effects

Aggregate resources have not been identified in the PSAs and therefore there is no associated potential effect.

Geological hazards, in the form of seismic activity, are not likely to occur in the PSAs; therefore, no potential effects are anticipated.

Mitigation Measures

There are no mitigation measures required for potential effects on geological resources.

6.2.2 Soil Resources

Potential Effects

Potential environmental effects on soil resources in active agricultural areas during construction and operation of the Project include:

- Reduction in soil capability (quality) from mixing, compaction and rutting risk, accidental contaminant spills, and erosion;
- Reduction in soil thickness and change in soil distribution from wind and water erosion and soil handling;
- Changes to surface and subsurface drainage patterns from changes in topography; and
- Effects to surface water drainage patterns as a result of crushing or severing agricultural tiles.

Construction activities (e.g., excavation, use of heavy equipment, stripping and stockpiling of soil and dewatering discharge) may cause changes in soil quality through processes such as mixing, compaction, rutting, and wind and water erosion. These processes may alter soil capability, thickness and structure, resulting in reduced soil productivity because of impaired soil fertility and rooting zone. Also, construction activities that damage existing agricultural tiles, changes the topography, or results in inadequate control of surface runoff and dewatering discharge has the potential to cause soil erosion of adjacent agricultural areas.

General construction activities such as vehicle and machinery operation also has the potential to change soil quality through minor contaminant releases. Spills consisting of materials that constitute a contaminant may affect soils and will therefore have to be managed.

Mitigation Measures

Table 6-1 identifies potential effects, proposed mitigation and net effects on soil resources that might occur during the construction and operation of the Project.

Table 6-1: Potential Effects, Proposed Mitigation, and Net Effects on Soil Resources

Potential Effect	Proposed Mitigation Measures	Net Effects
Reduction in topsoil quantity and quality due to mixing and compaction	<ul style="list-style-type: none"> ■ Consult with landowners regarding preferred topsoil handling measures (e.g. no stripping or additional stripping and potential storage preferences to avoid mixing of topsoil and subsoil). ■ Steel plates will be used, where required, to access existing wells which will prevent soil mixing and erosion. ■ During periods of high wind, apply mitigation measures to limit the erosion of topsoil (e.g. suspending earth moving, use of dust suppressants and protection of stockpiles). ■ Avoid construction activities during seasonally wet periods (i.e., spring), high volume rain events (20 mm in 24 hours) and significant snow melts / thaws, where possible, to avoid risk of erosion, soil mixing and compaction or the potential for sediment release into the surrounding area. ■ If excessively wet soil conditions are encountered, temporarily halt construction per Enbridge’s standard wet soils shutdown practice. ■ Keep all equipment within identified work areas and confine construction activities to the narrowest area practical to minimize disturbance of adjacent soils. 	<ul style="list-style-type: none"> ■ Reduction in topsoil quality due to mixing and compaction will be minimized through the effective implementation of mitigation measures. – <i>Low likelihood of occurrence with the adherence to Enbridge construction standards and limited magnitude of effects following the application of mitigation measures.</i>

Potential Effect	Proposed Mitigation Measures	Net Effects
	<ul style="list-style-type: none"> ▪ If compaction occurs, a qualified individual should determine if compaction relief is necessary. Relief measures should be discussed with landowners prior to taking place. 	
<p>Reduction in soil quality and quantity due to erosion and sedimentation resulting from excavation, use of heavy equipment and stockpiling of cleared materials.</p>	<ul style="list-style-type: none"> ▪ Develop plans for erosion and sediment control to minimize the potential for construction related sediment release (Erosion and Sediment Control Plan Guideline) and prepare condition reports as part of the monitoring and maintenance plan. ▪ Maintain undisturbed buffer strips around watercourses, waterbodies and/or natural features, where possible. ▪ Re-vegetate or stabilize exposed sites as soon as possible following disturbance using species native to the area to limit the duration of soil exposure. ▪ Maintain roadside ditches in good condition to avoid diversion of drainage ditch water into the construction area. ▪ Grade disturbed or remediated slopes or stockpiles to a stable angle to avoid slope instability and reduce erosion. ▪ Keep all equipment within identified work areas and confine construction activities to the narrowest area practical to minimize disturbance of adjacent soils. ▪ Remove construction debris from the site and stabilize it to prevent it from entering the nearby waterbodies. ▪ Avoid construction activities during seasonally wet periods (i.e., spring), high volume rain events (20 mm in 24 hours) and significant snow melts / thaws, where possible to avoid risk of erosion, soil compaction or the potential for sediment release into the surrounding area. 	<ul style="list-style-type: none"> ▪ Reduced soil quality and quantity from erosion, sedimentation and compaction minimized through implementation of mitigation measures. – <i>Low likelihood of occurrence with the adherence to Enbridge construction standards and limited magnitude of effects following the application of mitigation measures.</i>
<p>Reduction in soil quality and quantity due to the release of construction dewatering discharge resulting in erosion and sedimentation.</p>	<ul style="list-style-type: none"> ▪ Where dewatering of excavations is required, mitigation could include the use of splash pads, discharge energy diffusers, filter bags, sediment basins or similar measures at discharge locations to ensure that any water discharged to the natural environment does not result in scouring, erosion or physical alteration of the soil at the discharge location, streams channel or banks. ▪ Leave a layer of vegetation intact between the outfall and receiving waterbody to provide additional water dispersion and entrapment of suspended solids, if discharge is to a waterbody and/or wetland, where feasible. ▪ Obtain applicable Conservation Authority / MNR / MECP, and/or municipal permits for the release of dewatering discharge. 	<ul style="list-style-type: none"> ▪ Reduced soil quality and quantity from the release of dewatering discharge will be minimized through the effective implementation of mitigation measures. – <i>High likelihood of occurrence but limited magnitude of effects as there will only be short-term and localized dewatering (if required).</i>
<p>Reduction in soil quality due to accidental release of contaminants during construction.</p>	<ul style="list-style-type: none"> ▪ Apply the following general mitigation measures to avoid soil contamination: <ul style="list-style-type: none"> – Ensure machinery is maintained free of fluid leaks. – All stationary equipment, such as generators shall have secondary containment to prevent spills. Potential contaminant storage will not occur within 50 m of a wetland or watercourse. – Site maintenance, vehicle maintenance, vehicle washing and refuelling to be done in specified areas at least 50 m away from wetlands and/or waterbodies or a required by regulatory authority. Where it is impracticable to maintain the 50 m buffer (such as in the case of an operating pump), the following fuelling measures will be followed: <ul style="list-style-type: none"> – The equipment will be positioned as far away as possible on a secure and level surface; 	<ul style="list-style-type: none"> ▪ Reduced soil quality from the accidental release of contaminants will be minimized through the effective implementation of mitigation measures. – <i>Low likelihood of occurrence and limited magnitude of effects as an effect is only anticipated to occur in the event of an accidental release of contaminants.</i>

Potential Effect	Proposed Mitigation Measures	Net Effects
	<ul style="list-style-type: none"> – The equipment will have a secondary containment system in place; – Two (2) workers will refuel the equipment such that one person is positioned at the fuel truck close to the emergency shut off, while the second person handles to nozzle/hose to refuel the equipment; and – An emergency spill kit will be set out in the open for immediate use, if required. ▪ Develop and implement a Spill Prevention and Response protocol outlining steps to prevent and contain any chemicals and to avoid soil contamination. This plan will include, for example: <ul style="list-style-type: none"> – In the event of a contaminant spill, all work will stop until the spill is cleaned up. – Reporting procedures to meet federal, provincial and local requirements (e.g., reporting spills and verification of clean-up), emergency contact and project management phone numbers. – Spill control and containment equipment/materials shall be readily available on site. – Protocols for access to additional spill clean-up materials, if needed. – Contaminated materials to be handled in accordance with relevant federal and provincial guidelines and standards. – Include the use of Material Safety Data Sheets, which provide information on proper handling of chemicals readily available for the types of chemicals that will be used on site. – Proper training of operational staff on associated emergency response plan and spill clean-up procedures. – Spills to be cleaned up as soon as possible, with contaminated soils/water removed to a licenced disposal site, if required. – Materials contained in spill clean-up kits are restocked as necessary. – Any soil encountered during excavation that has visual staining odours or other visual evidence of contamination effects should be analyzed to determine its quality in order to identify the appropriate disposal method. ▪ Waste and excess materials management (including excess soil) to be completed in accordance with relevant federal and provincial guidelines and standards 	
<p>Effects to surface water drainage patterns as a result of crushing or severing agricultural tiles</p>	<ul style="list-style-type: none"> ▪ Discuss areas of concern with the landowner to identify potential tile drainage systems. ▪ Pre-construction tiling will be undertaken prior to the start of any operations, if necessary. ▪ Disrupted or broken tiles will be recorded, flagged and repaired following Enbridge’s documented procedures for tile repair. Prior to completing repairs, landowners will be invited to inspect and approve repairs. <ul style="list-style-type: none"> – If a main drain or header drain is severed, a temporary repair will be made to maintain field drainage and prevent flooding. – Downstream sides of severed drains will be capped to prevent soil or debris from entering. 	<ul style="list-style-type: none"> ▪ Effects to agricultural tiles will be minimized through the effective implementation of mitigation measures. <ul style="list-style-type: none"> – <i>Moderate likelihood of occurrence and limited magnitude of effects as an effect is only anticipated to occur in the event a broken tile drain isn’t repaired.</i>

6.2.3 Groundwater Resources

Potential Effects

Potential effects on groundwater resources during construction and operation of the Project include:

- Changes in groundwater quantity and groundwater flow patterns; and
- Changes in groundwater quality.

Excavations below the water table may be required for portions of the proposed pipeline alignment, particularly in areas where fine-textured surficial sediments occur at surface (glaciolacustrine deposits [Figure 5-1 of Appendix A]). In these areas, groundwater dewatering may be required to facilitate construction under dry working conditions. Construction dewatering has the potential to change groundwater quantity. Where dewatering occurs, local water table elevations may be temporarily lowered during construction. These effects are confined to the Zone of Influence (ZOI) that is formed from dewatering activities and are typically temporary in nature. Water wells located within the dewatering ZOI, where groundwater levels have been lowered to facilitate construction, have the potential to be affected temporarily by lower well yields and/or changes in water quality. A reduction in well yield and/or water quality may result in the temporary inability to use the well as a potable water source.

General construction activities such as vehicle and machinery operation and use of drilling fluids have the potential to change groundwater quality through minor contaminant releases. Spills consisting of materials that constitute a contaminant may affect groundwater and will therefore have to be managed.

Mitigation Measures

Table 6-2 identifies potential effects, proposed mitigation and net effects on groundwater resources that might occur during the construction and operation of the Project.

Table 6-2: Potential Effects, Proposed Mitigation, and Net Effects on Groundwater Resources

Potential Effect	Proposed Mitigation Measures	Net Effects
Reduction in groundwater quantity as a result of temporary construction dewatering.	<ul style="list-style-type: none"> ■ Retain an independent hydrogeologist to assess the potential for construction to affect groundwater quantity and identify the need for a well monitoring program during construction. Prior to construction, Enbridge will obtain appropriate dewatering permits (i.e., PTTW or EASR registration) and establish a water well monitoring plan/protocol, if necessary. ■ Limit duration of dewatering to as short a time frame as possible. ■ Direct dewatering discharge to affected watercourse, waterbody and/or wetland following appropriate water quality and temperature control measures. Discharge of water must comply with relevant regulations (i.e., MECP, Conservation Authority, MNRF, DFO, municipal, etc.), and as specified in any/all required discharge authorizations. 	<ul style="list-style-type: none"> ■ Reduction in groundwater quantity due to temporary construction dewatering activities (if required) will be minimized through the implementation of mitigation measures. – <i>Low likelihood of occurrence due to shallow nature of construction and inferred low permeability soils, and limited magnitude of effects as there will only be short-term dewatering (if required).</i>
Reduction in groundwater quantity as a result of groundwater seepage into the buried pipelines granular base material, resulting in changes to local groundwater flow patterns.	<ul style="list-style-type: none"> ■ In areas where the pipeline is planned to be installed below the water table, use trench plugs (or other forms of groundwater cut-offs) to limit the quantity of groundwater inflow into the granular base material. 	<ul style="list-style-type: none"> • No net effects anticipated following the implementation of mitigation measures.

Potential Effect	Proposed Mitigation Measures	Net Effects
Reduction in groundwater quality due to accidental release of contaminants during construction.	<ul style="list-style-type: none"> ▪ Refer to mitigation measures in Table 6-1 for “<i>Reduction in soil quality due to accidental release of contaminants during construction.</i>”. 	<ul style="list-style-type: none"> • Reduced groundwater quality from the accidental release of contaminants will be minimized through the implementation of mitigation measures. – <i>Low likelihood of occurrence and limited magnitude of effects as an effect is only anticipated to occur in the event of an accidental release of contaminants.</i>

6.3 Biophysical Features

6.3.1 Aquatic Resources

6.3.1.1 Surface Water

Potential Effects

Potential effects on surface water during construction and operation include:

- Changes in surface water quality; and
- Changes in surface water quantity.

Changes to surface water quality could occur wherever erosion is possible. Erosion of soils into nearby waterbodies and watercourses could occur as a result of dewatering discharge, and equipment use. Site preparation activities near waterbodies, such as vegetation clearing and soil grading, may result in unstable soils that are susceptible to erosion.

In addition to change in levels of suspended sediment, contamination of surface water could occur through accidental spills from vehicle and machinery operation (e.g., drilling fluids, leaks) near waterbodies and watercourses. Washing equipment (e.g., excavator) could also potentially result in contaminant releases to surface water.

Changes to surface water quantity during construction resulting from stream flow diversions, dewatering discharges, grading, removal or placement of fill and temporary stockpiling at/ or near waterbodies and watercourses have the potential to change surface water drainage patterns. Overland surface water flow direction and volume may change as a result of loss of vegetation, changes in surficial topography and changes in surficial soils.

Construction dewatering during the pipeline installation has the potential to change surface water quantity. Where dewatering occurs, water level of waterbodies may be temporarily lowered during construction.

Mitigation Measures

Table 6-3 identifies potential effects, proposed mitigation and net effects on surface water that might occur during the construction and operation of the Project.

Table 6-3: Potential Effects, Proposed Mitigation and Net Effects on Surface Water

Potential Effects	Proposed Mitigation Measures	Net Effects
<p>Changes in surface water quality due to water contamination (e.g., oils, gasoline, grease and other hazardous materials) and as a result of sedimentation.</p>	<ul style="list-style-type: none"> • Develop plans for spill prevention and response prior the start of construction to provide a detailed response system to respond to the release of petroleum, oils, lubricants and/ or other hazardous materials released into the environment. Site supervisors must keep a spill kit on-site at all times and train workers in the use of this kit. • Operate construction equipment (i.e., back hoes, etc.) in a manner that minimizes disturbance to the banks of waterbodies (e.g., avoiding unnecessary travel, machine rotations, etc.) and ensure equipment is kept out of waterbodies, wherever possible. • All vehicles, machinery and other construction equipment shall not enter the water. • Restrict construction equipment to designated controlled vehicle access routes to minimize the potential contamination. • Construction equipment should arrive on site in a clean condition. Frequent checks and maintenance should ensure that no fluid leaks occur. All stationary equipment, such as generators shall have secondary containment to prevent spills. • Construction equipment must be refuelled, washed, and serviced a minimum of 50 m away from all waterbodies and other drainage features to prevent any deleterious substances from entering a water resource, or as designated by the local regulatory authority. Where it is impracticable to maintain the 50 m buffer (such as in the case of an operating pump), the following fuelling measures will be followed: <ul style="list-style-type: none"> – The equipment will be positioned as far away as possible on a secure and level surface; – The equipment will have a secondary containment system in place; – Two (2) workers will refuel the equipment such that one person is positioned at the fuel truck close to the emergency shut off, while the second person handles to nozzle/hose to refuel the equipment; and – An emergency spill kit will be set out in the open for immediate use, if required. • Fuel and other construction related fuels/lubricants must be stored securely in a designated area that is a minimum of 50 m away from any waterbody or drainage feature, or as designated by the local regulatory authority. • For mitigation measure associated with erosion and sedimentation, refer to mitigation measures for “Reduction in soil quality and quantity due to erosion, sedimentation and compaction resulting from evacuation, use of heavy equipment and stockpiling of cleared materials” in Table 6-1. 	<ul style="list-style-type: none"> • Water contamination minimized through implementation of mitigation measures. <ul style="list-style-type: none"> – <i>Low likelihood of occurrence and limited magnitude of effects as an effect is only anticipated to occur in the event of an accidental release of contaminants or failure of erosion and sediment control measures.</i>
<p>Changes to surface water quality due to</p>	<ul style="list-style-type: none"> • Assuming any watercourses are in conservation authority regulated area, the Project will adhere 	<ul style="list-style-type: none"> • Water contamination minimized through implementation of mitigation measures.

Potential Effects	Proposed Mitigation Measures	Net Effects
working near watercourses	to any permit conditions to minimize the effect of the Project on nearby watercourses. <ul style="list-style-type: none"> • Implement necessary erosion and sediment control (ESC) measures (i.e., silt fencing) for Project work near watercourses to prevent potential erosion and sedimentation into nearby watercourses. 	– <i>Low likelihood of occurrence and limited magnitude of effects as an effect is only anticipated if sediment control measures and conservation authority permits are not adhered to.</i>
Changes in surface water quantity due to alterations to local drainage patterns.	<ul style="list-style-type: none"> • Clearly delineate work area using erosion fencing or other barriers, to avoid effecting hydrological functions associated with permanent open water. • Control quantity and quality of stormwater discharge using best management practices. • Minimize grading activities to maintain existing drainage patterns as much as possible. • Schedule construction activities near water to occur within the low flow period of the late summer months, where possible, to avoid or minimize effects. • Develop plans to deal with on-site flooding in order to mitigate any possible effects to the aquatic. • Operate construction equipment (i.e., back hoes, etc.) in a manner that minimizes disturbance to the banks of waterbodies (e.g., avoiding unnecessary travel, machine rotations, etc.) and ensure equipment is kept out of waterbodies, wherever possible. 	<ul style="list-style-type: none"> • Alteration to local drainage patterns minimized through application of mitigation measures. <ul style="list-style-type: none"> – <i>Low likelihood of occurrence and limited magnitude of effect as effects are anticipated to be temporary until the site is re-graded to existing conditions.</i>

6.3.1.2 Fish and Fish Habitat

Potential Effects

Potential effect on fish and fish habitat during construction operation include:

- Changes in fish habitat (including other aquatic biota habitat such as invertebrates); and
- Fish mortality risk (including other aquatic such as invertebrates).

Fish habitat includes all waters frequented by fish and any other areas upon which fish depend directly or indirectly to carry out their life processes (DFO, 2019a). The types of areas that can directly or indirectly support life processes include, however are not limited to, the following: spawning grounds and nursery, rearing, food supply and migration areas.

Potential effects to fish and fish habitat resulting from pipeline construction activities are primarily due to erosion and sedimentation. Disturbance to surficial soils associated with clearing and grubbing of riparian vegetation in close proximity to waterbodies results in an increased risk of erosion.

Changes to suspended sediment concentrations caused by water runoff from disturbed waterbody banks and riparian areas can lower the productivity of aquatic systems and have detrimental effects to the health of fish (DFO, 2010a). Short-term increases in turbidity can result in the degradation of spawning habitat or decreases in egg-to-larval survival, while long-term or frequent exposure can result in fish population declines and changes in fish community structure (Robertson et al., 2006). Removal of riparian vegetation reduces the amount of organic matter input to waterbodies, which in turn may reduce the amount of available food and shelter for aquatic species (DFO, 2010b).

Changes in fish habitat may result due to increased contaminants in surface water and on waterbody banks. Where vehicles and machinery operate within 30 m of a waterbody, there is potential for minor contaminant releases due to fuel and engine fluid leaks, accidental spills, and equipment washing (e.g., excavator).

6.3.1.3 Aquatic Species at Risk

Potential Effects

Potential effects to aquatic SAR during construction and operation of the Project include:

- Loss and/or degradation of aquatic SAR habitat; and
- Mortality, harm and/or disturbance/displacement of aquatic SAR.

Construction and operation activities that result in effects to fish and fish habitat will also have the potential to affect aquatic SAR and their habitat. Desktop review identified records of Silver Lamprey within the Study Area. Silver Lamprey is designated as Special Concern under both the provincial ESA and the federal SARA. Although this species is listed under Schedule 1, species that are listed as Special Concern under Schedule 1 of SARA receive management initiatives under SARA to prevent them from becoming Endangered and Threatened, but do not receive individual or habitat protection. Additionally, Special Concern species are not provided species or habitat protection under the provincial ESA.

Effects to aquatic SAR are not anticipated as a result of the Project and additional mitigation measures specific to aquatic SAR are not proposed.

6.3.1.4 Mitigation Measures

Table 6-4 identifies potential effects, proposed mitigation and net effects on fish and fish habitat might occur during the construction and operation of the Project.

Table 6-4: Potential Effects, Proposed Mitigation and Net Effects on Fish and Fish Habitat

Potential Effects	Proposed Mitigation Measures	Net Effects
Changes in fish habitat or fish mortality risk (including other aquatic biota such as invertebrates) due to removal of riparian vegetation, erosion and sedimentation and/or water contamination.	<ul style="list-style-type: none"> • Where construction activity occurs within 30 m of a waterbody clearly delineate the construction area to avoid accidental damage to riparian vegetation. • Operate machinery in a manner that minimizes disturbance to the watercourse bed and banks. <ul style="list-style-type: none"> – Protect entrances at machinery access points (e.g., using swamp mats) and establish single site entry and exit where feasible and practical. – Machinery is to arrive on site in a clean condition and is to be maintained free of fluid leaks. – Wash, refuel and service machinery and store fuel and other materials for the machinery away from the water to prevent deleterious substances from entering the water. – Keep an emergency spill kit on site in case of fluid leaks or spills from machinery. • Where riparian vegetation needs to be removed or has the potential to become damaged, mitigation measures outlined in Table 6-5 for “Removal of and/or damage to vegetation” must be implemented. • Where there is a potential for water contamination to effect fish habitat or fish mortality risk, mitigation 	<ul style="list-style-type: none"> • Harm to fish or fish habitat as a result of physical changes riparian vegetation minimized through implementation of mitigation measures. <ul style="list-style-type: none"> – Low likelihood of occurrence and limited magnitude of effects as a result of riparian cover and adjacent watercourse.

Potential Effects	Proposed Mitigation Measures	Net Effects
	<p>measures outlined in Table 6-3 for “<i>Changes in surface water quality due to water contamination by oils, gasoline, grease and other hazardous materials and sedimentation</i>” must be implemented.</p> <ul style="list-style-type: none"> Where there is a possibility for erosion or sedimentation to effect fish habitat or fish mortality risk, mitigation measures outlined in Table 6-1 for “<i>Reduction in soil quality and quantity due to erosion, sedimentation and compaction resulting from evacuation, use of heavy equipment and stockpiling of cleared materials</i>” must be implemented. 	

6.4 Species at Risk

6.4.1 Terrestrial Resources

6.4.1.1 Vegetation and Ecological Communities

Potential Effects

Potential effects on vegetation and ecological communities during construction include the following:

- Removal of and/or damage to vegetation; and
- Loss and/or degradation of ecological communities including designated natural areas.

Site preparation (e.g., vegetation clearing, site grading), construction of temporary stockpile areas, and excavation may negatively affect vegetation (including tree branches, trunks, and/or roots) and ecological communities through direct loss. In addition, these activities may damage vegetation or degrade ecological communities through soil removal and/or disturbance, compaction, increased erosion or sedimentation, altered surface water drainage, and/or soil or water contamination (e.g., oils, grease, gasoline, or other substances) from construction equipment and/or materials storage and handling. Loss or damage to vegetation and degradation of ecological communities has the potential to alter the structure and ecological function of communities, as well as change species composition and diversity.

Spread of invasive plant species could also occur as a result of vegetation clearing through the spread of invasive seeds on construction equipment and through disturbance of naturally vegetated areas allowing for colonization of invasive species.

Potential effects to vegetation and ecological communities during operations include the following:

- Removal of and/or damage to vegetation.
- Removal of and/or damage to vegetation may occur during the operations phase as a result of maintenance activities such as periodic mowing or trimming through mechanical means. Based on the location and proximity of the new pipeline and wells, there are no effects to ecological communities associated with designated natural areas anticipated during the operations phase.

Mitigation Measures

Table 6-5 identified the potential effects, proposed mitigation and net effects to vegetation and ecological communities that might occur during the construction and operation of the Project.

Table 6-5: Potential Effects, Proposed Mitigation and Net Effects to Vegetation and Ecological Communities

Potential Effect	Proposed Mitigation Measures	Net Effects
<p>Removal of and/or damage to vegetation</p>	<ul style="list-style-type: none"> • Minimize vegetation removal to the extent possible and limit to within the construction footprint. Designated natural areas (including significant wetlands and significant woodlands) will be avoided, wherever possible. • Obtain appropriate government approvals to construct pipeline facilities adjacent to designated natural areas (e.g., significant woodlands). Any permitting that may be required to be determined in consultation with the MECP, MNRF and/or SCRCA. • Prune any tree limbs or roots that are accidentally damaged by construction activities within 48 hours of damage using appropriate arboricultural techniques. • Clearly delineate the construction area to avoid accidental damage to species to be retained. Delineation will be in the form of construction fencing and/or barriers with the latter implemented if sediment and erosion control is also acquired. • Inspection staff may also consider substituting other demarcating types for fencing, such as staking and flagging, where it is determined that there is no apparent risk to nearby natural features. • Re-vegetate cleared areas as soon as reasonably possible. If there is insufficient time in the growing season to effectively re-vegetate the disturbed areas, overwintering treatments such as erosion control blankets or fibre matting should be installed to contain the site over the winter months. • Prior to removal, landowners should be consulted on any vegetation removed from their property. Any merchantable wood must be offered to the landowner or, where possible, used in pipeline construction or associated works. • Any slash generated as part of clearing and grubbing the pipeline ROW must be chipped or disposed to the satisfaction of the landowner. • Trees directly above or adjacent to the pipeline or pipeline infrastructure will be removed and not replaced to facilitate future maintenance. Trees on private land(s) will be negotiated with the landowner and trees removed in temporary construction areas will be replaced, in accordance with the Enbridge Tree Replacement Program. 	<ul style="list-style-type: none"> • Vegetation loss, adjacent to the construction area will be minimized through the application of mitigation measures. <ul style="list-style-type: none"> – <i>High likelihood of occurrence and will be of limited magnitude and duration.</i>
<p>Degradation of ecological communities including designated natural areas</p>	<ul style="list-style-type: none"> • Minimize spread of invasive plant species by ensuring equipment and machinery is clean prior to arriving on-site. • Clearly delineate work area using erosion fencing, or other barrier, to minimize seed transfer into suitable habitat. Inspection staff may also consider substituting other demarcating types for fencing, such as staking and flagging, where it is determined that there is no apparent risk to nearby significant rare vegetation communities. This could include instances where the significant rare vegetation communities are at a higher elevation than the occurring construction activity. • Depending on site-specific conditions, such as steep topography and the presence of direct, or regular, surface water flow, inspection staff may consider substituting other styles of fencing for erosion fencing, when appropriate. • Regularly clean vehicles and equipment. • Re-vegetate cleared areas as soon as reasonably possible. • Apply dust suppressants to unpaved areas when necessary, as determined by inspection staff. Application frequency and method will vary, but should be determined by site-specific weather 	<ul style="list-style-type: none"> • Where possible, degradation of ecological communities, adjacent to the construction area will be minimized through the implementation of mitigation measures. <ul style="list-style-type: none"> – <i>Degradation of ecological communities will largely be avoided by siting the Project adjacent to the public road ROW. However, where adjacent ecological communities are affected, the effect will be of limited magnitude and duration.</i>

Potential Effect	Proposed Mitigation Measures	Net Effects
	<p>conditions, including recent precipitation, temperatures and wind speeds. Input from the construction team may warrant an increased frequency of dust suppression.</p> <ul style="list-style-type: none"> • Dust control plans should be developed in consultation with the local municipality. • Implement a speed limit for construction equipment and trucks on construction roads/routes. • Install wind fences, where determined to be necessary by the on-site inspection staff. Installation of these fences will depend on site-specific conditions, including wind speeds, topography, land cover and the extent of surrounding natural wind breaks. • Store any stockpiled material > 30 m from a wetland, or waterbody. 	

6.4.1.2 Wildlife and Wildlife Habitat

Potential Effects

Potential effects on wildlife and wildlife habitat during construction include the following:

- Loss and/or degradation of wildlife habitat; and
- Mortality, harm, and/or disturbance/displacement of wildlife.

Direct loss of habitat may occur during site preparation (e.g., vegetation clearing, site preparation), construction of temporary stockpile areas, and excavation. In addition to direct loss, these activities may cause degradation of wildlife habitat through soil removal and/or disturbance, compaction, increased erosion or sedimentation, altered surface water drainage, and/or soil or water contamination (e.g., oils, grease, gasoline, or other substances) from construction equipment and/or materials storage and handling. Further, changes to surface water drainage patterns and/or obstruction of lateral flows in surface water caused by land contour changes may also negatively affect wildlife habitat.

Vegetation removal, sub-surface excavation, and increased traffic due to construction may result in a higher potential for accidental wildlife mortality. Pipe installation activities, specifically, is of particular concern during sensitive life stages (e.g., breeding season, hibernation). However, the proposed pipeline installation is located directly adjacent to existing roads and the storage well locations are small and will likely require minimal vegetation removal. Bird nest mortality may occur during vegetation removal in any areas where suitable habitat exists within the work area. Most birds and their nests are protected under the *Migratory Birds Convention Act* (MBCA). Although roads adjacent to and intersecting the proposed work areas represent an existing source of wildlife mortality, increased traffic due to construction presents additional risk for wildlife mortality, particularly reptiles, through collisions with construction traffic and/or heavy equipment.

Noise and human presence associated with construction activities have the potential to alter wildlife behaviour, and potentially lead to disturbance or displacement of wildlife. Disturbance or displacement of bird species during construction activities (e.g., site preparation, pipe installation, etc.) may lead to decreased breeding success for nesting birds (EC, 2014).

Potential effects to wildlife and wildlife habitat during operation include the following:

- Mortality, harm, and/or disturbance/displacement of wildlife.
- Removal of and/or damage to vegetation may occur during the operations phase as a result of maintenance activities such as periodic mowing or trimming through mechanical means. These activities have the potential for accidental mortality and/or injury to wildlife, including damage to nests and eggs. Maintenance activities will be infrequently required and generally limited to previously

disturbed. Other potential negative effects on wildlife include disturbance/displacement caused by increased noise or human activity during maintenance and routine inspection. However, species occurring in the PSA are likely tolerant to short, infrequent disturbance based on existing traffic. Therefore, no effects to wildlife and/or wildlife habitat are anticipated during the operations phase of the Project.

Mitigation Measures

Table 6-6 identified the potential effect, proposed mitigation and net effect to wildlife and wildlife habitat that might occur during the construction and operation of the Project.

Table 6-6: Potential Effects, Proposed Mitigation and Net Effects to Wildlife and Wildlife Habitat

Potential Effect	Proposed Mitigation Measures	Net Effects
<p>Loss and / or degradation of wildlife habitat including significant wildlife habitat during construction</p>	<ul style="list-style-type: none"> ▪ Construction activities will be located on agricultural land to minimize impacts to wildlife habitat and SWH. Minimize vegetation removal to the extent possible and limit to within the construction footprint. Avoid potential significant wildlife habitat wherever possible. ▪ Clearly delineate the construction footprint to avoid accidental damage to retained vegetation. Delineation will be in the form of construction fencing and / or silt fence barriers with the latter implemented if erosion and sediment control is also required. ▪ Inspection staff may also consider substituting other demarcating types for fencing, such as staking and flagging, where it is determined that there is no apparent risk to nearby vegetation communities. ▪ Install and maintain sediment and erosion controls such as silt fence barriers, rock flow check dams, compost filter socks or approved alternative along the edge of the construction footprint area if within 30 m of a wetland or waterbody where appropriate to delineate work area and avoid effecting water quality. ▪ Ensure machinery is maintained free of fluid leaks. ▪ Vehicle maintenance, washing and refuelling to be done in specified areas at least 50 m away from wetlands and / or waterbodies. Avoid the use of herbicides, to the extent possible, within significant during the construction. 	<ul style="list-style-type: none"> ▪ Loss or degradation of local wildlife habitat will be minimized through the application of mitigation measures. – <i>Low likelihood of occurrence and limited magnitude as a result.</i>
<p>Changes in habitat, mortality risk or behaviour.</p>	<ul style="list-style-type: none"> ▪ Conduct field investigations in advance of construction to identify wildlife habitats and determine significance and necessary mitigation measures to avoid or reduce any anticipated effects to wildlife or their habitats. ▪ Conduct vegetation clearing outside of the breeding bird nesting period (April 1st to August 31st) to avoid incidental take and limit disturbance to birds (including SOCC) or their nests, unless nest and nesting activity surveys have been completed by a qualified avian biologist and no active nests are present. If vegetation removal or trimming must occur during the breeding bird nesting period (April 1st – August 31st), nest and nesting activity searches will be conducted by a qualified avian biologist no more than 24 hours in advance. If an active nest or nesting activity of a protected bird is observed, the area will be protected and no construction activities will occur until the young have fledged or until the nest is no longer active, as confirmed by a qualified biologist. ▪ Schedule construction activities within 30 m of woodlands to occur during daylight hours to avoid excessive noise and/or light disturbances to wildlife, wherever possible. ▪ If construction activities within 30 m of woodlands must occur outside of daylight hours, spotlights will be directed downward and/or away from the woodland to limit potential light disturbance to breeding birds. ▪ Obey site speed limits identified in plans for traffic management. ▪ Construction equipment and vehicles must yield the right of way to wildlife. 	<ul style="list-style-type: none"> ▪ Disturbance and/or mortality to local wildlife will be minimized through the implementation of mitigation measures. – <i>Low likelihood of occurrence and limited magnitude as a result.</i>

Potential Effect	Proposed Mitigation Measures	Net Effects
	<ul style="list-style-type: none"> ▪ Trench operations should be backfilled as soon as reasonable to facilitate wildlife movement across the ROW. ▪ Workers must never threaten, harass or injure wildlife. 	

6.4.1.3 Wildlife Species at Risk

Potential Effects

Potential effects to terrestrial SAR during construction include the following:

- Loss and/or degradation of SAR wildlife habitat; and
- Mortality, harm, and/or disturbance/displacement of SAR.

Construction and operations activities that result in effects to vegetation and ecological communities (**Section 6.4.1.1**), as well as wildlife and wildlife habitat (**Section 6.4.1.2**) have the potential to affect terrestrial SAR and their habitat. For each terrestrial SAR, the construction and operations activities causing effects are outlined in **Table 6-7** and **Table 6-8**, respectively.

Table 6-7: Effects on Species at Risk and their Habitat during Construction

Species At Risk	Effects
Bird SAR (Bank Swallow, Barn Swallow, Bobolink and Eastern Meadowlark)	<ul style="list-style-type: none"> ▪ Potential for bird SAR and their habitat to occur within the PSA was identified during the background information review. Site investigations will be conducted in fall 2020 to confirm habitat suitability for SAR birds. If suitable habitat is present breeding bird surveys may be conducted during the Spring/Summer 2021 field investigations to confirm presence/absence of these species and their habitats within or adjacent to the Project. Alternatively, mitigation and avoidance measures will be developed and implemented to avoid impacts to the SAR. If necessary, a permit or other authorization from the MECP will be obtained to ensure adherence to the ESA, ▪ Although unlikely, bird SAR may be accidentally injured or killed as a result of collisions with construction vehicles or equipment. The risk of mortality, although existing due to the presence of roads, may be elevated as a result of increased vehicular or heavy equipment traffic. ▪ Elevated noise levels and vibration generated by construction within or adjacent to bird SAR habitats during the breeding bird season of April 1 and August 31 may also cause birds to abandon their nests. ▪ Direct loss and/or damage of bird SAR habitat may occur during site preparation, construction of temporary stockpile areas, transportation of equipment and materials, and excavation. ▪ Mitigation will be necessary to minimize the effects to the species and warrants consultation with the MNRF to determine any permitting needs.
Bat SAR (Eastern Small-footed Myotis; Little Brown Myotis; Northern Myotis; and Tri-colored Bat)	<ul style="list-style-type: none"> ▪ Potential for bat SAR and their habitat to occur within the PSA was identified during the background information review. A site visit will be conducted in fall 2020 to determine habitat suitability for SAR bats. In the unlikely event that suitable forest habitat is identified within the area of proposed works, an assessment of trees that may require removal for the Project will be conducted and mitigation measures will be developed and implemented to avoid impacts to the SAR. If necessary, a permit or other authorization from the MECP will be obtained to avoid contravention of the ESA. Removal of potentially suitable roost trees could result in the mortality of bat SAR if present and if conducted during the bat roosting season (between May 1 and September 1). Increased noise and vibration as a result of construction activities or the presence of artificial light if proposed works occur at night may negatively affect bats through disturbance/displacement. ▪ Direct loss and/or damage of bat SAR habitat including suitable maternity roost trees or forested habitats is unlikely but could occur during site preparation, construction of temporary stockpile areas, transportation of equipment and materials, and excavation. These activities may negatively affect bat SAR habitat through increased erosion and sedimentation; soil removal/disturbance and compaction; and accidental soil or water contamination by oils, gasoline, grease and other materials from construction equipment and materials storage or handling. ▪ Removal of candidate bat maternity roost habitat and/or potentially suitable maternity roost trees is unlikely. However, if it is required consultation with the MNRF will occur to determine permitting needs.

Species At Risk	Effects
Reptile SAR (Eastern Foxsnake, and Butler's Gartersnake)	<ul style="list-style-type: none"> ▪ Potential for reptile SAR and their habitat to occur within the PSA was identified during the background information review. A reptile SAR habitat assessment will be conducted in fall 2020 to determine if suitable habitat is present. If suitable habitat is present, snake visual encounter surveys may be conducted in spring/summer 2021. Alternatively, mitigation and avoidance measures will be developed and implemented to avoid impacts to the SAR. If necessary, a permit or other authorization from the MECP will be obtained to ensure compliance with ESA, ▪ Reptile SAR may be accidentally injured or killed as a result of collisions with construction vehicles or equipment. The risk of mortality, although existing due to the presence of roads, may be elevated as a result of increased vehicular or heavy equipment traffic. ▪ Direct loss and/or damage of reptile SAR habitat may occur during site preparation, construction of temporary stockpile areas, transportation of equipment and materials, and excavation. These activities may negatively affect reptile SAR habitat through increased erosion and sedimentation; soil removal/disturbance and compaction; and accidental soil or water contamination by oils, gasoline, grease and other materials from construction equipment and materials storage and handling. ▪ Mitigation will be necessary to minimize the effects to the species and warrants consultation with the MNRF to determine permitting needs.

Table 6-8: Effects on Species at Risk and their Habitat during Operation

Species At Risk	Effects
Unlikely but possible mortality, harm and / or disturbance / displacement of SAR.	<ul style="list-style-type: none"> ▪ Removal of and/or damage to vegetation may occur as a result of periodic mowing or trimming through mechanical means. These activities have potential for accidental mortality of and/or injury to SAR. Maintenance activities will be infrequently required and generally limited to previously disturbed areas. The Project will be located on private lands adjacent to the public road ROW, which is subject to existing vegetation management by the municipality. As such, possible mortality, harm and/or disturbance/displacement of SAR are unlikely given the nature of the maintenance activities that will be undertaken by Enbridge.

Mitigation Measures

Measures to protect terrestrial SAR and SAR habitat are similar to those required for the protection of non-SAR wildlife. Therefore, the mitigation measures presented in **Tables 6-5 and 6-6** are acceptable to all SAR and SAR habitat present within the PSA. However, site-specific and species-specific mitigation may be necessary should any SAR dependant on specialized and/or sensitive habitat features be identified within the PSA during future surveys. This will be confirmed through future surveys and in consultation with appropriate regulatory agencies.

6.5 Socio-economic Features

6.5.1 Economy and Employment

Potential Effects

Negative effects on the local economy and/or employment are not anticipated due to the construction or operation of the Project. However, the construction and operation of the Project may result in direct and/or indirect income to local businesses during the construction phase. The Project will result in increased property tax assessment paid on the new pipeline to local municipalities by Enbridge annually which provides new revenues to support local services.

Mitigation Measures

As no negative effects are anticipated, no mitigation measures are required. Enbridge will make all reasonable efforts to procure goods and services from local suppliers, subject to product availability and pricing.

6.5.2 Residents, Farms, Businesses and Land Uses

Potential Effects

Potential environmental effects on, residents, farms and businesses during construction and operation of the Project include:

- Temporary increases in noise, dust and air emissions;
- Increased construction traffic volumes;
- Restricted land access; and
- Undesirable aesthetic effects, real or perceived safety concerns and general disturbances (i.e., impairment of the use of property).

Construction activities have the potential to result in short-term increases of noise, dust and air emissions that may cause disturbances to a number of land uses adjacent to the Project. The Preferred Pipeline Route and will be installed parallel to the public road ROW and along lot and property lines to minimize negative effects on adjacent land uses.

Increased truck traffic and lane disturbances/closures associated with installation of the pipeline and other infrastructure works may result in increased traffic volumes and/or disturbances to local transportation patterns. Disturbance to local transportation patterns may affect school bus routes, farm machinery and heavy vehicles.

In general, pipeline installation may temporarily restrict access to properties adjacent to the route during construction. Where no alternative property access is available, Enbridge will work with landowners to ensure access to their property is maintained. The Project construction may also restrict access within the pipeline corridor, potentially causing interference with the activities of other utility providers with infrastructure in the vicinity of the Project (e.g., transmission lines).

Construction activities and construction crews may pose undesirable aesthetic effects. The pipeline may also raise concerns of residences, farms, businesses and facilities about pipeline and natural gas safety due to the construction and operation of a new pipeline in the PSA. Construction activities are likely to cause temporary disturbances to local residents, which may impair their ability to use and enjoy their property.

Mitigation Measures

Enbridge understands that the construction of the Project will temporarily affect residents, farms and businesses along the Preferred Pipeline Route and other infrastructure works. Enbridge is committed to being a good neighbour and will work with landowners, residents, farmers, businesses and other interested stakeholders to discuss their concerns and identify acceptable resolutions to minimize effects. Prior to construction, Enbridge may hold meetings, if requested, to provide the public with information on construction activities and timing. Installing the pipeline parallel to the public road ROW and along existing lot and property lines may require road lane restrictions. Traffic management plan(s) will be developed in co-operation with municipalities and implemented to manage traffic associated with construction. Representatives from Enbridge will also be available to discuss construction-related effects to ensure that all concerns are heard and considered.

Enbridge will assign a single point of contact for affected residents, the community in general and non-landowners. This Enbridge representative will work with any construction-related disruption, receive questions, respond to concerns and record any complaints received related to construction of the Project while monitoring to ensure there is appropriate follow-up.

Table 6-9 identifies potential effects, proposed mitigation and net effects on residents, farms and businesses that might occur during the construction and operation of the Project.

No effects on land use are anticipated during the operation phase.

6.5.3 Indigenous Communities and Interests

Potential Effects

Potential environmental effects to Indigenous communities and interests during construction and operation of the Project include:

- Disturbances to Indigenous artifacts.

As noted in **Section 5.4.8**, further Stage 2 archaeological assessment is required for areas not previously assessed. It is possible that the Stage 2 archaeological assessment could also result in the finding of Indigenous artifacts. Indigenous communities will be invited to participate in the monitoring of Stage 2 Archaeological Assessment. A copy of the Stage 1 Archaeological Assessment reports is provided in **Appendix D**.

Due to the location of Project in areas likely to already be disturbed, effects to traditional land and resource use are not anticipated during construction or operation of this portion of the Project.

Mitigation Measures

Mitigation measures for archaeological resources are discussed in **Section 6.5.8**.

Table 6-9: Potential Effects, Proposed Mitigation and Net Effects on Land Uses, Residents and Businesses

Potential Effect	Proposed Mitigation Measures	Net Effects
<p>Temporary increases in noise, dust and air emissions</p>	<ul style="list-style-type: none"> ■ The idling of vehicles should be avoided, and vehicles and/or equipment should be turned off when not in use. ■ Apply dust suppressants to unpaved areas, when necessary, as determined by inspection staff. Application frequency and method will vary, but should be determined by site-specific weather conditions, including recent precipitation, temperatures and wind speeds. Input from the construction team may warrant an increased frequency of dust suppression. ■ Implement a speed limit for construction equipment and trucks on construction roads/routes. ■ Construction activities that result in noise should be restricted to daylight hours and will adhere to any applicable local noise by-laws. In the event that construction activities that may cause excessive noise must occur outside of these time frames, application(s) for Noise By-law exemption will be submitted for approval. ■ During construction, practices to reduce and limit air emissions should include, but not be limited to: <ul style="list-style-type: none"> – Maintaining equipment in compliance with regulatory requirements. – Protecting stockpiles of friable material with barriers and/or widescreens during dry conditions and covering friable material during transportation. – Dust suppression of source areas. 	<ul style="list-style-type: none"> ■ Noise, dust and air emission effects are anticipated to be minimized with the implementation of mitigation measures. – <i>High likelihood of occurrence and limited magnitude as a result.</i>

Potential Effect	Proposed Mitigation Measures	Net Effects
Increased construction traffic volumes	<ul style="list-style-type: none"> ▪ Enbridge should develop plans for traffic management in co-operation with St. Clair Township prior to the commencement of construction activities, if necessary. ▪ The Contractor should implement plans for traffic management for all roads affected by construction activities. The traffic management planning should, at a minimum, follow the Ontario Traffic Manual Book 7 and should additionally include: <ul style="list-style-type: none"> – Warn oncoming motorists of construction activity. – Restrict the movement of personnel and materials to and from the construction site. – Employ a trained traffic control officer to assist with truck movements where possible. – Control traffic at road crossings. – Reduce lane disturbances and closures. – Store equipment as far away from the roadway as possible. – Utilize and install construction barricades at road crossings. ▪ Return all road ROWs to their original condition or better following construction. ▪ The period of time that a road is closed (except for local access) should be reduced to the shortest extent possible. Enbridge should meet with representatives of St. Clair Township and local school board(s) to discuss potential road crossing procedures and address the following issues: <ul style="list-style-type: none"> – Deterioration of roadways due to increased traffic; – Crossing procedures including resurfacing or grading of roadways, and traffic safety; – Road restrictions and haul routes; and – Road surface and municipal drain restoration. • Any municipal approvals required for lane restrictions and haul routes. 	<ul style="list-style-type: none"> ▪ Traffic disturbances are anticipated to be minimal with the implementation of mitigation measures. <ul style="list-style-type: none"> – <i>High likelihood of occurrence and limited magnitude as a result.</i>
Restricted property access	<ul style="list-style-type: none"> ▪ Access to adjacent properties should be maintained at all times, where feasible. ▪ All work should be confined to the construction disturbance area. If additional work area is required, temporary working space must be acquired through discussions with landowners. ▪ Construction activities will be co-ordinated with adjacent land users, such as other utility providers. ▪ Mitigation measures listed under “<i>Increased construction traffic volumes</i>” shall be implemented to avoid interference of the construction traffic with the access to the properties. 	<ul style="list-style-type: none"> ▪ Effects due to restricted property access are anticipated to be minimal with the implementation of mitigation measures. <ul style="list-style-type: none"> – <i>Low likelihood of occurrence and limited magnitude as a result.</i>
Social effects (i.e., impairment of the use and enjoyment of property)	<ul style="list-style-type: none"> ▪ Contact information for a designated Enbridge representative will be made available prior to and throughout construction activities in order to address any questions or concerns. ▪ A complaint tracking system should be implemented in order to record concerns, actions taken and follow-up dates. ▪ While any undesirable aesthetic effects will only occur during construction activities, construction should be completed as expediently as possible to reduce the duration of any temporary aesthetic effects. ▪ Warning signs and construction barricades should be erected at all areas of construction activity. ▪ Safety fences should be installed at the edge of the construction ROW where public safety considerations are required. 	<ul style="list-style-type: none"> ▪ The implementation of mitigation measures is anticipated to result in minimal effects. <ul style="list-style-type: none"> – <i>Low likelihood of occurrence and limited magnitude as a result.</i>

6.5.4 Institutional Services and Facilities

Potential Effects

Potential environmental effects on institutional services and facilities during construction and operation of the Project include:

- Increased use of emergency and medical services;
- Increased construction traffic volumes effecting routing and response times; and
- Restricted land access.

There are no institutional services or facilities adjacent to the Project. The closest hospital is 18 km away from the Project.

6.5.4.1 Mitigation Measures

Table 6-10 identifies potential effects, proposed mitigation and net effects on institutional services and facilities that might occur during the construction and operation of the Project.

6.5.5 Recreation and Tourism

There are no recreational or tourism facilities, including protected areas, Crown Lands, Provincial Parks or Conservation Reserves/Areas located within the PSA.

6.5.6 Infrastructure

6.5.6.1 Railways

There are no railways crossed or impacted by the Project.

