



Dave Janisse
Technical Manager
Leave to Construct Applications
Regulatory Affairs

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

VIA EMAIL and RESS

May 19, 2022

Nancy Marconi
Registrar
Ontario Energy Board
2300 Yonge Street, Suite 2700
Toronto, Ontario, M4P 1E4

Dear Nancy Marconi:

**Re: Enbridge Gas Inc. (“Enbridge Gas”)
Ontario Energy Board (“OEB”) File No. EB-2022-0155
Crowland Test Well Drilling Project Application and Evidence - Redacted**

Enclosed please find the redacted application and evidence for the Crowland Test Well Drilling Project.

In accordance with the OEB’s *Practice Direction on Confidential Filings*, Enbridge Gas has redacted personal information from the following exhibits. Details of the specific information for which confidential treatment is sought are set out below:

Exhibit	Description of Document	Confidential Information Location	Brief Description	Basis for Confidentiality
Exhibit G-1-1 Attachment 1	Landowner List	Pages 4-10	Personal information	The redactions relate to the names and contact information of property owners. This information should not be disclosed in accordance with the <i>Freedom of Information and Protection of Privacy Act</i> . Pursuant to section 10 of the OEB’s <i>Practice Direction on Confidential Filings</i> , such information should not be provided to parties to a proceeding.

The unredacted confidential Exhibit will be sent separately via email to the OEB.

Page 2 of 2

If you have any questions, please contact the undersigned.

Sincerely,

(Original Digitally Signed)

Dave Janisse
Technical Manager, Leave to Construct Applications

EXHIBIT LIST

A – GENERAL

<u>Exhibit</u>	<u>Tab</u>	<u>Schedule</u>	<u>Contents of Schedule</u>
A	1	1	Exhibit List
		2	Glossary
	2	1	Application
			Attachment 1 – Map of Proposed Facilities

B – PROJECT NEED

B	1	1	Project Need
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C – PROJECT ALTERNATIVES

C	1	1	Project Alternatives
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D – PROPOSED PROJECT

D	1	1	Proposed Project
			Attachment 1 – Map - DSA and Isopach
			Attachment 2 – Crowland Cross Section
			Attachment 3 – drilling application provided to the MNDMNR
			Attachment 4 - Construction Schedule
			Attachment 5 - Executive Summaries

E – PROJECT COST & ECONOMICS

<u>Exhibit</u>	<u>Tab</u>	<u>Schedule</u>	<u>Contents of Schedule</u>
E	1	1	Cost & Economics

F – ENVIRONMENTAL MATTERS

E	1	1	Environmental Matters Attachment 1 – Environmental Report Attachment 2 – OPCC Consultation Log
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G – LAND MATTERS

G	1	1	Land Matters Attachment 1 – Landowner List
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H – INDIGENOUS CONSULTATION

H	1	1	Indigenous Consultation Attachment 1 – Project Description for MOE Attachment 2 – Letter from MOE Attachment 3 – Indigenous Peoples Policy
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<u>GLOSSARY OF ACRONYMS AND DEFINED TERMS</u>	
AA	Archaeological Assessment
Act	The Ontario Energy Board Act, 1998
Applicant	Enbridge Gas Inc.
CSA Z341	Canadian Standards Association Standard Z341.1-22 – Storage of Hydrocarbons in Underground Formations
DSA	Designated Storage Area
EC 1	Proposed stratigraphic test well in the Crowland Storage Pool
Enbridge Gas or the Company	Enbridge Gas Inc
ER	Environmental Report
Guidelines	The OEB's Environmental Guidelines for the Location, Construction, and Operation of Hydrocarbon Pipelines and Facilities in Ontario (7 th Edition, 2016)
MCFN	Mississaugas of the Credit First Nation
MECP	Ministry of Environment, Conservation and Parks
MHSTCI	Ministry of Heritage, Sport, Tourism and Culture Industries
MNDMNRF	Ministry of Northern Development, Mines, Natural Resources and Forestry
MOE	Ministry of Energy
OEB	The Ontario Energy Board
OGSRA	Ontario Oil, Gas & Salt Resources Act
OPCC	Ontario Pipeline Coordinating Committee
Policy	Enbridge Inc. Indigenous Peoples Policy
Project	Enbridge Gas's 2022 Crowland Test Well Drilling Project, which involves drilling a stratigraphic test well in the Crowland Storage Pool for the purpose of obtaining core and installation of instrumentation.
SAR	Species at Risk
Stantec	Stantec Consulting Ltd.