Table 6-10: Potential Effects, Proposed Mitigation and Net Effects on Institutional Services and Facilities

Potential Effect	Proposed Mitigation Measures	Net Effects
Increased uses of emergency and medical services.	<ul style="list-style-type: none"> ■ Prepare plans for health and safety during the construction phase of the Project and notify emergency services about construction commencement. ■ Restricted public access to construction sites and other construction safety measures should be in place during construction. Signage indicating the location of pipeline construction should also be placed at all crossings and entrances. The Project will be constructed and operated in accordance with the Canadian Standards Association (CSA) code and Technical Standards and Safety Authority (TSSA, 1998) guidelines. 	<ul style="list-style-type: none"> ■ With the implementation of mitigation measures, no net effects are anticipated. <ul style="list-style-type: none"> – <i>Low likelihood of occurrence and limited magnitude as a result.</i>
Increased construction traffic volumes	<ul style="list-style-type: none"> ■ Mitigation measure listed in Table 6-9 for “<i>Increased construction traffic volumes</i>” shall be implemented. Traffic disturbances are anticipated to be minimal once mitigation measures are applied. 	<ul style="list-style-type: none"> ■ Traffic disturbances are anticipated to be minimal once mitigation measures are applied. <ul style="list-style-type: none"> – <i>High likelihood of occurrence and limited magnitude as a result.</i>

Restricted land access	<ul style="list-style-type: none"> ▪ Mitigation measure listed in Table 6-9 for “<i>Restricted property access</i>” shall be implemented. Effects due to restricted property access are anticipated to be minimal once mitigation measures are applied. 	<ul style="list-style-type: none"> ▪ Effects due to restricted property access are anticipated to be minimal once mitigation measures are applied. <ul style="list-style-type: none"> – <i>Low likelihood of occurrence and limited magnitude as a result.</i>
-------------------------------	---	---

6.5.6.2 Local Roads

Potential Effects

Potential effects on roads during construction and operation include:

- Increased construction traffic volumes; and
- Restricted land access.

Increased truck traffic and lane disturbances/closures associated with the installation of the pipeline and other infrastructure works may result in increased traffic volumes and/or disturbances to local transportation patterns. Disturbance to local transportation patterns may affect school bus routes, farm machinery and heavy vehicles.

In general, pipeline and other infrastructure works installation may temporarily (typically limited to part of a day) restrict access to properties adjacent to the route during construction. Where no alternate property access is available, Enbridge will consult with the effected party to develop a crossing plan or schedule that reduces the potential effect from a temporary restriction to property access. The Project construction may also restrict access within the pipeline corridor and other infrastructure works potentially causing interference with the activities of other utility providers with infrastructure in the vicinity of the Project (e.g., local electrical transmission line).

Mitigation

Table 6-11 identifies potential effects, proposed mitigation and net effects on existing infrastructure that might occur during the construction and operation of the Project.

6.5.6.3 Electrical Infrastructure, Natural Gas Pipelines and other Utilities

Potential Effects

Potential environmental effects on electricity infrastructure, natural gas pipelines, and other utilities during construction and operation of the Project include:

- Utility service disruptions; and
- Decreases in infrastructure integrity.

Construction activities could affect the operation of existing underground and overhead utilities with the PSA resulting in disruptions to a number of utilities to local residents. It is important to implement the mitigation measures outlined in **Table 6-11** below to minimize any negative effects.

Mitigation

Table 6-11 identifies potential effects, proposed mitigation and net effects on existing infrastructure that might occur during the construction and operation of the Project.

Table 6-11: Potential Effects, Proposed Mitigation and Net Effects on Infrastructure

Potential Effect	Proposed Mitigation Measures	Net Effects
Increased construction traffic volumes	<ul style="list-style-type: none"> Mitigation measure listed in Table 6-9 “Increased construction traffic volumes” shall be implemented. Traffic disturbances are anticipated to be minimal once mitigation measures are applied. 	<ul style="list-style-type: none"> Traffic disturbances are anticipated to be minimal once mitigation measures are applied. <ul style="list-style-type: none"> – High likelihood and limited magnitude as a result.
Restricted land access	<ul style="list-style-type: none"> Mitigation measure listed in Table 6-9 for “Restricted property access” shall be implemented. Effects due to restricted property access are anticipated to be minimal once mitigation measures are applied. 	<ul style="list-style-type: none"> Effects due to restricted property access are anticipated to be minimal once mitigation measures are applied. <ul style="list-style-type: none"> – Low likelihood and limited magnitude as a result.
Utility service disruptions and/or decreases in infrastructure integrity	<ul style="list-style-type: none"> Prior to construction, consultation with municipalities and all local utility companies should occur to determine the exact location of all underground utilities in the area of excavation and other construction activities. Prior to construction, consultation with the all local utility companies should occur to determine the exact location of all overhead utilities in the construction area and to determine the need to re-site overhead utilities. Safety and distance requirements should be determined prior to construction adjacent to underground and overhead utilities. Heavy construction machinery should cross underground utilities to the least extent possible, and machine operators should be advised of the location of all underground utilities prior to commencing with construction activities. 	<ul style="list-style-type: none"> With the implementation of mitigation measures, no net effects are anticipated.

6.5.7 Contaminated Soils and Waste Management

Potential Effects

Potential environmental effects due to contaminated soil and improper waste disposal during construction and operation of the Project include:

- Contamination of soil, surface and/or groundwater resources due to improper waste disposal; and
- Contaminated soils discovered during trench excavation.

Although there are no waste disposal sites located within or adjacent to the PSA, improper disposal of waste material generated during construction activities could result in the contamination of soil, surface water and/or groundwater resources.

Contaminated soil may be encountered during construction activities adjacent to existing hydrocarbon and pipeline infrastructure. Additionally, contaminated soil may be encountered during construction activities along public roadway ROWs, as well as through agricultural properties.

Mitigation Measures

Table 6-12, below, identifies potential effects, proposed mitigation and net effects due to contaminated soils and improper waste disposal that might occur during the construction and operation of the Project. Mitigation for accidental contaminant spills is detailed in **Table 6-1** and **Table 6-2**.

Table 6-12: Potential Effects, Proposed Mitigation and Net Effects due to Contaminated Soils and Improper Waste Disposal

Potential Effect	Proposed Mitigation Measures	Net Effects
Contamination of soil, surface and/or groundwater resources due to improper waste disposal	<ul style="list-style-type: none"> ▪ Site-specific Soil Management Plans for waste collection and disposal management should be developed by the contractor prior to the execution of the Project and should include provisions for: <ul style="list-style-type: none"> – The transportation of waste and recycling off-site by private waste contractors licensed by the MECP. – The removal of excess materials from the site; and – The reuse and recycling of materials. 	<ul style="list-style-type: none"> ▪ With the implementation of mitigation measures, no net effects are anticipated.
Contaminated soil discovered during trench excavation	<ul style="list-style-type: none"> ▪ Site-specific Soil Management Plans for excess soils, waste collection and disposal management should be developed by the Contractor (see <i>Contamination of soil, surface and/or groundwater resources due to improper waste disposal</i> above). ▪ Should excess soil be generated on-site during construction activities that will require off-site management, or if contaminated soils are suspected (e.g., odour, film, sheen, staining, previous known contamination issues in the vicinity), representative soil samples should be collected and submitted for chemical analysis to determine management options and appropriate handling and health and safety guidelines. 	<ul style="list-style-type: none"> ▪ With the implementation of mitigation measures, no net effects are anticipated.

6.5.8 Archaeological Resources

Potential Effects

Potential effects on archaeological resources during construction and operation of the Project include:

- Disturbances to previously undocumented archaeological resources.

Mitigation Measures

The Stage 1 Archaeological Assessment determined that the Project has archaeological potential for the recovery of pre- and post-contact First Nation resources and Euro-Canadian archaeological resources (see **Appendix D**). Enbridge will undertake a Stage 2 Archaeological Assessment of undisturbed areas with archaeological potential that will be directly affected by the Project prior to construction. The Stage 2 Archaeological Assessment will be independently reviewed by MHSTCI. Construction activities will not proceed in these areas until they are cleared of archaeological concern and acceptance has been received from the MHSTCI.

6.5.9 Heritage Resources and Cultural Heritage Landscapes

The Study Area does not contain Listed or Designated Part IV cultural heritage resources. Given the Project will occur on lands currently used for industrial and agricultural activities that are previously disturbed no effects to cultural heritage resources or landscapes are anticipated.

7. Cumulative Effects Assessment

In addition to assessing Project-specific effects, the *Environmental Guidelines* (2016) require that proponents consider cumulative environmental effects that might result from the Project. Cumulative effects examine the potential effects of the proposed Project in combination with other developments already in place or planned within or near the PSA. The OEB has specified that only effects that are additive or interact with effects that have been identified as resulting from pipeline construction and operation are to be considered as part of the cumulative effects assessment. If environmental effects are anticipated to be compounded with the application of other developments, then it is necessary to determine whether these cumulative effects require additional mitigation measures. The cumulative effects assessment included in this section has been prepared considering this direction from the *Environmental Guidelines* (2016).

The first stage of the cumulative effect's assessment is to determine whether the Project has the potential to contribute to cumulative effects in combination with other past or existing development or development that is certain and/ or reasonably foreseeable. Two conditions must be met for the Project to act cumulatively with the environmental effects of other developments.

- The Project has net environmental effects on physical, biophysical, or socio-economic features; and
- The net effects of the Project have potential to act cumulatively with the environmental effects of other developments (i.e. effects overlap in time and geographic extent).

If these conditions are not met, there is no reasonable expectation that cumulative effects will occur, and further assessment is not warranted. If both conditions are met, then the assessment of cumulative effects proceeds following the methods used to assess the Project net effects in **Section 6**. If there is reasonable doubt about whether a cumulative interaction might take place, a conservative approach is taken, and the interaction is carried forward for an assessment of cumulative effects. This is particularly the case if there is a heightened concern about the status of the feature and the consequence of potential cumulative effects.

An approximate 100 m boundary around the Project Study Area was used for the cumulative effect's assessment. The boundary has been found, through previous experience of pipeline construction and operation, to be appropriate for the most commonly encountered net effects on environmental and socio-economic resources. The temporal boundaries considered other developments already in place (i.e. past and existing) and reasonably foreseeable future developments known at the time of developing the ER. Since the Project is not predicted to have net effects during operations, only the construction, operation and/or decommissioning of future developments occurring before the completion of construction were considered in the assessment of cumulative effects. That is, potential for the Project to act cumulatively with other developments is during the construction phase only.

Past and existing developments within the cumulative effects assessment Study Area are accounted for in the description of the existing environmental and socio-economic features (**Section 5**) and assessment of net effects (**Section 6**). Therefore, past and existing developments are considered in the cumulative effect's assessment only if ongoing operations or planned expansions or decommissioning have effects that overlap with Project-related net effects during the construction phase. The following sources were reviewed to identify other development within the cumulative effect's assessment Study Area:

- Atlas of Canada – Indigenous Mining Agreements (Government of Canada, 2020);
- Applications before the OEB (Government of Ontario, 2020);
- BuildON: our infrastructure plan (Government of Ontario, 2020);
- Canadian Environmental Assessment Registry (Government of Canada, 2020);
- County of Lambton Website (County of Lambton, 2019);
- Environmental Registry of Ontario (Government of Ontario, 2020);

- Infrastructure Ontario Projects (Government of Ontario, 2020);
- Major Projects Inventory – Natural Resources Canada (Government of Canada, 2019)
- Major Application and Projects before the National Energy Board Registry (Government of Canada, 2020);
- Ontario Major Projects Inventory (Government of Ontario, 2020);
- Ontario Mining Operations Map and Advanced Mineral Projects in Ontario 2020 Map (Ontario Mining Association, 2020); Renewable Energy Projects Listing (Government of Ontario, 2020); and
- St. Clair Township Website (St. Clair Township, 2020).

No developments were identified through the review of the above sources.

7.1 Assessment of Cumulative Effects

It is expected that the Project will result in both minor positive and negative cumulative effects. There may be cumulative effects between this Project and other projects in the area, although Enbridge is unaware of any projects that would interact with this proposal. Cumulative effects are likely to occur on:

- Terrestrial Resources (ELC/ vegetation clearing and accidental wildlife mortality); and
- Residents, Farms and Businesses.

Additional noise, dust and traffic could be an issue should construction occur concurrently with a separate project. However, provided that mitigation measures are implemented to avoid or reduce effects for the Project and any additional projects in the area, cumulative effects are not anticipated to be significant. The benefits of the Project will be a positive effect in the long term as it is being constructed to address the increasing demand for natural gas across Ontario by allowing Enbridge to store additional natural gas and will increase the deliverability of Enbridge Gas' storage operations.

8. Environmental Monitoring and Contingency Measures

Monitoring is recommended to confirm that proposed mitigation measures are effectively implemented. Inspection staff will conduct regular site inspections to monitor and assess the effectiveness of the environmental protection and mitigation measures (e.g., sediment and erosion control measures), and to work collaboratively and proactively with Enbridge and their Contractor to address any deficiencies. If, in the event the planned mitigation measures are ineffective during construction, contingency measures should be implemented to address such situations.

The following subsections list environmental monitoring and contingency measures recommended for the Project. For ease of reference, a summary table of potential effects, proposed mitigation, net effects and environmental monitoring and contingency measures has been provided in **Appendix F**.

8.1 Sediment Erosion and Slope Stability

Inspection staff shall conduct inspections of sediment and erosion control measures to confirm activities comply with plans to control site erosion. Inspection frequency will be increased during significant rainfall events. Inspection results shall be recorded in a daily report and provided to the Construction Superintendent to identified potential deficiencies that should be addressed. In the event that sediment and erosion control measures are not working effectively, the Contractor is required to repair and/or re-install deficient sediment and erosion control barriers within a reasonable time frame. There should also be a standby supply of erosion and sediment control devices (e.g., silt fence, etc.) for emergency installation.

8.2 Water Wells

If there is a potential for water wells to be affected by the Project, Enbridge should implement their standard water well monitoring program. An independent hydrogeologist shall be retained to assess the need for and to develop if necessary, a well monitoring program. Should a private domestic water well be affected by Project construction, a potable water supply should be provided, and the water well should be repaired or restored as required.

8.3 Accidental Contaminant Spills

In the event of an accidental contaminant spill, immediate determination of the spills extent and magnitude should occur. Spills should be immediately reported to the on-site inspection team, and if necessary, the MECP Spills Action Centre. Plans for spill prevention and response should be implemented, and the results of a spill clean-up recorded. Frequent inspection of the emergency response equipment should occur to ensure that required materials are available and readily accessible

8.4 Vegetation and Watercourses

Inspection frequency during construction should be increased at habitat features and near other sensitive environmental features such as woodlands. The re-establishment of vegetative cover upon the completion of construction should be monitored. Protective measures such as silt fencing should be retained in place until cover is fully established. The vegetative cover should be planted as soon as weather permits in the next growing season,

followed by maintenance (i.e., removal of invasive species) and inspection to confirm the successful establishment of native vegetation.

Response measures for accidental tree damage should be developed. Any limbs or roots that are accidentally damaged by construction activities should be pruned using proper arboricultural techniques. Should accidental damage result in tree mortality, compensation in the form of replacement of the tree species should occur within an area agreed to by Enbridge, the landowner and municipality.

8.5 Wildlife

Inspection staff should verify that wildlife protection timing windows are adhered to, as applicable. To avoid contravention of the MBCA, any vegetation removal activities should occur between September 1st and March 30th to ensure that all bird nesting activities have been completed and the majority of chicks have reached the adult stage. In most cases nest searches during the nesting season (April 1st – August 31st) are not recommended within complex habitats as the ability to detect nests is largely low while risk of disturbance to active nests is high. Disturbance increases the risk of nest predation and abandonment of adults. Therefore, nest searches are not recommended unless nests are known to be easily located without disturbing them.

8.6 Residences, Farms and Businesses

The contractor should verify the measures outlined in the traffic management plan are fully implemented, access adjacent properties is being maintained and that traffic is not being unnecessarily interrupted.

8.7 Archaeology

Indigenous communities will be invited to participate in the monitoring of Stage 2 Archaeological field assessment. Should previously undocumented archaeological resources be discovered during construction, they may be a new archaeological site and therefore subject to Section 48(1) of the *Ontario Heritage Act* (Government of Ontario, 1990). 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 field work, in compliance with Section 48(1) of the *Ontario Heritage Act* (Government of Ontario, 1990).

9. Conclusion

This report outlined the potential effects and proposed mitigation measures associated with the Project. With the implementation of the recommendations in this report, including the additional field investigations and environmental monitoring during construction described in **Section 6** and **Section 8**, as well as adherence to all permitting, regulatory and/or legislative requirements, potential adverse environmental effects associated with the construction of the Project will largely be avoided and, where avoidance is not possible, effects have been minimized to the point where they are not significant.

10. References

- Agriculture and AgriFood Canada, 2018:
Canada Soils Information System. Accessed August 2020 from: <http://sis.agr.gc.ca/cansis/>
- Armstrong, D.K. and J.E.P. Dodge, 2007:
Paleozoic Geology of Southern Ontario; Project Summary and Technical Document. Ontario Geological Survey Miscellaneous Release – Data 219.
- Bat Conservation International, 2019:
Species Profiles. Accessed August 2020, from: <http://www.batcon.org/resources/media-education/species-profiles>.
- Bird Studies Canada (BSC), Environment Canada - Canadian Wildlife Service (EC-CWS), Ontario Nature, Ontario Field Ornithologists (OFO) and Ontario Ministry of Natural Resources and Forestry (MNFR), 2006:
Ontario Breeding Bird Atlas (OBBA) Website. Accessed August 2020, from:
<http://www.birdsontario.org/atlas/index.jsp>
- Chapman, L.J. and D.F. Putnam, 1984:
The Physiography of Southern Ontario, Third Edition. Ontario Geological Survey, Special Volume 2, 270p. Accompanied by Map P.2715 (coloured), scale 1:600,000.
- Chapman, L.J. and D.F. Putnam, 2007:
The Physiography of Southern Ontario; Ontario Geological Survey, Miscellaneous Release – Data 228 ISBN 978-1-4249-5158-1.
- Committee on the Status of Endangered Wildlife in Canada (COSEWIC), 2008:
COSEWIC assessment and update status report on the Eastern Foxsnake *Elaphe gloydi*, Carolinian population and Great Lakes/St. Lawrence population, in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 45 pp.
- Committee on the Status of Endangered Wildlife in Canada (COSEWIC), 2010a:
COSEWIC assessment and status report on the Bobolink *Dolichinyx oryzivorus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. ix + 48 pp.
(<http://www.gov.pe.ca/photos/original/bobolinkCOSEWIC.pdf>).
- Committee on the Status of Endangered Wildlife in Canada (COSEWIC), 2010b:
COSEWIC assessment and status report on the Butler's Gartersnake *Thamnophis butleri* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xi + 51 pp.
- Committee on the Status of Endangered Wildlife in Canada (COSEWIC), 2011a: COSEWIC assessment and status report on the Barn Swallow *Hirundo rustica* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. ix + 46 pp.
(http://www.sararegistry.gc.ca/virtual_sara/files/cosewic/sr_barn_swallow_0911_eng.pdf).
- Committee on the Status of Endangered Wildlife in Canada (COSEWIC), 2011b:
COSEWIC assessment and update status report on the Eastern Meadowlark *Sturnella magna* in Canada.

Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 40 pp.
(http://www.registrelep.sara.gc.ca/virtual_sara/files/cosewic/sr_eastern_meadowlark_0911_eng.pdf).

Committee on the Status of Endangered Wildlife in Canada (COSEWIC), 2012:
COSEWIC assessment and status report on the Massasauga *Sistrurus catenatus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xiii + 84 pp.

Committee on the Status of Endangered Wildlife in Canada (COSEWIC), 2013:
COSEWIC assessment and status report on the Little Brown Myotis (*Myotis lucifugus*), Northern Myotis (*Myotis septentrionalis*), and Tri-colored Bat (*Perimyotis subflavus*) in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xxiv + 93 pp.

County of Lambton. 2012:
By-Law No. 04 of 2012 – A By-Law to Amend By-Law No. 4 of 2012, Together Forming the County of Lambton Woodlands Conservation By-Law.

County of Lambton, 2019:
County of Lambton Official Plan, May 6th, 2019. Accessed August 2020, from <https://www.lambtononline.ca/en/business-and-development/resources/Documents/PlanningandDevelopment/OfficialPlan/Lambton-County-Official-Plan---Portions-Under-Appeal-Noted.pdf>.

County of Lambton, 2019: Planning and Development. Accessed August 2020, form: <https://www.lambtononline.ca/en/business-and-development/planning-and-development.aspx>

County of Lambton, 2020:
Topographic Map. Accessed August 2020 from <https://en-ca.topographic-map.com/maps/s286/Lambton-County/>

Department of Fisheries and Oceans Canada (DFO), 2010a:
Pathways of Effects – Use of Industrial Equipment: <http://www.dfo-mpo.gc.ca/pnw-ppe/pathways-sequences/industrial-industriel-eng.html> Accessed July 2020.

Department of Fisheries and Oceans Canada (DFO), 2010b:
Pathways of Effects – Vegetation Clearing: <http://www.dfo-mpo.gc.ca/pnw-ppe/pathways-sequences/vegetation-eng.html>. Accessed July 2020.

Department of Fisheries and Oceans Canada (DFO), 2017:
Guidance for Maintaining and Repairing Municipal Drains in Ontario. Available online: <https://www.dsao.net/images/Documents/Dart/General/Guidance-for-Maintaining-and-Repairing-Municipal-Drains-in-Ontario-March-7-2017-V1.0.pdf>. Assessed July 2020

Department of Fisheries and Oceans Canada (DFO), 2019:
Measures to Avoid Harm: <https://www.dfo-mpo.gc.ca/pnw-ppe/measures-mesures-eng.html>. Accessed July 2020

Department of Fisheries and Oceans Canada (DFO), 2020:
Aquatic Species at Risk (SAR) Mapping. Online Application at: <https://www.dfo-mpo.gc.ca/speciesespeces/sara-lep/map-carte/index-eng.html>. Accessed July 2020

- Department of Fisheries and Oceans Canada (DFO), 2019:
Fish and Fish Habitat Protection Policy Statement: Available online at: <https://www.dfo-mpo.gc.ca/pnw-ppe/policy-politique-eng.pdf>. Accessed July 2020.
- Dobbyn, J. S., 1994:
Atlas of the Mammals of Ontario. Don Mills: Federation of Ontario Naturalists.
- Environment Canada (EC), 2014:
Avoidance guidelines: Reducing Risk to Migratory Birds: Technical information. Accessed August 2015.
Available: <https://www.ec.gc.ca/paom-itmb/default.asp?lang=En&n=AB36A082-1>
- Environment Canada (EC), 2015:
Recovery Strategy for Little Brown Myotis (*Myotis lucifugus*), Northern Myotis (*Myotis septentrionalis*), and Tri-colored Bat (*Perimyotis subflavus*) in Canada [Proposed]. Species at Risk Act Recovery Strategy Series. Environment Canada, Ottawa. ix + 110 pp.
- Government of Canada, 2020:
Canada Energy Regulator; Major Applications and Projects before the CER. Accessed August 2020, from: <https://www.cer-rec.gc.ca/pplctnflng/mjrpp/index-eng.html>
- Government of Canada, 2020:
Canadian Environmental Assessment Registry. Accessed August 2020 from: https://iaac-aeic.gc.ca/050/evaluations/exploration?active=true&showMap=true&document_type=project
- Government of Canada, 2020:
Natural Resources Canada. The Atlas of Canada - Indigenous Mining Agreements. Accessed April 2020 from <http://atlas.gc.ca/imaema/en>.
- Government of Canada, 2020:
Natural Resources Canada. Major Projects Inventory. Accessed August 2020, from: <https://open.canada.ca/data/en/dataset/7d42d280-ccca-4d7b-ba2b-2e1494cf1f4b>
- Government of Ontario, 2020:
Environmental Registry of Ontario. Accessed August 2020, from: <https://ero.ontario.ca/search>
- Government of Ontario, 2020:
Ontario Builds: our infrastructure plan. Accessed August 2020 form: <https://www.ontario.ca/page/building-ontario#:~:text=Ontario's%20growth,population%20and%20strengthen%20our%20economy>.
- Government of Ontario, 1990:
Ontario Heritage Act, R.S.O. 1990, c. O.18. Accessed August 2020 from: <https://www.ontario.ca/laws/statute/90o18>
- Government of Ontario, 2020: Renewable Energy Projects Listing. Accessed August 2020, from: <https://www.ontario.ca/page/renewable-energy-projects-listing>
- Humphrey, C. 2017:
Recovery Strategy for the Eastern Small-footed Myotis (*Myotis leibii*) in Ontario. Ontario Recovery Strategy Series. Prepared for the Ontario Ministry of Natural Resources and Forestry, Peterborough, Ontario. Vii + 76 pp.
- Infrastructure Ontario, 2020:

- Major Projects Mapping. Accessed August 2020, from:
<https://www.infrastructureontario.ca/projects/map/?projectTypeId=34359738436>
- Karrow, P.F., 1991:
Quaternary Geology, Stratford – Conestogo Area. Ontario Geological Survey, Report 283, 104 pp.
- Lee, H.T., W.D. Bakowsky, J. Riley, J. Bowles, M. Puddister, P. Uhlig and S. McMurray, 1998:
Ecological Land Classification for Southern Ontario: First Approximation and its Application. Ontario Ministry of Natural Resources, Southcentral Science Section, Science Development and Transfer Branch. SCSS Field Guide FG-02.
- Macnaughton, A., Layberry, R., Cavasin, R., Edwards, B. and C. Jones, 2020:
Ontario Butterfly Atlas. Toronto Entomologists' Association. Accessed August 2020.
<https://www.ontarioinsects.org/atlas/index.html>
- Natural Resources Canada, 2015:
2010 National Building Code of Canada seismic hazard maps. Accessed May 2018 from:
<http://www.earthquakescanada.nrcan.gc.ca/hazard-alea/zoning-zonage/NBCC2010maps-en.php>
- Natural Resources Canada, 2019:
Major Projects Inventory. Accessed August 2020, from: <https://open.canada.ca/data/en/dataset/7d42d280-ccca-4d7b-ba2b-2e1494cf1f4b>
- NatureServe, 2020:
Conservation Status Ranks. NatureServe, Arlington, Virginia. Accessed August 2020, from
<https://explorer.natureserve.org/AboutTheData/Statuses>
- Oil, Gas and Salt Resource Library, 2018:
Oil, Gas and Salt Resource Library. Accessed May 2018 from: <http://www.ogsrlibrary.com/>
- Ontario Energy Board, 2016:
Environmental Guidelines for the Location, Construction and Operation of Hydrocarbon Pipelines and Facilities in Ontario, 7th Edition.
- Ontario Energy Board, 2020:
Applications before the OEB. Accessed August 2020 from: <https://www.oeb.ca/industry/applications-oeb>
- Ontario Geological Survey (OGS), 1991:
Bedrock Geology of Ontario, Southern Sheet; Ontario Geological Survey, Map 2544, scale 1:1 000 000.
- Ontario Geological Survey, 1997:
Quaternary geology, seamless coverage of the province of Ontario: Ontario Geological Survey, Data Set 14
- Ontario Geological Survey (OGS), 2003:
Surficial Geology of Southern Ontario. Ontario Geological Survey, MRD128.
- Ontario Geological Survey (OGS), 2010:
Surficial geology of Southern Ontario; Ontario Geological Survey, Miscellaneous Release--Data 128-REV. ISBN 978-1-4435-2483-4 [DVD] ISBN 978-1-4435-2482-7

- Ontario Geological Survey (OGS), 2020:
ARIP: Aggregate Resource Inventory Papers. Accessed August 2020, from <https://www.geologyontario.mndm.gov.on.ca/mines/data/google/arip/doc.kml>
- Ontario Mining Association, 2018:
Ontario Mining Association 2018 Map and Advanced Mineral Projects in Ontario 2018 Map. Accessed April 2018, from <http://www.oma.on.ca/en/ontariominning/Map.asp>.
- Ontario Mining Association, 2020: Ontario Mining Operations 2020. Accessed August 2020, from: <https://www.oma.on.ca/en/ontariominning/Map.asp>
- Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA), 2017
Soil Survey Complex. Available online at <https://www.ontario.ca/data/soil-survey>
- Ontario Ministry of Finance, 2019:
Ontario Population Projections, 2018-2046. Retrieved from <https://www.fin.gov.on.ca/en/economy/demographics/projections/projections2018-2046.pdf>.
- Ontario Ministry of Indigenous Affairs, 2017:
Ontario First Nations Maps, 2017. Accessed August 2020 from: <https://www.ontario.ca/page/ontario-first-nations-maps>
- Ontario Ministry of Municipal Affairs and Housing, 2020:
Provincial Policy Statement, 2020 under the Planning Act. Ontario: Queen's Printer for Ontario. 53 pp.
- Ontario Ministry of Natural Resources (OMNR) and Ontario Geological Survey (OGS), 1980:
Annual report of the Regional and Resident Geologists, 1979. Edited by C.R. Kustra, MP91, 143 pp.
- Ontario Ministry of Natural Resources and Forestry, 2000:
Significant Wildlife Habitat Technical Guide. Peterborough: Queen's Printer for Ontario, 151 pp.
- Ontario Ministry of Natural Resources and Forestry, 2010:
Natural Heritage Reference Manual for Natural Heritage Policies of the Provincial Policy Statement, 2005. Toronto: Queen's Printer for Ontario, 244 pp.
- Ontario Ministry of Natural Resources and Forestry, 2014:
Ontario Wetland Evaluation System Southern Manual. Third Edition, Version 3.3, Queen's Printer for Ontario, 284 pp.
- Ontario Ministry of Natural Resources and Forestry, 2015:
Significant Wildlife Habitat Criteria Schedules for Ecoregion 7E. Peterborough, 40 pp.
- Ontario Ministry of Natural Resources and Forestry, 2019a:
Eastern Small-footed Myotis. Ontario Ministry of Natural Resources and Forestry. Available: <https://www.ontario.ca/page/eastern-small-footed-myotis>. Accessed August 2020.
- Ontario Ministry of Natural Resources and Forestry, 2019b:
Little Brown Myotis. Ontario Ministry of Natural Resources and Forestry. Available: <https://www.ontario.ca/page/little-brown-myotis>. Accessed August 2020.

- Ontario Ministry of Natural Resources and Forestry, 2019c:
Northern Myotis. Ontario Ministry of Natural Resources and Forestry. Available:
<https://www.ontario.ca/page/northern-myotis>. Accessed August 2020.
- Ontario Ministry of Natural Resources and Forestry, 2019d:
Tri-colored Bat. Ontario Ministry of Natural Resources and Forestry. Available:
<https://www.ontario.ca/page/tri-colored-bat>. Accessed August 2020.
- Ontario Ministry of Natural Resources and Forestry, 2020a:
Fish ON-Line, online mapping application.
<https://www.gisapplication.lrc.gov.on.ca/FishONLine/Index.html?site=FishONLine&viewer=FishONLine&locale=en-US>. Accessed July 2020
- Ontario Ministry of Natural Resources and Forestry, 2020b:
Make a Map: Natural Heritage Areas. Natural Heritage Information Centre. Accessed August 2020.
https://www.gisapplication.lrc.gov.on.ca/mamnh/Index.html?site=MNR_NHLUPS_NaturalHeritage&viewer=NaturalHeritage&locale=en-US
- Ontario Ministry of Natural Resources and Forestry, 2020c:
Land Information Ontario: Ontario GeoHub. <https://geohub.lio.gov.on.ca/>. Accessed July 2020
- Ontario Ministry of the Environment, Conservation and Parks (MECP), 2017a:
Records of site condition and transition notices (filed between October 1, 2004 and June 30, 2011),
Accessed August 14, 2020, from: <https://www.lrcsde.lrc.gov.on.ca/besrWebPublic/generalSearch>.
- Ontario Ministry of the Environment, Conservation and Parks (MECP), 2017b:
Records of site condition (filed since July 1, 2011), Accessed May 16, 2018, from:
https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/searchFiledRsc_search?request_locale=en.
- Ontario Ministry of the Environment, Conservation and Parks (MECP), 2018:
Small landfill sites list. Accessed May 16, 2018 from: <https://www.ontario.ca/environment-and-energy/small-landfill-sites-list?drpDistrict=all&drpStatus=all>.
- Ontario Ministry of the Environment, Conservation and Parks (MECP), 2019:
Brownfields redevelopment, Accessed August 14, 2020, from: <https://www.ontario.ca/page/brownfields-redevelopment#section-2>.
- Ontario Ministry of the Environment, Conservation and Parks (MECP), 2020a:
Map of large landfills in Ontario. Accessed August 14, 2020 from: <https://www.ontario.ca/environment-and-energy/map-large-landfill-sites?region=Southwestern>.
- Ontario Ministry of the Environment, Conservation and Parks (MECP), 2020b:
Water Well Information System (WWIS), Accessed August 2020 from: <https://data.ontario.ca/dataset/well-records>.
- Ontario Nature. 2019:
Ontario Reptile and Amphibian Atlas. Ontario: Toronto Entomologists' Association.
<https://www.ontarioinsects.org/herp/>. Accessed August 2020
- Owen, S.F., M.A. Menzel, W.M. Ford, J.W. Edwards, B.R. Chapman, K.V. Miller and P.B. Wood, 2002:
Roost tree selection by maternal colonies of northern long-eared myotis in an intensively managed forest.

United States Department of Agriculture Forest Service, General Technical Report NE-292, Northeastern Research Station, Newtown Square, PA, p. 6.

Perry, R. and R. Thill, 2007:

Tree roosting by male and female eastern pipistrelles in a forested landscape. *Journal of Mammalogy* 88: 974-981.

Randall, J. and H.G. Broders, 2014:

Identification and characterization of swarming sites used by bats in Nova Scotia, Canada. *Acta Chiropterologica* 16(1): 109-116.

Richards, N.R. and R.E. Wicklund, 1961:

The Soil Survey of Lambton County; Canada Department of Agriculture and the Ontario Agricultural College.

Robertson, M.J., D.A. Scruton, R.S. Gregory and K.D. Clarke, 2006:

Effect of Suspended Sediment on Freshwater Fish and Fish Habitat. Canadian Technical Report of Fisheries and Aquatic Sciences 2644. P37.

Sarnia & Lambton County This Week, 2020:

Lambton County's population recorded modest boost in 2019. Accessed August 2020, from <https://www.sarniathisweek.com/news/local-news/lambton-countys-population-recorded-modest-boost-in-2019#:~:text=The%20total%20estimated%20population%20for,infrastructure%20and%20development%20services%20office>.

Schlumberger Water Services (Canada) Inc., 2011:

Thames – Sydenham and Region; Upper Thames River Tier 2 Conceptual Model Report, May 9, 2011, page 44-45.

Statistics Canada. 2017:

Lambton, CTY [Census division], Ontario and Ontario [Province] (table). *Census Profile*. 2016 Census. Statistics Canada Catalogue no. 98-316-X2016001. Ottawa. Released November 29, 2017.

Statistics Canada. 2017:

St. Clair, TP [Census subdivision], Ontario and Ontario [Province] (table). *Census Profile*. 2016 Census. Statistics Canada Catalogue no. 98-316-X2016001. Ottawa. Released November 29, 2017.

St. Clair Region Conservation Authority (SCRCA), 2009:

St. Clair River Watershed Plan. Available online: <https://www.scrca.on.ca/wp-content/uploads/2013/11/Pub-St-Clair-River-Watershed-Plan-Part-I.pdf>. Accessed July 2020.

St. Clair Region Conservation Authority (SCRCA), 2018a:

Lower Bear Creek Subwatershed Report Card. Available online: <https://www.scrca.on.ca/wp-content/uploads/2019/02/2018-SCRCA-WRC-Lower-Bear-Creek.pdf>. Assessed July 2020.

St. Clair Region Conservation Authority (SCRCA), 2018b:

St. Clair River Tributaries Subwatershed Report Card, Available online <https://www.scrca.on.ca/wp-content/uploads/2019/02/2018-SCRCA-WRC-Lower-Bear-Creek.pdf>. Assessed July 2020.

St. Clair Region Conservation Authority (SCRCA), 2019:

St. Clair Region Annual Report. Available online: <https://www.scrca.on.ca/wp-content/uploads/2020/02/2019-SCRCA-Annual-Report-Low-Res.pdf>. Accessed Aug 2020.

St. Clair Township, 2003:

St. Clair Township Zoning By-Law 17 of 2003. Accessed August 2020, from http://stclairtownship.ca/wordpress/wp-content/uploads/zoning_by-law.pdf.

St. Clair Township, 2005:

St. Clair Township Official Plan, 2005. Accessed August 2020, from http://stclairtownship.ca/wordpress/wp-content/uploads/official_plan.pdf

Thames-Sydenham and Region Source Protection Committee (TSRSPC), 2015:

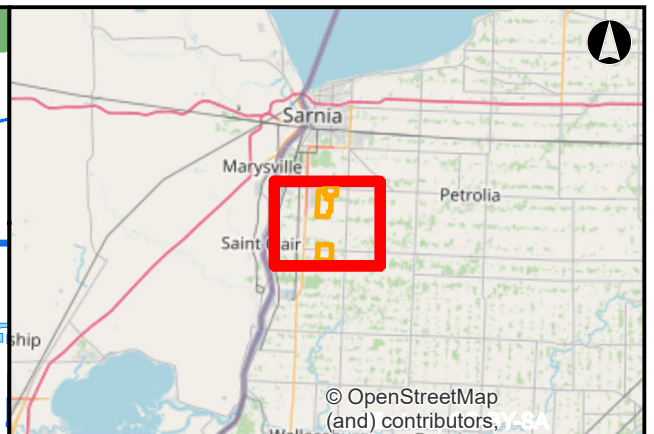
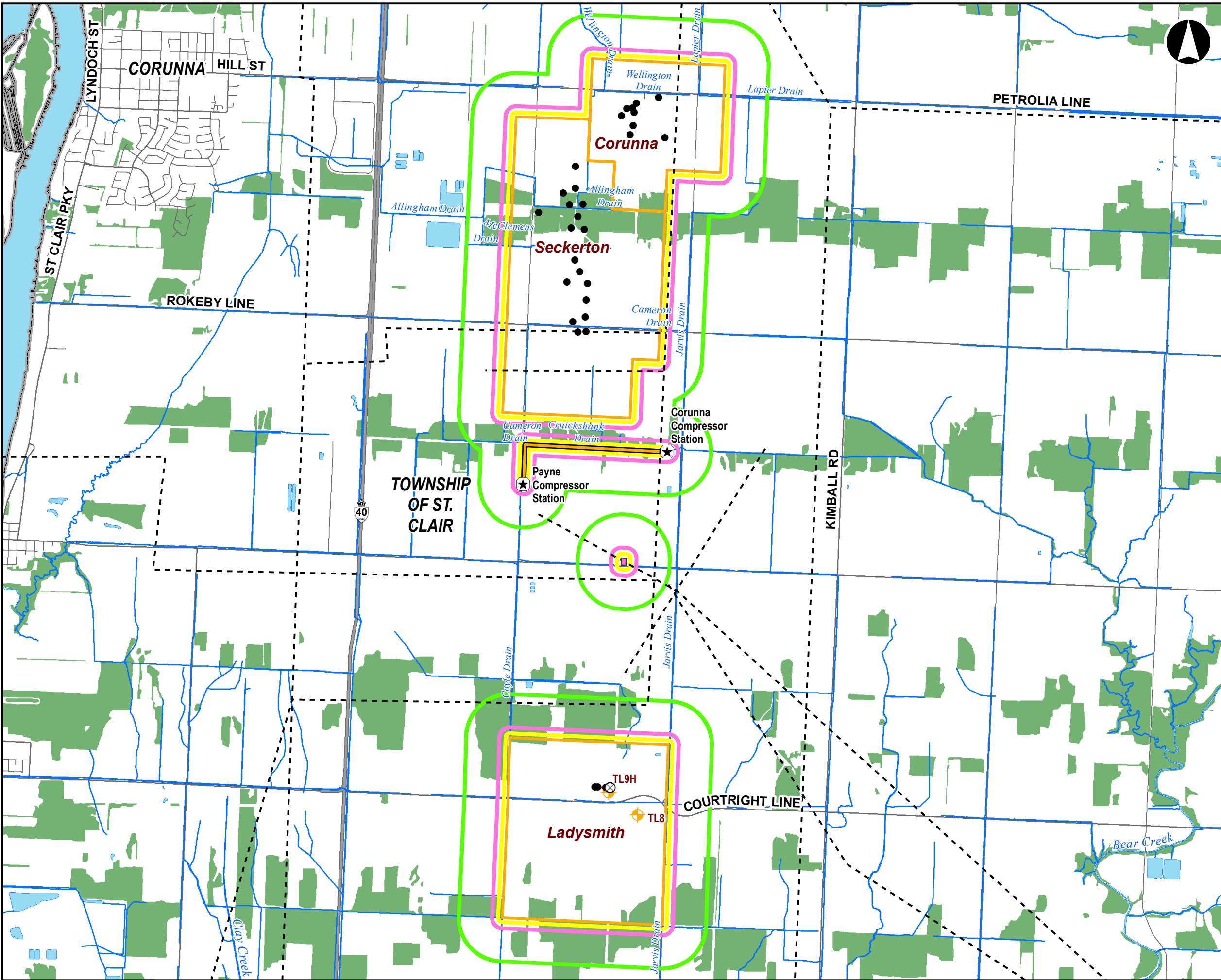
Thames-Sydenham and Region Watershed Characterization Report, St. Clair Region Source Protection Area – Volume 1. Revised March 5, 2015.

Treasury Board of Canada Secretariat, 2018:

Federal Contaminated Sites Inventory, Accessed August 14, 2020 from: <https://map-carte.tbs-sct.gc.ca/map-carte/fcsi-rscf/map-carte.aspx?Language=EN&qid=2161830&backto=http://www.tbs-sct.gc.ca/fcsi-rscf/numbers-numeros-eng.aspx?qid=2161830>

Appendix **A**

Figures



Legend

- ⊗ NPS 16 Bi-Directional Control Valve
- Existing Gas Well
- ⊕ Proposed New Gas Well
- ★ Existing Enbridge Gas Station
- Ladysmith Gathering Line
- - - Existing Gas Pipeline
- Proposed NPS 24 Pipeline
- Watercourse
- Highway
- Major Road
- Local Road
- Storage Pool Area
- Proposed Cross Over Station
- Municipal Boundary
- Wooded Area
- Socio-Economic Study Area
- Cultural Heritage and Archaeology Study Area
- Natural Heritage Study Area

0 200 400 800 1,200 1,600 2,000 2,400 2,800
Metres

2021/2022 Storage Enhancement Project

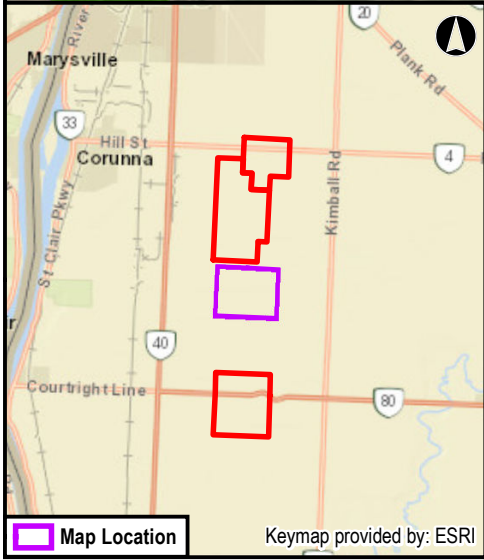
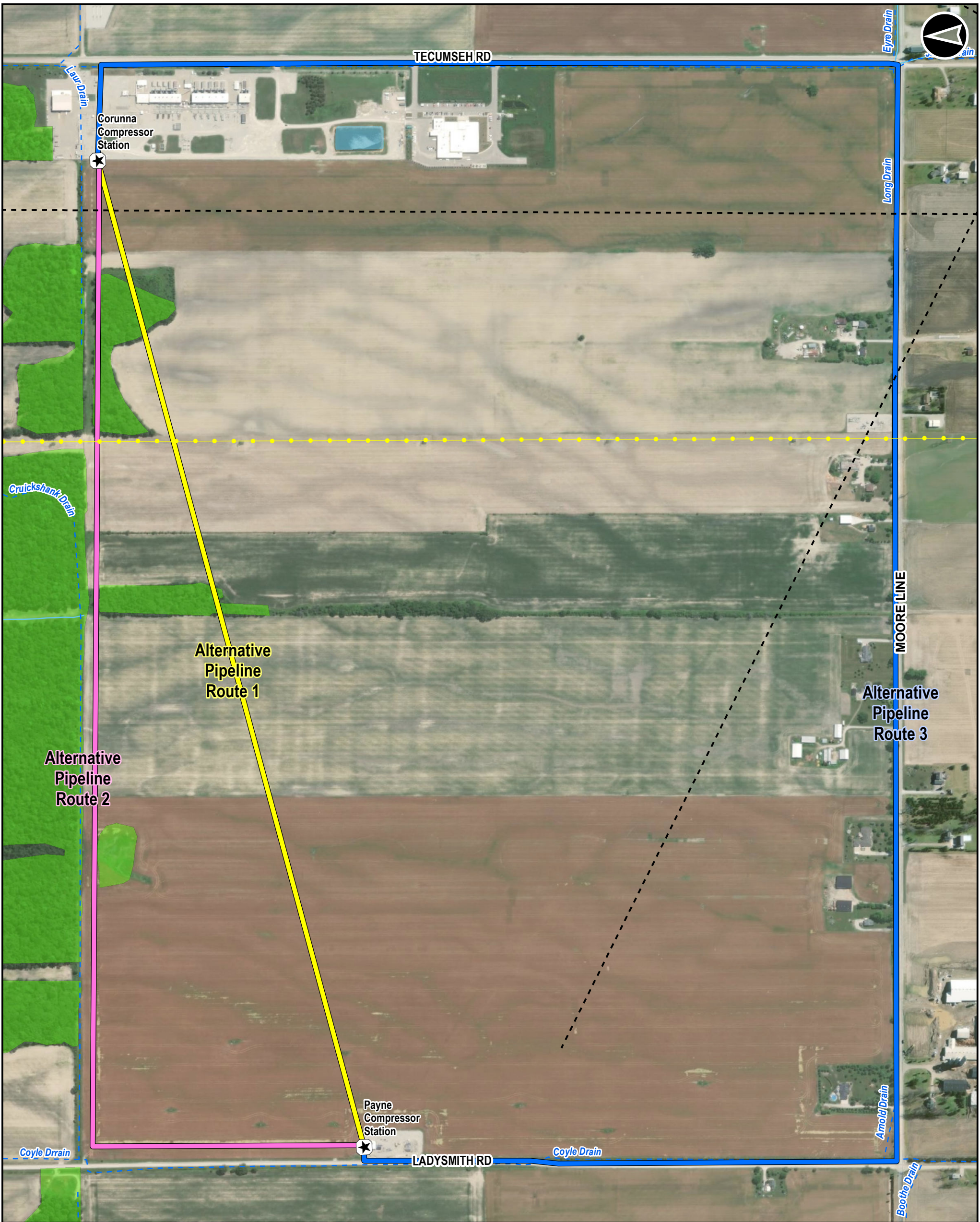
Project Study Area

Sep, 2020	1:42,000 <small>*when printed 11"x17"</small>	Datum: NAD 1983 UTM Zone 17N Source: MNRF
P#: 60633149		

AECOM Figure 1-1

This drawing has been prepared for the use of AECOM's client and may not be used, reproduced or relied upon by third parties, except as agreed by AECOM and its client, as required by law or for use by governmental reviewing agencies. AECOM accepts no responsibility, and denies any liability whatsoever, to any party that modifies this drawing without AECOM's express written consent.

Date Saved: 01/20/20 12:14:24 PM User Name: clairb



Legend

- ★ Existing Enbridge Gas Station
- Alternative Pipeline Route 1
- Alternative Pipeline Route 2
- Alternative Pipeline Route 3
- - - Existing Gas Pipeline
- Hydro Line
- - - Constructed Drain
- Watercourse
- Waterbody
- Wooded Area

Map Location

Keymap provided by: ESRI

2021/2022 Storage Enhancement Project

Alternative Pipeline Routes

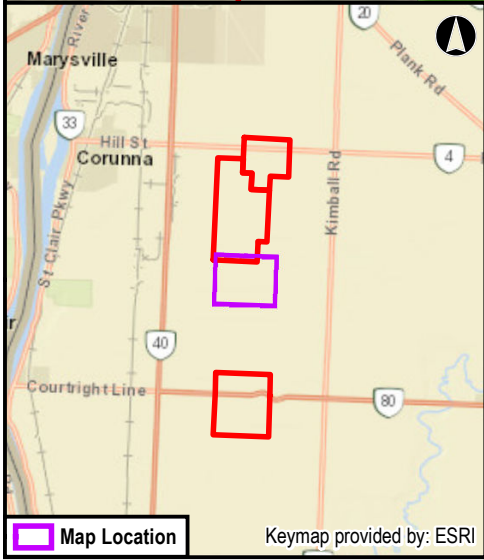
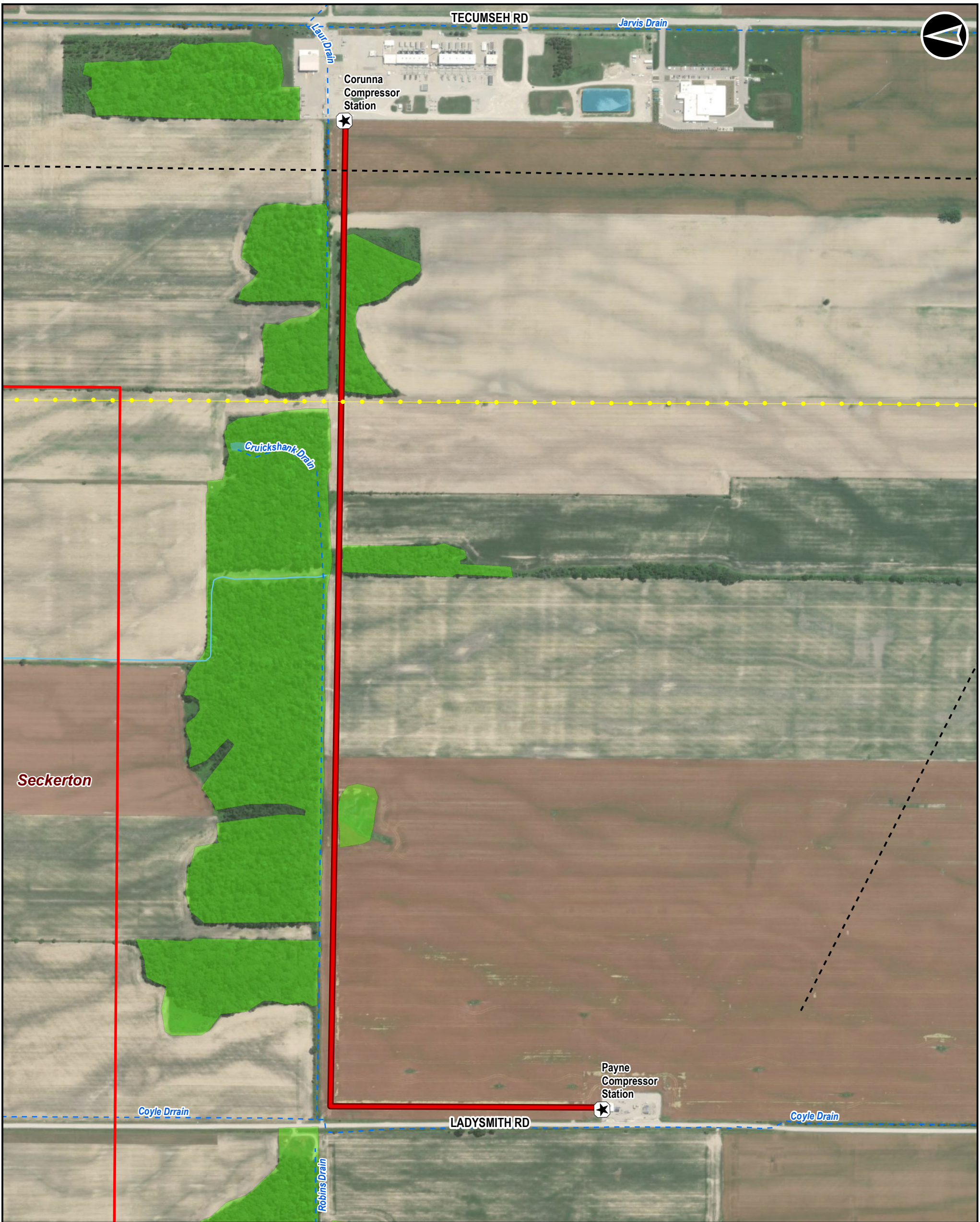
0 50 100 200 300
Meters

Datum: NAD 1983 UTM Zone 17N

Sep, 2020	1:6,000 * when printed 11"x17"	Data Sources: MECP, Enbridge
P#:60633149	REV: 00	

AECOM **Figure 3-1**

Contains Information licensed under the Open Government Licence Ontario. This drawing has been prepared for the use of AECOM's client and may not be used, reproduced or relied upon by third parties, except as agreed by AECOM and its client, as required by law or for use by governmental reviewing agencies. AECOM accepts no responsibility, and denies any liability whatsoever, to any party that modifies this drawing without AECOM's express written consent.



Legend

- ★ Existing Enbridge Gas Station
- Proposed NPS 24 Pipeline
- - - Existing Gas Pipeline
- Hydro Line
- - - Constructed Drain
- Watercourse
- Waterbody
- Wooded Area
- Storage Pool

2021/2022 Storage Enhancement Project

Preferred Pipeline Route

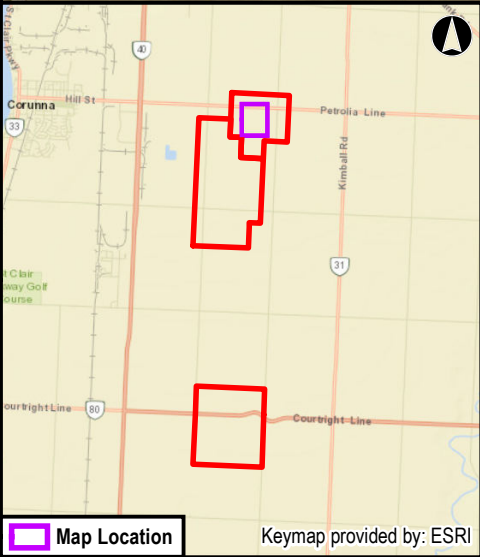
0 50 100 200 300
Meters

Datum: NAD 1983 UTM Zone 17N

Sep, 2020	1:6,000 * when printed 11"x17"	Data Sources: MECP, Enbridge
P#:60633149	REV: 00	

AECOM **Figure 3-2**

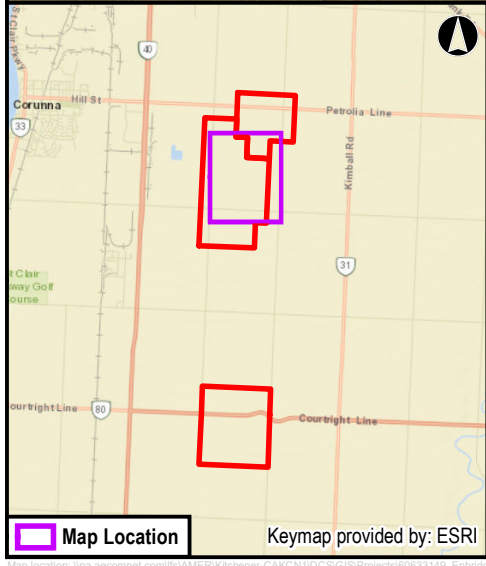
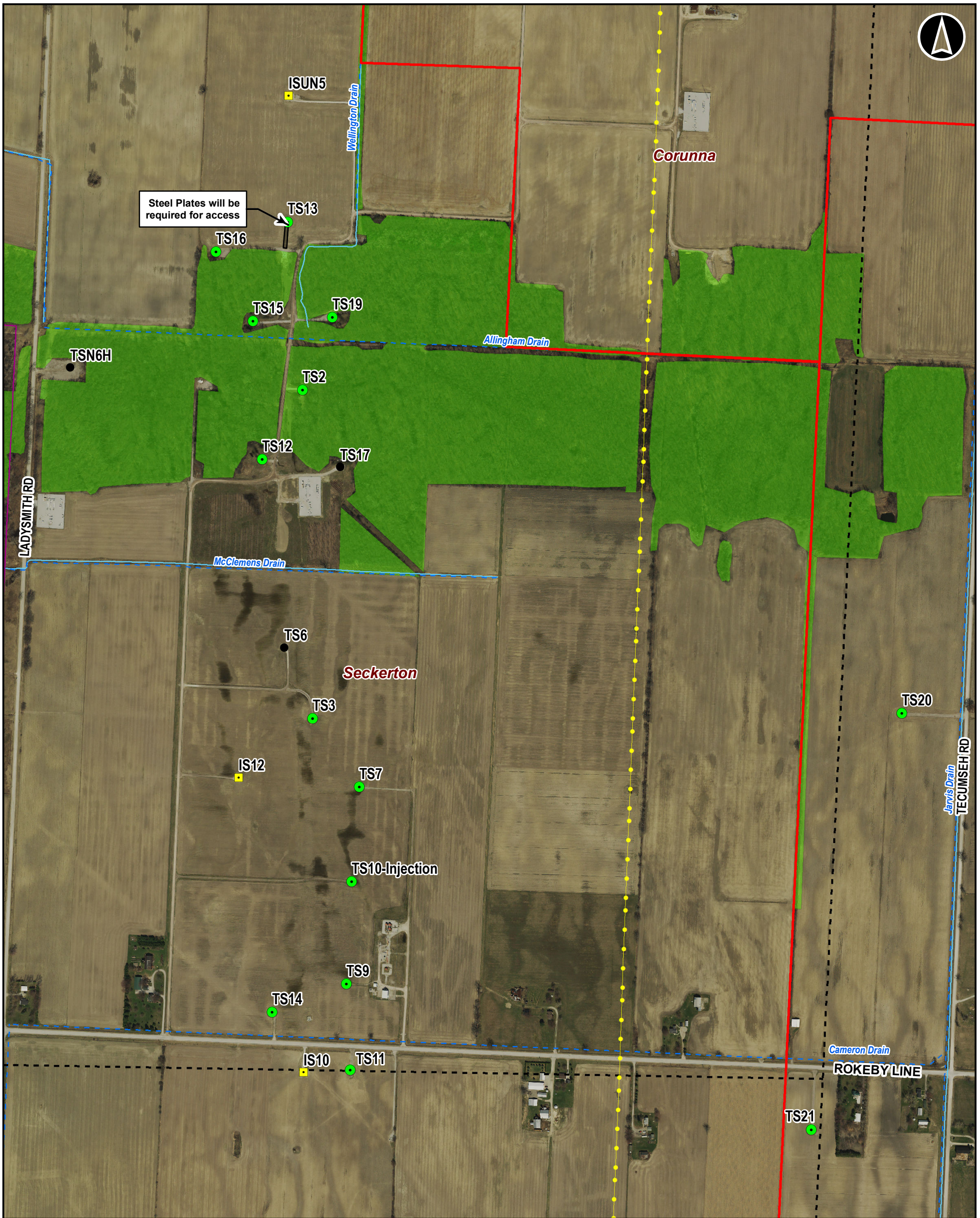
Contains Information licensed under the Open Government Licence Ontario. This drawing has been prepared for the use of AECOM's client and may not be used, reproduced or relied upon by third parties, except as agreed by AECOM and its client, as required by law or for use by governmental reviewing agencies. AECOM accepts no responsibility, and denies any liability whatsoever, to any party that modifies this drawing without AECOM's express written consent.



Legend

- Existing Gas Well Upgrades and Pressure Testing
- ▲ Existing Gas Well Pressure Testing
- Existing Oil Wells Pressure Testing
- ◆ Existing Oil Wells (No work or pressure testing)
- Hydro Line
- - - Agricultural Drain
- Storage Pool
- Steel Plates Installed for Construction Access

2021/2022 Storage Enhancement Project		
Proposed Works at Corunna Storage Pool		
<p>Datum: NAD 1983 UTM Zone 17N</p>		
Sep, 2020	1:2,500 <small>" when printed 11"x17"</small>	Data Sources: MECP, Enbridge, Enbridge SWOOP 2015
P#:60633149	REV: 00	
AECOM		Figure 3-3
Contains Information licensed under the Open Government Licence Ontario. This drawing has been prepared for the use of AECOM's client and may not be used, reproduced or relied upon by third parties, except as agreed by AECOM and its client, as required by law or for use by governmental reviewing agencies. AECOM accepts no responsibility, and denies any liability whatsoever, to any party that modifies this drawing without AECOM's express written consent.		



Legend

- Existing Gas Well Upgrades and Pressure Testing
- Oil Wells Pressure Testing
- Oil Well
- - - Existing Gas Pipeline
- Hydro Line
- Unknown Pipeline
- - - Agricultural Drain
- Watercourse
- ▭ Storage Pool
- ▭ Steel Plates Installed for Construction Access

2021/2022 Storage Enhancement Project

Proposed Works at Seckerton Storage Pool

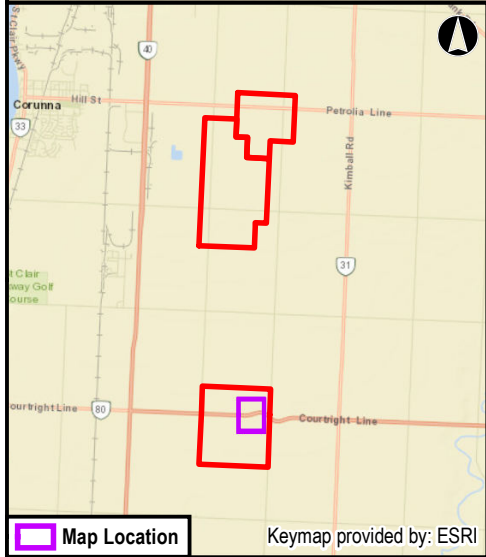
0 25 50 100 150 200 250 300 350 400
Meters

Datum: NAD 1983 UTM Zone 17N

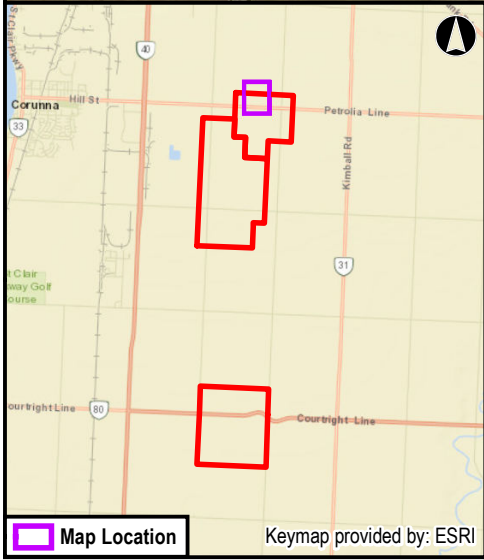
Sep, 2020	1:7,000 * when printed 11"x17"	Data Sources: MECP, Enbridge, Enbridge SWOOP 2015
P#:60633149	REV: 00	

AECOM **Figure 3-4**

Contains Information licensed under the Open Government Licence Ontario. This drawing has been prepared for the use of AECOM's client and may not be used, reproduced or relied upon by third parties, except as agreed by AECOM and its client, as required by law or for use by governmental reviewing agencies. AECOM accepts no responsibility, and denies any liability whatsoever, to any party that modifies this drawing without AECOM's express written consent.



2021/2022 Storage Enhancement Project	
Proposed Works at LadySmith Storage Pool	
Datum: NAD 1983 UTM Zone 17N	
Sep, 2020	1:2,500 * when printed 11"x17"
P#:60633149	REV: 00
AECOM	
Figure 3-5	
<small>Contains Information licensed under the Open Government Licence Ontario. This drawing has been prepared for the use of AECOM's client and may not be used, reproduced or relied upon by third parties, except as agreed by AECOM and its client, as required by law or for use by governmental reviewing agencies. AECOM accepts no responsibility, and denies any liability whatsoever, to any party that modifies this drawing without AECOM's express written consent.</small>	



Legend

- New A-1 Observation Well (TC-8)
- Existing Gas Well Upgrades and Pressure Testing
- ◆ Existing Oil Wells
- Hydro Line
- - - Agricultural Drain
- Steel Plates Installed for Construction Access

Map Location
Keymap provided by: ESRI

2021/2022 Storage Enhancement Project

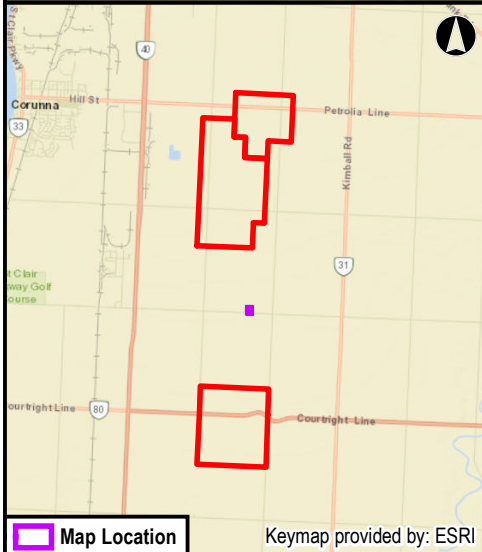
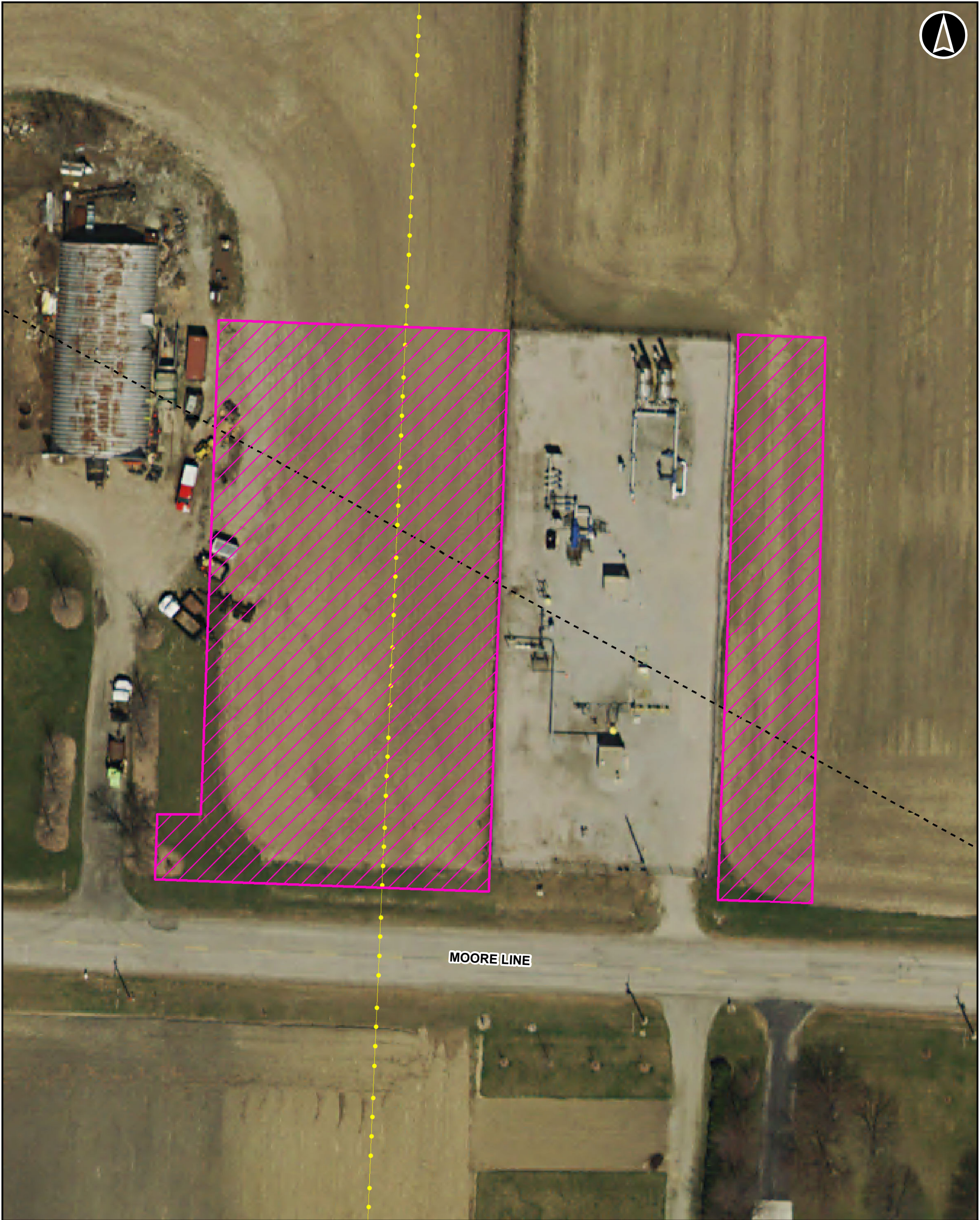
A-1 Observation Well (TC-8)

0 10 20 40 60 80 100 120 140
Meters
Datum: NAD 1983 UTM Zone 17N

Sep, 2020	1:2,500 <small>" when printed 11"x17"</small>	Data Sources: MECP, Enbridge, Enbridge SWOOP 2015
P#:60633149	REV: 00	

AECOM **Figure 3-6**

Contains Information licensed under the Open Government Licence Ontario. This drawing has been prepared for the use of AECOM's client and may not be used, reproduced or relied upon by third parties, except as agreed by AECOM and its client, as required by law or for use by governmental reviewing agencies. AECOM accepts no responsibility, and denies any liability whatsoever, to any party that modifies this drawing without AECOM's express written consent.



Legend

- - - Existing Gas Pipeline
- Hydro Line
- ▨ Potential Crossover Station Area
- ▭ Storage Pool

2021/2022 Storage Enhancement Project

Potential Crossover Station Area

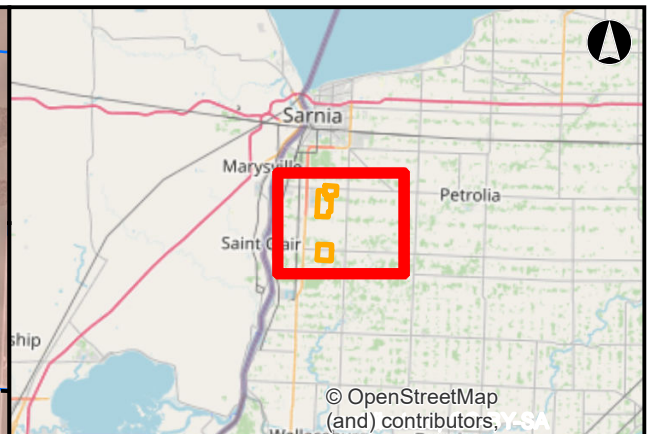
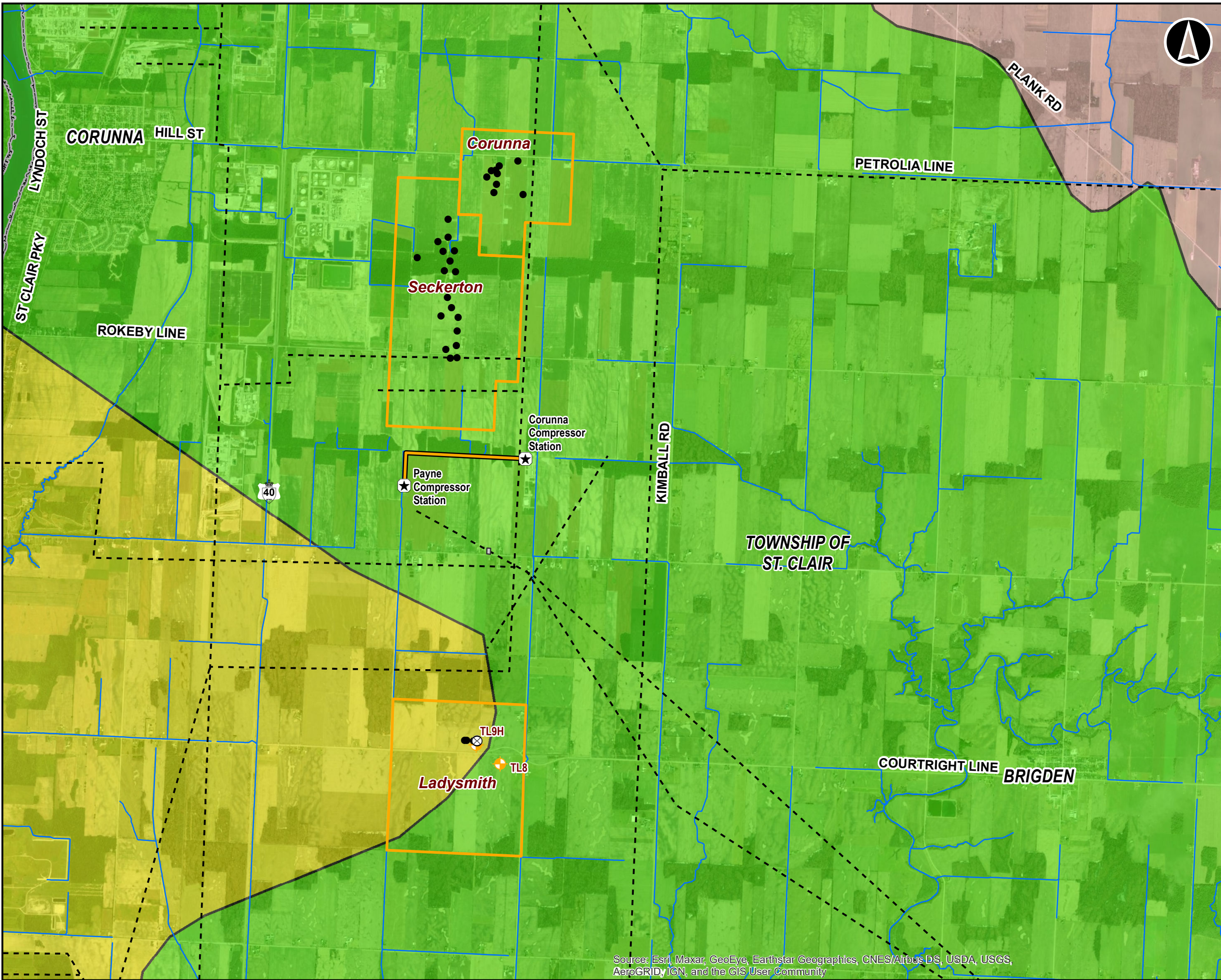
0 10 20
Meters

Datum: NAD 1983 UTM Zone 17N

Sep, 2020	1:500 * when printed 11"x17"	Data Sources: MECP, Enbridge, Enbridge SWOOP 2015
P#:60633149	REV: 00	

AECOM **Figure 3-7**

Contains Information licensed under the Open Government Licence Ontario. This drawing has been prepared for the use of AECOM's client and may not be used, reproduced or relied upon by third parties, except as agreed by AECOM and its client, as required by law or for use by governmental reviewing agencies. AECOM accepts no responsibility, and denies any liability whatsoever, to any party that modifies this drawing without AECOM's express written consent.



Legend

- ⊗ NPS 16 Bi-Directional Control Valve
- Existing Gas Well
- ⊕ Proposed New Gas Well
- ★ Existing Enbridge Gas Station
- Ladysmith Gathering Line
- - - Existing Gas Pipeline
- Proposed NPS 24 Pipeline
- Watercourse
- Storage Pool Area
- Proposed Cross Over Station
- Municipal Boundary

Bedrock Geology

- 59a: Limestone, dolostone, shale - Hamilton Group
- 60a: Shale - Kettle Point Formation
- 61: Shale - Port Lambton Group

0 250 500 1,000 1,500 2,000 2,500 3,000 3,500
Metres

2021/2022 Storage Enhancement Project

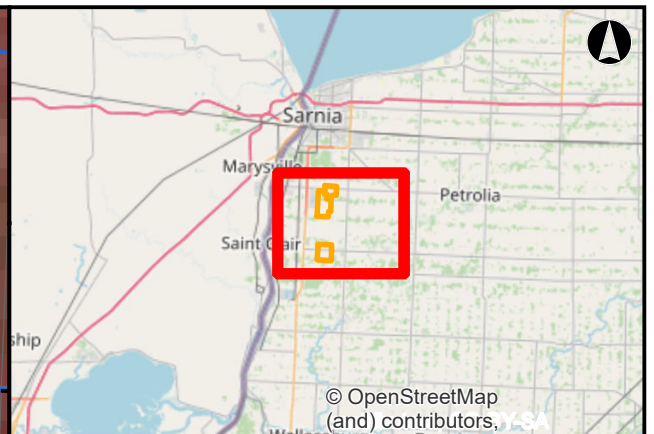
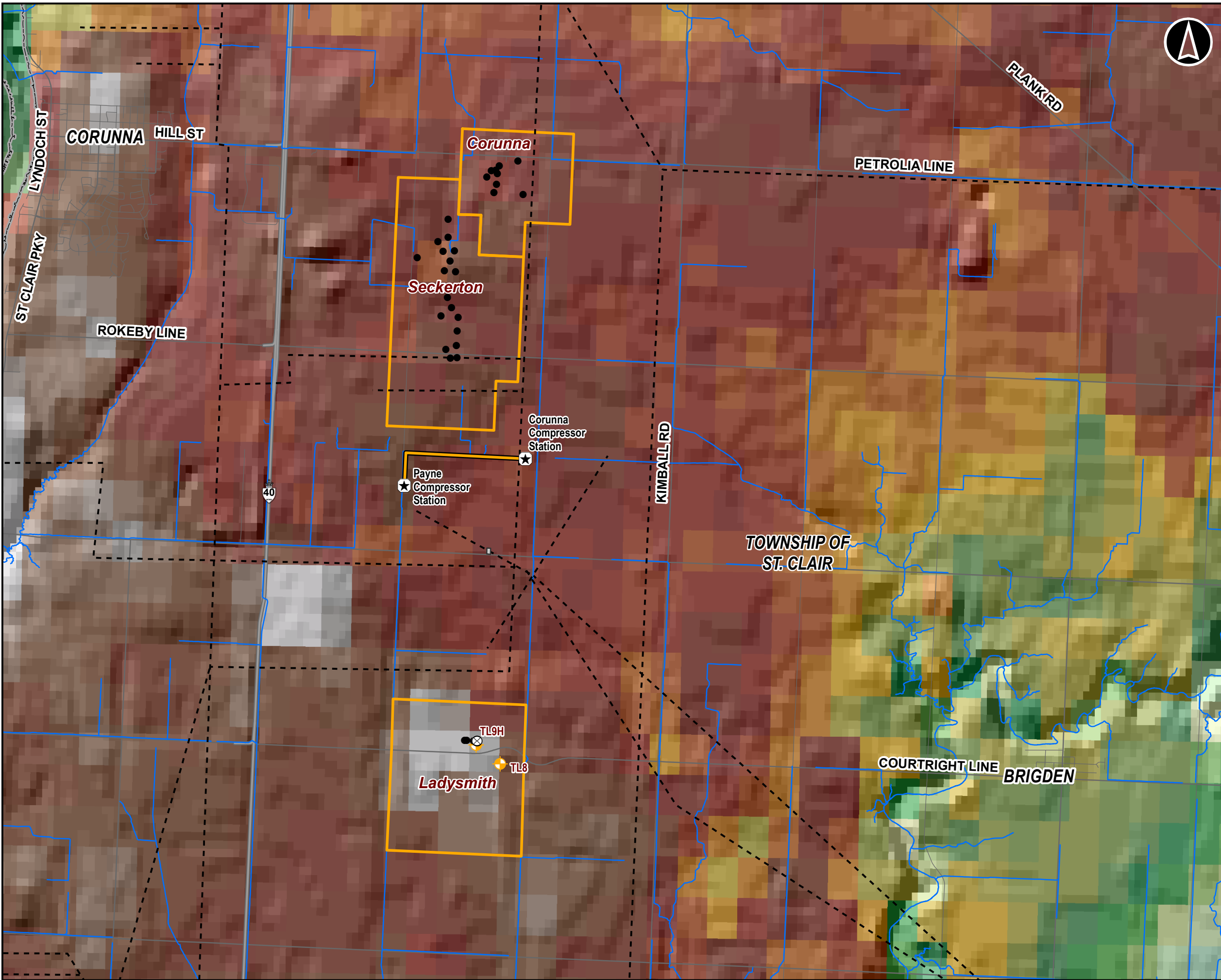
Bedrock Geology

Sep, 2020	1:50,000 <small>*when printed 11"x17"</small>	Datum: NAD 1983 UTM Zone 17N Source: MNRF, MNDM (MRD126-REV1)
P#: 60633149		Figure 5-1

AECOM

This drawing has been prepared for the use of AECOM's client and may not be used, reproduced or relied upon by third parties, except as agreed by AECOM and its client, as required by law or for use by governmental reviewing agencies. AECOM accepts no responsibility, and denies any liability whatsoever, to any party that modifies this drawing without AECOM's express written consent.

Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



Legend

- ⊗ NPS 16 Bi-Directional Control Valve
- Existing Gas Well
- ◆ Proposed New Gas Well
- ★ Existing Enbridge Gas Station
- Ladysmith Gathering Line
- - - Existing Gas Pipeline
- Proposed NPS 24 Pipeline
- Watercourse
- Storage Pool Area
- Proposed Cross Over Station
- Municipal Boundary

Drift Thickness (m)

- High : 70
- Mid : 35
- Low : 10

0 250 500 1,000 1,500 2,000 2,500 3,000 3,500
Metres

2021/2022 Storage Enhancement Project

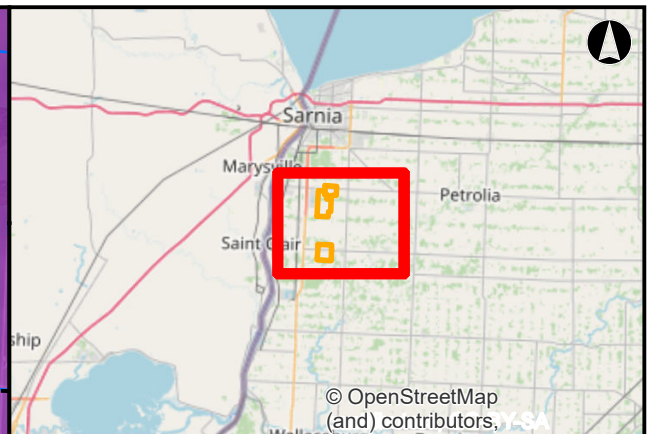
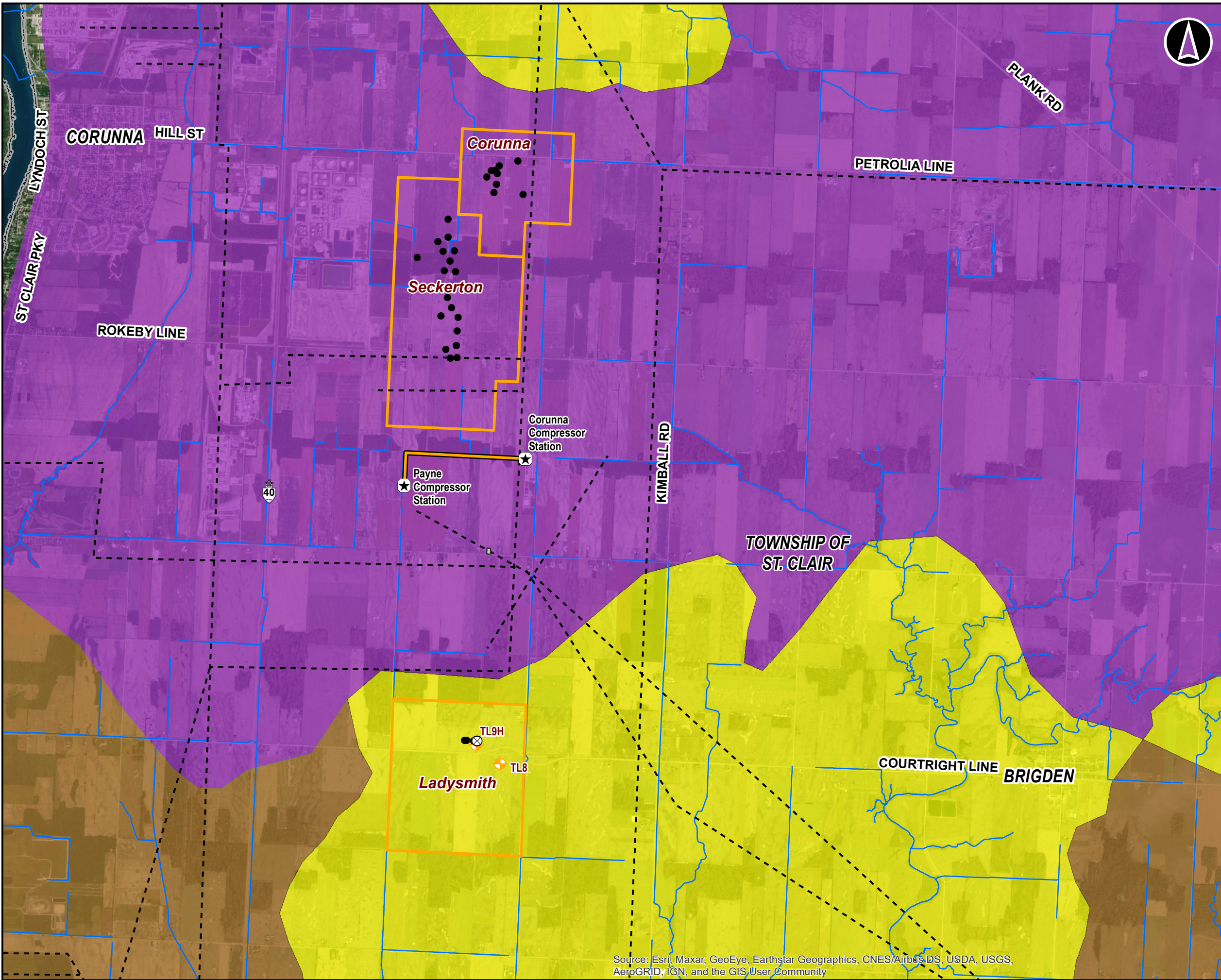
Drift Thickness

Sep, 2020	1:50,000 <small>* when printed 11"x17"</small>	Datum: NAD 1983 UTM Zone 17N Source: MNR, MNDM (MRD207)
P#: 60633149		Figure 5-2

AECOM

This drawing has been prepared for the use of AECOM's client and may not be used, reproduced or relied upon by third parties, except as agreed by AECOM and its client, as required by law or for use by governmental reviewing agencies. AECOM accepts no responsibility, and denies any liability whatsoever, to any party that modifies this drawing without AECOM's express written consent.

I:\Projects\2021\2022 Storage Enhancement Project\Drawings\Fig_5-2\Drift_Thickness_Sarnia_Storage_Enhancement_2022-08-20\Drift_Thickness_Sarnia_Storage_Enhancement_2022-08-20\Drift_Thickness_Sarnia_Storage_Enhancement_2022-08-20.mxd
 Date Saved: 01/20/2022 2:00:15 PM User: Name: clark



Legend

- ⊗ NPS 16 Bi-Directional Control Valve
- Existing Gas Well
- ⊕ Proposed New Gas Well
- ★ Existing Enbridge Gas Station
- Ladysmith Gathering Line
- - - Existing Gas Pipeline
- Proposed NPS 24 Pipeline
- Watercourse
- Storage Pool Area
- Proposed Cross Over Station
- Municipal Boundary

Quaternary Geology

- Glaciolacustrine Deposits: Silt and Clay
- Rannoch Till
- St. Joseph Till

0 250 500 1,000 1,500 2,000 2,500 3,000 3,500
Metres

2021/2022 Storage Enhancement Project

Quaternary Geology

Sep, 2020	1:50,000 <small>* when printed 11"x17"</small>	Datum: NAD 1983 UTM Zone 17N Source: MNRF, MNDM (MRD126-REV1)
-----------	---	--

P#: 60633149

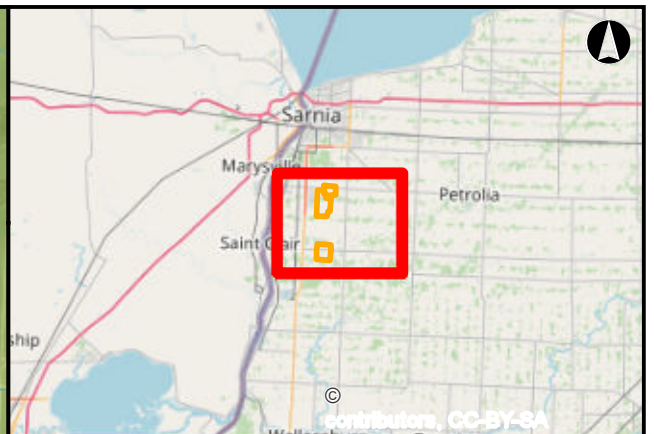
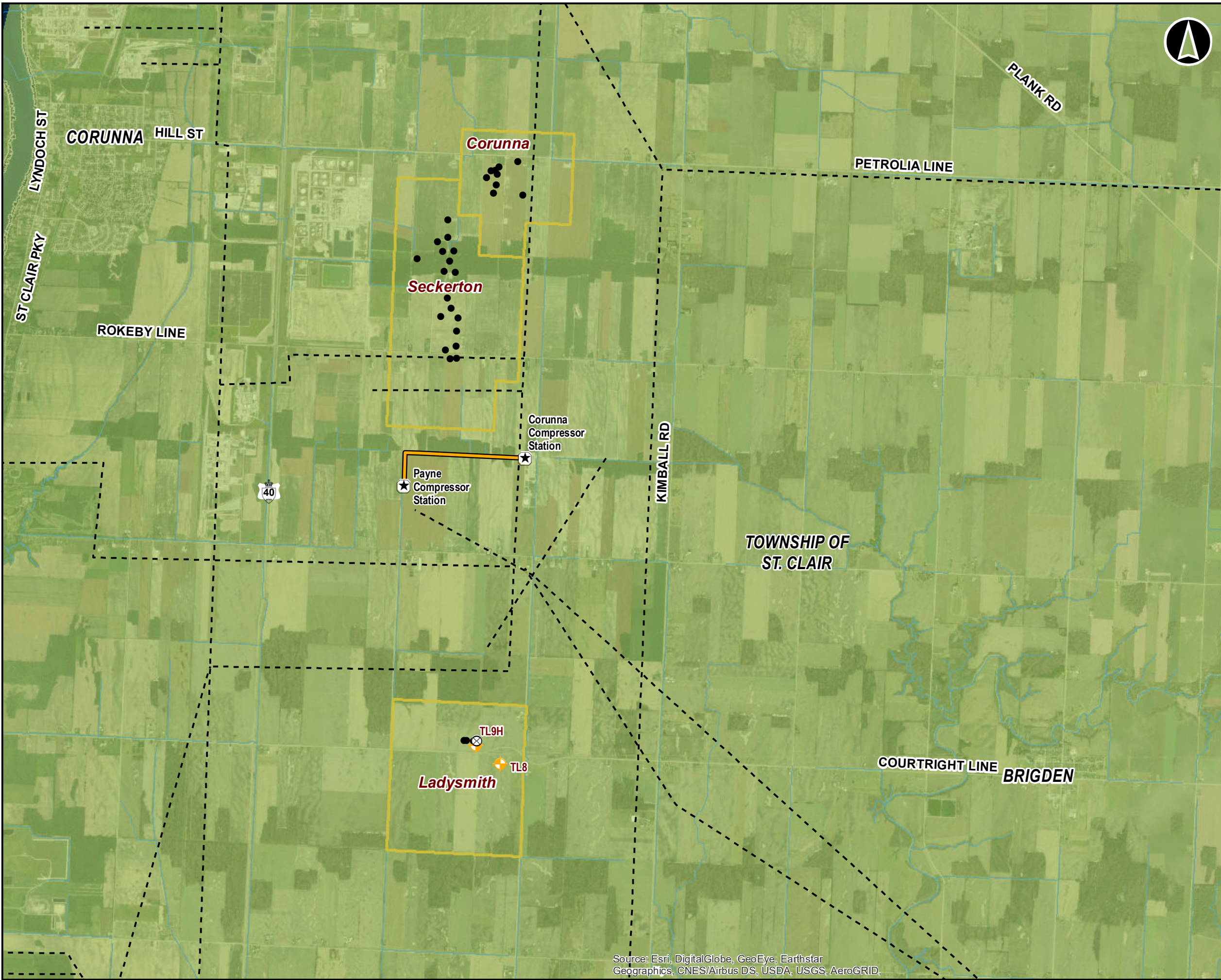
AECOM

Figure 5-3

This drawing has been prepared for the use of AECOM's client and may not be used, reproduced or relied upon by third parties, except as agreed by AECOM and its client, as required by law or for use by governmental reviewing agencies. AECOM accepts no responsibility, and denies any liability whatsoever, to any party that modifies this drawing without AECOM's express written consent.

Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Date Saved: 01/20/2021 1:54:08 PM User Name: clark

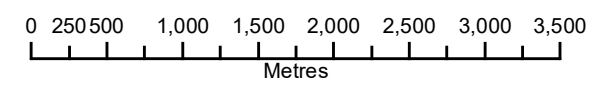


Legend

- ⊗ NPS 16 Bi-Directional Control Valve
- Existing Well
- ⊕ Proposed New Well
- ★ Existing Station
- Ladysmith Gathering Line
- - - Existing Gas Pipeline
- Proposed NPS 24 Pipeline
- Watercourse
- Storage Pool Area
- Proposed Cross Over Station
- Municipal Boundary

Physiography

- 8: Bevelled Till Plains

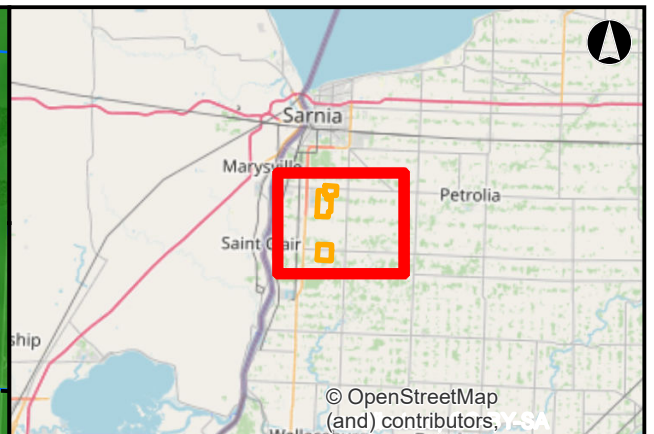
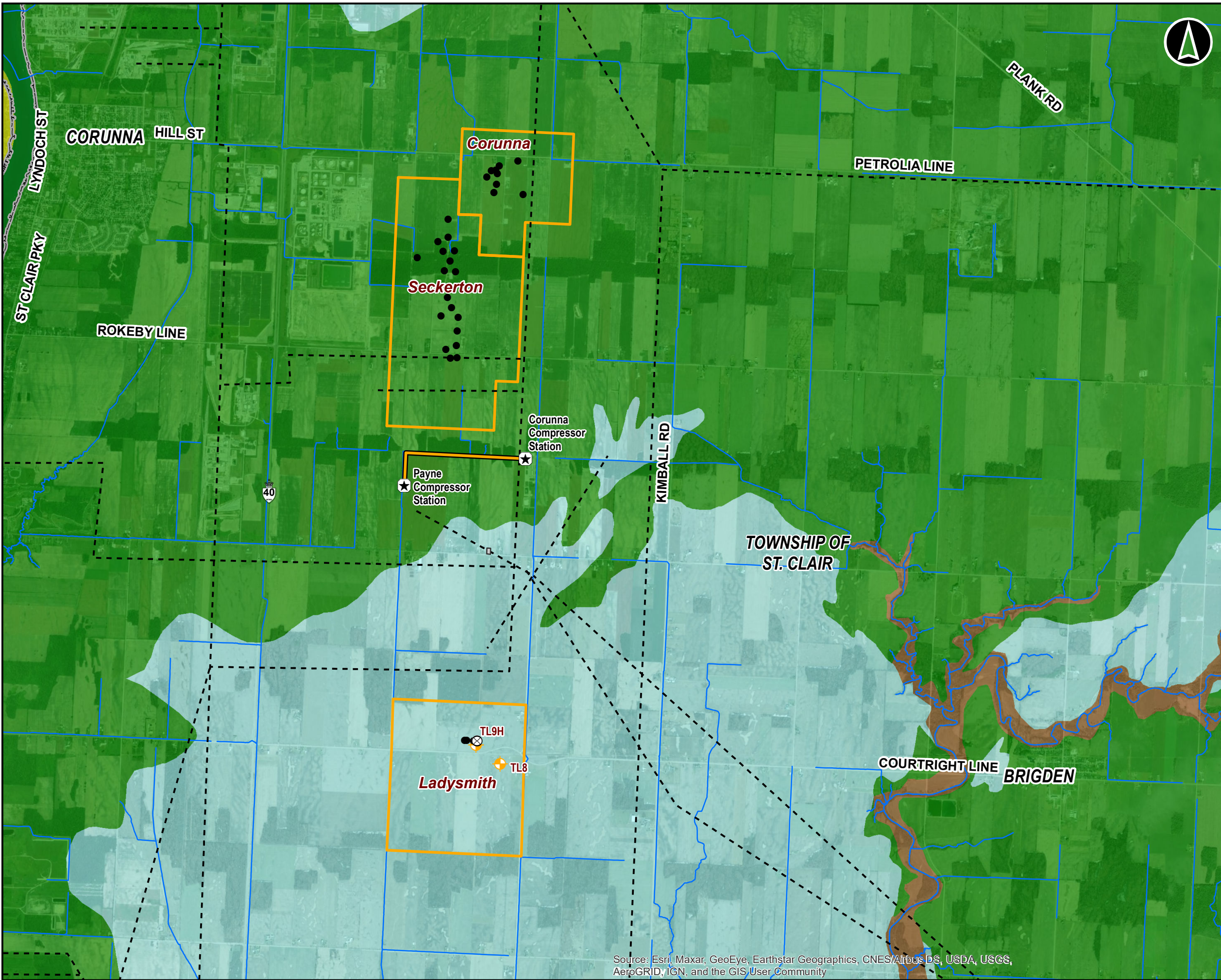


2021/2022 Storage Enhancement Project		
Physiography Geology		
Aug, 2020	1:50,000 <small>* when printed 11"x17"</small>	Datum: NAD 1983 UTM Zone 17N Source: MNR, MNDM (MRD128)
P#: 60633149		Figure 5-4
AECOM		

This drawing has been prepared for the use of AECOM's client and may not be used, reproduced or relied upon by third parties, except as agreed by AECOM and its client, as required by law or for use by governmental reviewing agencies. AECOM accepts no responsibility, and denies any liability whatsoever, to any party that modifies this drawing without AECOM's express written consent.