ONTARIO ENERGY BOARD

IN THE MATTER OF the *Ontario Energy Board Act, 1998*, S.O. 1998, c.15, Schedule B; and in particular section 40(1) thereof;

AND IN THE MATTER OF an application by Enbridge Gas Inc. for a favourable report to the Ministry of Northern Development, Mines, Natural Resources and Forestry to support a licence to drill a natural gas stratigraphic test well.

APPLICATION

1. Pursuant to section 40(1) of the *Ontario Energy Board Act, 1998*, S.O. 1998, c. 15, Schedule B (the “Act”), Enbridge Gas Inc. (“Enbridge Gas” or the “Company”) is seeking a favourable report from the Ontario Energy Board (“OEB”) to the Ministry of Northern Development, Mines, Natural Resource and Forestry (“MNDMNR”) for a license to drill a stratigraphic test well in the Crowland Storage Pool.
2. Enbridge Gas’s 2022 Crowland Test Well Drilling Project (the “Project”) will involve drilling a stratigraphic test well in the Crowland Storage Pool for the purpose of coring and installation of instrumentation, to characterize the rock properties of the storage zone and the geological formations above and below the storage zone. The proposed well will not be connected to the main gathering system and therefore no new pipeline will be required at this time.
3. For ease of reference and to assist the OEB with preparation of the notice of application for the Project, a map of the proposed facilities is included at Attachment 1 to this Exhibit.

4. The Crowland Storage Pool was designated as a gas storage area by Ontario Regulation 299/64. Enbridge Gas has the authority to store gas in the Crowland Storage Pool pursuant to the OEB's E.B.O. 8.
5. Subject to a favourable report from the OEB and receiving a license from the MNDRMRF, construction of the Project is planned to commence as early as September 2022. The Project is proposed to be fully placed into service by December 1, 2022. The proposed Project schedule can be found at Exhibit D, Tab 1, Schedule 1, Attachment 4.
6. If the OEB determines that it will conduct a hearing for this application, then Enbridge Gas requests that it proceed by way of written hearing in English.
7. Enbridge Gas requests that copies of all documents filed with the OEB in connection with this proceeding be served on it and on its counsel, as follows:

- | | |
|-----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (a) The Applicant | Dave Janisse
Technical Manager, Leave to Construct Applications |
| Address: | P. O. Box 2001
50 Keil Drive N
Chatham, ON N7M 5M1 |
| Telephone: | (519) 436-5442 |
| Email: | dave.janisse@enbridge.com
EGIRegulatoryProceedings@enbridge.com |
| (b) The Applicant's counsel | Tania Persad
Associate General Counsel, Regulatory Law
Enbridge Gas Inc. |

Address for personal service 500 Consumers Road
Toronto, ON M2J 1P8

Mailing Address: P. O. Box 650, Scarborough, ON M1K 5E3

Telephone: 416-495-5891

Fax: 416-495-5994

Email: tania.persad@enbridge.com

DATED at the City of Chatham, Ontario this 19th day of May, 2022.

ENBRIDGE GAS INC.

(Original Digitally Signed)

Dave Janisse
Technical Manager – Leave to Construct Applications

PROJECT NEED

1. Enbridge Gas is proposing to drill a stratigraphic test well (“EC 1”) in the Crowland Storage Pool, located in the geographic Township of Humberstone, City of Port Colborne, Regional Municipality of Niagara (“Niagara”), Ontario. The Crowland Storage Pool is a Designated Storage Area (“DSA”) as defined in s. 36.1(1)(a) of the Act.
2. In this application, Enbridge Gas is requesting that the OEB issue a favourable report to the MNDMNR for the drilling of well EC 1.
3. The Crowland Storage Pool is currently used by Enbridge Gas to balance natural gas demands in Niagara and fulfills part of the storage requirement for the Company’s regulated gas supply plan and associated utility storage operations. Further information about the Crowland Storage Pool can be found within Exhibit D, Tab 1, Schedule 1.
4. The Crowland Storage Pool was converted to natural gas storage in 1965, many years before the establishment of the original Canadian Standards Association Z341 Standard (“CSA Z341”) in 1993. The wells in the Crowland Storage Pool are at least 45 years old and therefore were not drilled in accordance with CSA Z341. Consistent with its broader storage integrity management program, Enbridge Gas is planning to complete a thorough review of the Crowland Storage Pool, including assessment of the geology of reservoir and confining formations and assessment of the condition of the existing storage and observation wells. The Crowland Storage Pool is the only remaining Enbridge Gas storage pool for which the Company does not possess core of the caprock, which is used to determine threshold pressure, porosity, and permeability of the caprock.