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID,

C:\Users\michael.w.coffin\OneDrive\Documents\60633149\2021\2022 Storage Enhancement Project\GIS\Map_Series\Physiography.mxd
 Date Saved: 02/17/2020 2:55:55 PM User Name: michael.w.coffin



Legend

- ⊗ NPS 16 Bi-Directional Control Valve
- Existing Gas Well
- ⊕ Proposed New Gas Well
- ★ Existing Enbridge Gas Station
- Ladysmith Gathering Line
- - - Existing Gas Pipeline
- Proposed NPS 24 Pipeline
- Watercourse
- Storage Pool Area
- Proposed Cross Over Station
- Municipal Boundary
- 5d: Glaciolacustrine-derived silty to clayey till
- 8a: Fine-textured glaciolacustrine deposits
- 12: Older alluvial deposits
- 19: Modern alluvial deposits

0 250 500 1,000 1,500 2,000 2,500 3,000 3,500
Metres

2021/2022 Storage Enhancement Project

Surficial Geology

Sep, 2020	1:50,000 <small>*when printed 11"x17"</small>	Datum: NAD 1983 UTM Zone 17N Source: MNRF, MNDM (MRD128)
-----------	--	---

P#: 60633149

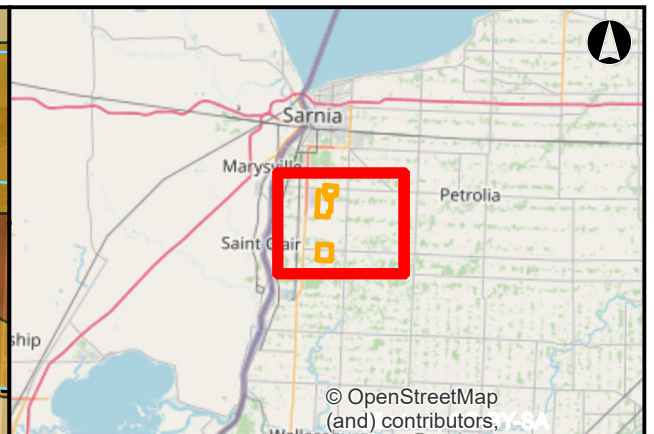
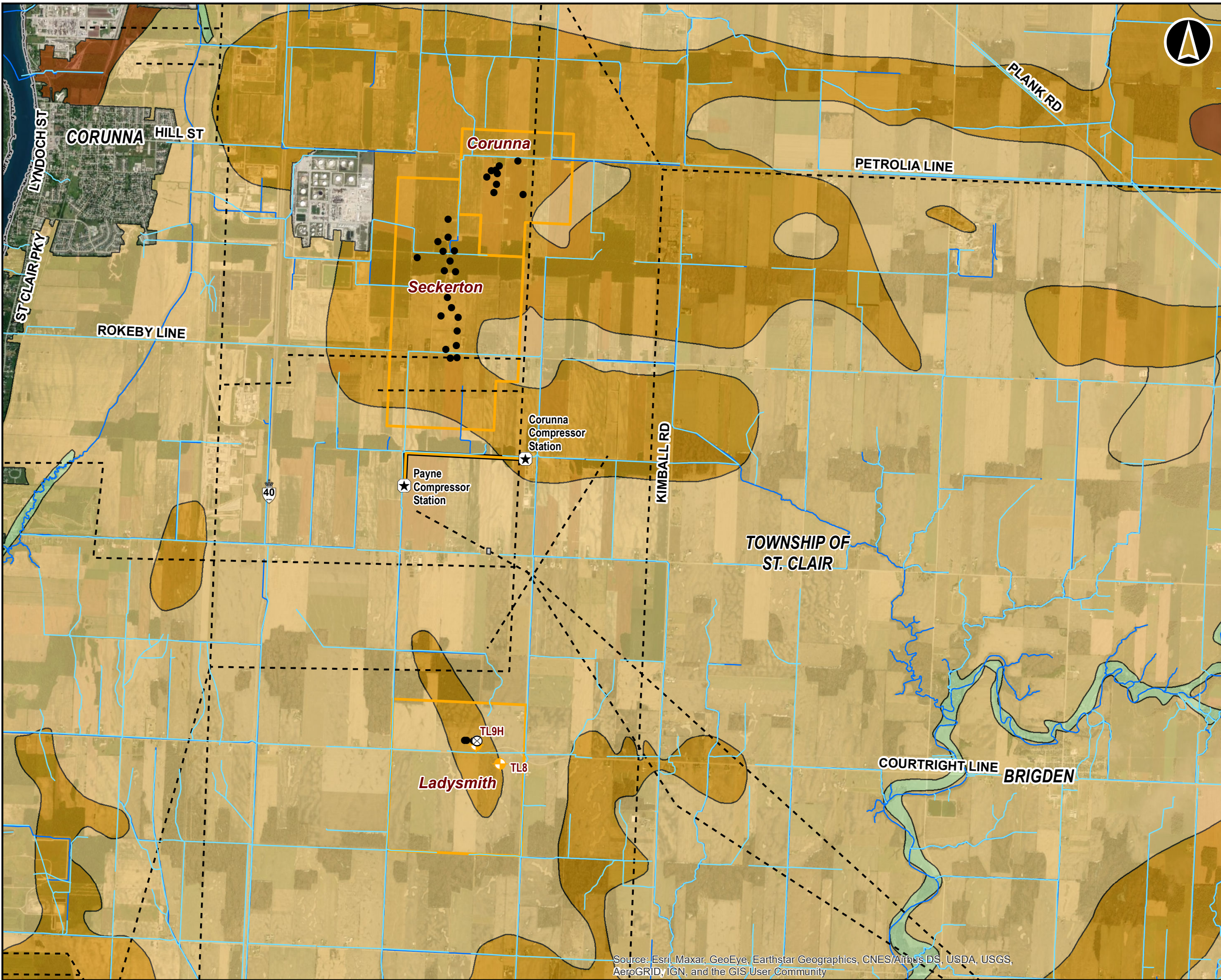
AECOM

Figure 5-5

This drawing has been prepared for the use of AECOM's client and may not be used, reproduced or relied upon by third parties, except as agreed by AECOM and its client, as required by law or for use by governmental reviewing agencies. AECOM accepts no responsibility, and denies any liability whatsoever, to any party that modifies this drawing without AECOM's express written consent.

Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

\\sarnia\share\GIS\Projects\2021\2022\2021-2022 Storage Enhancement\2021-2022 Storage Enhancement\SURFICIAL_GEOLOGY_SARNIA.mxd
 Date Saved: 01/12/2021 1:22:27 PM User Name: clark



Legend

- ⊗ NPS 16 Bi-Directional Control Valve
- Existing Gas Well
- ⬢ Proposed New Gas Well
- ★ Existing Enbridge Gas Station
- Ladysmith Gathering Line
- - - Existing Gas Pipeline
- Proposed NPS 24 Pipeline
- Watercourse
- Constructed Drain
- Storage Pool Area
- Proposed Cross Over Station
- Municipal Boundary

Soil Class

- CLASS 1 - No Significant Limitations
- CLASS 2 - Moderate Limitations
- CLASS 3 - Moderately Severe Limitations
- CLASS 5 - Very Severe Limitations

0 250 500 1,000 1,500 2,000 2,500 3,000 3,500
Metres

2021/2022 Storage Enhancement Project

Soil Classification and Agricultural Drains

Sep, 2020	1:50,000 <small>*when printed 11"x17"</small>	Datum: NAD 1983 UTM Zone 17N Source: MNRF
-----------	--	--

P#: 60633149

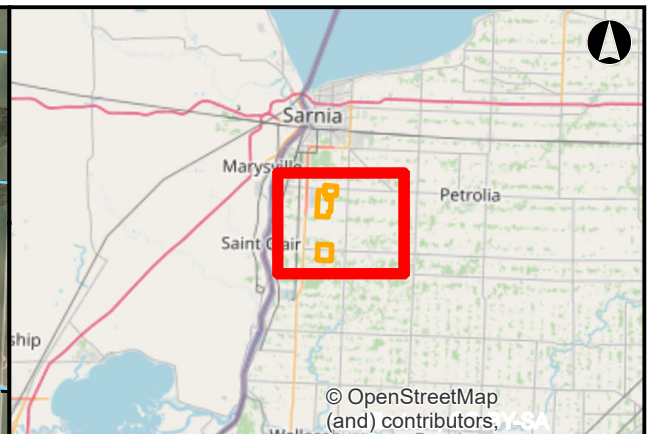
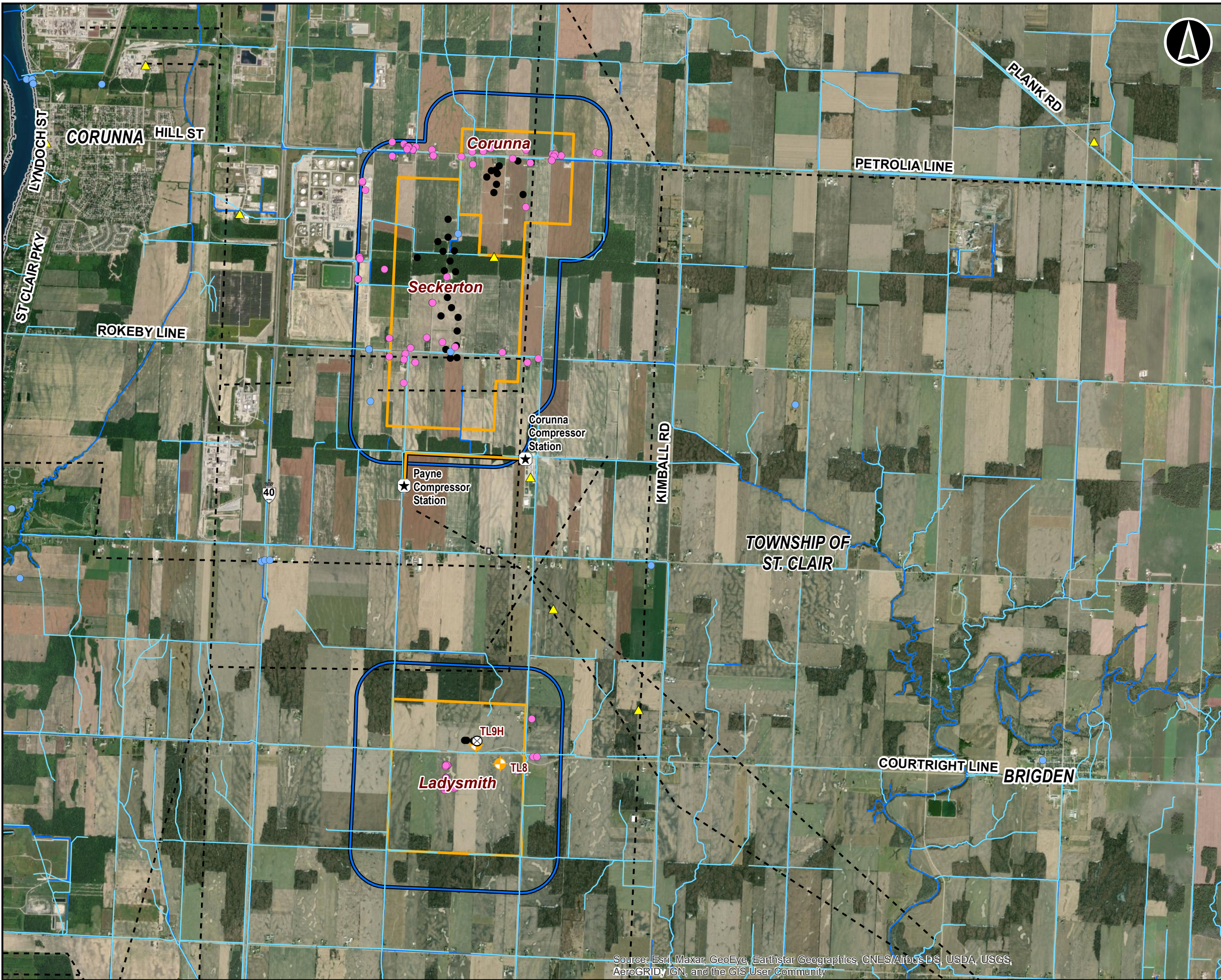
AECOM

Figure 5-6

This drawing has been prepared for the use of AECOM's client and may not be used, reproduced or relied upon by third parties, except as agreed by AECOM and its client, as required by law or for use by governmental reviewing agencies. AECOM accepts no responsibility, and denies any liability whatsoever, to any party that modifies this drawing without AECOM's express written consent.

Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

\\s01\proj\2021\2022 Storage Enhancement Project\GIS\Map_Series\Map_Series_Storage_Enhancement\Map_Series_Storage_Enhancement_Sarnia.mxd
 Date Saved: 01/20/2021 1:56:13 PM User Name: clark



Legend

- Environmental Activity and Sector Registrations (2020)
- Permit to Take Water (MECP, 2019)
- Water Well Record (MECP, 2019)
- NPS 16 Bi-Directional Control Valve
- Existing Gas Well
- Proposed New Gas Well
- Existing Enbridge Gas Station
- Ladysmith Gathering Line
- Existing Gas Pipeline
- Proposed NPS 24 Pipeline
- Watercourse
- Constructed Drain
- Storage Pool Area
- Proposed Cross Over Station
- Municipal Boundary
- 500m Water Well Buffer from the Project

0 250 500 1,000 1,500 2,000 2,500 3,000 3,500
Metres

2021/2022 Storage Enhancement Project

MECP Water Well Records, PTTW Records and EASR Registrations

Sep, 2020	1:50,000 <small>* when printed 11"x17"</small>	Datum: NAD 1983 UTM Zone 17N Source: MNRF
-----------	---	--

P#: 60633149

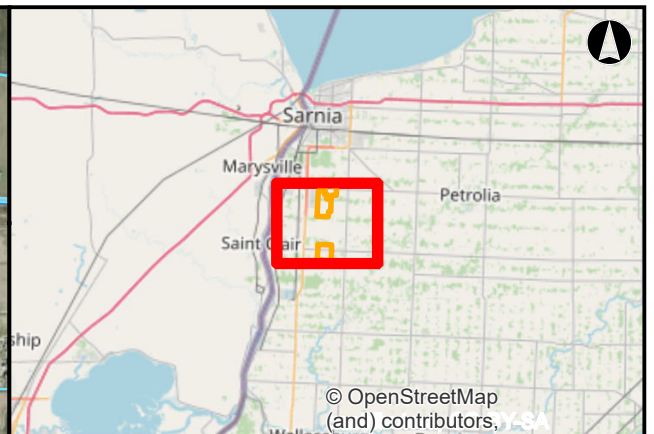
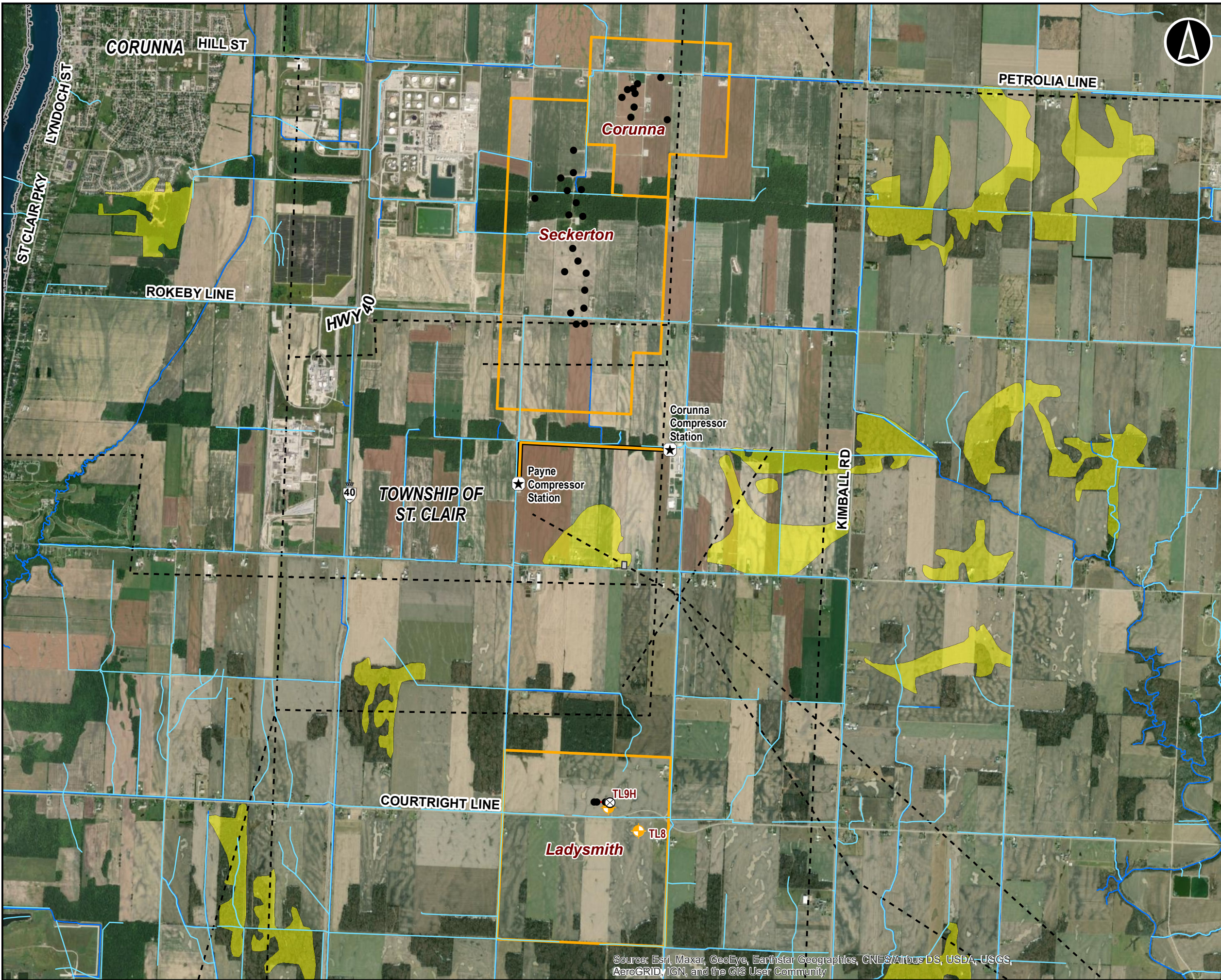
AECOM

Figure 5-7

This drawing has been prepared for the use of AECOM's client and may not be used, reproduced or relied upon by third parties, except as agreed by AECOM and its client, as required by law or for use by governmental reviewing agencies. AECOM accepts no responsibility, and denies any liability whatsoever, to any party that modifies this drawing without AECOM's express written consent.

Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Date Saved: 01/20/2020 1:27:13 PM User Name: clark



Legend

- ⊗ NPS 16 Bi-Directional Control Valve
- Existing Gas Well
- ⊕ Proposed New Gas Well
- ★ Existing Enbridge Gas Station
- Ladysmith Gathering Line
- - - Existing Gas Pipeline
- Proposed NPS 24 Pipeline
- Watercourse
- Constructed Drain
- Storage Pool Area
- Proposed Cross Over Station
- Municipal Boundary
- Significant Groundwater Recharge Area - Vulnerability = 2

0 200 400 800 1,200 1,600 2,000 2,400 2,800
Metres

2021/2022 Storage Enhancement Project

Groundwater Recharge Areas

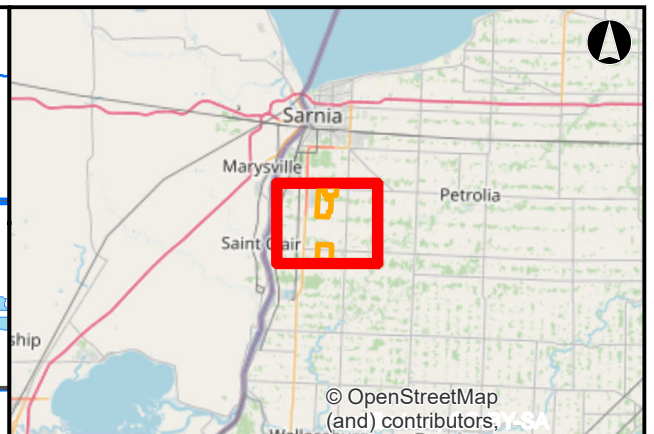
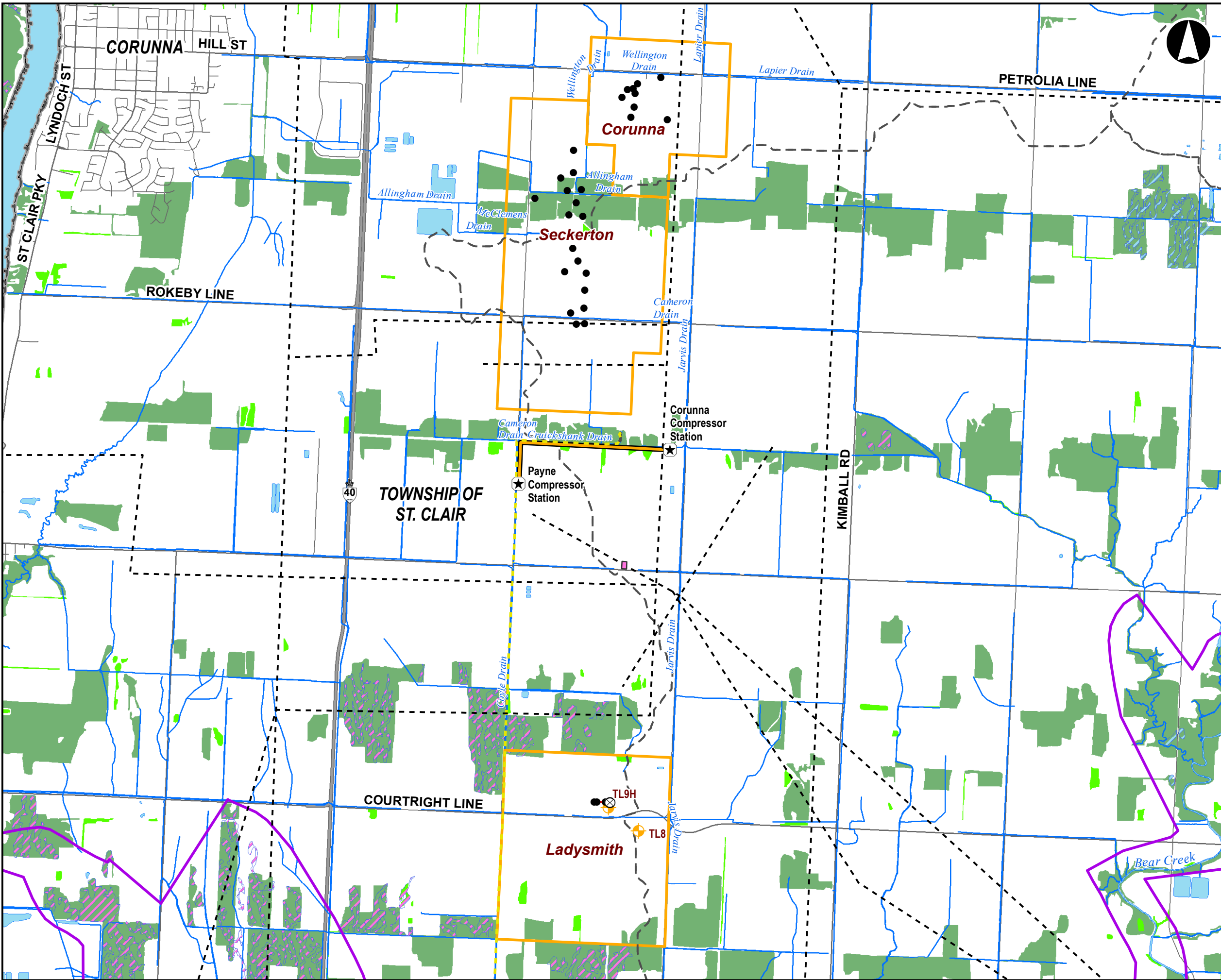
Sep, 2020	1:40,000 <small>*when printed 11"x17"</small>	Datum: NAD 1983 UTM Zone 17N Source: MNR, Upper Thames Conservation Authority
P#: 60633149		

AECOM **Figure 5-8**

This drawing has been prepared for the use of AECOM's client and may not be used, reproduced or relied upon by third parties, except as agreed by AECOM and its client, as required by law or for use by governmental reviewing agencies. AECOM accepts no responsibility, and denies any liability whatsoever, to any party that modifies this drawing without AECOM's express written consent.

Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA-USGS, AeroGRID, IGN, and the GIS User Community

C:\Users\jgibson\OneDrive\Documents\2021\2022 Storage Enhancement Project\GIS\Map_Summary_Storage\Drawings\01_Storage\GIS\Map_Summary_Storage\Drawings\01_Storage_Summary_Map_Summary_Storage_Enhancement_Vulnerability_2.mxd
 Date Saved: 01/20/2021 1:59:23 PM User: Name: clark



Legend

- ⊗ NPS 16 Bi-Directional Control Valve
- Existing Gas Well
- ⊕ Proposed New Gas Well
- ★ Existing Enbridge Gas Station
- Ladysmith Gathering Line
- - - Existing Gas Pipeline
- Proposed NPS 24 Pipeline
- - - Silver Lamprey (SC) Habitat
- Watercourse
- Freeway / Highway
- Major Road
- Local Road
- Storage Pool Area
- Proposed Cross Over Station
- Municipal Boundary
- Wooded Area
- Potentially Significant Woodlands
- Wetland, Evaluated Other
- Wetland, Provincially Significant
- Deer Wintering Area
- Watershed Boundary

0 200 400 800 1,200 1,600 2,000 2,400 2,800
Metres

2021/2022 Storage Enhancement Project

Biophysical Features Map

Sep, 2020	1:40,000 <small>*when printed 11"x17"</small>	Datum: NAD 1983 UTM Zone 17N Source: MNRF
-----------	--	--

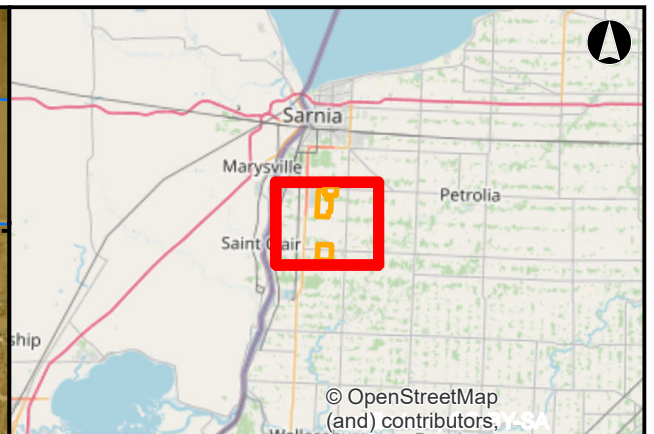
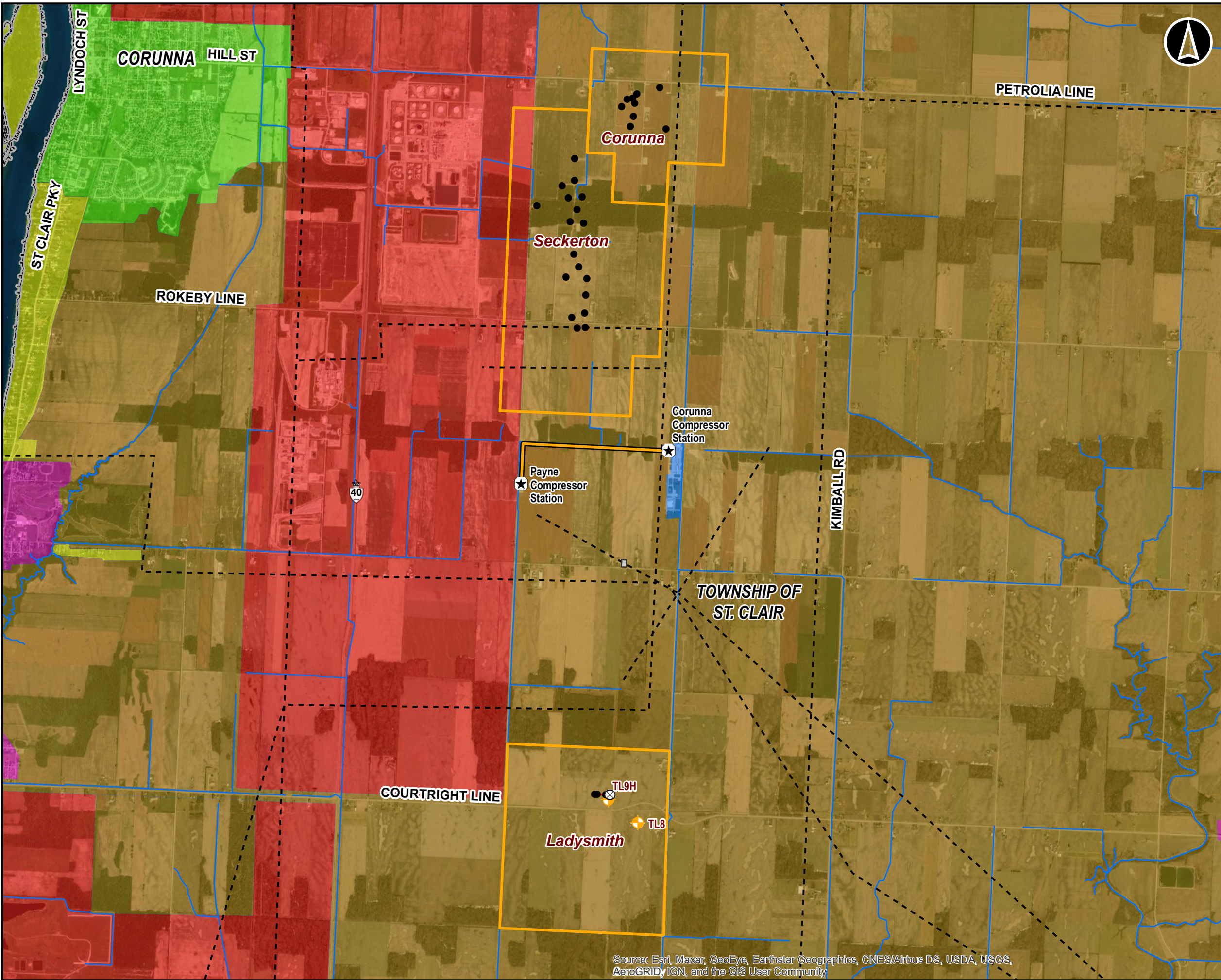
P#: 60633149

AECOM

Figure 5-9

This drawing has been prepared for the use of AECOM's client and may not be used, reproduced or relied upon by third parties, except as agreed by AECOM and its client, as required by law or for use by governmental reviewing agencies. AECOM accepts no responsibility, and denies any liability whatsoever, to any party that modifies this drawing without AECOM's express written consent.

Date Saved: 9/17/2020 2:08:42 PM User Name: clark



Legend

- ⊗ NPS 16 Bi-Directional Control Valve
- Existing Gas Well
- ⊕ Proposed New Gas Well
- ★ Existing Enbridge Gas Station
- Ladysmith Gathering Line
- - - Existing Gas Pipeline
- Proposed NPS 24 Pipeline
- Watercourse
- Storage Pool Area
- Proposed Cross Over Station
- Municipal Boundary

Land Use

- Agricultural Area
- Gas Compressor Station
- Petrochemical Industrial Land
- Secondary Settlement
- Urban Centre
- Urban Settlement

0 200 400 800 1,200 1,600 2,000 2,400 2,800
Metres

2021/2022 Storage Enhancement Project

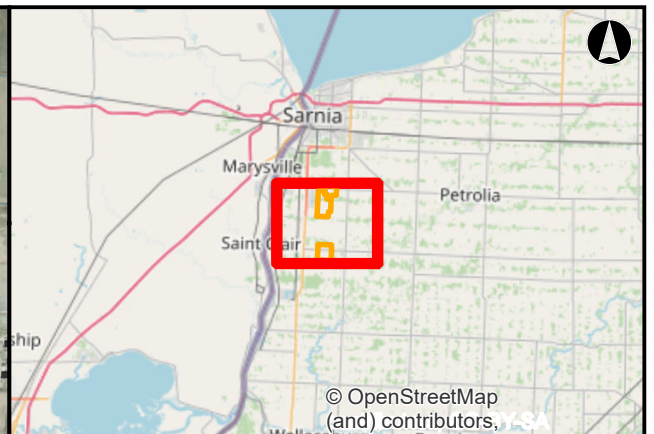
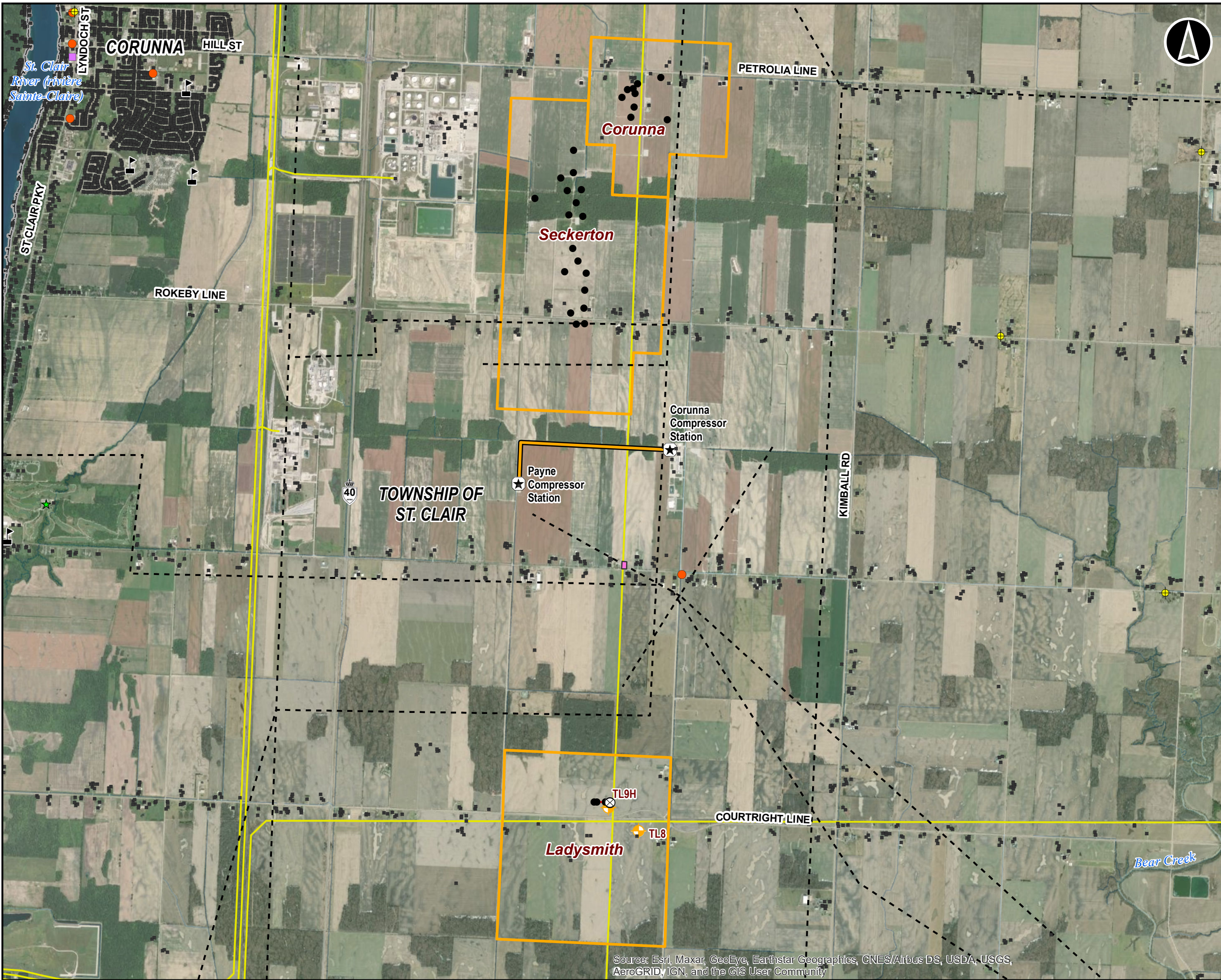
Land Use Designation Map

Sep, 2020	1:41,000 <small>* when printed 11"x17"</small>	Datum: NAD 1983 UTM Zone 17N Source: MNR
P#: 60633149		Figure 5-11

AECOM

This drawing has been prepared for the use of AECOM's client and may not be used, reproduced or relied upon by third parties, except as agreed by AECOM and its client, as required by law or for use by governmental reviewing agencies. AECOM accepts no responsibility, and denies any liability whatsoever, to any party that modifies this drawing without AECOM's express written consent.

Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



Legend

- ▲ Campgrounds
- ⊕ Cemetery
- ★ Golf Course
- Library
- Place of Worship
- School
- Building
- ⊗ NPS 16 Bi-Directional Control Valve
- Existing Gas Well
- ⊕ Proposed New Gas Well
- ★ Existing Enbridge Gas Station
- Ladysmith Gathering Line
- - - Existing Gas Pipeline
- Hydro Line
- Proposed NPS 24 Pipeline
- Storage Pool Area
- Proposed Cross Over Station
- Municipal Boundary

0 200 400 800 1,200 1,600 2,000 2,400 2,800
Metres

2021/2022 Storage Enhancement Project

Socio-Economic Features

Sep, 2020	1:40,000 <small>*when printed 11"x17"</small>	Datum: NAD 1983 UTM Zone 17N Source: MNRF
-----------	--	--

P#: 60633149

AECOM

Figure 5-12

This drawing has been prepared for the use of AECOM's client and may not be used, reproduced or relied upon by third parties, except as agreed by AECOM and its client, as required by law or for use by governmental reviewing agencies. AECOM accepts no responsibility, and denies any liability whatsoever, to any party that modifies this drawing without AECOM's express written consent.

Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

C:\Users\jgibson\OneDrive\Desktop\GIS\Projects\2021-2022\2021-2022_SocioEconomic\2021-2022_SocioEconomic_06033149.mxd
 Date Saved: 01/20/2022 2:05:04 PM User Name: jgibson

Appendix **B**

Consultation

- **Agency Contact List**
- **Indigenous Communities Contact List**
- **Letter Templates**
- **Notice of Project Commencement**
- **Consultation Record Summary Table**
- **Correspondence**

Agencies and other Stakeholders Contact List

Stakeholder/ Agency	Salutation	First Name	Last Name	Title	Street Address	City	Prov	Postal Code	Phone #	Email
Elected Officials										
St. Clair Township	Mr.	Steve	Arnold	Mayor	1155 Emily Street	Mooretown	ON	N0N 1M0	519-381-7440	steve.arnold@county-lambton.on.ca
Corporation of the County of Lambton	Mr.	Bill	Weber	Warden	7883 Amtelecom Parkway, Box 610	Forest	ON	N0N 1J0	519-786-2335	bill.weber@county-lambton.on.ca
Municipal Agencies										
Corporation of the County of Lambton	Mr.	Ron	Van Horne	Chief Administrative Officer	789 Broadway Street, Box 3000	Wyoming	ON	N0N 1T0	519-845-0801 ext. 5410	ron.vanhorne@county-lambton.on.ca
Corporation of the County of Lambton	Mr.	Jason	Cole	General Manager, Infrastructure & Development	789 Broadway Street, Box 3000	Wyoming	ON	N0N 1T0	519-845-5413	jason.cole@county-lambton.on.ca
Corporation of the County of Lambton	Mr.	Matt	Deline	Manager, Public Works	789 Broadway Street, Box 3000	Wyoming	ON	N0N 1T0	519-845-0801	matt.deline@county-lambton.on.ca
St. Clair Township	Mr.	Jeff	Baranek	Clerk	1155 Emily Street	Mooretown	ON	N0N 1M0	519-867-2021	jbaranek@stclairtownship.ca
St. Clair Township	Mr.	Brian	Black	Public Works Director	1155 Emily Street	Mooretown	ON	N0N 1M0	519-867-2993	publicworks@twp.stclair.on.ca
Conservation Authority										
St. Clair Region Conservation Authority	Mr.	Brian	McDougall	General Manager / Secretary Treasurer	205 Mill Pond Crescent	Strathroy	ON	N7G 3P9	519-245-3710 ext. 236	stclair@scrca.on.ca
St. Clair Region Conservation Authority	Ms.	Meagan	Weber	Planning and Regulations Clerk	205 Mill Pond Crescent	Strathroy	ON	N7G 3P9	519-245-3710 ext. 235	planning@scrca.on.ca
St. Clair Region Conservation Authority	Ms.	Donna	Blue	Manager of Communications	205 Mill Pond Crescent	Strathroy	ON	N7G 3P9	519-245-3710 ext. 219	stclair@scrca.on.ca
Provincial Agencies										
Ministry of the Environment, Conservation and Parks	Ms.	Annamaria	Cross	Director, Environmental Assessment	135 St. Clair Avenue W	Toronto	ON	M4V 1P5	416-314-7967	annamaria.cross@ontario.ca
Ministry of Natural Resources and Forestry Aylmer District	Mr.	Mitch	Wilson	District Manager	615 John Street North	Aylmer	ON	N5H 2S8	519-773-4710	mitch.wilson@ontario.ca
Ministry of Transportation West Region (London)	Mr.	Neil	Zohorsky	Regional Director (Acting)	659 Exeter Road, 4th Floor	London	ON	N6E 1L3	519-873-4335	neil.zohorsky@ontario.ca
OPCC Members										
Ontario Energy Board	Ms.	Zora	Crnojacki	Project Advisor, Applications & Regulatory Audit Chair - Ontario Pipeline Coordinating Committee	P.O. Box 2319, 2300 Yonge Street, 26th Floor	Toronto	ON	M4P 1E4	416-440-8104	zora.crnojacki@oeb.ca
Ministry of Agriculture, Food, and Rural Affairs	Ms.	Helma	Geerts	Policy Advisor	1 Stone Road West, 3rd Floor SE	Guelph	ON	N1G 4Y2	519-546-7423	helma.geerts@ontario.ca
Ministry of Heritage, Sport, Tourism, and Culture Industries	Mr.	Dan	Minkin	Heritage Planner Member - Ontario Pipeline Coordinating Committee	401 Bay Street, Suite 1700	Toronto	ON	M7A 0A7	416-314-7147	dan.minkin@ontario.ca
Ministry of Transportation	Mr.	Tony	Difabio	Team Lead, Highway Corridor Management Section Member - Ontario Pipeline Coordinating Committee	301 St. Paul Street, 2nd Floor	St. Catharines	ON	L2R 7R4	905-704-2656	Tony.DiFabio@ontario.ca
Technical Standards and Safety Authority	Mr.	Kouros	Manouchehri	Member - Ontario Pipeline Coordinating Committee	345 Carlingview Drive	Toronto	ON	M9W 6N9	416-734-3539	kmanouchehri@tssa.org
Ministry of Natural Resources and Forestry	Ms.	Sally	Renwick	Team Lead - Strategic and Indigenous Policy Branch Member - Ontario Pipeline Coordinating Committee	300 Water Street	Peterborough	ON	K9J 8M5	705-755-5195	sally.renwick@ontario.ca
Ministry of Municipal Affairs and Housing Western Municipal Services Office	Mr.	Scott	Oliver	Member - Ontario Pipeline Coordinating Committee	659 Exeter Road, 2nd Floor	London	ON	N6E 1L3	519-873-4033	scott.oliver@ontario.ca
Ministry of Energy, Northern Development and Mines	Mr.	Jason	McCullough	Senior Advisor (Acting) Member - Ontario Pipeline Coordinating Committee	77 Grenville Street, 6th Floor	Toronto	ON	M7A 2C1	416-526-2963	jason.mccullough@ontario.ca
Ministry of the Environment, Conservation and Parks Regional Contact- Southwestern	Ms.	Crystal	Lafrance	Supervisor, APEP Member - Ontario Pipeline Coordinating Committee	733 Exeter Road	London	ON	N6E 1L3	519-873-5055	crystal.lafrance@ontario.ca
Ministry of the Environment, Conservation and Parks	Ms.	Debbie	Scanlon	Manager - Source Protection Approvals Unit Member - Ontario Pipeline Coordinating Committee	191 Booth Road, Unit 16 & 17	North Bay	ON	P1A 4K3	647-627-5917	debbie.scanlon@ontario.ca
Infrastructure Ontario	Mr.	Cory	Ostrowka	Environmental Specialist Member - Ontario Pipeline Coordinating Committee	1 Dundas Street West, Suite 2000	Toronto	ON	M5G 2L5	647-264-3331	cory.ostrowka@infrastructureontario.ca
Utilities										
Hydro One Networks Inc.	-	-	-	-	483 Bay Street, 8th Floor, South Tower	Toronto	ON	M5G 2P5	416-345-5866	Regulatory@HydroOne.com
Hydro One Networks Inc.	Mr.	Walter D.	Klooststra	Transmission Lines Sustainment Manager	483 Bay Street, TCT15-A11, North Tower	Toronto	ON	M5G 2P5	416-345-6275	w.d.klooststra@HydroOne.com
Hydro One Networks Inc. - Real Estate Management	Mr.	Roman	Dorfman	Real Estate Coordinator	185 Clegg Road, P.O. Box 4300	Markham	ON	L6G 1B7	905-946-6243	roman.dorfman@hydroone.com

Indigenous Communities Contact List

Indigenous Community	First Name	Last Name	Title	Street Address	City	Prov	Postal Code	Email
Aamjiwnaang First Nation	Chris	Plain	Chief	978 Tashmoo Avenue	Sarnia	Ontario	N7T 7H5	-
Aamjiwnaang First Nation	Sharilyn	Johnston	Environment Coordinator	979 Tashmoo Avenue	Sarnia	Ontario	N7T 7H5	-
Bkejwanong (Walpole Island First Nation)	Dan	Miskokomon	Chief	117 Tahgahoning Road	Wallaceburg	Ontario	N8A 4K9	-
Bkejwanong (Walpole Island First Nation)	Dawn	White	Lands Clerk	117 Tahgahoning Road	Wallaceburg	Ontario	N8A 4K9	Dawn.White@wifn.org
Chippewas of the Thames First Nation	Jacqueline	French	Chief	320 Chippewa Road	Muncey	Ontario	N0L 1Y0	jfrench@cottfn.com
Chippewas of the Thames First Nation	Fallon	Burch	Consultation Coordinator	320 Chippewa Road	Muncey	Ontario	N0L 1Y0	fburch@cottfn.com
Chippewas of Kettle and Stony Point	Jason	Henry	Chief	6247 Indian Lane	Kettle and Stony Point First Nation	Ontario	N0N 1J1	-
Chippewas of Kettle and Stony Point	Anna	Batten	Lands Manager	6247 Indian Lane	Kettle and Stony Point First Nation	Ontario	N0N 1J1	-
Oneida Nation of the Thames	Adrian	Chrisjohn	Chief	2210 Elm Avenue	Southwold	Ontario	N0L 2G0	adrian.chrisjohn@oneida.on.ca
Oneida Nation of the Thames	Yvonne	Lunham	Band Representative Manager	2213 Elm Avenue	Southwold	Ontario	N0L 2G0	-
Haudenosaunee Development Institute	-	-	-	P.O. Box 714	Ohsweken	Ontario	N0A 1M0	-

August 14, 2020

«First_Name» «Last_Name»
«Title»
«Stakeholder_Agency»
«Street_Address»
«City», «Prov» «Postal_Code»

Dear «Salutation» «Last_Name»:

Regarding: Project Commencement for 2021/2022 Storage Enhancement Project

To address increasing demand for natural gas across Ontario, Enbridge Gas is proposing to undertake a Storage Enhancement Project at its natural gas storage facilities in St. Clair Township. The Project will allow Enbridge Gas to store additional natural gas and will increase the deliverability of Enbridge Gas's storage operations.

The Project involves increasing the maximum operating pressure in three existing storage pools (Ladysmith, Corunna and Seckerton), and:

- Re-entering an existing well and converting it to a horizontal well, drilling an observation well.
- Upgrading an existing natural gas gathering pipeline.
- Installation of a bi-directional valve and station piping at an existing station.
- Constructing approximately 2.2 km of natural gas pipeline to connect the Payne Storage Pool to the Corunna Compressor Station located on Tecumseh Road, in St. Clair Township, Ontario.

The location of the Project, including the preliminary preferred pipeline route and accompanying storage enhancement works, is shown in **Figure 1**.

AECOM has been retained by Enbridge Gas to prepare an environmental report (ER) to assess the potential environmental and socio-economic effects that may result from the Storage Enhancement Project. The report will outline plans for avoiding and/or mitigating any effects, where possible. The ER will be prepared in accordance with the Ontario Energy Board's (OEB) *Environmental Guidelines for the Location, Construction and Operation of Hydrocarbon Pipelines and Facilities in Ontario (2016)*. The ER will accompany a leave-to-vary application, a request for a favourable report from the OEB to the Ministry of Natural Resources and Forestry, and a leave-to-construct application that will be submitted to the OEB in November 2020. OEB review and approval is required before this project can proceed. Construction of the Project is planned to begin as early as 2021.

If you have any questions about the Storage Enhancement Project or would like to receive additional information and participate in the environmental study process, please do not hesitate to contact me using the contact information provided below.

Sincerely,

A handwritten signature in black ink, appearing to read "Mark Van der Woerd". The signature is fluid and cursive, with the first name "Mark" being the most prominent.

Mark Van der Woerd
Senior Environmental Planner
AECOM
Phone: 289-439-9803
Email: mark.vanderwoerd@aecom.com

CC: Evan Tomek - Enbridge Inc.
Jordan Witt - AECOM

August 14, 2020

Dear Resident and/or Landowner:

Regarding: Project Commencement for 2021/2022 Storage Enhancement Project

To address increasing demand for natural gas across Ontario, Enbridge Gas is proposing to undertake a Storage Enhancement Project at its natural gas storage facilities in St. Clair Township. The Project will allow Enbridge Gas to store additional natural gas and will increase the deliverability of Enbridge Gas's storage operations.

The Project involves increasing the maximum operating pressure in three existing storage pools (Ladysmith, Corunna and Seckerton), and:

- Re-entering an existing well and converting it to a horizontal well, drilling an observation well.
- Upgrading an existing natural gas gathering pipeline.
- Installation of a bi-directional valve and station piping at an existing station.
- Constructing approximately 2.2 km of natural gas pipeline to connect the Payne Storage Pool to the Corunna Compressor Station located on Tecumseh Road, in St. Clair Township, Ontario.

The location of the Project, including the preliminary preferred pipeline route and accompanying storage enhancement works, is shown in **Figure 1**.

AECOM has been retained by Enbridge Gas to prepare an environmental report (ER) to assess the potential environmental and socio-economic effects that may result from the Storage Enhancement Project. The report will outline plans for avoiding and/or mitigating any effects, where possible. The ER will be prepared in accordance with the Ontario Energy Board's (OEB) *Environmental Guidelines for the Location, Construction and Operation of Hydrocarbon Pipelines and Facilities in Ontario (2016)*. The ER will accompany a leave-to-vary application, a request for a favourable report from the OEB to the Ministry of Natural Resources and Forestry, and a leave-to-construct application that will be submitted to the OEB in November 2020. OEB review and approval is required before this project can proceed. Construction of the Project is planned to begin as early as 2021.

If you have any questions about the Storage Enhancement Project or would like to receive additional information and participate in the environmental study process, please do not hesitate to contact me using the contact information provided below.

Sincerely,



Chris Pincombe
Advisor, Lands & ROW
Enbridge Gas Inc.
Phone: 519-862-1168
Email: Chris.Pincombe@Enbridge.com

CC: Evan Tomek - Enbridge Inc.
Mark Van der Woerd - AECOM
Jordan Witt - AECOM



Enbridge Gas Inc.
500 Consumers Road
North York, ON M2J 1P8
Canada

August 14, 2020

«First_Name» «Last_Name»

«Title»

«First_Nation_or_Métis_Nation»

«Street_Address»

«City», «Province» «Postal_Code»

Dear «Salutation» «Last_Name»:

Regarding: Project Commencement for 2021/2022 Storage Enhancement Project

To address increasing demand for natural gas across Ontario, Enbridge Gas is proposing to undertake a Storage Enhancement Project at its natural gas storage facilities in St. Clair Township. The Project will allow Enbridge Gas to store additional natural gas and will increase the deliverability of Enbridge Gas's storage operations.

The Project involves increasing the maximum operating pressure in three existing storage pools (Ladysmith, Corunna and Seckerton), and:

- Re-entering an existing well and converting it to a horizontal well, drilling an observation well.
- Upgrading an existing natural gas gathering pipeline.
- Installation of a bi-directional valve and station piping at an existing station.
- Constructing approximately 2.2 km of natural gas pipeline to connect the Payne Storage Pool to the Corunna Compressor Station located on Tecumseh Road, in St. Clair Township, Ontario.

The location of the Project, including the preliminary preferred pipeline route and accompanying storage enhancement works, is shown in **Figure 1**.

AECOM has been retained by Enbridge Gas to prepare an environmental report (ER) to assess the potential environmental and socio-economic effects that may result from the Storage Enhancement Project. The report will outline plans for avoiding and/or mitigating any effects, where possible. The ER will be prepared in accordance with the Ontario Energy Board's (OEB) *Environmental Guidelines for the Location, Construction and Operation of Hydrocarbon Pipelines and Facilities in Ontario (2016)*. The ER will accompany a leave-to-vary application, a request for

a favourable report from the OEB to the Ministry of Natural Resources and Forestry, and a leave-to-construct application that will be submitted to the OEB in November 2020. OEB review and approval is required before this project can proceed. Construction of the Project is planned to begin as early as 2021.

If you have any questions about the Storage Enhancement Project or would like to receive additional information and participate in the environmental study process, please do not hesitate to contact me using the contact information provided below.

Sincerely,

Kevin Berube
Sr. Advisor, Community & Indigenous Engagement
Enbridge Gas Inc.
Kevin.Berube@enbridge.com
Phone: (416) 666-6759

CC: Evan Tomek - Enbridge Inc.
Mark Van der Woerd - AECOM
Jordan Witt - AECOM

2021/2022 Storage Enhancement Project Notice of Project Commencement



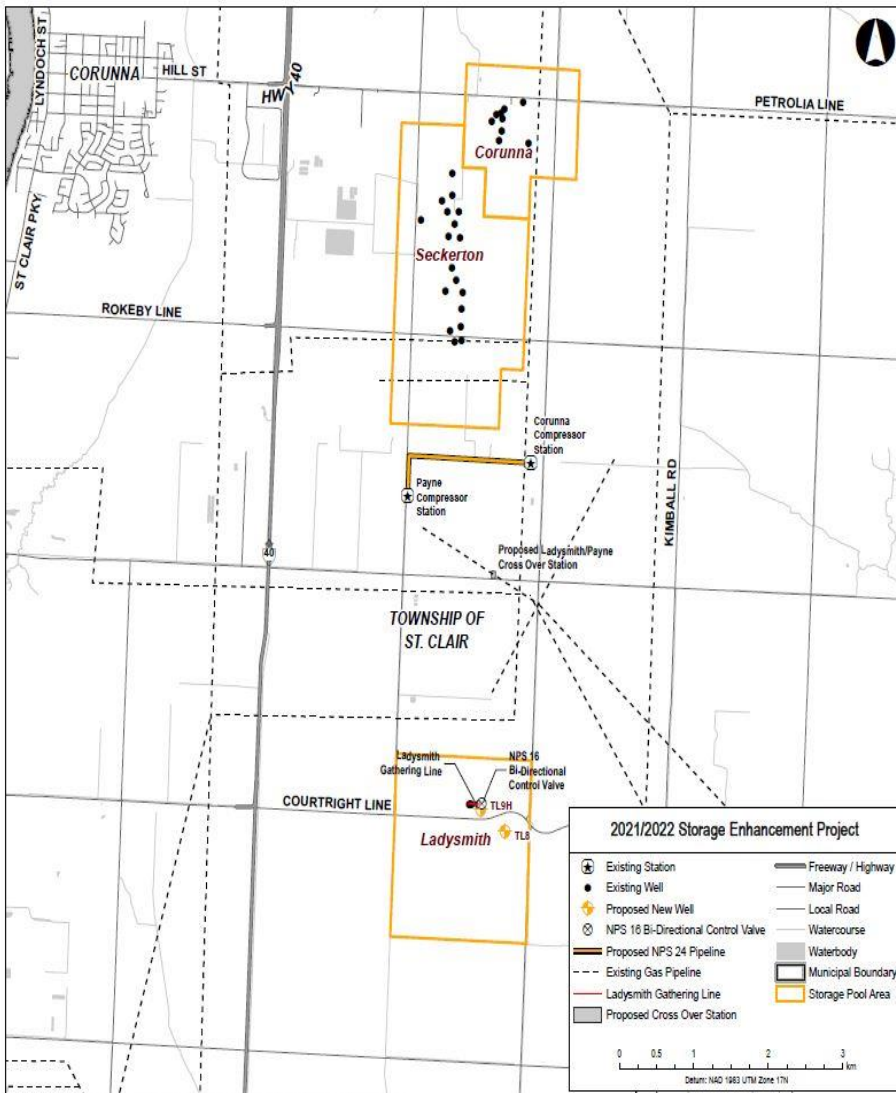
Project Overview

To address increasing demand for natural gas across Ontario, Enbridge Gas is proposing to undertake a Storage Enhancement Project at its natural gas storage facilities in St. Clair Township. The Project will allow Enbridge Gas to store additional natural gas and will increase the deliverability of Enbridge Gas's storage operations.

The Project involves increasing the maximum operating pressure in three existing storage pools (Ladysmith, Corunna and Seckerton), and:

- Re-entering an existing well and converting it to a horizontal well, drilling an observation well.
- Upgrading an existing natural gas gathering pipeline.
- Installation of a bi-directional valve and station piping at an existing station.
- Constructing approximately 2.2 km of natural gas pipeline to connect the Payne Storage Pool to the Corunna Compressor Station located on Tecumseh Road, in St. Clair Township, Ontario.

The location of the Storage Enhancement Project and the preferred location of the new pipeline is shown on the map below. Construction would begin in 2021.



Preparation of an Environmental Report

AECOM has been retained by Enbridge Gas to prepare an environmental report to assess the potential environmental and socio-economic effects that may result from the project, and outline plans for avoiding and/or mitigating any effects where possible. The environmental report will accompany a leave-to-construct application that will be submitted to the Ontario Energy Board (OEB) in the fall of 2020. OEB review and approval is needed to undertake construction.

For questions regarding the environmental report or the project, please contact:

Mark Van der Woerd
Senior Environmental Planner

mark.vanderwoerd@aecom.com
45 Goderich Road, Suite 201
Hamilton, ON, L8E 4W8
(289) 439-9803

ID	Initial Contact Details				Response Details	
	To/From, Comment Format	Date	Subject Line	Comment / Question / Request	Action / Response	From / Format
1	From: Jim Oriotis (Hydro One) To: Mark Van der Woerd (AECOM) Cc: Jordan Witt (AECOM) Email	August 26, 2020	EGI Storage Enhancement Project	Hydro One confirmed receipt of notice letter for the Environmental Report and asked to have the design drawings passed along for Hydro One's technical comments/approval.	AECOM thanked Hydro One for confirming receipt of the letter and advised they will send mapping along via email when ready for their review.	Mark Van der Woerd (AECOM) / 20200903 / Email
2	From: Sarah Hodgkiss (SCRCA) To: Mark Van der Woerd (AECOM) Email	August 26, 2020	Enbridge 2021/2022 Storage Enhancement Project	SCRCA confirmed receipt of the notice letter for the Environmental Report and provided information regarding SCRCA natural hazard and natural heritage features mapping.	AECOM thanked SCRCA for their response and the information and asked if Sarah and Melissa should be the contacts for future correspondence.	Mark Van der Woerd (AECOM) / 20200917 / Email
2.1	From Sarah Hodgkiss (SCRCA) To: Mark Van der Woerd (AECOM) Email	September 17, 2020	Enbridge 2021/2022 Storage Enhancement Project	SCRCA confirmed that both Sarah and Melissa can be included in future correspondence.	AECOM thanked SCRCA for confirming.	Mark Van der Woerd (AECOM) / 20200917 / Email
3	From: Barb Slattery (MECP) To: Mark Van der Woerd (AECOM) Email	August 28, 2020	Enbridge Gas Storage Enhancement Project	MECP confirmed receipt of the notice letter for the Environmental Report and advised they will be providing AECOM with a letter containing any relevant information for the area and comments on potential MECP approvals that may be required. MECP also requested clarification on some of the well work.	AECOM acknowledged receipt of MECP's email and asked if they had sent the letter that was mentioned in their original correspondence. AECOM also advised they would be happy to discuss the Project in further details.	Mark Van der Woerd (AECOM) / 20200917 / Email
3.1	From: Barb Slattery (MECP) To: Mark Van der Woerd (AECOM) Email	September 17, 2020	Enbridge Gas Storage Enhancement Project	MECP advised they have not sent the letter yet and requested the original notice be sent again so that they could arrange a time to discuss the Project.	AECOM provided the notice and advised of a time to discuss the Project.	Mark Van der Woerd (AECOM) / 20200917 / Email
4	From Angelune Des Lauriers (MECP) To: Mark Van der Woerd AECOM) Cc: Debbie Scanlon (MECP), Jennifer Moulton (MECP), Neil Gervais (MECP) Email	August 31, 2020	Project Commencement Notice – 2021/2022 Storage Enhancement Project in St. Clair Township	MECP Source Protection Programs Branch (SPPB) confirmed notification about the Project and provided information regarding drinking water and pipeline construction activities.	AECOM thanked the SPPB for acknowledging receipt and advised that the information shared has been integrated into the Environmental Report. AECOM also asked if the SPPB would like to continue to receive updates regarding the Project.	Mark Van der Woerd (AECOM) / 20200917 / Email
5	From: Secondary Land Use (Hydro One) To: Mark Van der Woerd (AECOM) Email and letter	September 17, 2020	Hydro One Response: 2021/2022 Storage Enhancement Project	Hydro One provided their response to the Project and provided information regarding high voltage transmission facilities within the study area.		

From: Van der Woerd, Mark <Mark.VanderWoerd@aecom.com>
Sent: Thursday, 3 September 2020 3:36 AM
To: Jim.Oriotis@HydroOne.com
Cc: Witt, Jordan <Jordan.Witt@aecom.com>; Evan Tomek <Evan.Tomek@enbridge.com>; Brian Lennie <Brian.Lennie@enbridge.com>
Subject: RE: EGI Storage Enhancement Project

Hi Jim,

Thanks for confirming receipt of our letter and outlining next steps for your review. We are currently working to put together some detailed mapping that shows the proposed works in relation to HONI infrastructure. We will send this along via email for your review. In the meantime, please feel free to reach out if you have questions or want to discuss the project.

Kind regards,
Mark

Mark van der Woerd
AECOM Environment
mark.vanderwoerd@aecom.com
(289) 439-9803

From: Jim.Oriotis@HydroOne.com <Jim.Oriotis@HydroOne.com> **Sent:** August-26-20 9:33 AM
To: Van der Woerd, Mark <Mark.VanderWoerd@aecom.com> **Cc:** Witt, Jordan <Jordan.Witt@aecom.com>
Subject: [EXTERNAL] EGI Storage Enhancement Project

Hello Mr. Van der Woerd,

I am in receipt of your letter notice of environmental report re Expansion of Enbridge Gas facilities in St Clair Township.

To receive Hydro One's technical comments / approval please provide me with detailed drawings showing proposed work in relation to all Hydro One transmission corridors / plant.

Thank you.

Jim



Jim Oriotis
Senior Real Estate Coordinator
Southwest Ontario & Niagara Region
Hydro **One** Networks Inc.
185 Clegg Road
Markham, ON L6G 1B7
Tel: 905.946.6261
Cell: 647.938.6261
Fax: 905.946.6242
Email: jim.orientis@hydroone.com

This message contains confidential and/or privileged information and is intended for the addressee only. Any unauthorized copying, use or disclosure of this message is strictly prohibited. If you have received this message in error, please immediately notify the sender and then delete it without reading, copying or forwarding it to anyone. Thank you.

This email and any attached files are privileged and may contain confidential information intended only for the person or persons named above. Any other distribution, reproduction, copying, disclosure, or other dissemination is strictly prohibited. If you have received this email in error, please notify the sender immediately by reply email and delete the transmission received by you. This statement applies to the initial email as well as any and all copies (replies and/or forwards) of the initial email

Witt, Jordan

From: Van der Woerd, Mark
Sent: September 17, 2020 11:07 AM
To: Sarah Hodgkiss
Cc: Melissa Deisley; Witt, Jordan; Evan Tomek
Subject: RE: Enbridge 2021/2022 Storage Enhancement Project

Thanks for confirming, Sarah.

Have a great day!
Mark

Mark van der Woerd
AECOM Environment
mark.vanderwoerd@aecom.com
(289) 439-9803

From: Sarah Hodgkiss <shodgkiss@scrca.on.ca>
Sent: September-17-20 11:06 AM
To: Van der Woerd, Mark <Mark.VanderWoerd@aecom.com>
Cc: Melissa Deisley <mdeisley@scrca.on.ca>; Witt, Jordan <Jordan.Witt1@aecom.com>; Evan Tomek <Evan.Tomek@enbridge.com>
Subject: [EXTERNAL] RE: Enbridge 2021/2022 Storage Enhancement Project

Hi Mark,

You can continue to circulate both of us.

Thanks

Sarah

From: Van der Woerd, Mark <Mark.VanderWoerd@aecom.com>
Sent: September 17, 2020 11:04 AM
To: Sarah Hodgkiss <shodgkiss@scrca.on.ca>
Cc: Melissa Deisley <mdeisley@scrca.on.ca>; Witt, Jordan <Jordan.Witt1@aecom.com>; Evan Tomek <Evan.Tomek@enbridge.com>
Subject: RE: Enbridge 2021/2022 Storage Enhancement Project

Hi Sarah,

Thanks for your response and for providing links to the SCRCA's mapping. We appreciate you providing that information and confirming that we can reach out to Melissa for additional information. Could you please let us know if the two of you should be included on future correspondence or if it should just be directed to Melissa?

Best,
Mark

Mark van der Woerd
AECOM Environment
mark.vanderwoerd@aecom.com
(289) 439-9803

From: Sarah Hodgkiss <shodgkiss@scrca.on.ca>
Sent: August-26-20 6:55 PM
To: Van der Woerd, Mark <Mark.VanderWoerd@aecom.com>
Subject: [EXTERNAL] Enbridge 2021/2022 Storage Enhancement Project

EA#2020-012

Hello Mark,

Thank you for circulating the Conservation Authority on your notice regarding the Enbridge Gas Storage Enhancement Project in St. Clair Township.

SCRCA's mapping of natural hazard and natural heritage features is available on our website:

<https://www.scrca.on.ca/planning-and-regulations/map-your-property/>

Should you require any additional information, please feel free to contact me, or Melissa Deisley, our Regulations Coordinator at mdeisley@scrca.on.ca.

We appreciate being circulated on the progress of the project.

Thanks,

Sarah Hodgkiss

Planning Ecologist
St. Clair Region Conservation Authority
shodgkiss@scrca.on.ca

519-245-3710 ext. 234
205 Mill Pond Crescent, Strathroy
www.scrca.on.ca

CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Witt, Jordan

From: Van der Woerd, Mark
Sent: September 17, 2020 11:55 AM
To: Slattery, Barbara (MECP)
Cc: Evan Tomek; Witt, Jordan
Subject: RE: Enbridge Gas Storage Enhancement Project
Attachments: 2021-2022 Storage Enhancement Project-Agency Letters- MECP-60633149.pdf

Hi Barb,

No problem, Barb. Please find the original notice for the Project attached to this email. I am out of the office tomorrow but could connect after 3:30 p.m. on Monday, if that would work for you.

Cheers,
Mark

Mark van der Woerd
AECOM Environment
mark.vanderwoerd@aecom.com
(289) 439-9803

From: Slattery, Barbara (MECP) <barbara.slattery@ontario.ca>
Sent: September-17-20 11:30 AM
To: Van der Woerd, Mark <Mark.VanderWoerd@aecom.com>
Subject: [EXTERNAL] RE: Enbridge Gas Storage Enhancement Project

Hello Mark,

Apologies. No, I have not yet been able to turn my attention to this project. I will need to refresh my memory and to be honest, it would really assist me if you could just send me the original notice of the project. Then we could arrange for a time to talk? My day is quite full today but I am free for the entire day tomorrow.

Barb Slattery, EA/Planning Coordinator
Ministry of the Environment, Conservation and Parks
Project Review Unit, Environmental Assessment Branch
(905) 521-7864

We want to hear from you. How was my service? You can provide feedback at 1-888-745-8888.

From: Van der Woerd, Mark <Mark.VanderWoerd@aecom.com>
Sent: September 17, 2020 10:59 AM
To: Slattery, Barbara (MECP) <barbara.slattery@ontario.ca>
Cc: Witt, Jordan <Jordan.Witt1@aecom.com>; Evan Tomek <Evan.Tomek@enbridge.com>
Subject: RE: Enbridge Gas Storage Enhancement Project

CAUTION -- EXTERNAL E-MAIL - Do not click links or open attachments unless you recognize the sender.

Hi Barb,

Further to my voicemail this morning, I wanted to connect to confirm if you had sent through the letter you referenced in your note below. I would also be happy to connect anytime to discuss the Project in more detail, including the work at the wells listed in our initial correspondence. You can reach me when convenient on my cell at (289) 439-9803.

Thanks,
Mark

Mark van der Woerd
AECOM Environment
mark.vanderwoerd@aecom.com
(289) 439-9803

From: Slattery, Barbara (MECP) <barbara.slattery@ontario.ca>
Sent: August-28-20 12:55 PM
To: Van der Woerd, Mark <Mark.VanderWoerd@aecom.com>
Subject: [EXTERNAL] Enbridge Gas Storage Enhancement Project

Good afternoon Mark,

Your notice of project commencement to Crystal Lafrance dated August 14 was forwarded on to me for response. It has been our practice to assist with these OEB applications by providing any relevant information that we may have for the area and to also provide comment on potential MECP approvals that may be required to implement the project.

I will be providing this type of letter to you hopefully by end of next week. In the meantime, I would like some clarification as to the nature of the wells that are shown on the site plan, and the additional well that is mentioned in the description of the project.

Thank you, I look forward to hearing back from you.

Barb Slattery, EA/Planning Coordinator
Ministry of the Environment, Conservation and Parks
Project Review Unit, Environmental Assessment Branch
(905) 521-7864

We want to hear from you. How was my service? You can provide feedback at 1-888-745-8888.

Witt, Jordan

From: Van der Woerd, Mark
Sent: September 17, 2020 11:44 AM
To: protection, source (MECP)
Cc: Scanlon, Debbie (MECP); Moulton, Jennifer L. (MECP); Gervais, Neil (MECP); Evan Tomek; Witt, Jordan
Subject: RE: Project Commencement Notice - 2021/2022 Storage Enhancement Project in St. Clair Township

Hi Angelune,

Thank you for responding on behalf of the Source Protection Programs Branch at MECP. We appreciate you passing along the information on Source Protection Areas. We are in the process of drafting the Environmental Report and have used this information to inform our analysis of existing environmental conditions/features within the Project Study Area. We will also consider your recommendations as we assess the potential effects to Source Protection Areas and other hydrologic features.

If you have further comments, please do not hesitate to reach out to me. We would also appreciate it if you could confirm your interest in receiving any additional information about the Project moving forward.

Best,
Mark

Mark van der Woerd
AECOM Environment
mark.vanderwoerd@aecom.com
(289) 439-9803

From: protection, source (MECP) <source.protection@ontario.ca>
Sent: August-31-20 3:31 PM
To: Van der Woerd, Mark <Mark.VanderWoerd@aecom.com>
Cc: Scanlon, Debbie (MECP) <Debbie.Scanlon@ontario.ca>; Moulton, Jennifer L. (MECP) <Jennifer.L.Moulton@ontario.ca>; Gervais, Neil (MECP) <Neil.Gervais@ontario.ca>
Subject: [EXTERNAL] Project Commencement Notice - 2021/2022 Storage Enhancement Project in St. Clair Township

Good afternoon Mark,

Source Protection Programs Branch (SPPB) has received notification about this natural gas pipeline project. Natural gas pipelines are not identified as a threat to drinking water sources under the Clean Water Act, 2006. However, certain activities related to the construction of pipelines may pose a risk to sources of drinking water. SPPB offers the following information for your consideration as you proceed with the assessment of this proposed project and development of an *Environmental Report per the Ontario Energy Board's Environmental Guidelines for the Location, Construction and Operation of Hydrocarbon Pipelines and Facilities in Ontario*.

The *Clean Water Act, 2006* (CWA) aims to protect existing and future sources of drinking water. To achieve this, several types of vulnerable areas are delineated around surface water intakes and wellheads for every municipal residential drinking water system that is located in a source protection area. These vulnerable areas are known as a Wellhead Protection Areas (WHPAs), and surface water Intake Protection Zones (IPZs). Other vulnerable areas that can be delineated under the CWA for municipal drinking water systems include Significant Groundwater Recharge Areas (SGRAs) and Highly Vulnerable Aquifers (HVAs). In addition, event-based modelling areas (EBAs) and Issues

Contributing Areas (ICAs) may also occur, overlapping with one of the four above-named vulnerable areas.

To identify whether the project would be occurring within a drinking water source protection area, and whether it intersects with a vulnerable area, please consult the Source Protection Information Atlas: <https://www.gisapplication.lrc.gov.on.ca/SourceWaterProtection/Index.html?site=SourceWaterProtection&viewer=SWPViewer&locale=en-US>

Specifically, natural gas pipeline projects may include activities during the construction or maintenance phases that, if located in a vulnerable area, may pose a risk to sources of drinking water (i.e. have the potential to adversely affect the quality or quantity of drinking water sources) and could be subject to policies in a source protection plan. Where an activity poses a risk to drinking water, policies in the local source protection plan may impact how or where that activity is undertaken. For example, construction and maintenance phase activities that may pose a risk to sources of drinking water may include the storage of fuel, stormwater management facilities, and the relocation of sanitary sewage pipes. Policies may prohibit certain activities, or they may require risk management measures for these activities.

Where an activity related to the construction or maintenance phase of the natural gas pipeline poses a risk (significant, moderate, or low) to drinking water, the proponent should document and discuss in the environmental report how the project addresses applicable policies in the local source protection plan. This section should then be used to inform, and be reflected in, other sections of the report; such as the identification of net positive/negative effects of alternatives, mitigation measures, evaluation of alternatives etc. Environmental reports may refer to spill prevention and contingency plans and other mitigation measures that protect human and environmental health. Environmental reports should also demonstrate how these measures protect sources of drinking water to address the intent of the CWA.

The environmental report should also identify how sensitive hydrologic features including current or future sources of drinking water not explicitly addressed in source protection plans, will be protected during the construction and maintenance of the project. This may include private systems – individual or clusters, and designated facilities within the meaning of O. Reg. 170/03 under the Safe Drinking Water Act – i.e., camps, schools, health care facilities, seasonal users, etc.

For further information about the source protection plan and assistance in identifying all applicable policies and their requirements, proponents should contact source protection program manager for the applicable source protection region.

<https://conservationontario.ca/conservation-authorities/source-water-protection/source-protection-plans-and-resources/>

Thank you for considering the Source Protection Programs Branch's comments as you undertake the environmental review for your natural gas pipeline. If you have any questions or concerns about the above information, please do not hesitate to contact me or Debbie Scanlon, Manager, Source Protection Programs Branch.

Angelune Des Lauriers

Program Analyst, Source Protection Programs Branch
289-237-3062 | Angelune.DesLauriers@ontario.ca

**Ministry of the Environment,
Conservation and Parks**

**Ministère de l'Environnement,
de la Protection de la nature
et des Parcs**

Environmental Assessment Branch

Direction des évaluations
environnementales

1st Floor

135 St. Clair Avenue W
Toronto ON M4V 1P5

Tel.: 416 314-8001

Fax.: 416 314-8452

Rez-de-chaussée

135, avenue St. Clair Ouest
Toronto ON M4V 1P5

Tél. : 416 314-8001

Télééc. : 416 314-8452

356-366-8185

Via email only

September 24, 2020

Mark Van der Woerd
Senior Environmental Planner
AECOM

**Re: Enbridge Gas
Project Commencement for 2021/2022 Storage Enhancement Project**

Thank you for providing the ministry with a notice of project commencement for the work that is being undertaken to complete an environmental report (ER) to assess potential impacts that may result from this Project. You have indicated that the ER will be in accordance with the Ontario Energy Board's (OEB) *Environmental Guidelines for the Location, Construction and Operation of Hydrocarbon Pipelines and Facilities in Ontario (2016)*.

It is understood that the project is needed to address increasing demand for natural gas by enabling Enbridge Gas to store additional natural gas and will increase the deliverability of Enbridge Gas's storage operations. In order to do so, the following is required:

- Increasing the maximum operating pressure in three existing storage pools (Ladysmith, Corunna and Seckerton)
- Re-entering an existing well and converting it to a horizontal well, drilling an observation well
- Upgrading an existing natural gas gathering pipeline
- Installation of a bi-directional valve and station piping at an existing station
- Constructing approximately 2.2 km of natural gas pipeline to connect the Payne Storage Pool to the Corunna Compressor Station located on Tecumseh Road, in St. Clair Township, Ontario.

It is expected that the ER process will address the following areas that fall within the mandate of MECP:

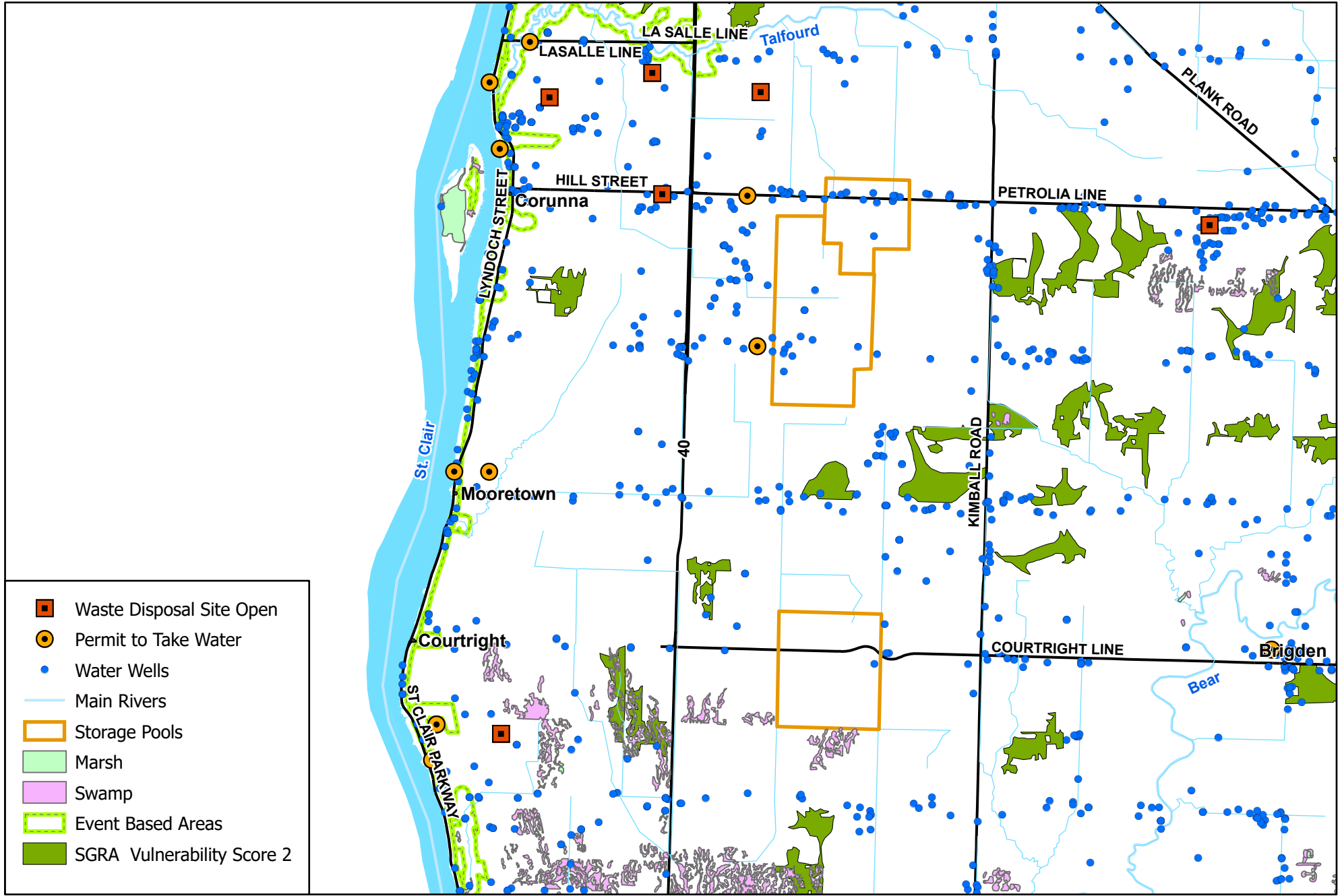
- Consideration of climate change in terms of both adaptation and mitigation;
- Consideration of all approvals, permits, licences etc. necessary to implement each of the improvements that have been identified;
- Consideration as to how existing source water protection features will need to be modified;
- Consideration of how the construction of new infrastructure may affect Species at Risk and their habitats. In this regard, you are encouraged to contact the ministry's Species at Risk branch at SARSOntario@ontario.ca with a description of the scope of this EA so that you receive appropriate direction; and
- Consideration of land use compatibility and separation distances for any new or expanded infrastructure that will result in noise, vibration or emissions into the atmosphere.
- Management of waste materials, including those from the construction phase (e.g. excess oil and fuel), excavation (e.g. contaminated sediments/soils, non-operating and or operating landfills) and the operational phase of all works.










A map of the study area has been prepared using data that the ministry has access to. Please be mindful of the features that have been identified in your identification and assessment of impacts and proposed mitigation measures. Also, please note that the Ministry of Energy, Northern Development and Mines should be contacted for a list of First Nations communities that should be notified of the project and consulted with.

This concludes our comments. If you have any questions or require clarification on any of the points provided herein, please contact me at (365) 366-8185 or via email at Barbara.slattery@ontario.ca

With best regards,

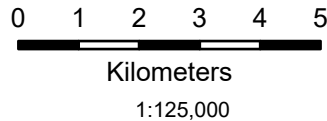
A handwritten signature in cursive script that reads "Barbara Slattery". The signature is written in black ink on a light-colored background.



-  Waste Disposal Site Open
-  Permit to Take Water
-  Water Wells
-  Main Rivers
-  Storage Pools
-  Marsh
-  Swamp
-  Event Based Areas
-  SGRA Vulnerability Score 2

September 23 2020
Southwest Region
Ministry of the Environment
Conservation and Parks

© 2020 Queen's Printer for Ontario



Data Credits:
Roads: 2019 ORN
Rivers: MNRF
Storage Pools: Enbridge Gas Inc
All Other Data: MECP

Enbridge_Gas_Storage_Enhancement_Project

From: SecondaryLandUse@HydroOne.com <SecondaryLandUse@HydroOne.com>
Sent: September-17-20 8:06 AM
To: Van der Woerd, Mark <Mark.VanderWoerd@aecom.com>
Subject: [EXTERNAL] Hydro One Response: 2021/2022 Storage Enhancement Project

Please see the attached for Hydro One's Response.

Hydro One Networks Inc
SecondaryLandUse@HydroOne.com

This email and any attached files are privileged and may contain confidential information intended only for the person or persons named above. Any other distribution, reproduction, copying, disclosure, or other dissemination is strictly prohibited. If you have received this email in error, please notify the sender immediately by reply email and delete the transmission received by you. This statement applies to the initial email as well as any and all copies (replies and/or forwards) of the initial email



Hydro One Networks Inc
483 Bay St
Toronto, ON

September 17, 2020

Re: 2021/2022 Storage Enhancement Project

Attention:

Mark Van der Woerd
Senior Environmental Planner
AECOM

Thank you for sending us notification regarding (2021/2022 Storage Enhancement Project). In our preliminary assessment, we have confirmed that Hydro One has existing high voltage Transmission facilities within your study area (see map attached). At this time we do not have sufficient information to comment on the potential resulting impacts that your project may have on our infrastructure. As such, we must stay informed as more information becomes available so that we can advise if any of the alternative solutions present actual conflicts with our assets, and if so; what resulting measures and costs could be incurred by the proponent. Note that this response does not constitute approval for your plans and is being sent to you as a courtesy to inform you that we must continue to be consulted on your project.

In addition to the existing infrastructure mentioned above, the applicable transmission corridor may have provisions for future lines or already contain secondary land uses (e.g., pipelines, watermains, parking). Please take this into consideration in your planning.

Also, we would like to bring to your attention that should (2021/2022 Storage Enhancement Project) result in a Hydro One station expansion or transmission line replacement and/or relocation, an Environmental Assessment (EA) will be required as described under the Class Environmental Assessment for Minor Transmission Facilities (Hydro One, 2016). This EA process would require a minimum of 6 months for a Class EA Screening Process (or up to 18 months if a Full Class EA were to be required) to be completed. Associated costs will be allocated and recovered from proponents in accordance with the Transmission System Code. If triggered, Hydro One will rely on studies completed as part of the EA you are current undertaking.

Consulting with Hydro One on such matters during your project's EA process is critical to avoiding conflicts where possible or, where not possible, to streamlining processes (e.g., ensuring study coverage of expansion/relocation areas within the current EA). Once in receipt of more specific project information regarding the potential for conflicts (e.g., siting, routing), Hydro One will be in a better position to communicate objections or not objections to alternatives proposed.

If possible at this stage, please formally confirm that Hydro One infrastructure and associated rights-of-way will be completely avoided, or if not possible, allocate appropriate lead-time in your project schedule to collaboratively work through potential conflicts with Hydro One, which ultimately could result in timelines identified above.

In planning, note that developments should not reduce line clearances or limit access to our infrastructure at any time. Any construction activities must maintain the electrical clearance from the transmission line conductors as specified in the Ontario Health and Safety Act for the respective line voltage.

Be advised that any changes to lot grading or drainage within, or in proximity to Hydro One transmission corridor lands must be controlled and directed away from the transmission corridor.

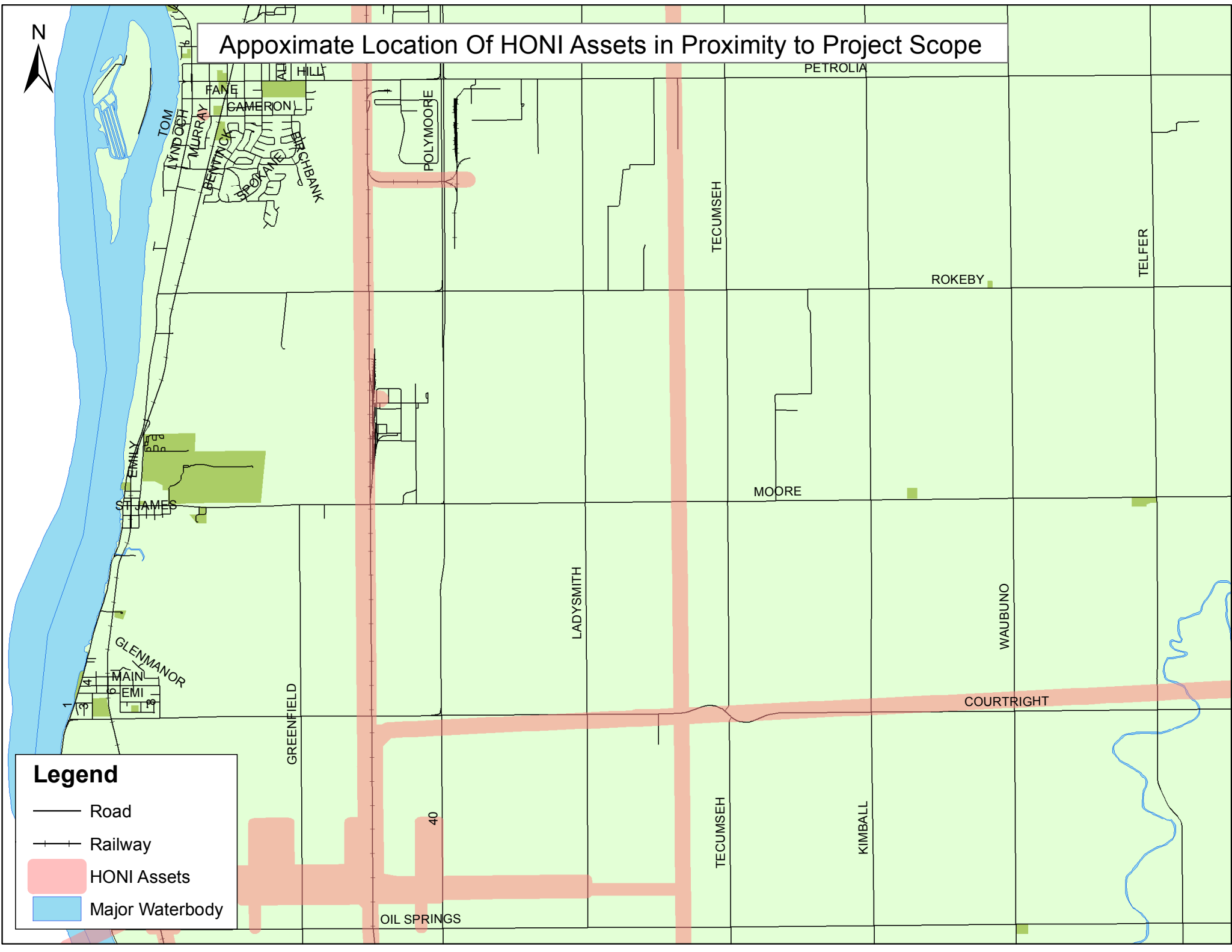
Please note that the proponent will be held responsible for all costs associated with modifications or relocations of Hydro One infrastructure that result from your project, as well as any added costs that may be incurred due to increased efforts to maintain said infrastructure.

We reiterate that this message does not constitute any form of approval for your project. Hydro One must be consulted during all stages of your project. Please include secondarylanduse@hydroone.com on your distribution list for all future communications about this and future project(s).

Sent on behalf of,

***Secondary Land Use
Asset Optimization
Strategy & Integrated Planning
Hydro One Networks Inc.***

Approximate Location Of HONI Assets in Proximity to Project Scope



Legend

- Road
- +— Railway
- HONI Assets
- Major Waterbody

40

OIL SPRINGS

Appendix **C**

MECP Water Well Records

Appendix C - MECP Water Well Records

Well ID	Bore Hole ID	Top of Screen (m)	Casing Diameter (cm)	Water Kind	Eastng (NAD83)	Northng (NAD83)	UTM Zone	Well Type	Final Status	Primary Water Use	Pumping Rate (lpm)	Construction Date	Recommended Pump Rate (gpm)	Depth (end of 60min)	Static Level (m)	Lot	Concession	Street	City	Deepest Depth (m)	Depth to Bedrock (m)	Positional Reliability	Elevation (mASL)	Pumping Duration (Hr)	Pumping Duration (min)	Well Depth (m)	
3401562	10195164		10.16	FRESH	387692.9	4740822	17	Overburden	Water Supply	Livestock	4.55	17-Dec-61	1	86.26	2.74	019	CON 04			62.48		margin of error: 100 m - 300 m	194.24	20	0	88.09	
3401588	10195190		10.16	FRESH	387832.9	4746382	17	Bedrock	Water Supply	Domestic	40.91	20-Jan-51		7.32	7.01	019	CON 08			41.45	41.76	unknown UTM	197.51	2	0	42.37	
3401589	10195191		10.16	FRESH	386307.9	4746382	17	Bedrock	Water Supply	Livestock	9.09	25-Nov-54		9.14	9.14	021	CON 08			42.98	43.28	unknown UTM	201.73	5	0	43.89	
3401590	10195192		10.16	FRESH	386152.9	4746422	17	Bedrock	Water Supply	Livestock	13.64	08-Apr-48		10.06	9.14	022	CON 08			46.33	45.72	unknown UTM	202.08	10	0	48.77	
3401525	10195227		17.78	FRESH	387892.9	4741532	17	Overburden	Water Supply	Livestock	45.46	03-Sep-56		13.72	9.75	018	CON 05			39.93		unknown UTM	193.34		0	40.23	
3401674	10195276		10.16	FRESH	386462.9	4746722	17	Bedrock	Water Supply	Livestock	90.92	03-Dec-64	6	13.72	10.67	021	CON 09			42.37		unknown UTM	198.77	72	0	46.63	
3401675	10195277		5.08	FRESH	385952.9	4746712	17	Bedrock	Water Supply	Livestock			3	9.14	9.14	022	CON 09			43.28	42.67	unknown UTM	199.42	1	0	43.59	
3401708	10195310		5.08	FRESH	388162.9	4749133	17	Bedrock	Water Supply	Domestic	13.64	14-Aug-47		20.73	20.73	018	CON 10			44.20	42.06	unknown UTM	199.99	2	0	44.20	
3401709	10195311				388162.9	4749133	17	Overburden	Abandoned-Supply	Abandoned		24-Sep-48				018	CON 10					unknown UTM	199.99		0	62.48	
3401710	10195312		15.24	FRESH	387872.9	4749103	17	Bedrock	Water Supply	Livestock	68.19	30-Jul-56		12.19	8.23	019	CON 10			44.20	42.98	unknown UTM	199.79	2	0	44.81	
3401711	10195313		15.24	FRESH	387832.9	4749163	17	Bedrock	Water Supply	Domestic	27.28	03-Jan-57		21.34	7.32	019	CON 10			42.06	42.06	unknown UTM	199.63	8	0	48.16	
3401712	10195314		10.16	FRESH	386932.9	4749188	17	Bedrock	Water Supply	Public	22.73	30-Apr-54		8.23	8.23	021	CON 10			44.81	44.81	unknown UTM	197.21	12	0	45.11	
3401713	10195315		10.16	FRESH	386552.9	4749203	17	Bedrock	Water Supply	Abandoned	4.55	20-Aug-60	1	17.37	16.76	021	CON 10			44.81	44.81	margin of error: 100 m - 300 m	197.87	3	0	50.29	
3401714	10195316		10.16	FRESH	385992.9	4749193	17	Bedrock	Water Supply	Livestock	22.73	24-Aug-54		14.33	8.23	022	CON 10			44.81	44.81	unknown UTM	200.26		0	46.33	
3401727	10195329		10.16		388192.9	4749188	17	Overburden	Water Supply	Abandoned		06-Sep-48				018	CON 11					unknown UTM	199.96		0	46.63	
3401730	10195330		10.16		388172.9	4749223	17	Overburden	Abandoned-Supply	Abandoned		14-Sep-48				018	CON 11					unknown UTM	199.81		0	62.48	
3401729	10195331		10.16	FRESH	387812.9	4749283	17	Bedrock	Water Supply	Livestock	27.28	08-Jan-65	6	14.63	8.53	019	CON 11			43.59	42.98	margin of error: 100 m - 300 m	199.76	3	0	44.20	
3401730	10195332		10.16	FRESH	387332.9	4749303	17	Bedrock	Water Supply	Livestock	22.73	11-Dec-53	020	7.01	7.01	020	CON 11			43.89	43.89	unknown UTM	198.32	2	0	44.20	
3401731	10195333		10.16	FRESH	386532.9	4749283	17	Bedrock	Water Supply	Domestic	22.73	28-Jul-53		22.86	15.24	021	CON 11			46.02	43.89	unknown UTM	197.67	1	0	46.02	
3401732	10195334		10.16		386192.9	4749323	17	Bedrock	Abandoned-Supply	Abandoned		08-Dec-56				022	CON 11			41.45	41.45	unknown UTM	199.23		0	48.16	
3401733	10195335		10.16		386312.9	4749323	17	Bedrock	Abandoned-Supply	Abandoned		12-Dec-56				022	CON 11			41.45	41.45	unknown UTM	197.47		0	47.55	
3401734	10195336		10.16	FRESH	386212.9	4749323	17	Bedrock	Water Supply	Livestock	13.64	17-Dec-56		19.81	17.37	022	CON 11			41.45	41.45	unknown UTM	198.98	2	0	45.42	
3401735	10195337		10.16	FRESH	386212.9	4749323	17	Bedrock	Water Supply	Livestock	9.09	06-May-60	2	20.42	20.42	022	CON 11			41.15	41.15	unknown UTM	198.98	2	0	44.20	
3401736	10195338		10.16		386272.9	4749283	17	Bedrock	Abandoned-Supply	Abandoned		15-Nov-63				022	CON 11			41.15	41.15	margin of error: 100 m - 300 m	198.27		0	43.89	
3401737	10195339		10.16		386272.9	4749283	17	Bedrock	Abandoned-Supply	Abandoned		21-Dec-63				022	CON 11			41.15	41.15	margin of error: 100 m - 300 m	198.27		0	42.06	
3401738	10195340		10.16		386152.9	4749363	17	Bedrock	Abandoned-Supply	Abandoned		23-May-64				022	CON 11			41.45	41.45	unknown UTM	199.58		0	43.28	
3401739	10195341		10.16		385192.9	4749288	17	Bedrock	Abandoned-Supply	Abandoned		29-May-64				022	CON 11			41.45	41.45	unknown UTM	199.30		0	43.28	
3401740	10195342		10.16	FRESH	385992.9	4749388	17	Bedrock	Water Supply	Livestock	9.09	18-Jul-64	2	22.86	12.19	022	CON 11			42.98	42.98	margin of error: 100 m - 300 m	199.45	2	0	46.63	
3403266	10196866		10.16	FRESH	386242.9	4746582	17	Bedrock	Water Supply	Domestic	31.82	08-May-68	7	13.72	10.36	021	CON 09			43.59	43.59	margin of error: 100 m - 300 m	199.49	7	0	46.33	
3403273	10196873		10.16	FRESH	387232.9	4749263	17	Bedrock	Water Supply	Livestock	77.28	05-Jan-68	7	18.29	12.19	020	CON 11			42.67	42.67	margin of error: 100 m - 300 m	197.79	1	0	44.50	
3403246	10197146		10.16	FRESH	387082.9	4749283	17	Bedrock	Water Supply	Domestic	22.73	23-Apr-69	5	24.38	9.45	020	CON 11			44.81	42.98	margin of error: 30 m - 100 m	199.92	8	0	47.55	
3403675	10197275		12.70	FRESH	387492.9	4746522	17	Bedrock	Water Supply	Livestock	54.55	15-Apr-70	12	18.29	10.67	019	CON 09			45.72	43.28	margin of error: 30 m - 100 m	197.60	4	0	49.07	
3404549	10198143		10.16	FRESH	386736.9	4747550	17	Bedrock	Water Supply	Livestock	9.09	25-Oct-74	2	45.72	7.62	021	CON 09			44.20	44.20	margin of error: 30 m - 100 m	199.78	4	0	49.38	
3404550	10198144		10.16	FRESH	386676.9	4746661	17	Bedrock	Water Supply	Livestock	9.09	16-Oct-74	2	48.77	12.19	021	CON 09			45.11	41.76	margin of error: 30 m - 100 m	199.14	2	0	48.77	
3404724	10198315		10.16		388763.9	4749250	17	Bedrock	Abandoned-Supply	Abandoned		08-Jul-75				017	CON 11			43.89	43.89	margin of error: 30 m - 100 m	199.58		0	48.77	
3404725	10198316		10.16		388813.9	4749233	17	Bedrock	Abandoned-Supply	Abandoned		25-Aug-75				017	CON 11			43.89	43.89	margin of error: 30 m - 100 m	199.78		0	48.77	
3404962	10198525		10.16	FRESH	385952.9	4746462	17	Bedrock	Water Supply	Domestic	45.46	02-Jun-76	5	15.24	9.14	022	CON 08			44.20	44.20	margin of error: 30 m - 100 m	199.43	2	0	48.77	
3407038	10199586		10.16	FRESH	386172.9	4746502	17	Bedrock	Water Supply	Livestock	27.28	16-Apr-82	6	27.28	10.67	022	CON 08			42.67	42.67	margin of error: 30 m - 100 m	202.08	2	30	43.89	
3407203	10199751		10.16		388212.9	4749233	17	Bedrock	Abandoned-Supply	Abandoned		10-Sep-84				018	CON 11			44.20	44.20	margin of error: 30 m - 100 m	199.87		0	47.24	
3407204	10199752		10.16	FRESH	388202.9	4749203	17	Bedrock	Water Supply	Domestic	45.46	14-Sep-84	6		38.10	7.62	018	CON 11			43.89	43.89	margin of error: 30 m - 100 m	199.94	3	0	46.94
3408271	10200776		17.78		387963	4741014	17									018	CON 05					margin of error: 10 - 30 m	193.12		0		
3408272	10200777		17.78		387914	4741014	17									018	CON 05					margin of error: 10 - 30 m	193.00		0		
3408273	10200778				386538.9	4747196	17		Not A Well	Not Used		09-Sep-98				021	CON 09					unknown UTM	199.43		0		
3408288	10200793				386539.9	4747197	17					15-May-99				021	CON 09					unknown UTM	199.43		0		
3408397	10519087				387811.3	4748502	17					07-Jun-01				019	CON 10					unknown UTM	200.06		0		
7155291	1003433332		10.16		385149	4746106	17		Abandoned-Other	Abandoned		20-Jan-10				022	CON 08	3765 LADYSMITH RD	MOORETOWN			margin of error: 30 m - 100 m	200.15		0	43.89	
7155852	1003433333				385553	4747791	17		Abandoned-Other	Abandoned		18-Oct-10											margin of error: 10 - 30 m	198.13		0	
7155853	1003433334		</																								

Appendix **D**

Stage 1 Archaeological Assessment Report

Enbridge Gas Inc.