5. EC 1 is needed for the purpose of coring and installation of instrumentation to characterize the rock properties of the storage zone and the geological formations above and below the storage zone. The well will be cored, and upon completion of drilling activities, instrumentation will be installed in the well. The testing of the core and the information provided by the instrumentation will help Enbridge Gas to determine rock properties of the storage formation and the confining geological formations.
6. The 2021 – 2025 Enbridge Gas Asset Management Plan, which was filed within the Company's 2021 Rates proceeding, described the Crowland Wells Upgrade project, which includes the installation of new horizontal wells, an observation well, and new wellhead and master valve upgrades to existing storage and observation wells within the Crowland Storage Pool.¹ The purpose of the Crowland Wells Upgrade project is to assess and respond to potential integrity concerns associated with the existing Crowland Storage Pool wells.
7. The drilling of EC 1 is the first phase of the Crowland Wells Upgrade project. The results of the drilling and testing of the core from EC 1 will provide the data needed to finalize the next phase of the project, which is expected to entail the drilling, abandonment and upgrading of the Crowland Storage Pool wells. The determination of the final configuration of well work required in the Crowland Storage Pool will be informed by the data obtained from the stratigraphic test well.

¹ EB-2020-0181, Exhibit C, Tab 2, Schedule 1, p. 206

PROJECT ALTERNATIVES

1. As discussed in Exhibit B, Tab 1, Schedule 1, the Project is driven by the need to obtain information concerning the rock properties of the storage formation and the geological formations above and below the storage formation. This information will be used to inform future phases of the Crowland Wells Upgrade project to assess and respond to potential integrity concerns for the Crowland Storage Pool.
2. Enbridge Gas is not aware of any comparable alternative facility or non-facility solution that would enable the Company to gather information on the rock properties of these specific geological formations. No historic information of this nature exists, as there have been no other wells in the Crowland Storage Pool that have been cored and tested in the manner proposed by Enbridge Gas in this application.

PROPOSED PROJECT

Project Description

1. Enbridge Gas is proposing to drill one stratigraphic test well in the Crowland Storage Pool.
2. The Crowland Storage Pool was discovered in 1952 with the drilling of Crowland 32 and was converted to natural gas storage in 1965. Currently, the pool is operated and monitored using 16 natural gas storage wells, 7 Whirlpool Formation observation wells, and 1 Grimsby Formation observation well. The Crowland Storage Pool has a total capacity of 14,000 10^3m^3 and a working capacity of 8,100 10^3m^3 . The pool currently operates between a cushion pressure of 1,478 kPaa and a maximum pressure of 3,381 kPaa.
3. A map showing the Crowland DSA, Whirlpool isopach and depth-to-reservoir can be found in Attachment 1 to this Exhibit. The geological interpretation was completed using existing Enbridge Gas well information. The map is contoured in 1-meter intervals and shows the reservoir as having a maximum thickness of approximately 8 metres. The minimum depth to the top of the storage reservoir is 206.05 meters.
4. A cross section illustrating the reservoir structure of the Crowland Storage Pool can be found in Attachment 2 to this Exhibit. The cross section illustrates the relationship of the storage reservoir to the surrounding formations. The Cabot Head is a tight shale formation that overlies the reservoir, forming an effective caprock seal ranging in thickness from 5.4 to 12.8 meters. The lateral containment of the reservoir is formed by porosity and permeability pinchout of the Whirlpool

Formation. The bottom seal for the reservoir is the Queenston Formation, which is a tight shale that is over 250 metres thick.