Stage 1 Archaeological Assessment 2021/2022 Storage Enhancement Project Part of Lots 19-21, Concessions 4-5, and Lots 18-22, Concessions 7-11, Geographic Township of Moore, Now Township of St. Clair, Lambton County, Ontario

Prepared by:

AECOM

410 – 250 York Street, Citi Plaza
London, ON, Canada N6A 6K2

519 673 0510 tel
519 673 5975 fax

www.aecom.com

Licensee: Samantha Markham, MES

License: P438

PIF Number: P438-0224-2020

Distribution List

# Hard Copies	PDF Required	Association / Company Name
0	Yes	Enbridge Gas Inc.
0	Yes	Ministry of Heritage, Sport, Tourism and Culture Industries
0	Yes	AECOM Canada Ltd.

Revision History

Revision #	Date	Revised By:	Revision Description

Statement of Qualifications and Limitations

The attached Report (the "Report") has been prepared by AECOM Canada Ltd. ("AECOM") for the benefit of the Client ("Client") in accordance with the agreement between AECOM and Client, including the scope of work detailed therein (the "Agreement").

The information, data, recommendations and conclusions contained in the Report (collectively, the "Information"):

- is subject to the scope, schedule, and other constraints and limitations in the Agreement and the qualifications contained in the Report (the "Limitations");
- represents AECOM's professional judgement in light of the Limitations and industry standards for the preparation of similar reports;
- may be based on information provided to AECOM which has not been independently verified;
- has not been updated since the date of issuance of the Report and its accuracy is limited to the time period and circumstances in which it was collected, processed, made or issued;
- must be read as a whole and sections thereof should not be read out of such context;
- was prepared for the specific purposes described in the Report and the Agreement; and
- in the case of subsurface, environmental or geotechnical conditions, may be based on limited testing and on the assumption that such conditions are uniform and not variable either geographically or over time.

AECOM shall be entitled to rely upon the accuracy and completeness of information that was provided to it and has no obligation to update such information. AECOM accepts no responsibility for any events or circumstances that may have occurred since the date on which the Report was prepared and, in the case of subsurface, environmental or geotechnical conditions, is not responsible for any variability in such conditions, geographically or over time.

AECOM agrees that the Report represents its professional judgement as described above and that the Information has been prepared for the specific purpose and use described in the Report and the Agreement, but AECOM makes no other representations, or any guarantees or warranties whatsoever, whether express or implied, with respect to the Report, the Information or any part thereof.

Without in any way limiting the generality of the foregoing, any estimates or opinions regarding probable construction costs or construction schedule provided by AECOM represent AECOM's professional judgement in light of its experience and the knowledge and information available to it at the time of preparation. Since AECOM has no control over market or economic conditions, prices for construction labour, equipment or materials or bidding procedures, AECOM, its directors, officers and employees are not able to, nor do they, make any representations, warranties or guarantees whatsoever, whether express or implied, with respect to such estimates or opinions, or their variance from actual construction costs or schedules, and accept no responsibility for any loss or damage arising therefrom or in any way related thereto. Persons relying on such estimates or opinions do so at their own risk.

Except (1) as agreed to in writing by AECOM and Client; (2) as required by-law; or (3) to the extent used by governmental reviewing agencies for the purpose of obtaining permits or approvals, the Report and the Information may be used and relied upon only by Client.

AECOM accepts no responsibility, and denies any liability whatsoever, to parties other than Client who may obtain access to the Report or the Information for any injury, loss or damage suffered by such parties arising from their use of, reliance upon, or decisions or actions based on the Report or any of the Information ("improper use of the Report"), except to the extent those parties have obtained the prior written consent of AECOM to use and rely upon the Report and the Information. Any injury, loss or damages arising from improper use of the Report shall be borne by the party making such use.

This Statement of Qualifications and Limitations is attached to and forms part of the Report and any use of the Report is subject to the terms hereof.

Quality Information

Report Prepared By:



Kristen Nadal
Junior Archaeologist



Samantha Markham, MES
Professional Archaeologist

Report Reviewed By:



Adria Grant, MA, CAHP
Ontario Department Manager
Impact Assessment and Permitting (IAP)

Executive Summary

AECOM Canada Ltd. (AECOM) was retained by Enbridge Gas Inc. to conduct a Stage 1 archaeological assessment for the proposed 2021/2022 Storage Enhancement Project in Lambton County, Ontario, in advance of the proposed development of a natural gas pipeline, as well as accompanying storage enhancement works. The study area consists an area approximately 1,063.47 hectares (ha) in size and is located within multiple lots and concessions in the Geographic Township of Moore, Lambton County, Ontario.

This Stage 1 archaeological assessment was triggered by the requirements of the Ontario Energy Board's (OEB) *Environmental Guidelines for the Location, Construction and Operation of Hydrocarbon Pipelines and Facilities in Ontario* and conducted in accordance with Chapter 4, subsection 4.3.4 prior to implementation of the project (Ontario Energy Board 2016). This project is also subject to the *Ontario Heritage Act* (Government of Ontario 1990) and the *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011).

AECOM's Stage 1 background study for the 2021/2022 Storage Enhancement Project area has determined that the potential for the recovery of both First Nation and Euro-Canadian archaeological resources within the current study area is high. Based on these findings, **Stage 2 archaeological assessment is recommended for all areas of potentially undisturbed land within the study area limits.**

The Stage 2 archaeological assessment must be conducted by a licensed archaeologist and must follow the requirements set out in the *Standards and Guidelines for Consultant Archaeologists* (Ontario Government 2011), including:

- The standard test pit survey method at 5 m intervals is to be conducted in all areas that will be impacted by the project where ploughing is not feasible (e.g. woodlots, overgrown areas, manicured lawns, small sections of agricultural land); and
- Pedestrian survey at 5 m intervals where ploughing is possible (e.g. agricultural fields). This assessment will occur when agricultural fields have been recently ploughed, weathered by rain, and exhibit at least 80% surface visibility.
- Poorly drained areas, areas of steep slope, and areas of confirmed previous disturbance (e.g. building footprints, roadways, areas with identifiable underground infrastructure) are to be mapped and photo-documented but are not recommended for Stage 2 survey as they possess low to no archaeological potential.

Should additional land outside of the current study area boundaries be included as part of the 2021/2022 Storage Enhancement Project, the standard requirements for archaeological assessments to be conducted prior to land disturbance remain in place.

The MHSTCI is asked to accept this report into the Ontario Public Register of Archaeological Reports thereby concurring with the recommendations presented herein. As further archaeological assessment is required, archaeological concerns for the study area in the Township of Moore, Ontario have not been fully addressed.

Please note that this archaeological assessment report has been written to meet the requirements of the MHSTCI' *Standards and Guidelines for Consultant Archaeologists* (Ontario Government 2011); however properties that are subject to archaeological assessment are not considered cleared for ground disturbance activities until the associated report has been reviewed and accepted by the MHSTCI. In order to maintain compliance with the MHSTCI and the *Ontario Heritage Act* (1990), no ground disturbing activities are to occur until the proponent and approval authority receive a formal letter from the MHSTCI stating that the recommendations provided herein are compliant and that the report has been accepted into the MHSTCI' register of archaeological reports.

Project Personnel

Project Manager	Adria Grant, MA, CAHP (P131)
Licensed Archaeologist	Samantha Markham, MES (P438)
Field Supervisor	Samantha Markham, MES
Report Production	Kristen Nadal Samantha Markham, MES
Office Assistance	Jennifer Deline
Senior Review	Adria Grant, MA, CAHP
GIS Analyst	Ben Clark, BAA

Acknowledgements

Proponent Contact	Evan Tomek, BES, Enbridge Gas Inc.
Approval Authority	Zora Crnojacki, Ontario Energy Board

Table of Contents

	page
1. Project Context	2
1.1 Development Context	2
1.1.1 Objectives	2
1.2 Historical Context.....	2
1.2.1 Pre-Contact First Nation Settlement	3
1.2.2 Post-Contact Period Settlement	6
1.2.3 Euro-Canadian Settlement	7
1.3 Archaeological Context	9
1.3.1 Natural Environment.....	9
1.3.2 Previous Archaeological Work.....	9
1.3.3 Known Archaeological Sites	10
1.3.4 Existing Conditions.....	11
2. Analysis and Conclusions	12
2.1 Determination of Archaeological Potential.....	12
2.2 Conclusions	13
3. Recommendations	14
4. Advice on Compliance with Legislation.....	15
5. Bibliography	16
6. Figures	18

List of Figures

Figure 1: Location of the Study Area	19
Figure 2: Study Area in Detail	20
Figure 3: Treaties and Purchases	21
Figure 4: Portion of 1880 Illustrated Historical Atlas of the County of Lambton	22
Figure 5: Soil Drainage and Agricultural Suitability	23
Figure 6: Results of the Stage 1 Archaeological Assessment.....	24

List of Tables

Table 1: Cultural Chronology for Lambton County	3
Table 2: 1880 Landowners and Historic Features within the Study Area.....	8
Table 3: Archaeological Reports with Relevant Background Information	9
Table 4: Registered Archaeological Sites within 1 km of the Study Area.....	10

1. Project Context

1.1 Development Context

AECOM Canada Ltd. (AECOM) was retained by Enbridge Gas Inc. to conduct a Stage 1 archaeological assessment for the proposed 2021/2022 Storage Enhancement Project in Lambton County, Ontario, in advance of the proposed development of a natural gas pipeline, as well as accompanying storage enhancement works. The study area consists an area approximately 1,063.47 hectares (ha) in size and is located within multiple lots and concessions in the Geographic Township of Moore, Lambton County, Ontario.

This Stage 1 archaeological assessment was triggered by the requirements of the Ontario Energy Board's (OEB) *Environmental Guidelines for the Location, Construction and Operation of Hydrocarbon Pipelines and Facilities in Ontario* and conducted in accordance with Chapter 4, subsection 4.3.4 prior to implementation of the project (Ontario Energy Board 2016). This project is also subject to the *Ontario Heritage Act* (Government of Ontario 1990) and the *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011).

1.1.1 Objectives

The objective of the Stage 1 background study is to document the archaeological and land use history and present conditions within the study area. This information will be used to support recommendations regarding cultural heritage values or interests as well as assessment and mitigation strategies. The results of Stage 1 archaeological assessment presented in this report are drawn in part from:

- Recent and historical maps of the study area;
- Reports of previous archaeological assessments within 50 m of the study area;
- The Ministry of Heritage, Sport, Tourism and Culture Industries' (MHSTCI) Archaeological Sites Database (ASDB) for a listing of registered archaeological sites within a 1 km radius of the study area;
- Archaeological management plans or other archaeological potential mapping, where available.

The Stage 1 archaeological assessment has been conducted to meet the requirements of the MHSTCI *Standards and Guidelines for Consultant Archaeologists* (Ontario Government 2011).

1.2 Historical Context

Years of archaeological research and assessments in southern Ontario have resulted in a well-developed understanding of the historic use of land in Lambton County from the earliest First Nation people to the more recent Euro-Canadian settlers and farmers. Table 1 provides a breakdown of the cultural and temporal history of past occupations in Lambton County.

Table 1: Cultural Chronology for Lambton County

Archaeological Period	Time Period	Characteristics
Early Paleo	9000-8400 BC	<ul style="list-style-type: none"> Fluted Points Arctic tundra and spruce parkland, caribou hunters
Late Paleo	8400-8000 BC	<ul style="list-style-type: none"> Holcombe, Hi-Lo and Lanceolate Points Slight reduction in territory size
Early Archaic	8000-6000 BC	<ul style="list-style-type: none"> Notched and Bifurcate base Points Growing populations
Middle Archaic	6000-2500 BC	<ul style="list-style-type: none"> Stemmed and Brewerton Points, Laurentian Development Increasing regionalization
Late Archaic	2000-1800 BC	<ul style="list-style-type: none"> Narrow Point Environment similar to present
	1800-1500 BC	<ul style="list-style-type: none"> Broad Point Large lithic tools
	1500-1100 BC	<ul style="list-style-type: none"> Small Point Introduction of bow
Terminal Archaic	1100-950 BC	<ul style="list-style-type: none"> Hind Points, Glacial Kame Complex Earliest true cemeteries
Early Woodland	950-400 BC	<ul style="list-style-type: none"> Meadowood Points Introduction of pottery
Middle Woodland	400 BC – AD 500	<ul style="list-style-type: none"> Dentate/Pseudo-scallop Ceramics Increased sedentism
	AD 550-900	<ul style="list-style-type: none"> Princess Point Introduction of corn horticulture
Late Woodland	AD 900-1300	<ul style="list-style-type: none"> Agricultural villages
	AD 1300-1400	<ul style="list-style-type: none"> Increased longhouse sizes
	AD 1400-1650	<ul style="list-style-type: none"> Warring nations and displacement
Contact Period	AD 1600-1875	<ul style="list-style-type: none"> Early written records and treaties
Historic	AD 1749-present	<ul style="list-style-type: none"> European settlement (French and English)

Notes: Taken from Ellis and Ferris (1990)

The following sections provide a detailed summary of the archaeological cultures that have settled in the vicinity of the study area. As Chapman and Putnam (1984) illustrate, the modern physiography of southern Ontario is largely a product of events of the last major glacial stage and the landscape is a complex mosaic of features and deposits produced during the last series of glacial retreats and advances prior to the withdrawal of the continental glaciers from the area. Southwestern Ontario was finally ice free by 12,500 years ago. With continuing ice retreat and lake regressions the land area of southern Ontario progressively increased while barriers to the influx of plants, animals, and people steadily diminished (Karrow and Warner 1990). The land within Lambton County has been extensively utilized by pre-contact First Nation people who began occupying southwestern Ontario as the glaciers receded from the land, as early as 11,000 BC.

1.2.1 Pre-Contact First Nation Settlement

The Paleo Period

In this area the first human settlement can be traced back to 11,000 BC; these earliest well-documented groups are referred to as Paleo which literally means old or ancient. During the Paleo period people were non-agriculturalists who depended on hunting and gathering of wild food, they moved their encampments on a regular basis to be in the locations where these resources naturally became available, and the size of the groups occupying any particular location would vary depending on the nature and size of the available food resources (Ellis and Deller 1990). The picture that has emerged for the early and late Paleo is of groups at low population densities who were residentially mobile and made use of large territories during annual cycles of resource exploitation.

The Archaic Period

The next major cultural period following the Paleo is termed the Archaic, which is broken temporally into the Early, Middle, and Late Archaic periods. There is much debate on how the term Archaic is employed; general practice bases the designation off assemblage content as there are marked differences in artifact suites from the preceding Paleo and subsequent Woodland periods. As Ellis *et al.* (1990) note, from an artifact and site characteristic perspective the Archaic is simply used to refer to non-Paleo manifestations that pre-date the introduction of ceramics. Ellis *et al.* (1990) stress that Archaic groups can be distinguished from earlier groups based on site characteristics and artifact content.

Early Archaic sites have been reported throughout much of southwestern Ontario and extend as far north as the Lake Huron Basin region and as far east as Rice Lake (Ellis *et al.* 1986). A lack of excavated assemblages from southern Ontario has limited understandings and inferences regarding the nature of stone tool kits in the Early Archaic and tool forms other than points are poorly known in Ontario; however, at least three major temporal horizons can be recognized and can be distinguished based on projectile point form (Ellis *et al.* 1990). These horizons are referred to as Side-Notched (*ca.* 8,000-7,700 BC), Corner-Notched (*ca.* 7,700-6,900 BC), and Bifurcated (*ca.* 6,900-6,000 BC) (Ellis *et al.* 1990). Additional details on each of these horizons and the temporal changes to tool types can be found in Ellis *et al.* (1990).

The Middle Archaic period (6,000-2,500 BC), like the Early Archaic, is relatively unknown in southern Ontario. Ellis *et al.* (1990) suggest that artifact traits that have come to be considered as characteristic of the Archaic period as a whole, first appear in the Middle Archaic. These traits include fully ground and polished stone tools, specific tool types including banner stones and net-sinkers, and the use of local and/or non-chert type materials for lithic tool manufacture (Ellis *et al.* 1990).

The Late Archaic begins around approximately 2,000 BC and ends with the appearance of ceramics and the Meadowood Phase at roughly 950 BC. Much more is known about this period than the Early and Middle Archaic and a number of Late Archaic sites are known. Sites appear to be more common than earlier periods, suggesting some degree of population increase. True cemeteries appear and have allowed for the analysis of band size, biological relationships, social organization, and health. Narrow and Small point traditions appear as well as tool recycling wherein points were modified into drills, knives, end scrapers, and other tools (Ellis *et al.* 1990). Other tools including serrated flakes used for sawing or shredding, spokeshaves, and retouched flakes manufactured into perforators, graters, micro-perforators, or piercers. Tools on coarse-grained rocks such as sandstone and quartz become common and include hammerstones, net-sinkers, anvils, and cobble spalls. Depending on preservation, several Late Archaic sites include bone and/or antler artifacts which likely represent fishing toolkits and ornamentation. These artifacts include bone harpoons, barbs or hooks, notched projectile points, and awls. Bone ornaments recovered have included tubular bone beads and drilled mammal canine pendants (Ellis *et al.* 1990).

Throughout the Early to Late Archaic periods the natural environment warmed and vegetation changed from closed conifer-dominated vegetation cover, to the mixed coniferous and deciduous forest in the north and deciduous vegetation in the south we see in Ontario today (Ellis *et al.* 1990). During the Archaic period there are indications of increasing populations and decreasing size of territories exploited during annual rounds; fewer moves of residential camps throughout the year and longer occupations at seasonal campsites; continuous use of certain locations on a

seasonal basis over many years; increasing attention to ritual associated with the deceased; and, long range exchange and trade systems for the purpose of obtaining valued and geographically localized resources (Ellis *et al.* 1990).

The Woodland Period

The Early Woodland period is distinguished from the Late Archaic period primarily by the addition of ceramic technology, which provides a useful demarcation point for archaeologists but is expected to have made less difference in the lives of the Early Woodland peoples. The settlement and subsistence patterns of Early Woodland people shows much continuity with the earlier Archaic with seasonal camps occupied to exploit specific natural resources (Spence *et al.* 1990). During the Middle Woodland well-defined territories containing several key environmental zones were exploited over the yearly subsistence cycle. Large sites with structures and substantial middens appear in the Middle Woodland associated with spring macro-band occupations focussed on utilizing fish resources and created by consistent returns to the same site (Spence *et al.* 1990). Groups would come together into large macro-bands during the spring-summer at lakeshore or marshland areas to take advantage of spawning fish; in the fall inland sand plains and river valleys were occupied for deer and nut harvesting and groups split into small micro-bands for winter survival (Spence *et al.* 1990). This is a departure from earlier Woodland times when macro-band aggregation is thought to have taken place in the winter (Ellis *et al.* 1988; Granger 1978).

The period between the Middle and Late Woodland period was both technically and socially transitional for the ethnically diverse populations of southern Ontario and these developments laid the basis for the emergence of settled villages and agriculturally based lifestyles (Fox 1990). The Late Woodland period began with some groups shifting settlement and subsistence patterns, involving an increasing reliance on corn horticulture. Corn may have been introduced into southwestern Ontario from the American Midwest as early as 600 AD. However, it did not become a dietary staple until at least three to four hundred years later. The first agricultural villages in southwestern Ontario date to the 10th century A.D. Unlike the riverine base camps of the Middle Woodland period, Late Woodland sites are located in the uplands, on well-drained sandy soils.

In the Late Woodland period, between 900-1300 AD, villages tended to be small settlements with nearby camps and hamlets that served as temporary spaces for hunting game and gathering resources outside of the villages. At this time, small village sites were characterized by the presence of longhouses with villages being occupied considerably longer than later in the Woodland period. Villages tended to be moved when nearby soils had been depleted by farming and conveniently collected firewood grew scarce. The Jesuits reported that the Huron moved their villages once every 10-15 years as they relied less heavily on corn than did later groups, and since their villages were much smaller, there was less demand on nearby resources. Small amounts of corn appear to have been a dietary component at this time; however, archaeological evidence suggests that its role was not as a dietary staple at this time but was possibly supplemental in nature.

Between 1300 and 1400 AD, village sizes grew significantly, resulting in the development of complex community political systems. This period also marks the emergence of fully developed horticulture, including the cultivation of corn, beans, and squash. Additionally, changes in ceramic styles may reflect increasing levels of inter-community communication and integration. This is supported by Michi Saagiig (Mississauga Anishinaabeg) oral histories, which speak to the coming of the corn growers and the symbiotic relationships that Algonkian speaking groups had with the Huron-Wendat in particular.

By the beginning of the fourteenth century, larger fortified village sites were often cleared to accommodate the cultivation of corn, beans, and squash as a result of an increasing reliance on horticulture. Longhouses also continued to grow in size until 1450 AD when a decrease in house length is observed. This decrease in house length may be partially attributed to large scale drops in population size associated with the introduction of European diseases.

1.2.2 Post-Contact Period Settlement

The post-contact Indigenous occupation of southern Ontario was heavily influenced by the dispersal of Iroquoian speaking peoples, including the Six Nations of the Iroquois – Mohawk, Cayuga, Oneida, Seneca, Onondaga, and Tuscarora. This was followed by the return of Algonkian speaking groups from northern Ontario, including the Michi Saagig, who had temporarily retreated to their wintering grounds in the mid-1600s to avoid warfare and disease as a result of colonial settlement. Algonkian speaking Ojibwe (Chippewa), Odawa (Ottawa), and Pottawatomi, known as the Three Fires Confederacy, remained in their traditional territory that covered a vast area of southern Ontario as well as eastern Michigan.

As European settlers encroached on their territory the nature of First Nation population distribution, settlement size and material culture changed. Despite these changes it is possible to correlate historically recorded villages with archaeological manifestations and the similarity of those sites to more ancient sites reveals an antiquity to documented cultural expressions that confirms a long historical continuity to systems of Indigenous ideology and thought (Ferris 2009).

It is important to note that, when discussing the historical documentation of the movement of Indigenous people, what has been documented by early European explorers and settlers represents only a very small snap-shot in time. Documentation of where Indigenous groups were residing during European exploration and settlement is restricted to only a very short period of time and does not reflect previous and subsequent movements of these groups. This brief history does not reflect the full picture of the pre- or post-contact period occupation of Indigenous groups or cultures. As such, relying on historic documentation in regards to Indigenous occupation and movement across the landscape can lead to misinterpretation. For example, noting the movement of Indigenous groups into an area may incorrectly suggest to the reader that these groups had not occupied the area previously; however, this is not the case. It is clear from Indigenous oral histories and the archaeological record that pre-contact Indigenous populations were extremely mobile and not tied to any one specific area. Over the vast period of time prior to the arrival of Europeans, Indigenous groups, language families, and cultures were fluid across the landscape.

The study area also falls within the part of Ontario that was purchased by the Crown as part of Treaty No. 27 ½ on April 25th, 1825 (Figure 3). Morris (1943) describes Treaty No. 27 ½ as follows:

... an agreement made at Amherstburg in the Western District of the Province of Upper Canada on the 26th of April, 1825, between James Givens, Esquire, Superintendent of Indian Affairs, on behalf of His Majesty King George the Fourth and the Chiefs and Principal Men of the part of the Chippewa Nation of Indians, inhabiting and claiming the tract of land Wawanosh Township in the County of Huron was named after Way-way-nosh the principal Chief of the Band making this Treaty.

Morris 1943: 26-27

Treaty Number 27½ was subsequently confirmed on July 10th, 1827 as Treaty Number 29 with only a minor change in the legal description of the boundaries of the land surrender (Morris 1943:27). The Chippewa Nation inhabiting and claiming this land was composed of 440 individuals, who would be entitled to equally share the yearly sum of 1,100 pounds. While it is difficult to delineate treaty boundaries on modern maps, Figure 3 provides an illustration of treaties and purchases taken from Morris (1943) with the approximate location of the current study area shown.

The British Parliament incorporated a large private chartered British land development company on July 27, 1825, called the Canada Company, to aid the colonization of Upper Canada (Lee 2004). The Upper Canada government sold the Canada Company 10,000 km² of land for 341,000 pounds. Slightly less than half of the land that was purchased comprised what would become the Huron Tract, located on the eastern shore of Lake Huron (Lee 2004).

1.2.3 Euro-Canadian Settlement

The Sarnia-Lambton Region and Lambton County

Euro-Canadian immigrants to the Sarnia-Lambton region began to settle the area as early as 1796, when French settlers first arrived and settled along the banks of the St. Clair river (Elford 1982). However, a significant wave of settlers would not begin to arrive until at least the 1830s. A subsequent wave followed in the 1850s during the potato famine in Ireland, resulting in a large population boom; by 1891, the population had risen to 58,810 individuals (Elford 1982). The principle crops grown in Sarnia-Lambton included wheat and peas, and farmers also supplemented their income by selling forestry products (City of Sarnia 2016). The early growth of Sarnia was stimulated by the wealth of stands of timber and the discovery of oil in the late 1850s. Lambton County became independent in 1853, following the Municipal Act of 1849 and the initial completion of surveying in 1835. It takes its name from Governor General John George Lambton, first Earl of Durham, who authored *The Report on the Affairs of British North America* (1839), often referred to as the Durham Report; this text investigated two armed uprisings known as the Rebellions of 1837-1838, and would later have a profound influence on the development of the *British North America Act, 1840* (Elford 1982), which established the Province of Canada in 1841.

In 1858, James M. Williams developed the world's first commercial oil well, which started an oil boom in the area. With the arrival of the Great Western Railway in 1858 and the Grand Trunk Railway in 1859, the shipping industry expanded and the rail lines were later linked to the United States by the opening of a rail tunnel under the St. Clair River in 1889. Later, ferry service to the U.S. was formed, bringing in prospectors from all over North America (City of Sarnia 2016).

Township of Moore

The Township of Moore takes its name from Sir John Moore, a general of the British Army killed at the 1829 Battle of Corunna (Elford 1982). The first Euro-Canadian settlements in this township were established along the St. Clair river, with surveyor Roswell Mount completing his work by 1829. A portion of land was ceded from the Aamjiwnaang First Nation in 1827 as part of Treaty 29, and a reserve was formed along the southern boundary of the Township of St. Clair (Plain 2017). In order to continue settlement expansion and agricultural activity, significant swamp drainage and forest clearing in the township needed to be undertaken, which would lead to a \$20,000 debt incurred by 1881 (Phelps 1973). Agriculture would remain an important industry for the township, and the land around the study area is still for the most part utilized for agricultural purposes.

Land Use and Settlement of the Study Area

The 1880 *Illustrated Historical Atlas of the County of Lambton* (H. Belden & Co.) was reviewed to determine the presence of 19th century settlement features within the study area as the presence of historic features elevates the potential for the recovery of 19th century archaeological resources. It should be noted that not all features of interest, particularly farmhouses and smaller homesteads, were mapped systematically as this would have been beyond the intended scope of the Ontario historical atlas series. In addition, given that atlases were funded by subscription, preference with regard to the level of detail included was given to subscribers. As such, the absence of structures or other features on historic atlas maps does not preclude the presence of historic features at the time the area was surveyed. Table 2 contains details regarding the listed 19th century property owners and any illustrated historic features within, or in immediate proximity to, the study area for the Geographic Township of Moore, Lambton County.

Table 2: 1880 Landowners and Historic Features within the Study Area

Lot #	Conc. #	Geo. Township	Landowner(s)	Historic Feature(s)
19	4	Moore	No landowner(s) listed	St. Clair Div. of Canada Southern Railway
20	4	Moore	No landowner(s) listed	St. Clair Div. of Canada Southern Railway
21	4	Moore	No landowner(s) listed	St. Clair Div. of Canada Southern Railway
19	5	Moore	No landowner(s) listed	St. Clair Div. of Canada Southern Railway
20	5	Moore	No landowner(s) listed	St. Clair Div. of Canada Southern Railway
21	5	Moore	Chas. Reilly	St. Clair Div. of Canada Southern Railway
18	7	Moore	Jno. J. Eyre	1 feature (homestead/farmhouse)
19	7	Moore	J. H. Sipprell	1 feature (homestead/farmhouse)
20	7	Moore	No landowner(s) listed	No visible features
21	7	Moore	J. B. McKinnon	2 features (homestead/farmhouse)
22	7	Moore	No landowner(s) listed	No visible features
18	8	Moore	No landowner(s) listed	No visible features
19	8	Moore	No landowner(s) listed	Templar Hall
20	8	Moore	W. J. Courtney Jas. Cruickshank	2 features (homestead/farmhouse)
21	8	Moore	No landowner(s) listed	No visible features
22	8	Moore	Jno. Robbins	No visible features
18	9	Moore	No landowner(s) listed	No visible features
19	9	Moore	No landowner(s) listed	No visible features
20	9	Moore	No landowner(s) listed	No visible features
21	9	Moore	No landowner(s) listed	No visible features
22	9	Moore	No landowner(s) listed	1 feature (homestead/farmhouse)
18	10	Moore	No landowner(s) listed	No visible features
19	10	Moore	No landowner(s) listed	No visible features
20	10	Moore	No landowner(s) listed	No visible features
21	10	Moore	No landowner(s) listed	1 feature (homestead/farmhouse)
22	10	Moore	Peter Gallogly	1 feature (homestead/farmhouse)
18	11	Moore	No landowner(s) listed	No visible features
19	11	Moore	No landowner(s) listed	No visible features
20	11	Moore	No landowner(s) listed	No visible features
21	11	Moore	Peter Gallogly	1 feature (homestead/farmhouse)
22	11	Moore	No landowner(s) listed	No visible features

1.3 Archaeological Context

1.3.1 Natural Environment

The study area is situated within the St. Clair Clay Plain (Chapman & Putnam 1986:146-147).

Adjoining Lake St. Clair in Essex and Kent County Counties and the St. Clair River in Lambton County are extensive clay plains covering 2,270 square miles. The region is one of little relief, lying between 575 and 700 feet a.s.l., except for the moraine at Ridgetown and Blenheim which rises 50 to 500 feet higher....Glacial Lake Whittlesey, which deeply covered all of these lands, and Lake Warren which subsequently covered nearly the whole area, failed to leave deep stratified beds of sediment on the underlying clay till except around Chatham, between Blenheim and the Rondeau marshes, and in a few other smaller areas. Most of Lambton and Essex Counties, therefore, are essentially till plains smoothed by shallow deposits of lacustrine clay which settled in the depressions while the knolls were being lowered by wave action.

Chapman & Putnam 1986:147

The single most important environmental feature necessary for extended human occupation is potable water. As such, proximity to water is regarded as a useful index for the determination of potential for the presence of archaeological resources. The St. Clair river, a 65.2 km river flowing into Lake St. Clair from Lake Huron, is located adjacent to the study area.

These environmental characteristics would have provided an ideal environment for both temporary and permanent settlement throughout the pre-and post-contact periods. These water sources would have served as important pre- and post-contact transportation routes as well as sources of potable water and riverine resources.

1.3.2 Previous Archaeological Work

To inform the current Stage 1 archaeological assessment and further establish the archaeological context of the study area, a search of the ASDB was conducted by AECOM to determine if any previous archeological work has been completed within the current study area or within 50m of the study area boundaries. Table 3 lists reports regarding previous archaeological work relevant to the study area.

Table 3: Archaeological Reports with Relevant Background Information

Year	Title	Author	PIF Number
2012	Stage 2 Archaeological Assessment NOVA 2020 Lots 22, 23, 24, 25 and 26 Concession 10; Lots 22, 23 and 24 Concession 9; Lots 25 and 26 Concession 8; and Lots 25 and 26 Concession 7, Geographic Township of Moore, Municipality of St. Clair Township, Lambton County	Stantec Consulting (Stantec)	P001-684-2012

In 2012, Stantec conducted a Stage 2 archaeological assessment of the NOVA Chemicals Corunna and Moore facility properties as part of the NOVA 2020 project, east of the Town of Corunna, Lambton County. This assessment resulted in the identification of six archaeological sites: three Euro-Canadian surface scatters, two isolated precontact lithic artifacts, and one precontact lithic scatter. Only the Euro-Canadian sites Location 1 (AfHo-49, 30 artifacts), Location 4 (AfHo-50, 68 artifacts), and Location 6 (AfHo-51, 122 artifacts) were found to retain cultural heritage value

or interest, and were recommended for Stage 3 archaeological assessment. However, as Location 1 lies over 70 m outside of the proposed development, Stage 3 archaeological assessment was only recommended if the development impacts extended beyond its current limits.

To the best of our knowledge, there are no other reports concerning archaeological work conducted within or in close proximity (i.e. within 50 m) of the study area; however, it should be noted that the MHSTCI does not maintain a database of all properties that have had past archaeological investigations and searches of the MHSTCI's public register do not always result in a complete listing of all archaeological work conducted in a given area. In consequence, in some cases the only way a consulting archaeologist will know that a past assessment has been conducted in a given area is if they have personal knowledge of it, or if the assessment resulted in the discovery and registration of one or more archaeological sites.

Archaeological Management Plans and Municipal Registers of Heritage Properties

There does not yet appear to be Archaeological Master Plans for Lambton County. This may be because the majority of the county is situated in predominantly rural settings with limited development that could be informed by a master plan study. A review of the Lambton County Inventory of Heritage Resources was completed to determine the presence of any heritage properties or historically significant sites within or in close proximity to the study area. The results of this search identified no listed properties, heritage plaques, or historic places within and/or in close proximity to the study area boundaries.

1.3.3 Known Archaeological Sites

AECOM conducted a data search of the ASDB to determine if any registered archaeological sites are located within the study area as well as within 1 km of the current study area boundaries. This search resulted in the identification of 5 registered archaeological sites within 1 km of the study area, and none are located within the study area boundaries. Table 4 provides details on the registered archaeological sites within 1 km of the current study area.

Table 4: Registered Archaeological Sites within 1 km of the Study Area

Borden #	Site Name	Cultural Affiliation	Site Type	Development Status
AeHo-19	Tecumseh A	Euro-Canadian	homestead	No record
AeHo-20	Tecumseh B	Euro-Canadian	homestead	No record
AfHo-40	No record	Pre-contact, Early Woodland	findspot	No further CHVI
AfHo-49	No record	Euro-Canadian, mid-to-late 19 th century	No record	No record
AfHo-51	No record	Pre-contact, Post-contact	No record	No record

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 (FIPPA)*. 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 MHSTCI 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.

1.3.4 Existing Conditions

The study area consists of primarily agricultural fields. The topography is generally flat with areas of gently rolling hills. During the pre-contact and early contact periods, this area would have been an ideal location for settlement as it is located adjacent to the St. Clair river, which offered rich, cultivable soils and a mixture of deciduous trees interspersed with open areas. During the early 19th century, Euro-Canadian settlers began to clear the forests for agricultural purposes. Over the course of the 19th century, the study area would have been made up of agricultural land just outside of the rapidly expanding municipality and port of call of Mooretown along historically surveyed road allowances. Presently, the study area is used primarily for agriculture.

2. Analysis and Conclusions

2.1 Determination of Archaeological Potential

Archaeological potential is established by determining the likelihood that archaeological resources may be present on a subject property. Criteria commonly used by the MHSTCI to determine areas of archaeological potential are listed in Section 1.3.1 of the *Standards and Guidelines for Consultant Archaeologists* (Ontario Government 2011). Distance to modern or ancient water sources is generally accepted as the most important element for past human settlement patterns and when considered alone may result in a determination of archaeological potential. In addition, any combination of two or more of the listed criteria indicates archaeological potential.

Based on a review of the historical, environmental, and archaeological context of the study area, it has been determined that potential for the recovery of pre- and post-contact First Nation and 19th century Euro-Canadian archaeological resources within the study area is high based on the presence of the following features:

- Proximity to previously identified archaeological sites;
- Distance to various types of water sources (St. Clair River);
- Soil texture and drainage (St. Clair plain);
- Glacial geomorphology, elevated topography and the general topographic variability of the area;
- Resource areas including food or medicinal plants, scarce raw materials and early Euro-Canadian industry;
- Areas of early Euro- Canadian settlement and early transportation routes (St. Clair Div. of Canada Southern Railway)

Distance to modern or ancient water sources is generally accepted as the most important element for past human settlement patterns and when considered alone may result in a determination of archaeological potential. In addition any combination of two or more of the criteria listed above, such as well drained soils or topographic variability, may indicate archaeological potential.

The potential for pre-contact and contact period First Nation archaeological resources is determined to be high based on the proximity to the St. Clair river, which was an important thoroughfare and source of river resources and potable water. The study area also possesses a number of environmental characteristics that would have made this area attractive to pre-contact First Nation populations, including the once diverse forest life and well drained, cultivable soils. Archaeological potential is also increased in this area given the presence of two registered pre-contact First Nation and four registered Euro-Canadian archaeological sites within a 1 km radius. In addition, the historical documentary evidence of the first European settlers and surveyors to the area indicate the long history of occupation here by First Nations people. The potential for Euro-Canadian archaeological resources is also judged to be high based on the early settlement of the Township of St. Clair and City of Sarnia by Euro-Canadian pioneers as well as evidence of early urban development.

Certain features indicate that archaeological potential has been removed, such as land that has been subject to extensive and intensive deep land alterations that have severely damaged the integrity of any archaeological resources. This includes landscaping that involves grading below the topsoil level, building footprints, quarrying and sewage and infrastructure development (Ontario Government 2011).

2.2 Conclusions

AECOM's Stage 1 archaeological background study of the 2021/2022 Storage Enhancement Project has determined that the potential for the recovery of archaeological resources is high, given the proximity of the study area to previously identified Euro-Canadian archaeological sites, proximity to the St. Clair river, and areas of early Euro-Canadian settlement and early transportation routes. Areas where archaeological potential has been removed include areas that have been subject to extensive land alterations that have significantly compromised the recovery of archaeological materials such as constructed roadways. All potentially undisturbed areas must be subject to Stage 2 field survey.

3. Recommendations

AECOM's Stage 1 background study for the 2021/2022 Storage Enhancement Project area has determined that the potential for the recovery of both First Nation and Euro-Canadian archaeological resources within the current study area is high. Based on these findings, **Stage 2 archaeological assessment is recommended for all areas of potentially undisturbed land within the study area limits.**

The Stage 2 archaeological assessment must be conducted by a licensed archaeologist and must follow the requirements set out in the *Standards and Guidelines for Consultant Archaeologists* (Ontario Government 2011), including:

- The standard test pit survey method at 5 m intervals is to be conducted in all areas that will be impacted by the project where ploughing is not feasible (e.g. woodlots, overgrown areas, manicured lawns, small sections of agricultural land); and
- Pedestrian survey at 5 m intervals where ploughing is possible (e.g. agricultural fields). This assessment will occur when agricultural fields have been recently ploughed, weathered by rain, and exhibit at least 80% surface visibility.
- Poorly drained areas, areas of steep slope, and areas of confirmed previous disturbance (e.g. building footprints, roadways, areas with identifiable underground infrastructure) are to be mapped and photo-documented but are not recommended for Stage 2 survey as they possess low to no archaeological potential.

Should additional land outside of the current study area boundaries be included as part of the 2021/2022 Storage Enhancement Project, the standard requirements for archaeological assessments to be conducted prior to land disturbance remain in place.

The MHSTCI is asked to accept this report into the Ontario Public Register of Archaeological Reports thereby concurring with the recommendations presented herein. As further archaeological assessment is required, archaeological concerns for the 2021/2022 Storage Enhancement Project in the Township of Moore, Ontario have not been fully addressed.

4. Advice on Compliance with Legislation

This report is submitted to the Ontario 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 0.18. 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 project area of a development proposal have been addressed to the satisfaction of the Ministry of Heritage, Sport, Tourism and Culture Industries, 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* 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 Archaeology Reports referred to in Section 65.1 of the *Ontario Heritage Act*.

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*. 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*.

Archaeological sites recommended for further archaeological fieldwork or protection remain subject to section 48 (1) of the *Ontario Heritage Act* and may not be altered, or have artifacts removed from them, except by a person holding an archaeological license.

The *Funeral, Burial and Cremation Services Act*, 2002, S.O. 2002, c.33 (when proclaimed in force in 2012) require that any person discovering human remains must notify the police or coroner and the Registrar of Burial Sites, War Graves, Abandoned Cemeteries, and Cemetery Closures.

5. Bibliography

Aboriginal Affairs and Northern Development Canada (AANDC)

2013 *Treaty Texts – Upper Canada Land Surrenders*. Retrieved March 20, 2014 from: <https://www.aadnc-aandc.gc.ca/eng/1370372152585/1370372222012#ucls9>

Belden & Co.

1880 *Lambton County Supplement to the Illustrated Atlas of the Dominion of Canada*. Toronto: H. Belden & Co.

City of Sarnia

2016 *Overview*. Retrieved August 25, 2020, from: <https://www.sarnia.ca/living-here/history-of-sarnia/overview/>

Chapman, L. J. and D. F. Putnam

1966 *The Physiography of Southern Ontario*. Second edition. Ontario Research Foundation, University of Toronto Press.

Elford, Jean Turnbull

1982 *Canada West's Last Frontier: A History of Lambton*. Sarnia: Lambton County Historical Society.

Ellis, C.J., and D. B. Deller

1986 Post-glacial Lake Nipissing "waterworn" assemblages from the southeastern Huron basin area. *Ontario Archaeology*, 45, 39–60.

Ellis, C.J., J.A. Fisher and D.B. Deller

1988 Four Meadowood Phase Lithic Artifact Assemblages from Caradoc and Delaware Townships, Southwestern Ontario. *Kewa* 88(8):3-20.

Ellis, Chris J., Ian T. Kenyon and Michael W. Spence

1990 The Archaic. In *The Archaeology of Southern Ontario to AD 1650*, eds. Chris J. Ellis and Neal Ferris. Occasional Publication of the London Chapter, OAS Number 5.

Ellis, Chris J. and D. Brian Deller

1990 Paleo-Indians. In *The Archaeology of Southern Ontario to AD 1650*, eds. Chris J. Ellis and Neal Ferris. Occasional Publication of the London Chapter, OAS Number 5.

Ellis, Christopher J. and Neal Ferris (editors)

1990 *The Archaeology of Southern Ontario to AD 1650*, Eds. Christopher Ellis and Neal Ferris, Occasional Publication of the London Chapter, Ontario Archaeological Society, Number 5.

Feest, Johanna E. and Christian F. Feest

1978 In *Handbook of North American Indians*. Vol.15 Northeast, pp.772-786. B.G. Trigger, Ed. Washington: Smithsonian Institute.

Ferris, Neal

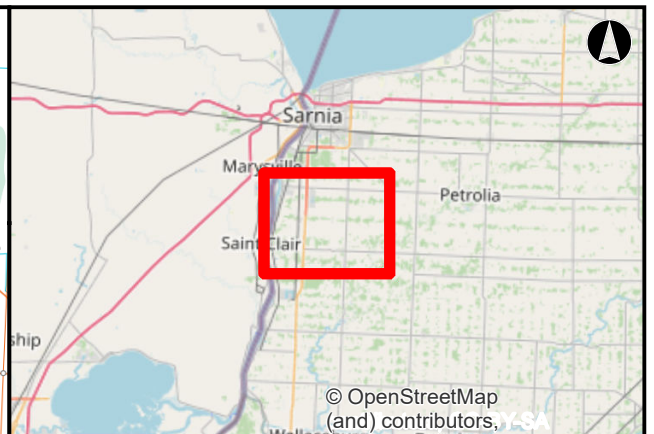
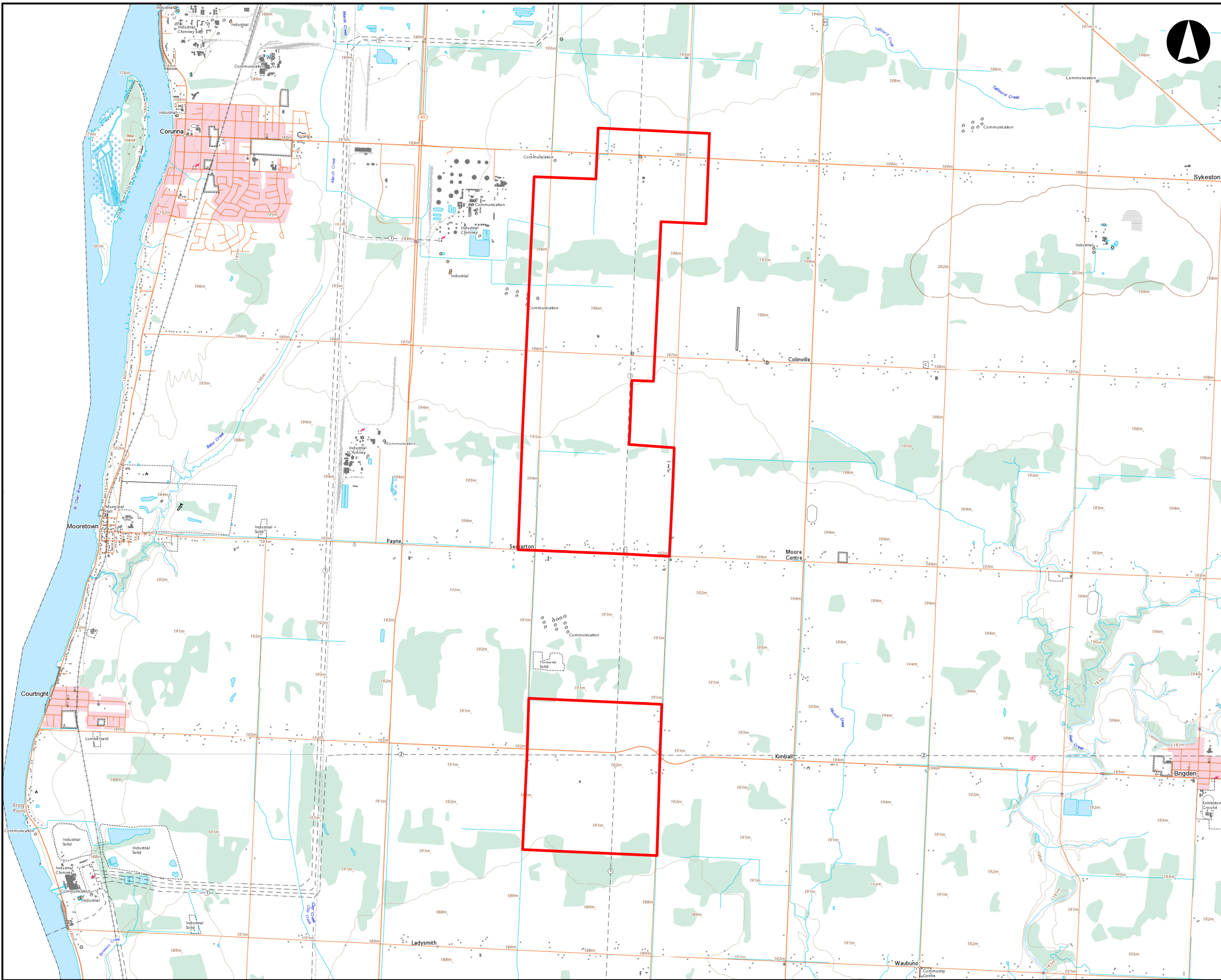
2009 *The Archaeology of Native-lived Colonialism: Challenging History in the Great Lakes*. University of Arizona Press, Tucson.

Fisher, Jaqueline A.

- 1997 *The Adder Orchard Site: Lithic Technology and Spatial Organization in the Broadpoint Late Archaic*. Occasional Publications of the London Chapter, OAS, Number 3.
- Fox, William A.
1990 The Middle to Late Woodland Transition. In *The Archaeology of Southern Ontario to AD 1650*, eds. Chris J. Ellis and Neal Ferris. Occasional Publication of the London Chapter, Ontario Archaeological Society, Number 5.
- Granger, Joseph
1978 *Meadowood Phenomenon Settlement Pattern in the Niagara Frontier Region of Western New York State*. Anthropological Papers 65, Museum of Anthropology, University of Michigan, Ann Arbor.
- Karrow, P.F. and B.G Warner
1990 The Geological and Biological Environment for Human Occupation in Southern Ontario. In *The Archaeology of Southern Ontario to AD 1650*, eds. Chris J. Ellis and Neal Ferris. Occasional Publication of the London Chapter, OAS Number 5.
- Lee, Robert C.
2004 *The Canada Company and the Huron Tract, 1826-1853*. Toronto, Ont.: Natural Heritage.
- Morris, J.L.
1943 Indians of Ontario. 1964 reprint. Department of Lands and Forests, Toronto.
- Ontario Government
1990b *Ontario Heritage Act*. R.S.O. 1990, CHAPTER O.18, Last amendment: 2009, c. 33, Sched. 11, s. 6. Electronic document: http://www.e-laws.gov.on.ca/html/statutes/english/elaws_statutes_90o18_e.htm. Last assessed July 2014.
2011 *Standards and Guidelines for Consultant Archaeologists*. Ministry of Heritage, Sport, Tourism and Culture Industries.
n.d Archaeological Sites Database (ASDB). Ministry of Heritage, Sport, Tourism and Culture Industries.
- Phelps, Edward, ed.
1973 Belden's 1880 Illustrated Historical Atlas of the County of Lambton Ontario. Edited and published with additions. Sarnia, Ontario.
- Plain, David D.
2017 *Aamjiwnaang Modern History*. Retrieved August 25, 2020, from: <https://www.aamjiwnaang.ca/history/>.
- Spence, Michael W., Robert H. Pihl and Carl R. Murphy
1990 Cultural Complexes of the Early and Middle Woodland Periods. In *The Archaeology of Southern Ontario to AD 1650*, eds. Chris J. Ellis and Neal Ferris. Occasional Publication of the London Chapter, OAS Number 5.
- Wright, James V.
1994 Before European Contact. In *Aboriginal Ontario: Historic Perspectives on the First Nations*. Eds. Edward S. Rogers and Donald B. Smith. Ontario Historical Studies Series, Dundurn Press, Toronto.

6. Figures

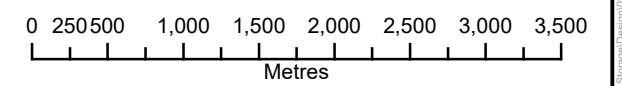
All figures pertaining to the Stage 1 archaeological assessment for the 2021/2022 Storage Enhancement Project are provided on the following pages.



© OpenStreetMap
(and) contributors.

Legend

Study Area



Stage 1 Archaeological Assessment
2021/2022 Storage Enhancement Project
Municipality of St. Clair, Lambton County, Ontario

Location of the Study Area

Aug, 2020	1:50,000 <small>* when printed 11"x17"</small>	Datum: NAD 1983 UTM Zone 17N Source: MNRF, http://wms.ess-ws.nrcan.gc.ca/wms/toporama_en
-----------	---	---

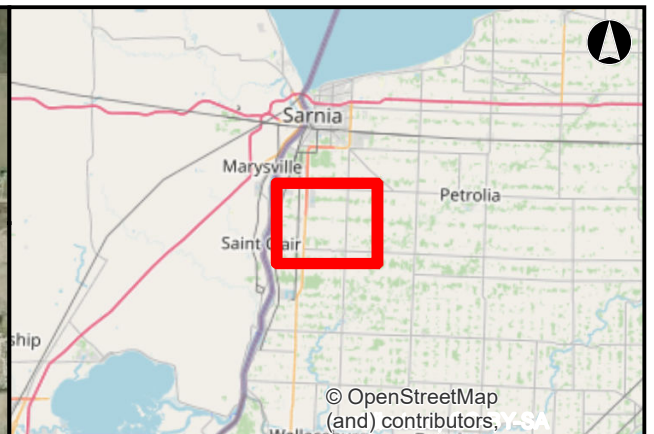
P#: 60633149



Figure 1

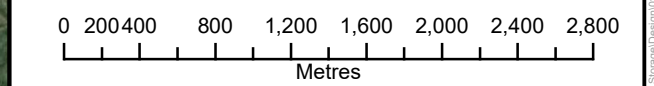
This drawing has been prepared for the use of AECOM's client and may not be used, reproduced or relied upon by third parties, except as agreed by AECOM and its client, as required by law or for use by governmental reviewing agencies. AECOM accepts no responsibility, and denies any liability whatsoever, to any party that modifies this drawing without AECOM's express written consent.

Date Saved: 03/17/2020 9:05:18 PM User Name: clairb
 C:\Users\clairb\OneDrive\Documents\Projects\2021\2022 Storage Enhancement Project\060633149_Enbridge_Sarnia_Storage\Drawings\01_Reports\ASSETING_StudyAreaLocation.mxd



Legend

- Study Area
- Municipal Boundary



Stage 1 Archaeological Assessment
 2021/2022 Storage Enhancement Project
 Municipality of St. Clair, Lambton County, Ontario

Study Area in Detail

Aug, 2020	1:40,000 <small>*when printed 11"x17"</small>	Datum: NAD 1983 UTM Zone 17N Source: MNRF
-----------	--	--

P#: 60633149

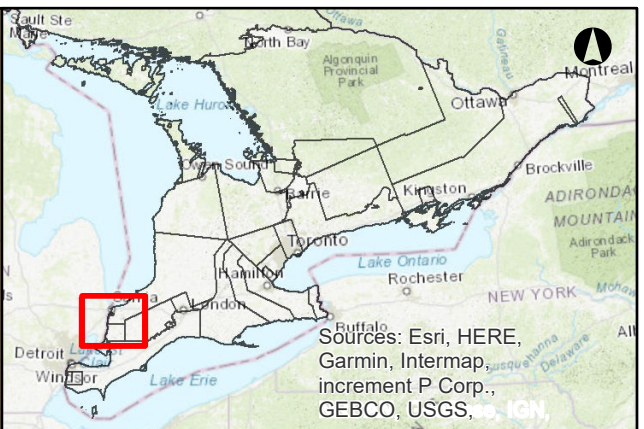
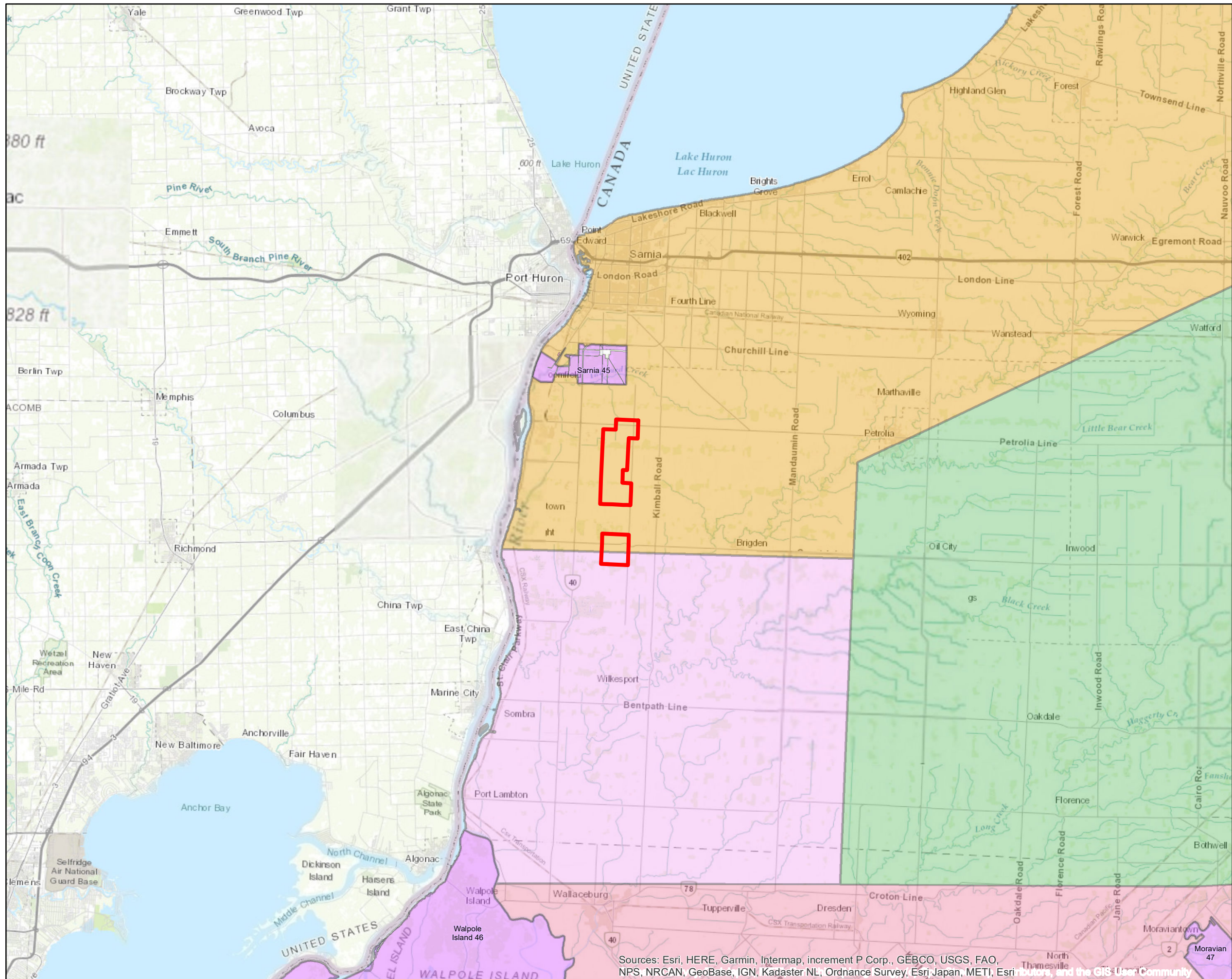
AECOM

Figure 2

This drawing has been prepared for the use of AECOM's client and may not be used, reproduced or relied upon by third parties, except as agreed by AECOM and its client, as required by law or for use by governmental reviewing agencies. AECOM accepts no responsibility, and denies any liability whatsoever, to any party that modifies this drawing without AECOM's express written consent.

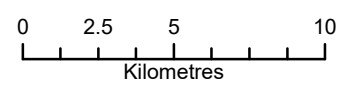
Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

C:\Users\james\OneDrive\Documents\Projects\2021\2022 Storage Enhancement Project\060633149_Enbridge_Sarnia_Storage\Drawings\01_Reports\ASST1\Fig-2_StudyArea.mxd
 Date Saved: 03/17/2020 9:05:56 PM User Name: clairb



Legend

- Study Area
- First Nations Reserve Land
- Treaty**
- Huron Tract Purchase, Treaty 29, August 13, 1833
- Long Woods Purchase, Treaty 21, March 9, 1819
- McKee Purchase, Treaty 2, May 19, 1790
- Sombra Township Purchase, Treaty 7, September 7, 1796



Stage 1 Archaeological Assessment
 Sarnia 2021/2022 Storage Enhancement Project
 Municipality of St. Clair, Lambton County, Ontario

Ontario Treaties Map

August 2020	1:250,000	Datum: NAD83 UTM17 Source: www.ontario.ca/page/map-ontario-treaties-and-reserves#17
P#: 60548456	V#:	

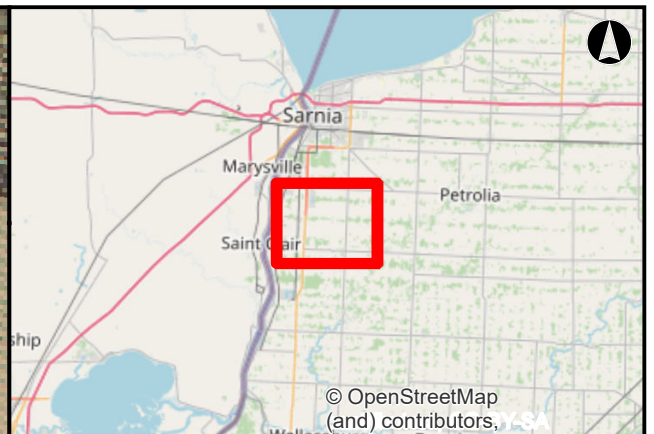
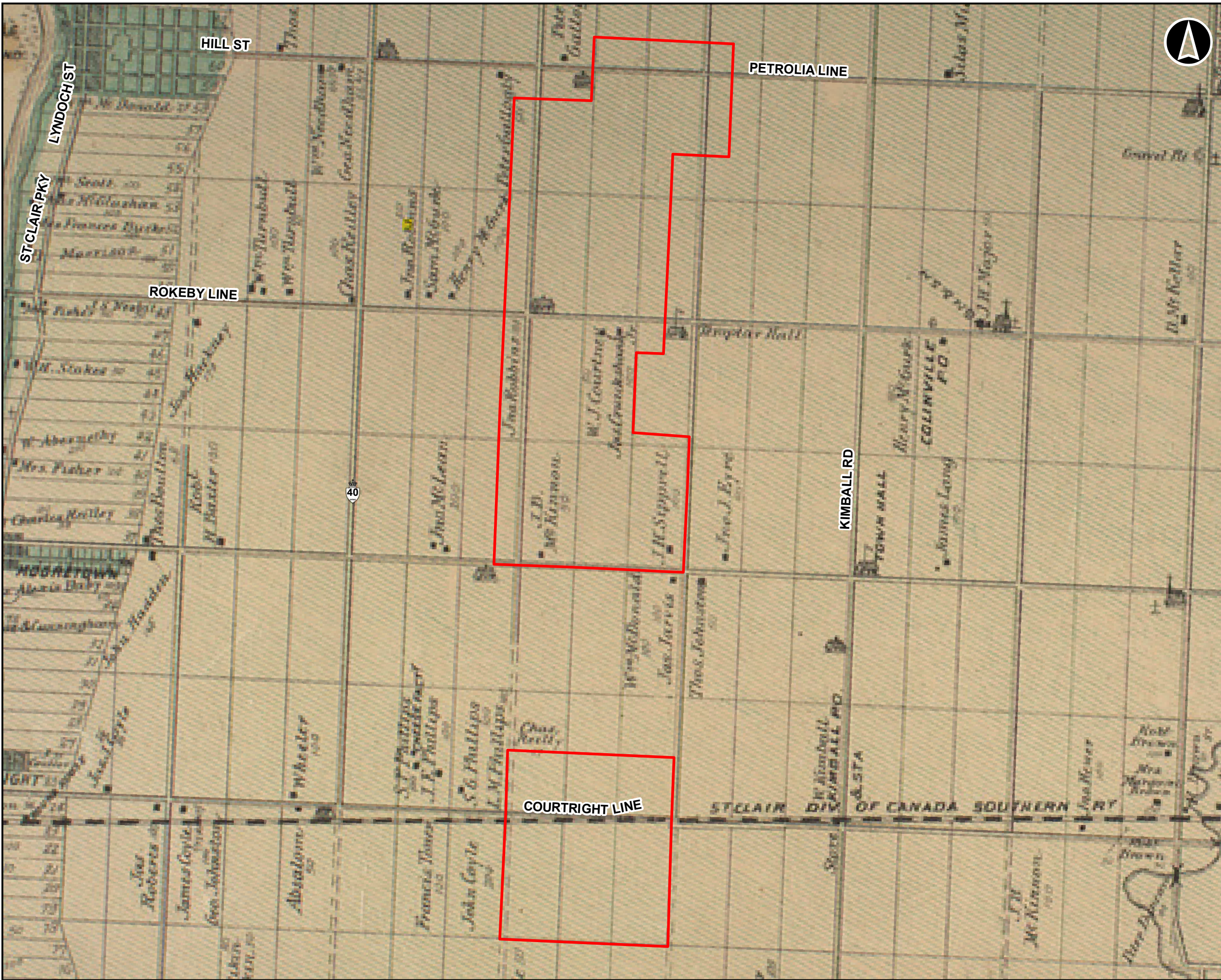


Figure 3

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri India, Swisstopo, and the GIS User Community

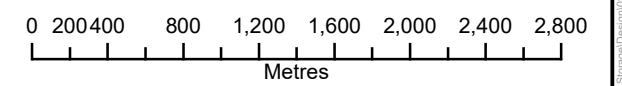
This drawing has been prepared for the use of AECOM's client and may not be used, reproduced or relied upon by third parties, except as agreed by AECOM and its client, as required by law or for use by governmental reviewing agencies. AECOM accepts no responsibility, and denies any liability whatsoever, to any party that modifies this drawing without AECOM's express written consent.

Map location: \\na.aecom.com\proj\AECOM\MapServer\CAKON\GIS\Projects\60548456\149_Embadge_Sarna_StorageDesign\01_Reports\ASST1\Figs-TreatiesPurchases.mxd Date saved: 05/12/2020 9:26:32 PM User Name: jgall



Legend

Study Area



Stage 1 Archaeological Assessment
 2021/2022 Storage Enhancement Project
 Municipality of St. Clair, Lambton County, Ontario

Portion of 1880 Illustrated Historical Atlas of the
 County of Lambton

Aug, 2020	1:40,000 <small>*when printed 11"x17"</small>	Datum: NAD 1983 UTM Zone 17N Source: MNRF, 1880 Illustrated Historical Atlas of the County of Lambton
-----------	--	--

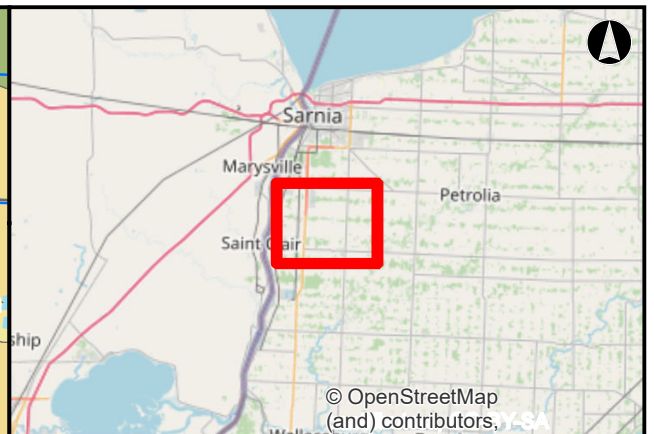
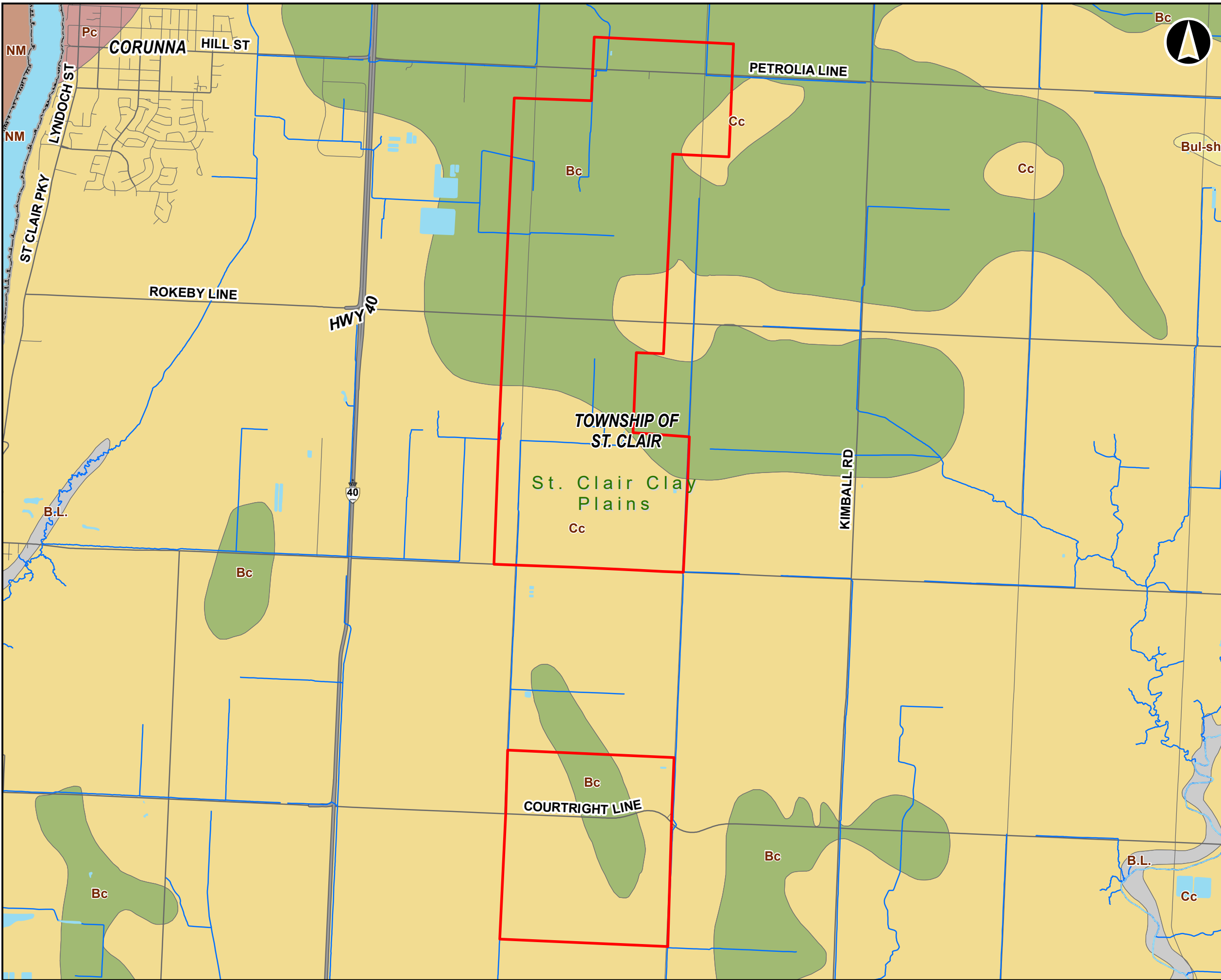
P#: 60633149

AECOM

Figure 4

This drawing has been prepared for the use of AECOM's client and may not be used, reproduced or relied upon by third parties, except as agreed by AECOM and its client, as required by law or for use by governmental reviewing agencies. AECOM accepts no responsibility, and denies any liability whatsoever, to any party that modifies this drawing without AECOM's express written consent.

C:\Users\jacob\OneDrive\Documents\Projects\2021\2022 Storage Enhancement Project\060633149_EIR\Drawings\ASST1\Fig-History 1880.mxd
 Date Saved: 03/17/2023 9:55:47 PM User Name: jacob



Legend

- Study Area
- Municipal Boundary
- Physiographic Region

Soils

- B.L. - Unclassified
- Bc - Brookston, Clay
- Bul-sh - Burford, Loam
- Cc - Clyde, Clay
- NM - Unclassified
- Pc - Perth, Clay

0 200 400 800 1,200 1,600 2,000 2,400 2,800
Metres

Stage 1 Archaeological Assessment
2021/2022 Storage Enhancement Project
Municipality of St. Clair, Lambton County, Ontario

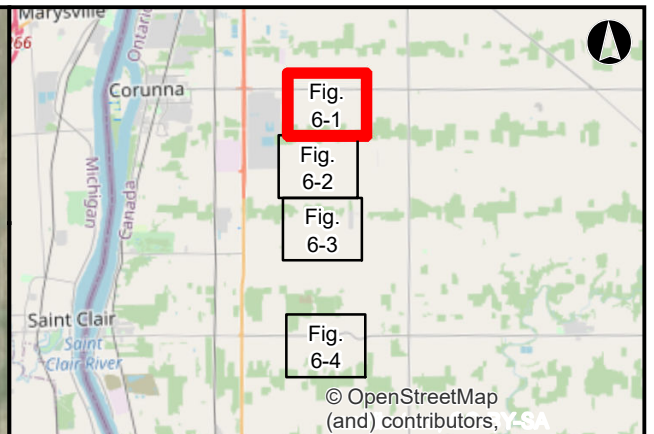
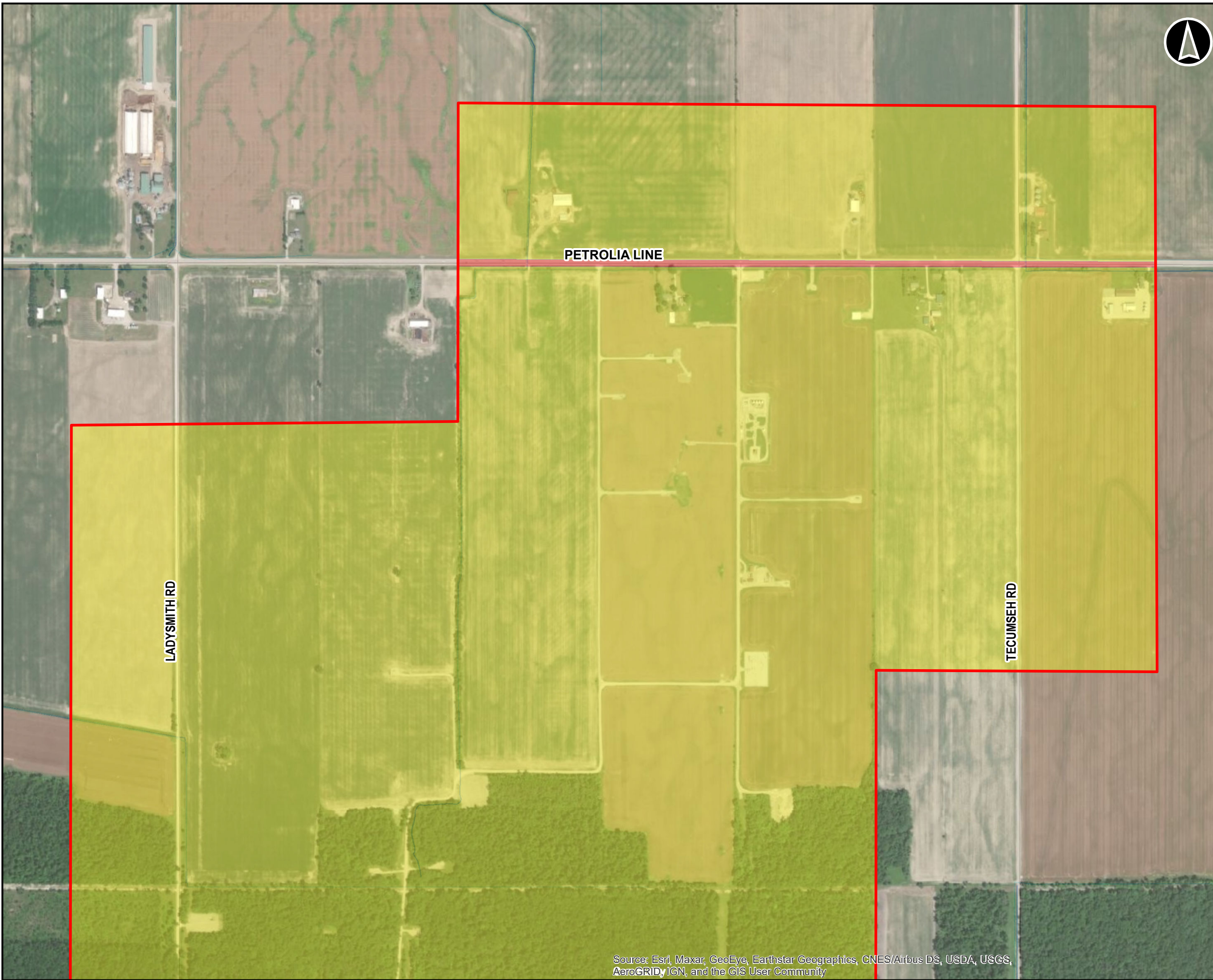
Soil Drainage and Agricultural Suitability

Aug, 2020	1:40,000 <small>*when printed 11"x17"</small>	Datum: NAD 1983 UTM Zone 17N Source: MNR, Ontario Soil Report Lambton County 1957
P#: 60633149		Figure 5

AECOM

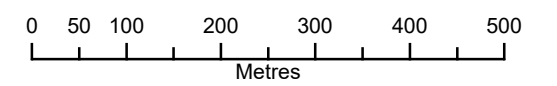
This drawing has been prepared for the use of AECOM's client and may not be used, reproduced or relied upon by third parties, except as agreed by AECOM and its client, as required by law or for use by governmental reviewing agencies. AECOM accepts no responsibility, and denies any liability whatsoever, to any party that modifies this drawing without AECOM's express written consent.

Date Saved: 03/17/2020 9:55:20 PM User Name: clairb



Legend

- Study Area
- Stage 2 Archaeological Assessment Required
- Disturbed Area - Stage 2 Archaeological Assessment Not Required



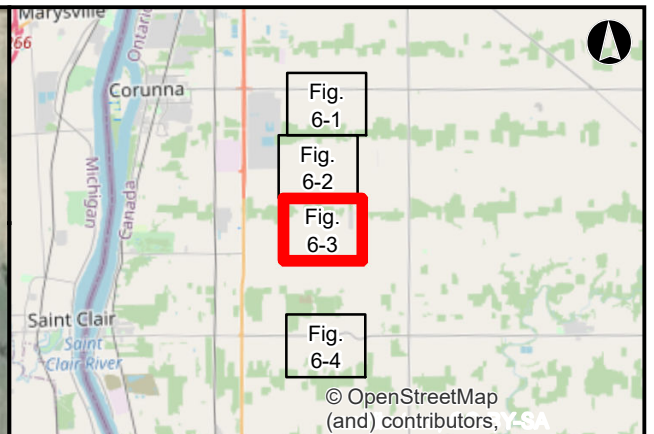
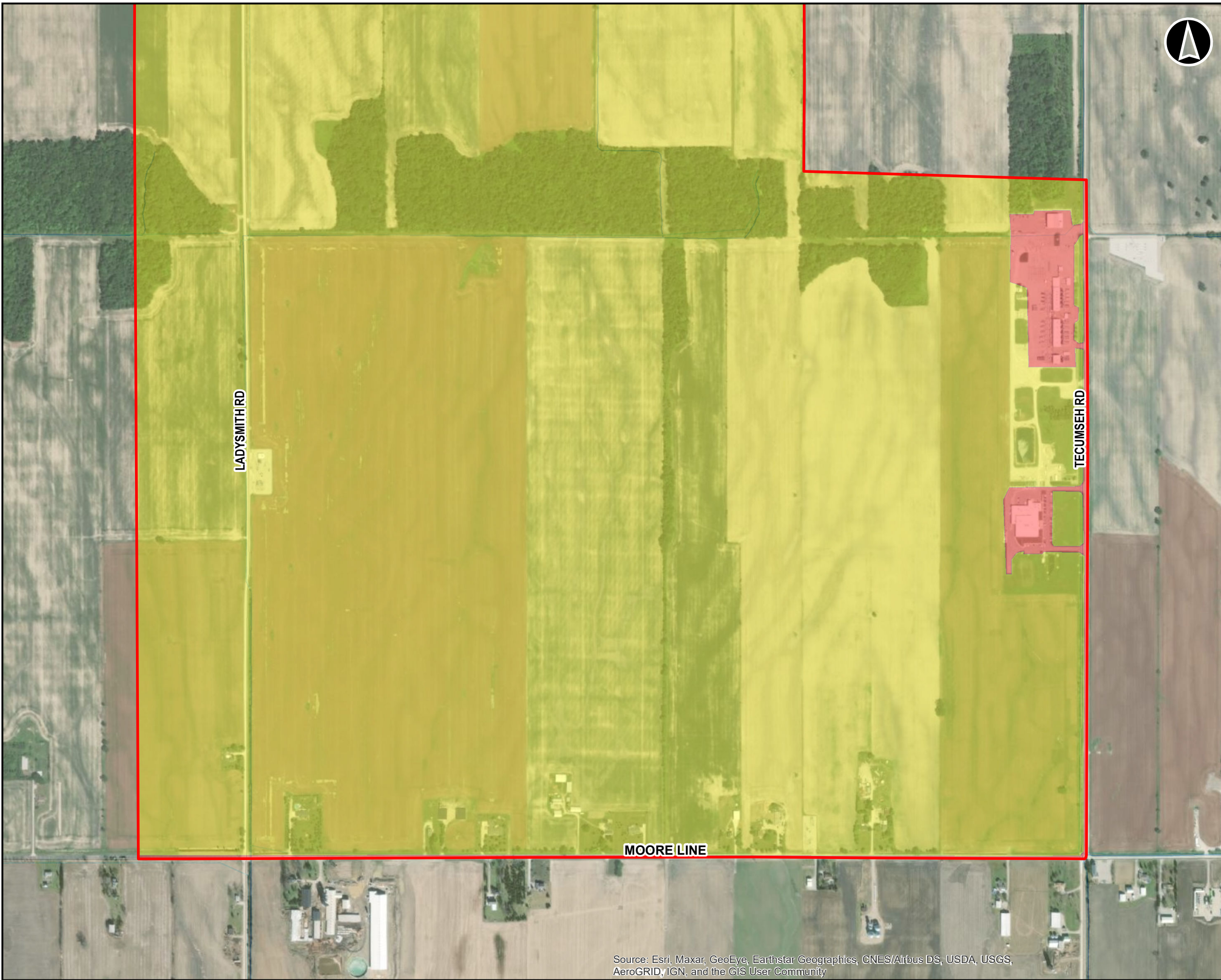
Stage 1 Archaeological Assessment
2021/2022 Storage Enhancement Project
Municipality of St. Clair, Lambton County, Ontario

Results of the Stage 1 Archaeological Assessment

Aug, 2020	1:8,000 <small>* when printed 11"x17"</small>	Datum: NAD 1983 UTM Zone 17N Source: MNRF
P#: 60633149		Figure 6-1

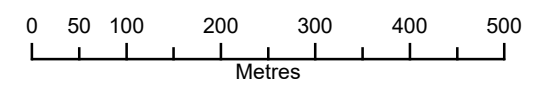
This drawing has been prepared for the use of AECOM's client and may not be used, reproduced or relied upon by third parties, except as agreed by AECOM and its client, as required by law or for use by governmental reviewing agencies. AECOM accepts no responsibility, and denies any liability whatsoever, to any party that modifies this drawing without AECOM's express written consent.

Date Saved: 03/17/2020 9:12:52 PM User Name: clairb



Legend

- Study Area
- Stage 2 Archaeological Assessment Required
- Disturbed Area - Stage 2 Archaeological Assessment Not Required



Stage 1 Archaeological Assessment
2021/2022 Storage Enhancement Project
Municipality of St. Clair, Lambton County, Ontario

Results of the Stage 1 Archaeological Assessment

Aug, 2020	1:8,000 <small>*when printed 11"x17"</small>	Datum: NAD 1983 UTM Zone 17N Source: MNRF
P#: 60633149		Figure 6-3



This drawing has been prepared for the use of AECOM's client and may not be used, reproduced or relied upon by third parties, except as agreed by AECOM and its client, as required by law or for use by governmental reviewing agencies. AECOM accepts no responsibility, and denies any liability whatsoever, to any party that modifies this drawing without AECOM's express written consent.

Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

\\s01\proj\2021\2022 Storage Enhancement Project\GIS\Map\Map_Summary_Storage_Enhancement\Map_Summary_Storage_Enhancement\Map_Summary_Storage_Enhancement.mxd

About AECOM

AECOM (NYSE: ACM) is built to deliver a better world. We design, build, finance and operate infrastructure assets for governments, businesses and organizations in more than 150 countries.

As a fully integrated firm, we connect knowledge and experience across our global network of experts to help clients solve their most complex challenges.

From high-performance buildings and infrastructure, to resilient communities and environments, to stable and secure nations, our work is transformative, differentiated and vital. A Fortune 500 firm, AECOM companies had revenue of approximately US\$19 billion during the 12 months ended June 30, 2015.

See how we deliver what others can only imagine at aecom.com and [@AECOM](https://twitter.com/AECOM).

Contact
Adria Grant
Ontario Department Manager
Impact Assessment and Permitting (IAP)
T +519-963-5861
E adria.grant@aecom.com

Appendix **E**

Application of the MHSTCI Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes

Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes A Checklist for the Non-Specialist

The **purpose of the checklist** is to determine:

- if a property(ies) or project area:
 - is a recognized heritage property
 - may be of cultural heritage value
- it includes all areas that may be impacted by project activities, including – but not limited to:
 - the main project area
 - temporary storage
 - staging and working areas
 - temporary roads and detours

Processes covered under this checklist, such as:

- *Planning Act*
- *Environmental Assessment Act*
- *Aggregates Resources Act*
- *Ontario Heritage Act* – Standards and Guidelines for Conservation of Provincial Heritage Properties

Cultural Heritage Evaluation Report (CHER)

If you are not sure how to answer one or more of the questions on the checklist, you may want to hire a qualified person(s) (see page 5 for definitions) to undertake a cultural heritage evaluation report (CHER).

The CHER will help you:

- identify, evaluate and protect cultural heritage resources on your property or project area
- reduce potential delays and risks to a project

Other checklists

Please use a separate checklist for your project, if:

- you are seeking a Renewable Energy Approval under Ontario Regulation 359/09 – [separate checklist](#)
- your Parent Class EA document has an approved screening criteria (as referenced in Question 1)

Please refer to the Instructions pages for more detailed information and when completing this form.

Project or Property Name
2021/2022 Storage Enhancement Project

Project or Property Location (upper and lower or single tier municipality)
St. Clair Township, Ontario

Proponent Name
Chris Pincombe, Enbridge Gas Inc.

Proponent Contact Information
Chris.Pincombe@Enbridge.com

Screening Questions

	Yes	No
1. Is there a pre-approved screening checklist, methodology or process in place?	<input type="checkbox"/>	<input checked="" type="checkbox"/>

If Yes, please follow the pre-approved screening checklist, methodology or process.

If No, continue to Question 2.

Part A: Screening for known (or recognized) Cultural Heritage Value

	Yes	No
2. Has the property (or project area) been evaluated before and found not to be of cultural heritage value?	<input type="checkbox"/>	<input checked="" type="checkbox"/>

If Yes, do **not** complete the rest of the checklist.

The proponent, property owner and/or approval authority will:

- summarize the previous evaluation and
- add this checklist to the project file, with the appropriate documents that demonstrate a cultural heritage evaluation was undertaken

The summary and appropriate documentation may be:

- submitted as part of a report requirement
- maintained by the property owner, proponent or approval authority

If No, continue to Question 3.

	Yes	No
3. Is the property (or project area):		
a. identified, designated or otherwise protected under the <i>Ontario Heritage Act</i> as being of cultural heritage value?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b. a National Historic Site (or part of)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c. designated under the <i>Heritage Railway Stations Protection Act</i> ?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d. designated under the <i>Heritage Lighthouse Protection Act</i> ?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e. identified as a Federal Heritage Building by the Federal Heritage Buildings Review Office (FHBRO)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f. located within a United Nations Educational, Scientific and Cultural Organization (UNESCO) World Heritage Site?	<input type="checkbox"/>	<input checked="" type="checkbox"/>

If Yes to any of the above questions, you need to hire a qualified person(s) to undertake:

- a Cultural Heritage Evaluation Report, if a Statement of Cultural Heritage Value has not previously been prepared or the statement needs to be updated

If a Statement of Cultural Heritage Value has been prepared previously and if alterations or development are proposed, you need to hire a qualified person(s) to undertake:

- a Heritage Impact Assessment (HIA) – the report will assess and avoid, eliminate or mitigate impacts

If No, continue to Question 4.

Part B: Screening for Potential Cultural Heritage Value

	Yes	No
4. Does the property (or project area) contain a parcel of land that:		
a. is the subject of a municipal, provincial or federal commemorative or interpretive plaque?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b. has or is adjacent to a known burial site and/or cemetery?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c. is in a Canadian Heritage River watershed?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d. contains buildings or structures that are 40 or more years old?	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Part C: Other Considerations

	Yes	No
5. Is there local or Aboriginal knowledge or accessible documentation suggesting that the property (or project area):		
a. is considered a landmark in the local community or contains any structures or sites that are important in defining the character of the area?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b. has a special association with a community, person or historical event?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c. contains or is part of a cultural heritage landscape?	<input type="checkbox"/>	<input checked="" type="checkbox"/>

If Yes to one or more of the above questions (Part B and C), there is potential for cultural heritage resources on the property or within the project area.

You need to hire a qualified person(s) to undertake:

- a Cultural Heritage Evaluation Report (CHER)

If the property is determined to be of cultural heritage value and alterations or development is proposed, you need to hire a qualified person(s) to undertake:

- a Heritage Impact Assessment (HIA) – the report will assess and avoid, eliminate or mitigate impacts

If No to all of the above questions, there is low potential for built heritage or cultural heritage landscape on the property.

The proponent, property owner and/or approval authority will:

- summarize the conclusion
- add this checklist with the appropriate documentation to the project file

The summary and appropriate documentation may be:

- submitted as part of a report requirement e.g. under the *Environmental Assessment Act*, *Planning Act* processes
- maintained by the property owner, proponent or approval authority

Instructions

Please have the following available, when requesting information related to the screening questions below:

- a clear map showing the location and boundary of the property or project area
 - large scale and small scale showing nearby township names for context purposes
- the municipal addresses of all properties within the project area
- the lot(s), concession(s), and parcel number(s) of all properties within a project area

For more information, see the Ministry of Tourism, Culture and Sport's [Ontario Heritage Toolkit](#) or [Standards and Guidelines for Conservation of Provincial Heritage Properties](#).

In this context, the following definitions apply:

- **qualified person(s)** means individuals – professional engineers, architects, archaeologists, etc. – having relevant, recent experience in the conservation of cultural heritage resources.
- **proponent** means a person, agency, group or organization that carries out or proposes to carry out an undertaking or is the owner or person having charge, management or control of an undertaking.

1. Is there a pre-approved screening checklist, methodology or process in place?

An existing checklist, methodology or process may already be in place for identifying potential cultural heritage resources, including:

- one endorsed by a municipality
- an environmental assessment process e.g. screening checklist for municipal bridges
- one that is approved by the Ministry of Tourism, Culture and Sport (MTCS) under the Ontario government's [Standards & Guidelines for Conservation of Provincial Heritage Properties](#) [s.B.2.]

Part A: Screening for known (or recognized) Cultural Heritage Value

2. Has the property (or project area) been evaluated before and found not to be of cultural heritage value?

Respond 'yes' to this question, if all of the following are true:

A property can be considered not to be of cultural heritage value if:

- a Cultural Heritage Evaluation Report (CHER) - or equivalent - has been prepared for the property with the advice of a qualified person and it has been determined not to be of cultural heritage value and/or
- the municipal heritage committee has evaluated the property for its cultural heritage value or interest and determined that the property is not of cultural heritage value or interest

A property may need to be re-evaluated, if:

- there is evidence that its heritage attributes may have changed
- new information is available
- the existing Statement of Cultural Heritage Value does not provide the information necessary to manage the property
- the evaluation took place after 2005 and did not use the criteria in Regulations 9/06 and 10/06

Note: Ontario government ministries and public bodies [prescribed under Regulation 157/10] may continue to use their existing evaluation processes, until the evaluation process required under section B.2 of the Standards & Guidelines for Conservation of Provincial Heritage Properties has been developed and approved by MTCS.

To determine if your property or project area has been evaluated, contact:

- the approval authority
- the proponent
- the Ministry of Tourism, Culture and Sport

3a. Is the property (or project area) identified, designated or otherwise protected under the *Ontario Heritage Act* as being of cultural heritage value e.g.:

- designated under the *Ontario Heritage Act*
 - individual designation (Part IV)
 - part of a heritage conservation district (Part V)

Individual Designation – Part IV

A property that is designated:

- by a municipal by-law as being of cultural heritage value or interest [s.29 of the *Ontario Heritage Act*]
- by order of the Minister of Tourism, Culture and Sport as being of cultural heritage value or interest of provincial significance [s.34.5]. **Note:** To date, no properties have been designated by the Minister.

Heritage Conservation District – Part V

A property or project area that is located within an area designated by a municipal by-law as a heritage conservation district [s. 41 of the *Ontario Heritage Act*].

For more information on Parts IV and V, contact:

- municipal clerk
- [Ontario Heritage Trust](#)
- local land registry office (for a title search)

ii. subject of an agreement, covenant or easement entered into under Parts II or IV of the *Ontario Heritage Act*

An agreement, covenant or easement is usually between the owner of a property and a conservation body or level of government. It is usually registered on title.

The primary purpose of the agreement is to:

- preserve, conserve, and maintain a cultural heritage resource
- prevent its destruction, demolition or loss

For more information, contact:

- [Ontario Heritage Trust](#) - for an agreement, covenant or easement [clause 10 (1) (c) of the *Ontario Heritage Act*]
- municipal clerk – for a property that is the subject of an easement or a covenant [s.37 of the *Ontario Heritage Act*]
- local land registry office (for a title search)

iii. listed on a register of heritage properties maintained by the municipality

Municipal registers are the official lists - or record - of cultural heritage properties identified as being important to the community.

Registers include:

- all properties that are designated under the *Ontario Heritage Act* (Part IV or V)
- properties that have not been formally designated, but have been identified as having cultural heritage value or interest to the community

For more information, contact:

- municipal clerk
- municipal heritage planning staff
- municipal heritage committee

iv. subject to a notice of:

- intention to designate (under Part IV of the *Ontario Heritage Act*)
- a Heritage Conservation District study area bylaw (under Part V of the *Ontario Heritage Act*)

A property that is subject to a **notice of intention to designate** as a property of cultural heritage value or interest and the notice is in accordance with:

- section 29 of the *Ontario Heritage Act*
- section 34.6 of the *Ontario Heritage Act*. **Note:** To date, the only applicable property is Meldrum Bay Inn, Manitoulin Island. [s.34.6]

An area designated by a municipal by-law made under section 40.1 of the *Ontario Heritage Act* as a **heritage conservation district study area**.

For more information, contact:

- municipal clerk – for a property that is the subject of notice of intention [s. 29 and s. 40.1]
- [Ontario Heritage Trust](#)

v. included in the Ministry of Tourism, Culture and Sport's list of provincial heritage properties

Provincial heritage properties are properties the Government of Ontario owns or controls that have cultural heritage value or interest.

The Ministry of Tourism, Culture and Sport (MTCS) maintains a list of all provincial heritage properties based on information provided by ministries and prescribed public bodies. As they are identified, MTCS adds properties to the list of provincial heritage properties.

For more information, contact the MTCS Registrar at registrar@ontario.ca.

3b. Is the property (or project area) a National Historic Site (or part of)?

National Historic Sites are properties or districts of national historic significance that are designated by the Federal Minister of the Environment, under the *Canada National Parks Act*, based on the advice of the Historic Sites and Monuments Board of Canada.

For more information, see the [National Historic Sites website](#).

3c. Is the property (or project area) designated under the *Heritage Railway Stations Protection Act*?

The *Heritage Railway Stations Protection Act* protects heritage railway stations that are owned by a railway company under federal jurisdiction. Designated railway stations that pass from federal ownership may continue to have cultural heritage value.

For more information, see the [Directory of Designated Heritage Railway Stations](#).

3d. Is the property (or project area) designated under the *Heritage Lighthouse Protection Act*?

The *Heritage Lighthouse Protection Act* helps preserve historically significant Canadian lighthouses. The Act sets up a public nomination process and includes heritage building conservation standards for lighthouses which are officially designated.

For more information, see the [Heritage Lighthouses of Canada](#) website.

3e. Is the property (or project area) identified as a Federal Heritage Building by the Federal Heritage Buildings Review Office?

The role of the Federal Heritage Buildings Review Office (FHBRO) is to help the federal government protect the heritage buildings it owns. The policy applies to all federal government departments that administer real property, but not to federal Crown Corporations.

For more information, contact the [Federal Heritage Buildings Review Office](#).

See a [directory of all federal heritage designations](#).

3f. Is the property (or project area) located within a United Nations Educational, Scientific and Cultural Organization (UNESCO) World Heritage Site?

A UNESCO World Heritage Site is a place listed by UNESCO as having outstanding universal value to humanity under the Convention Concerning the Protection of the World Cultural and Natural Heritage. In order to retain the status of a World Heritage Site, each site must maintain its character defining features.

Currently, the Rideau Canal is the only World Heritage Site in Ontario.

For more information, see Parks Canada – [World Heritage Site website](#).

Part B: Screening for potential Cultural Heritage Value

4a. Does the property (or project area) contain a parcel of land that has a municipal, provincial or federal commemorative or interpretive plaque?

Heritage resources are often recognized with formal plaques or markers.

Plaques are prepared by:

- municipalities
- provincial ministries or agencies
- federal ministries or agencies
- local non-government or non-profit organizations

For more information, contact:

- [municipal heritage committees](#) or local heritage organizations – for information on the location of plaques in their community
- Ontario Historical Society's [Heritage directory](#) – for a list of historical societies and heritage organizations
- Ontario Heritage Trust – for a [list of plaques](#) commemorating Ontario's history
- Historic Sites and Monuments Board of Canada – for a [list of plaques](#) commemorating Canada's history

4b. Does the property (or project area) contain a parcel of land that has or is adjacent to a known burial site and/or cemetery?

For more information on known cemeteries and/or burial sites, see:

- Cemeteries Regulations, Ontario Ministry of Consumer Services – for a [database of registered cemeteries](#)
- Ontario Genealogical Society (OGS) – to [locate records of Ontario cemeteries](#), both currently and no longer in existence; cairns, family plots and burial registers
- Canadian County Atlas Digital Project – to [locate early cemeteries](#)

In this context, adjacent means contiguous or as otherwise defined in a municipal official plan.

4c. Does the property (or project area) contain a parcel of land that is in a Canadian Heritage River watershed?

The Canadian Heritage River System is a national river conservation program that promotes, protects and enhances the best examples of Canada's river heritage.

Canadian Heritage Rivers must have, and maintain, outstanding natural, cultural and/or recreational values, and a high level of public support.

For more information, contact the [Canadian Heritage River System](#).

If you have questions regarding the boundaries of a watershed, please contact:

- your conservation authority
- municipal staff

4d. Does the property (or project area) contain a parcel of land that contains buildings or structures that are 40 or more years old?

A 40 year 'rule of thumb' is typically used to indicate the potential of a site to be of cultural heritage value. The approximate age of buildings and/or structures may be estimated based on:

- history of the development of the area
- fire insurance maps
- architectural style
- building methods

Property owners may have information on the age of any buildings or structures on their property. The municipality, local land registry office or library may also have background information on the property.

Note: 40+ year old buildings or structure do not necessarily hold cultural heritage value or interest; their age simply indicates a higher potential.

A building or structure can include:

- residential structure
- farm building or outbuilding
- industrial, commercial, or institutional building
- remnant or ruin
- engineering work such as a bridge, canal, dams, etc.

For more information on researching the age of buildings or properties, see the Ontario Heritage Tool Kit Guide [Heritage Property Evaluation](#).

Part C: Other Considerations

5a. Is there local or Aboriginal knowledge or accessible documentation suggesting that the property (or project area) is considered a landmark in the local community or contains any structures or sites that are important to defining the character of the area?

Local or Aboriginal knowledge may reveal that the project location is situated on a parcel of land that has potential landmarks or defining structures and sites, for instance:

- buildings or landscape features accessible to the public or readily noticeable and widely known
- complexes of buildings
- monuments
- ruins

5b. Is there local or Aboriginal knowledge or accessible documentation suggesting that the property (or project area) has a special association with a community, person or historical event?

Local or Aboriginal knowledge may reveal that the project location is situated on a parcel of land that has a special association with a community, person or event of historic interest, for instance:

- Aboriginal sacred site
- traditional-use area
- battlefield
- birthplace of an individual of importance to the community

5c. Is there local or Aboriginal knowledge or accessible documentation suggesting that the property (or project area) contains or is part of a cultural heritage landscape?

Landscapes (which may include a combination of archaeological resources, built heritage resources and landscape elements) may be of cultural heritage value or interest to a community.

For example, an Aboriginal trail, historic road or rail corridor may have been established as a key transportation or trade route and may have been important to the early settlement of an area. Parks, designed gardens or unique landforms such as waterfalls, rock faces, caverns, or mounds are areas that may have connections to a particular event, group or belief.

For more information on Questions 5.a., 5.b. and 5.c., contact:

- Elders in Aboriginal Communities or community researchers who may have information on potential cultural heritage resources. Please note that Aboriginal traditional knowledge may be considered sensitive.
- [municipal heritage committees](#) or local heritage organizations
- Ontario Historical Society's "[Heritage Directory](#)" - for a list of historical societies and heritage organizations in the province

An internet search may find helpful resources, including:

- historical maps
- historical walking tours
- municipal heritage management plans
- cultural heritage landscape studies
- municipal cultural plans

Information specific to trails may be obtained through [Ontario Trails](#).

Appendix **F**

Summary of Potential Effects, Proposed Mitigation, Net Effects and Environmental Monitoring and Contingency Measures

Appendix F. Summary of Potential Effects, Proposed Mitigation, Net Effects and Environmental Monitoring and Contingency Measures

Feature	Potential Effect	Proposed Mitigation Measures	Net Effects	Monitoring/Contingency Measures
Physical Features				
Soil Resources	Reduction in topsoil quantity and quality due to mixing and compaction	<ul style="list-style-type: none"> ▪ Consult with landowners regarding preferred topsoil handling measures (e.g. no stripping or additional stripping and potential storage preferences to avoid mixing of topsoil and subsoil). ▪ Steel plates will be used, where required, to access existing wells which will prevent soil mixing and erosion. ▪ During periods of high wind, apply mitigation measures to limit the erosion of topsoil (e.g. suspending earth moving, use of dust suppressants and protection of stockpiles). ▪ Avoid construction activities during seasonally wet periods (i.e., spring), high volume rain events (20 mm in 24 hours) and significant snow melts / thaws, where possible, to avoid risk of erosion, soil mixing and compaction or the potential for sediment release into the surrounding area. ▪ If excessively wet soil conditions are encountered, temporarily halt construction per Enbridge's standard wet soils shutdown practice. ▪ Keep all equipment within identified work areas and confine construction activities to the narrowest area practical to minimize disturbance of adjacent soils. ▪ If compaction occurs, a qualified individual should determine if compaction relief is necessary. Relief measures should be discussed with landowners prior to taking place. 	<ul style="list-style-type: none"> ▪ Reduced soil quality and quantity from erosion, sedimentation and compaction minimized through implementation of mitigation measures. ▪ <i>High likelihood of occurrence but limited magnitude of effects as affected areas will be remediated following the construction phase and are located adjacent to ROWs and property boundaries that are considered pre-disturbed.</i> 	<ul style="list-style-type: none"> ▪ N/A
	Reduction in soil quality and quantity due to erosion and sedimentation resulting from excavation, use of heavy equipment and stockpiling of cleared materials.	<ul style="list-style-type: none"> ▪ Develop plans for erosion and sediment control to minimize the potential for construction related sediment release (Erosion and Sediment Control Plan Guideline) and prepare condition reports as part of the monitoring and maintenance plan. ▪ Maintain undisturbed buffer strips around watercourses, waterbodies and/or natural features, where possible. ▪ Re-vegetate or stabilize exposed sites as soon as possible following disturbance using species native to the area to limit the duration of soil exposure. ▪ Maintain roadside ditches in good condition to avoid diversion of drainage ditch water into the construction area. ▪ Grade disturbed or remediated slopes or stockpiles to a stable angle to avoid slope instability and reduce erosion. ▪ Keep all equipment within identified work areas and confine construction activities to the narrowest area practical to minimize disturbance of adjacent soils. ▪ Remove construction debris from the site and stabilize it to prevent it from entering the nearby waterbodies. ▪ Avoid construction activities during seasonally wet periods (i.e., spring), high volume rain events (20 mm in 24 hours) and significant snow melts / thaws, where possible to avoid risk of erosion, soil compaction or the potential for sediment release into the surrounding area. 	<ul style="list-style-type: none"> ▪ Reduced soil quality and quantity from erosion and sedimentation minimized through implementation of mitigation measures. ▪ <i>Low likelihood of occurrence with adherence to Enbridge construction standards and limited magnitude of effects following the application of mitigation measures.</i> 	<ul style="list-style-type: none"> ▪ An Environmental Inspector shall conduct inspections of sediment and erosion control measures to confirm activities comply with plans to control site erosion. Inspection frequency will be increased during significant rainfall events. ▪ Inspection results shall be recorded in a daily report and provided to the Construction Superintendent to identified potential deficiencies that should be addressed. ▪ In the event that sediment and erosion control measures are not working effectively, the Contractor is required to repair and/or re-install deficient sediment and erosion control barriers within a reasonable time frame. ▪ There should also be a standby supply of erosion and sediment control devices (e.g., silt fence, etc.) for emergency installation.
	Reduction in soil quality and quantity due to the release of construction dewatering discharge resulting in erosion and sedimentation.	<ul style="list-style-type: none"> ▪ Where dewatering of excavations is required, mitigation could include the use of splash pads, discharge energy diffusers, filter bags, sediment basins or similar measures at discharge locations to ensure that any water discharged to the natural environment does not result in scouring, erosion or physical alteration of the soil at the discharge location, streams channel or banks. ▪ Leave a layer of vegetation intact between the outfall and receiving waterbody to provide additional water dispersion and entrapment of suspended solids, if discharge is to a waterbody and/or wetland, where feasible. ▪ Obtain applicable Conservation Authority / MNR / MECP, and/or municipal permits for the release of dewatering discharge. 	<ul style="list-style-type: none"> ▪ Reduced soil quality and quantity from the release of dewatering discharge will be minimized through the effective implementation of mitigation measures. ▪ <i>High likelihood of occurrence but limited magnitude of effects as there will only be short-term and localized dewatering (if required).</i> 	<ul style="list-style-type: none"> ▪ N/A
	Reduction in soil quality due to accidental release of contaminants during construction.	<ul style="list-style-type: none"> ▪ Apply the following general mitigation measures to avoid soil contamination: <ul style="list-style-type: none"> • Ensure machinery is maintained free of fluid leaks. • All stationary equipment, such as generators shall have secondary containment to prevent spills. Potential contaminant storage will not occur within 50 m of a wetland or watercourse. • Site maintenance, vehicle maintenance, vehicle washing and refuelling to be done in specified areas at least 50 m away from wetlands and/or waterbodies or a required by regulatory authority. Where it is impracticable to maintain the 50 m buffer (such as in the case of an operating pump), the following fuelling measures will be followed: <ul style="list-style-type: none"> ○ The equipment will be positioned as far away as possible on a secure and level surface; ○ The equipment will have a secondary containment system in place; ○ Two (2) workers will refuel the equipment such that one person is positioned at the fuel truck close to the emergency shut off, while the second person handles to nozzle/hose to refuel the equipment; and 	<ul style="list-style-type: none"> ▪ Reduced soil quality from the accidental release of contaminants will be minimized through the effective implementation of mitigation measures. ▪ <i>Low likelihood of occurrence and limited magnitude of effects as an effect is only anticipated to occur in the event of an accidental release of contaminants.</i> 	<ul style="list-style-type: none"> ▪ In the event of an accidental contaminant spill, immediate determination of the spills extent and magnitude should occur. ▪ Spills should be immediately reported to the on-site inspection team and if necessary, the MECP Spills Action Centre. ▪ Plans for spill prevention and response should be implemented and results of a spill clean-up recorded.

Appendix F. Summary of Potential Effects, Proposed Mitigation, Net Effects and Environmental Monitoring and Contingency Measures

Feature	Potential Effect	Proposed Mitigation Measures	Net Effects	Monitoring/Contingency Measures
		<ul style="list-style-type: none"> o An emergency spill kit will be set out in the open for immediate use, if required. ▪ Develop and implement a Spill Prevention and Response protocol outlining steps to prevent and contain any chemicals and to avoid soil contamination. This plan will include, for example: <ul style="list-style-type: none"> • In the event of a contaminant spill, all work will stop until the spill is cleaned up. • Reporting procedures to meet federal, provincial and local requirements (e.g., reporting spills and verification of clean-up), emergency contact and project management phone numbers. • Spill control and containment equipment/materials shall be readily available on site. • Protocols for access to additional spill clean-up materials, if needed. • Contaminated materials to be handled in accordance with relevant federal and provincial guidelines and standards. • Include the use of Material Safety Data Sheets, which provide information on proper handling of chemicals readily available for the types of chemicals that will be used on site. • Proper training of operational staff on associated emergency response plan and spill clean-up procedures. • Spills to be cleaned up as soon as possible, with contaminated soils/water removed to a licenced disposal site, if required. • Materials contained in spill clean-up kits are restocked as necessary. • Any soil encountered during excavation that has visual staining odours or other visual evidence of contamination effects should be analyzed to determine its quality in order to identify the appropriate disposal method. ▪ Waste and excess materials management (including excess soil) to be completed in accordance with relevant federal and provincial guidelines and standards. 		<ul style="list-style-type: none"> ▪ Frequent inspection of the emergency response equipment should occur to ensure required materials are available and readily accessible.
	Effects to surface water drainage patterns as a result of impacts to agricultural tiles	<ul style="list-style-type: none"> ▪ Discuss areas of concern with the landowner to identify potential tile drainage systems. ▪ Pre-construction tiling will be undertaken prior to the start of any operations, if necessary. ▪ Disrupted or broken tiles will be recorded, flagged and repaired following Enbridge's documented procedures for tile repair. Prior to completing repairs, landowners will be invited to inspect and approve repairs. <ul style="list-style-type: none"> • If a main drain or header drain is severed, a temporary repair will be made to maintain field drainage and prevent flooding. • Downstream sides of severed drains will be capped to prevent soil or debris from entering. 	<ul style="list-style-type: none"> ▪ Effects to agricultural tiles will be minimized through the effective implementation of mitigation measures. <ul style="list-style-type: none"> • <i>Moderate likelihood of occurrence and limited magnitude of effects as an effect is only anticipated to occur in the event a broken tile isn't repaired.</i> 	<ul style="list-style-type: none"> ▪ N/A
Groundwater Resources	Reduction in groundwater quantity as a result of temporary construction dewatering.	<ul style="list-style-type: none"> ▪ Retain an independent hydrogeologist to assess the potential for construction to affect groundwater quantity and identify the need for a well monitoring program during construction. Prior to construction, Enbridge will obtain appropriate dewatering permits (i.e., PTTW or EASR registration) and establish a water well monitoring plan/protocol, if necessary. ▪ Limit duration of dewatering to as short a time frame as possible. ▪ Direct dewatering discharge to affected watercourse, waterbody and/or wetland following appropriate water quality and temperature control measures. Discharge of water must comply with relevant regulations (i.e., MECP, Conservation Authority, MNRF, DFO, municipal, etc.), and as specified in any/all required discharge authorizations. 	<ul style="list-style-type: none"> ▪ Reduction in groundwater quantity due to temporary construction dewatering activities (if required) will be minimized through the implementation of mitigation measures. <ul style="list-style-type: none"> • <i>Low likelihood of occurrence due to shallow nature of construction and inferred low permeability soils, and limited magnitude of effects as there will only be short-term dewatering (if required).</i> 	<ul style="list-style-type: none"> ▪ If there is a potential for water wells to be impacted by the Project, Enbridge should implement their standard water well monitoring program. ▪ An independent hydrogeologist shall be retained to assess the need for and to develop if necessary, a well monitoring program. ▪ Should a private domestic water well be affected by Project construction, a potable water supply should be provided, and the water well should be repaired or restored as required.
	Reduction in groundwater quantity as a result of groundwater seepage into the buried pipelines granular base material, resulting in changes to local groundwater flow patterns.	<ul style="list-style-type: none"> ▪ In areas where the pipeline is planned to be installed below the water table, use trench plugs (or other forms of groundwater cut-offs) to limit the quantity of groundwater inflow into the granular base material. 	<ul style="list-style-type: none"> ▪ No net effects anticipated following the implementation of mitigation measures. 	
	Reduction in groundwater quality due to accidental release of contaminants during construction.	<ul style="list-style-type: none"> ▪ Refer to mitigation measures in Error! Reference source not found. for "<i>Reduction in soil quality due to accidental release of contaminants during construction.</i>". 	<ul style="list-style-type: none"> ▪ Reduced groundwater quality from the accidental release of contaminants will be minimized through the implementation of mitigation measures. <ul style="list-style-type: none"> • <i>Low likelihood of occurrence and limited magnitude of effects as an effect is only anticipated to occur in the event of an accidental release of contaminants.</i> 	<ul style="list-style-type: none"> ▪ Refer to monitoring/contingency measures of Soil Resources for "<i>Reduction in soil quality due to accidental release of contaminants during construction.</i>".

Appendix F. Summary of Potential Effects, Proposed Mitigation, Net Effects and Environmental Monitoring and Contingency Measures

Feature	Potential Effect	Proposed Mitigation Measures	Net Effects	Monitoring/Contingency Measures
Biophysical Features				
Surface Water	Changes in surface water quality due to water contamination (e.g., oils, gasoline, grease and other hazardous materials) and as a result of sedimentation.	<ul style="list-style-type: none"> Develop plans for spill prevention and response prior the start of construction to provide a detailed response system to respond to the release of petroleum, oils, lubricants and/ or other hazardous materials released into the environment. Site supervisors must keep a spill kit on-site at all times and train workers in the use of this kit. Operate construction equipment (i.e., back hoes, etc.) in a manner that minimizes disturbance to the banks of waterbodies (e.g., avoiding unnecessary travel, machine rotations, etc.) and ensure equipment is kept out of waterbodies, wherever possible. All vehicles, machinery and other construction equipment shall not enter the water. Restrict construction equipment to designated controlled vehicle access routes to minimize the potential contamination. Construction equipment should arrive on site in a clean condition. Frequent checks and maintenance should ensure that no fluid leaks occur. All stationary equipment, such as generators shall have secondary containment to prevent spills. Construction equipment must be refuelled, washed, and serviced a minimum of 50 m away from all waterbodies and other drainage features to prevent any deleterious substances from entering a water resource, or as designated by the local regulatory authority. Where it is impracticable to maintain the 50 m buffer (such as in the case of an operating pump), the following fuelling measures will be followed: <ul style="list-style-type: none"> The equipment will be positioned as far away as possible on a secure and level surface; The equipment will have a secondary containment system in place; Two (2) workers will refuel the equipment such that one person is positioned at the fuel truck close to the emergency shut off, while the second person handles to nozzle/hose to refuel the equipment; and An emergency spill kit will be set out in the open for immediate use, if required. Fuel and other construction related fuels/lubricants must be stored securely in a designated area that is a minimum of 50 m away from any waterbody or drainage feature, or as designated by the local regulatory authority. <ul style="list-style-type: none"> For mitigation measure associated with erosion and sedimentation, refer to mitigation measures for "Reduction in soil quality and quantity due to erosion, sedimentation and compaction resulting from evacuation, use of heavy equipment and stockpiling of cleared materials" in Table 6-1. 	<ul style="list-style-type: none"> Water contamination minimized through implementation of mitigation measures. <i>Low likelihood of occurrence and limited magnitude of effects as an effect is only anticipated to occur in the event of an accidental release of contaminants or failure of erosion and sediment control measures.</i> 	<ul style="list-style-type: none"> N/A
	Changes to surface water quality due to working near watercourses	<ul style="list-style-type: none"> Assuming any watercourses are in conservation authority regulated area, the Project will adhere to any permit conditions to minimize the effect of the Project on nearby watercourses. <ul style="list-style-type: none"> Implement necessary erosion and sediment control (ESC) measures (i.e., silt fencing) for Project work near watercourses to prevent potential erosion and sedimentation into nearby watercourses. 	<ul style="list-style-type: none"> Water contamination minimized through implementation of mitigation measures. <i>Low likelihood of occurrence and limited magnitude of effects as an effect is only anticipated if sediment control measures and conservation authority permits are not adhered to.</i> 	<ul style="list-style-type: none"> N/A
	Changes in surface water quantity due to alterations to local drainage patterns.	<ul style="list-style-type: none"> Clearly delineate work area using erosion fencing or other barriers, to avoid effecting hydrological functions associated with permanent open water. Control quantity and quality of stormwater discharge using best management practices. Minimize grading activities to maintain existing drainage patterns as much as possible. Schedule construction activities near water to occur within the low flow period of the late summer months, where possible, to avoid or minimize effects. Develop plans to deal with on-site flooding in order to mitigate any possible effects to the aquatic. <ul style="list-style-type: none"> Operate construction equipment (i.e., back hoes, etc.) in a manner that minimizes disturbance to the banks of waterbodies (e.g., avoiding unnecessary travel, machine rotations, etc.) and ensure equipment is kept out of waterbodies, wherever possible. 	<ul style="list-style-type: none"> Alteration to local drainage patterns minimized through application of mitigation measures. <i>Low likelihood of occurrence and limited magnitude of effect as effects are anticipated to be temporary until the site is re-graded to existing conditions.</i> 	<ul style="list-style-type: none"> N/A
Fish and Fish Habitat	Changes in fish habitat or fish mortality risk (including other aquatic biota such as invertebrates) due to removal of riparian vegetation, erosion and sedimentation and/or water contamination.	<ul style="list-style-type: none"> Where construction activity occurs within 30 m of a waterbody clearly delineate the construction area to avoid accidental damage to riparian vegetation. Operate machinery in a manner that minimizes disturbance to the watercourse bed and banks. <ul style="list-style-type: none"> Protect entrances at machinery access points (e.g., using swamp mats) and establish single site entry and exit where feasible and practical. Machinery is to arrive on site in a clean condition and is to be maintained free of fluid leaks. Wash, refuel and service machinery and store fuel and other materials for the machinery away from the water to prevent deleterious substances from entering the water. Keep an emergency spill kit on site in case of fluid leaks or spills from machinery. Where riparian vegetation needs to be removed or has the potential to become damaged, mitigation measures outlined in Table 6-5 for "Removal of and/or damage to vegetation" must be implemented. 	<ul style="list-style-type: none"> Harm to fish or fish habitat as a result of physical changes riparian vegetation minimized through implementation of mitigation measures. <i>Low likelihood of occurrence and limited magnitude of effects as a result of riparian cover and adjacent watercourse.</i> 	<ul style="list-style-type: none"> N/A

Appendix F. Summary of Potential Effects, Proposed Mitigation, Net Effects and Environmental Monitoring and Contingency Measures

Feature	Potential Effect	Proposed Mitigation Measures	Net Effects	Monitoring/Contingency Measures
		<ul style="list-style-type: none"> Where there is a potential for water contamination to effect fish habitat or fish mortality risk, mitigation measures outlined in Table 6-3 for “Changes in surface water quality due to water contamination by oils, gasoline, grease and other hazardous materials and sedimentation” must be implemented. <ul style="list-style-type: none"> Where there is a possibility for erosion or sedimentation to effect fish habitat or fish mortality risk, mitigation measures outlined in Table 6-1 for “Reduction in soil quality and quantity due to erosion, sedimentation and compaction resulting from evacuation, use of heavy equipment and stockpiling of cleared materials” must be implemented. 		
Vegetation and Ecological Communities	Removal of and/or damage to vegetation	<ul style="list-style-type: none"> Minimize vegetation removal to the extent possible and limit to within the construction footprint. Designated natural areas (including significant wetlands and significant woodlands) will be avoided, wherever possible. Obtain appropriate government approvals to construct pipeline facilities adjacent to designated natural areas (e.g., significant woodlands). Any permitting that may be required to be determined in consultation with the MECP, MNR and/or SCRC. Prune any tree limbs or roots that are accidentally damaged by construction activities within 48 hours of damage using appropriate arboricultural techniques. Clearly delineate the construction area to avoid accidental damage to species to be retained. Delineation will be in the form of construction fencing and/or barriers with the latter implemented if sediment and erosion control is also acquired. Inspection staff may also consider substituting other demarcating types for fencing, such as staking and flagging, where it is determined that there is no apparent risk to nearby natural features. Re-vegetate cleared areas as soon as reasonably possible. If there is insufficient time in the growing season to effectively re-vegetate the disturbed areas, overwintering treatments such as erosion control blankets or fibre matting should be installed to contain the site over the winter months. Prior to removal, landowners should be consulted on any vegetation removed from their property. Any merchantable wood must be offered to the landowner or, where possible, used in pipeline construction or associated works. Any slash generated as part of clearing and grubbing the pipeline ROW must be chipped or disposed to the satisfaction of the landowner. <ul style="list-style-type: none"> Trees directly above or adjacent to the pipeline or pipeline infrastructure will be removed and not replaced to facilitate future maintenance. Trees on private land(s) will be negotiated with the landowner and trees removed in temporary construction areas will be replaced, in accordance with the Enbridge Tree Replacement Program. 	<ul style="list-style-type: none"> Vegetation loss, adjacent to the construction area will be minimized through the application of mitigation measures. <ul style="list-style-type: none"> <i>High likelihood of occurrence and will be of limited magnitude and duration.</i> 	<ul style="list-style-type: none"> The re-establishment of vegetative cover upon the completion of construction should be monitored and protective measures such as silt fencing should be retained in place until cover is fully established. Vegetative cover should be planted as soon as weather permits in the next growing season, followed by maintenance (i.e., removal of invasive species) and inspection to confirm the successful establishment of native vegetation. Response measures for accidental tree damage will be developed. Any tree limbs or roots that are accidentally damaged by construction activities should be pruned using proper arboricultural techniques. Should accidental damage result in tree mortality, compensation in the form of replacement of the tree species should occur within an area agreed to by Enbridge Gas, the landowner and St. Clair Township
	Degradation of ecological communities including designated natural areas	<ul style="list-style-type: none"> Minimize spread of invasive plant species by ensuring equipment and machinery is clean prior to arriving on-site. Clearly delineate work area using erosion fencing, or other barrier, to minimize seed transfer into suitable habitat. Inspection staff may also consider substituting other demarcating types for fencing, such as staking and flagging, where it is determined that there is no apparent risk to nearby significant rare vegetation communities. This could include instances where the significant rare vegetation communities are at a higher elevation than the occurring construction activity. Depending on site-specific conditions, such as steep topography and the presence of direct, or regular, surface water flow, inspection staff may consider substituting other styles of fencing for erosion fencing, when appropriate. Regularly clean vehicles and equipment. Re-vegetate cleared areas as soon as reasonably possible. Apply dust suppressants to unpaved areas when necessary, as determined by inspection staff. Application frequency and method will vary, but should be determined by site-specific weather conditions, including recent precipitation, temperatures and wind speeds. Input from the construction team may warrant an increased frequency of dust suppression. Dust control plans should be developed in consultation with the local municipality. Implement a speed limit for construction equipment and trucks on construction roads/routes. Install wind fences, where determined to be necessary by the on-site inspection staff. Installation of these fences will depend on site-specific conditions, including wind speeds, topography, land cover and the extent of surrounding natural wind breaks. <ul style="list-style-type: none"> Store any stockpiled material > 30 m from a wetland, or waterbody. 	<ul style="list-style-type: none"> Where possible, degradation of ecological communities, adjacent to the construction area will be minimized through the implementation of mitigation measures. <ul style="list-style-type: none"> <i>Degradation of ecological communities will largely be avoided by siting the Project adjacent to the public road ROW. However, where adjacent ecological communities are affected, the effect will be of limited magnitude and duration.</i> 	<ul style="list-style-type: none"> N/A
Wildlife and Significant Wildlife Habitat	Loss and / or degradation of wildlife habitat including significant wildlife habitat during construction	<ul style="list-style-type: none"> Construction activities will be located on agricultural land to minimize impacts to wildlife habitat and SWH. Minimize vegetation removal to the extent possible and limit to within the construction footprint. Avoid potential significant wildlife habitat wherever possible. Clearly delineate the construction footprint to avoid accidental damage to retained vegetation. Delineation will be in the form of construction fencing and / or silt fence barriers with the latter implemented if erosion and sediment control is also required. Inspection staff may also consider substituting other demarcating types for fencing, such as staking and flagging, where it is determined that there is no apparent risk to nearby vegetation communities. 	<ul style="list-style-type: none"> Loss or degradation of local wildlife habitat will be minimized through the application of mitigation measures. <ul style="list-style-type: none"> <i>Low likelihood of occurrence and limited magnitude as a result.</i> 	<ul style="list-style-type: none"> The Environmental Inspector should verify that wildlife protection timing windows are adhered to, as applicable. To avoid contravention of the <i>Migratory Birds Convention Act</i>, any vegetation removal activities should occur between September 1st and March 30th to ensure

Appendix F. Summary of Potential Effects, Proposed Mitigation, Net Effects and Environmental Monitoring and Contingency Measures

Feature	Potential Effect	Proposed Mitigation Measures	Net Effects	Monitoring/Contingency Measures
		<ul style="list-style-type: none"> ▪ Install and maintain sediment and erosion controls such as silt fence barriers, rock flow check dams, compost filter socks or approved alternative along the edge of the construction footprint area if within 30 m of a wetland or waterbody where appropriate to delineate work area and avoid effecting water quality. ▪ Ensure machinery is maintained free of fluid leaks. ▪ Vehicle maintenance, washing and refuelling to be done in specified areas at least 50 m away from wetlands and / or waterbodies. Avoid the use of herbicides, to the extent possible, within significant during the construction. 		<p>that all bird nesting activities have been completed and the majority of chicks have reached the adult stage. In most cases nest searches during the nesting season (April 1st to August 31st) are not recommended within complex habitats, as the ability to detect nests is largely low while the risk of disturbance to active nests is high. Disturbance increases the risk of nest predation and abandonment by adults. Therefore, nest searches are not recommended unless nests are known to be easily located without disturbing them. Nests searches may be completed during the nesting period (April 1st to August 31st) by a qualified biologist within 'simple habitats' (ECCC, 2017). Simple habitats refer to habitats that contain few likely nesting spots or a small community of migratory birds. Examples of simple habitats include:</p> <ul style="list-style-type: none"> ▪ "an urban park consisting mostly of lawns with a few isolated trees; ▪ a vacant lot with few possible nest sites; ▪ a previously cleared area where there is a lag between clearing and construction activities (and where ground nesters may have been attracted to nest in cleared areas or in stockpiles of soil, for instance); or ▪ a structure such as a bridge, a beacon, a tower or a building (often chosen as a nesting spot by robins, swallows, phoebes, Common Nighthawks, gulls and others)" (CWS, 2014). <p>▪ Similarly, nest searches can also be considered when investigating:</p> <ul style="list-style-type: none"> ▪ "conspicuous nest structures (such as nests of Great Blue Herons, Bank Swallows, Chimney Swifts); ▪ cavity nesters in snags (such as woodpeckers, goldeneyes, nuthatches); or ▪ colonial-breeding species that can often be located from a distance (such as a colony of terns or gulls)" (CWS, 2014). <p>▪ For bats, it is recommended for tree removal to occur when bats are not using the habitat between the months of September and April (MNRF, 2015). If this</p>

Appendix F. Summary of Potential Effects, Proposed Mitigation, Net Effects and Environmental Monitoring and Contingency Measures

Feature	Potential Effect	Proposed Mitigation Measures	Net Effects	Monitoring/Contingency Measures
				<p>timing cannot be followed, tree removal cannot take place during the rearing of young from June 1st to July 31st (MNR, 2015). However, tree removal can occur between April 30th to May 31st and August 1st to September 1st provided the following is completed:</p> <ul style="list-style-type: none"> ▪ Candidate roost trees should be monitored through exit surveys for evidence of maternity colonies 24 hours prior to the trees being removed; and ▪ Should no bats be observed using the cavity, the trees may be removed immediately on the following day.
	Changes in habitat, mortality risk or behaviour.	<ul style="list-style-type: none"> ▪ Conduct field investigations in advance of construction to identify wildlife habitats and determine significance and necessary mitigation measures to avoid or reduce any anticipated effects to wildlife or their habitats. ▪ Conduct vegetation clearing outside of the breeding bird nesting period (April 1st to August 31st) to avoid incidental take and limit disturbance to birds (including SOCC) or their nests, unless nest and nesting activity surveys have been completed by a qualified avian biologist and no active nests are present. If vegetation removal or trimming must occur during the breeding bird nesting period (April 1st – August 31st), nest and nesting activity searches will be conducted by a qualified avian biologist no more than 24 hours in advance. If an active nest or nesting activity of a protected bird is observed, the area will be protected and no construction activities will occur until the young have fledged or until the nest is no longer active, as confirmed by a qualified biologist. ▪ Schedule construction activities within 30 m of woodlands to occur during daylight hours to avoid excessive noise and/or light disturbances to wildlife, wherever possible. ▪ If construction activities within 30 m of woodlands must occur outside of daylight hours, spotlights will be directed downward and/or away from the woodland to limit potential light disturbance to breeding birds. ▪ Obey site speed limits identified in plans for traffic management. ▪ Construction equipment and vehicles must yield the right of way to wildlife. ▪ Trench operations should be backfilled as soon as reasonable to facilitate wildlife movement across the ROW. ▪ Workers must never threaten, harass or injure wildlife. 	<ul style="list-style-type: none"> ▪ Disturbance and/or mortality to local wildlife will be minimized through the implementation of mitigation measures. • <i>Low likelihood of occurrence and limited magnitude as a result.</i> 	<ul style="list-style-type: none"> ▪ Refer to section on Wildlife and Wildlife Habitat above
Wildlife Species at Risk	Mortality, harm and / or disturbance / displacement of SAR; and Loss or degradation of SAR habitat during construction	<ul style="list-style-type: none"> ▪ Measures to protect SAR and SAR habitat will include those described above under Wildlife and Wildlife Habitat. ▪ Develop and implement, in consultation with the MECP or other applicable regulatory agencies, any additional mitigation measures that may be required to protect SAR. These measures will be site- and species-specific dependant on the identification of specialized or sensitive habitat within the PSA during future surveys. ▪ Enbridge will follow conditions of approvals, letters of advice, and/or permits issued by the MECP or other applicable regulatory agencies. 	<ul style="list-style-type: none"> ▪ Disturbance and/or mortality to SAR and their habitat will be minimized through the implementation of mitigation measures. ▪ <i>Low likelihood of occurrence and limited magnitude as a result</i> 	<ul style="list-style-type: none"> ▪ Refer to section on Wildlife and Wildlife Habitat above
	Mortality, harm and / or disturbance / displacement of wildlife including SAR during operation	<ul style="list-style-type: none"> ▪ Measures to protect SAR and SAR habitat during the operation phase will include those described above under Wildlife and Wildlife Habitat. ▪ Develop and implement, in consultation with the MECP or other applicable regulatory agencies, any additional mitigation measures that may be required to protect SAR. These measures will be site- and species-specific dependant on the identification of specialized or sensitive habitat within the PSA during future surveys. ▪ Enbridge will follow conditions of approvals, letters of advice, and/or permits issued by the MECP or other applicable regulatory agencies. 	<ul style="list-style-type: none"> ▪ Disturbance to wildlife and wildlife habitat, including SAR will be minimized through the implementation of mitigation measures. ▪ <i>Low likelihood of occurrence and limited magnitude as a result</i> 	<ul style="list-style-type: none"> ▪ Refer to section on Wildlife and Wildlife Habitat above
Socio-Economic Features				
Residents, Farms, Businesses and Land Uses	Temporary increases in noise, dust and air emissions	<ul style="list-style-type: none"> ▪ The idling of vehicles should be avoided, and vehicles and/or equipment should be turned off when not in use. ▪ Apply dust suppressants to unpaved areas, when necessary, as determined by inspection staff. Application frequency and method will vary, but should be determined by site-specific weather conditions, including recent precipitation, temperatures and wind speeds. Input from the construction team may warrant an increased frequency of dust suppression. ▪ Plans for dust control should be developed in consultation with the local municipality. ▪ Implement a speed limit for construction equipment and trucks on construction roads/routes. 	<ul style="list-style-type: none"> ▪ Noise, dust and air emission effects are anticipated to be minimized with the implementation of mitigation measures. • <i>High likelihood of occurrence and limited magnitude as a result.</i> 	<ul style="list-style-type: none"> ▪ The Contractor should verify that the measures outlined in the traffic management plan are fully implemented, access to adjacent properties is being

Appendix F. Summary of Potential Effects, Proposed Mitigation, Net Effects and Environmental Monitoring and Contingency Measures

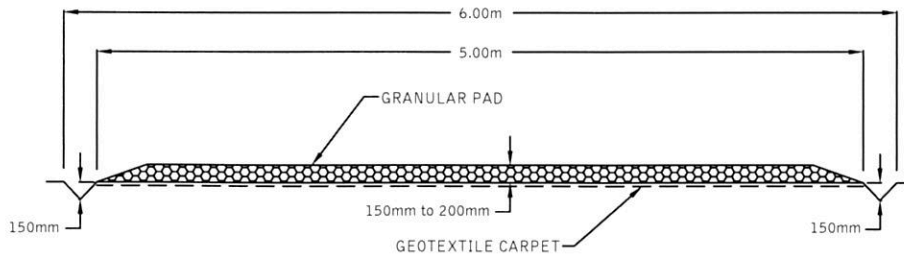
Feature	Potential Effect	Proposed Mitigation Measures	Net Effects	Monitoring/Contingency Measures
		<ul style="list-style-type: none"> ▪ Construction activities that result in noise should be restricted to daylight hours and will adhere to any applicable local noise by-laws. In the event that construction activities that may cause excessive noise must occur outside of these time frames, adjacent property owners and St. Clair Township will be notified and application(s) for Noise By-law exemption will be submitted for approval. ▪ During construction, practices to reduce and limit air emissions should include, but not be limited to: <ul style="list-style-type: none"> • Maintaining equipment in compliance with regulatory requirements. • Protecting stockpiles of friable material with barriers and/or widescreens during dry conditions and covering friable material during transportation. • Dust suppression of source areas. 		maintained and that traffic is not being unnecessarily interrupted.
	Increased construction traffic volumes	<ul style="list-style-type: none"> ▪ Enbridge should develop plans for traffic management in co-operation with St. Clair Township prior to the commencement of construction activities, if necessary. ▪ The Contractor should implement plans for traffic management for all roads affected by construction activities. The traffic management planning should, at a minimum, follow the Ontario Traffic Manual Book 7 and should additionally include: <ul style="list-style-type: none"> • Warn oncoming motorists of construction activity. • Restrict the movement of personnel and materials to and from the construction site. • Employ a trained traffic control officer to assist with truck movements where possible. • Control traffic at road crossings. • Reduce lane disturbances and closures. • Store equipment as far away from the roadway as possible. • Utilize and install construction barricades at road crossings. ▪ Return all road ROWs to their original condition or better following construction. ▪ The period of time that a road is closed (except for local access) should be reduced to the shortest extent possible. Enbridge should meet with representatives of St. Clair Township and local school board(s) to discuss potential road crossing procedures and address the following issues: <ul style="list-style-type: none"> • Deterioration of roadways due to increased traffic; • Crossing procedures including resurfacing or grading of roadways, and traffic safety; • Road restrictions and haul routes; and • Road surface and municipal drain restoration. ▪ Any municipal approvals required for lane restrictions and haul routes. 	<ul style="list-style-type: none"> ▪ Traffic disturbances are anticipated to be minimal with the implementation of mitigation measures. • <i>High likelihood of occurrence and limited magnitude as a result.</i> 	
	Restricted property access	<ul style="list-style-type: none"> ▪ Sufficient notice will be provided to landowners to address any concerns and mitigate any potential issues like noise, dust, access and general safety during construction. ▪ Access to adjacent properties should be maintained at all times, where feasible. ▪ All work should be confined to the construction disturbance area. If additional work area is required, temporary working space must be acquired through discussions with landowners. ▪ Construction activities will be co-ordinated with adjacent land users, such as other utility providers. ▪ Mitigation measures listed under “<i>Increased construction traffic volumes</i>” shall be implemented to avoid interference of the construction traffic with the access to the properties. 	<ul style="list-style-type: none"> ▪ Effects due to restricted property access are anticipated to be minimal with the implementation of mitigation measures. • <i>Low likelihood of occurrence and limited magnitude as a result.</i> 	
	Social impacts (i.e., impairment of the use and enjoyment of property)	<ul style="list-style-type: none"> ▪ Additional consultation with residents, farms and/or businesses adjacent to the pipeline route and accompanying infrastructure works will be held prior to the commencement of construction activities (e.g., mailings, public notices). Pre-construction interviews will be held with all landowners prior to construction start with a Land Relations Agent and Construction Superintendent. ▪ Contact information for a designated Enbridge representative will be made available prior to and throughout construction activities in order to address any questions or concerns. ▪ A complaint tracking system should be implemented in order to record concerns, actions taken and follow-up dates. ▪ While any undesirable aesthetic effects will only occur during construction activities, construction should be completed as expediently as possible to reduce the duration of any temporary aesthetic effects. ▪ Warning signs and construction barricades should be erected at all areas of construction activity. ▪ Safety fences should be installed at the edge of the construction ROW where public safety considerations are required. 	<ul style="list-style-type: none"> ▪ The implementation of mitigation measures is anticipated to result in minimal effects. • <i>Low likelihood of occurrence and limited magnitude as a result.</i> 	
Institutional Services and Facilities	Increased uses of emergency and medical services.	<ul style="list-style-type: none"> ▪ Prepare plans for health and safety during the construction phase of the Project and notify emergency services about construction commencement. ▪ Restricted public access to construction sites and other construction safety measures should be in place during construction. Signage indicating the location of pipeline construction should also be placed at all road and watercourse crossings. The Project will be constructed and operated in accordance with the Canadian Standards Association (CSA) code and Technical Standards and Safety Authority (TSSA, 1998) guidelines. 	<ul style="list-style-type: none"> ▪ With the implementation of mitigation measures, no net effects are anticipated. • <i>Low likelihood of occurrence and limited magnitude as a result.</i> 	▪ N/A
	Increased construction traffic volumes	<ul style="list-style-type: none"> ▪ Mitigation measure listed in Error! Reference source not found. 6-9 for “<i>Increased construction traffic volumes</i>” shall be implemented. Traffic disturbances are anticipated to be minimal once mitigation measures are applied. 	<ul style="list-style-type: none"> ▪ Traffic disturbances are anticipated to be minimal once mitigation measures are applied. 	▪ N/A

Appendix F. Summary of Potential Effects, Proposed Mitigation, Net Effects and Environmental Monitoring and Contingency Measures

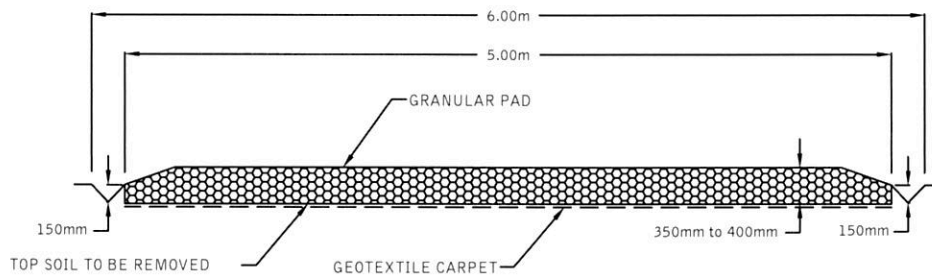
Feature	Potential Effect	Proposed Mitigation Measures	Net Effects	Monitoring/Contingency Measures
	Restricted land access	<ul style="list-style-type: none"> Mitigation measure listed in Error! Reference source not found. 6-9 for "Restricted property access" shall be implemented. Effects due to restricted property access are anticipated to be minimal once mitigation measures are applied. 	<ul style="list-style-type: none"> High likelihood of occurrence and limited magnitude as a result. Effects due to restricted property access are anticipated to be minimal once mitigation measures are applied. Low likelihood of occurrence and limited magnitude as a result. 	<ul style="list-style-type: none"> N/A
Electricity Infrastructure, Natural Gas and Oil Pipelines, and Other Utilities	Increased construction traffic volumes	<ul style="list-style-type: none"> Mitigation measure listed in Error! Reference source not found. 6-9 "Increased construction traffic volumes" shall be implemented. Traffic disturbances are anticipated to be minimal once mitigation measures are applied. 	<ul style="list-style-type: none"> Traffic disturbances are anticipated to be minimal once mitigation measures are applied. High likelihood and limited magnitude as a result. 	<ul style="list-style-type: none"> N/A
	Restricted land access	<ul style="list-style-type: none"> Mitigation measure listed in Error! Reference source not found. 6-9 for "Restricted property access" shall be implemented. Effects due to restricted property access are anticipated to be minimal once mitigation measures are applied. 	<ul style="list-style-type: none"> Effects due to restricted property access are anticipated to be minimal once mitigation measures are applied. Low likelihood and limited magnitude as a result. 	<ul style="list-style-type: none"> N/A
	Utility service disruptions and/or decreases in infrastructure integrity	<ul style="list-style-type: none"> Prior to construction, consultation with municipalities and all local utility companies should occur to determine the exact location of all underground utilities in the area of excavation and other construction activities. Prior to construction, consultation with the all local utility companies should occur to determine the exact location of all overhead utilities in the construction area and to determine the need to re-site overhead utilities. Safety and distance requirements should be determined prior to construction adjacent to underground and overhead utilities. Heavy construction machinery should cross underground utilities to the least extent possible, and machine operators should be advised of the location of all underground utilities prior to commencing with construction activities. 	<ul style="list-style-type: none"> With the implementation of mitigation measures, no net effects are anticipated. 	<ul style="list-style-type: none"> N/A
Contaminated Soils and Waste Management	Contamination of soil, surface and/or groundwater resources due to improper waste disposal	<ul style="list-style-type: none"> When details on excess fill volumes and soil quality are known, appropriate disposal locations and permitting should be identified/obtained. Site-specific Soil Management Plans for waste collection and disposal management should be developed by the contractor prior to the execution of the Project and should include provisions for: <ul style="list-style-type: none"> The transportation of waste and recycling off-site by private waste contractors licensed by the MECP. The removal of excess materials from the site; and The reuse and recycling of materials. 	<ul style="list-style-type: none"> With the implementation of mitigation measures, no net effects are anticipated. 	<ul style="list-style-type: none"> N/A
	Contaminated soil discovered during trench excavation	<ul style="list-style-type: none"> Site-specific Soil Management Plans for excess soils, waste collection and disposal management should be developed by the Contractor (see Contamination of soil, surface and/or groundwater resources due to improper waste disposal above). Should excess soil be generated on-site during construction activities that will require off-site management, or if contaminated soils are suspected (e.g., odour, film, sheen, staining, previous known contamination issues in the vicinity), representative soil samples should be collected and submitted for chemical analysis to determine management options and appropriate handling and health and safety guidelines. 	<ul style="list-style-type: none"> With the implementation of mitigation measures, no net effects are anticipated. 	<ul style="list-style-type: none"> N/A
Archaeological Resources	Disturbances to archaeological resources.	<ul style="list-style-type: none"> Undertake a Stage 2 Archaeological Assessment of undisturbed areas with archaeological potential that will be directly impacted by the Project prior to construction. Construction activities will not proceed in these areas until they are cleared of archaeological concern and acceptance has been received from the MTCS (i.e., undertake Stage 3 and/or 4 if required). Should previously undocumented archaeological resources be discovered during construction, they may be a new archaeological site and therefore subject to Section 48(1) of the <i>Ontario Heritage Act</i>. (Government of Ontario, 1990b) 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 field work, in compliance with Section 48(1) of the <i>Ontario Heritage Act</i>. The <i>Cemeteries Act</i>, R.S.O. 1990 c. C.4 (Government of Ontario, 1990a) and the <i>Funeral, Burial and Cremation Services Act</i>, 2002, S.O. 2002, c.33 (Government of Ontario, 2002) (when proclaimed in force) require that any person discovering human remains must notify the police or coroner and the Registrar of Cemeteries at the Ontario Ministry of Government and Consumer Services. 	<ul style="list-style-type: none"> No net effects to archaeological resources are expected following implementation of mitigation measures. 	<ul style="list-style-type: none"> Indigenous communities will be invited to participate in the monitoring of Stage 2 Archaeological field assessment. Should previously undocumented archaeological resources be discovered during construction, they may be a new archaeological site and therefore subject to Section 48(1) of the Ontario Heritage Act (Government of Ontario, 1990b). 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 field work, in compliance with Section 48(1) of the Ontario Heritage Act (Government of Ontario, 1990b).

Appendix **G**

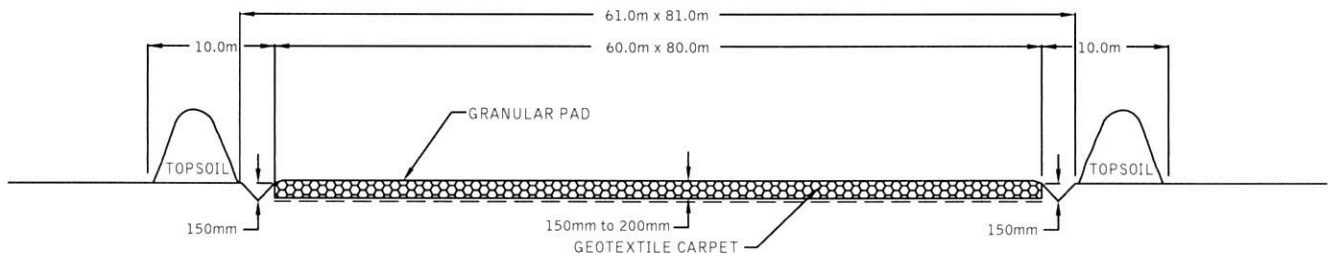
Enbridge Gas Inc Standards and Typical Drawings



TYPICAL TEMPORARY ACCESS ROAD



TYPICAL PERMANENT ACCESS ROAD



TYPICAL WELL DRILLING WORK AREA



A Spectra Energy Company

**TYPICAL ACCESS ROAD
AND WORK AREA DETAIL**

UNION GAS PIPELINE CONSTRUCTION TYPICAL

NOTICE: THIS DRAWING HAS NOT BEEN PUBLISHED AND IS THE PROPERTY OF UNION GAS LIMITED AND IS LENT TO THE BORROWER FOR HIS CONFIDENTIAL USE ONLY, AND IN CONSIDERATION OF THE LOAN OF THIS DRAWING, THE BORROWER PROMISES AND AGREES THAT IT SHALL NOT BE REPRODUCED, COPIED, LENT OR OTHERWISE DISPOSED OF DIRECTLY OR INDIRECTLY, NOR USED FOR ANY PURPOSE OTHER THAN FOR WHICH IT IS FURNISHED.

DRAWN BY Gary Hanuszak	DATE 2013-03-23	SCALE N.T.S.	SIZE A	FILE REVISION DATE 2013-00-00
APPROVED BY George Adams	DATE 2013-03-23	DRAWING NUMBER PL-30-13-05		REVISION
AC/DRAW CODE PL-30-13-05.dwg				

Entrance

Pipe Tub #3

Frac Tank

Frac Tank

Frac Tank

Work Area

Mud Pump

Mud Pump

Mud Tank

Mud Tank

Mud Tank

Pipe Tub #1

Pipe Tub #2

Cat Walk

Mast, Sub, Drawworks

Generator, Accumulator

Dog House

Matting

Flare Stack

Matting

Rig Manager

Directional

Enbridge

Non Work Area