5. The proposed EC 1 well will be drilled in accordance with the drilling application which was sent to the MNDMNRFF via email on April 29, 2022. Attachment 3 to this Exhibit sets out the cover letter and drilling application provided to the MNDMNRFF.
6. Drilling of the EC 1 well will occur between mid-September and November 2022, when there will be no injection or withdrawal operations in the Crowland Storage Pool. The drilling work must be done when the reservoir pressure is less than 2,100 kPa. This will allow the well to be safely drilled.
7. The drilling of EC 1 will not cause any disruption to service from the Crowland Storage Pool.
8. The well will be drilled on previously disturbed lands owned by Enbridge Gas. An all-weather laneway and gravel pad will be installed prior to the commencement of drilling operations. Upon completion of drilling operations, the drill pad will be reduced in size, a permanent access laneway will remain, and the balance of the land will be restored. There is currently no drainage tile on this property.

Project Timing

9. A construction schedule for the Project is set out as Attachment 4 to this Exhibit.

Risk to Schedule

10. The drilling of the well must take place between mid-September and November 2022 to ensure no disruption to service from the storage pool and to ensure the

pool pressure will be suitable to safely complete the drilling of the well. The pressure in the reef must remain low and static, so that any gas encountered in the well can be effectively controlled in compliance with the *Oil, Gas & Salt Resources Act* and the CSA Z341 Standard. If the wells cannot be drilled prior to November 2022, the work will have to be deferred until 2023 when Winter 2022/23 withdrawal operations have completed.

Engineering and Construction

11. All design, installation and testing of the proposed well will be in accordance with the requirements of the *Ontario Oil, Gas & Salt Resources Act* (“OGSRA”), Ontario Regulation 245/97, OGSRA Standards v.2.0, and CSA Z341.1-22.
12. Enbridge Gas understands that the OEB will require Enbridge Gas to conform to CSA Z341.1-22 to the satisfaction of the MNDMNRF. The Project design meets or exceeds the requirements of CSA Z341.1-22.
13. Enbridge Gas confirms that it will fulfill, to the satisfaction of the MNDMNRF, all the relevant requirements of CSA Z341.1-22, the OGSRA and related regulations. The following sections outline the requirements and work completed to date related to the aforementioned requirements.
14. Enbridge Gas contacted the MNDMNRF via email on May 9, 2022, to inform the MNDMNRF of Enbridge Gas’s intention to submit an application to the OEB after the MNDMNRF referred the drilling application for EC 1 to the OEB. Enbridge Gas advised that the application would contain a request for a favourable report from the OEB for the drilling of a well in the Crowland Storage Pool.

15. Enbridge Gas also informed the MNDMNRFF that the following studies had been conducted in compliance with CSA Z341.1-22 and to support the application:
- A Neighbouring Assessment for the Crowland Storage Pool as prescribed by CSA Z341.1-22.
 - A Risk Assessment (“What if” analysis of hazards and operability issues) for the Crowland Storage Pool for the proposed well drilling.
16. Enbridge Gas included copies of the executive summaries of each study and informed the MNDMNRFF that the entire studies would be made available to them in the Enbridge Gas office for their review and at their convenience. Enbridge Gas also offered to meet with the MNDMNRFF to review the studies and the proposed application.
17. The executive summaries supplied to the MNDMNRFF included the following technical information in support of the proposed drilling operations:
- An Assessment of Neighbouring Activities for the Crowland Storage Pool, as prescribed by Clause 5.2 of CSA Z341.1-22, assessing: a) wells within 1 kilometre; b) operations within 5 kilometre; and c) the integrity of all wells penetrating the storage zone.
 - “What If” Analysis of hazards and operability for the Crowland Storage Pool.
18. The executive summaries can be found at Attachment 5 to this Exhibit.
19. The executive summaries contain:
- An outline of the considerations employed in the “What If” Analysis of Hazards and Operability Issues sessions and report. A total of 268 “What If” entries were generated from the scope of CSA Z341.1-22 during the sessions and there were no action items generated from the risk ranking

sessions. It was concluded that the sessions were a complete study of the hazards and operability issues associated with the proposed drilling application.

- A synopsis of the methodology and results of the Assessment of Neighbouring Activities for the Crowland Storage Pool. The assessment identified 56 wells (both abandoned and active) that have been drilled within 1 kilometer of the Crowland Storage Pool boundary, with 29 of the wells (5 abandoned wells and 24 active wells) penetrating the storage zone. For each of the wells identified within 1 kilometer of the Crowland Storage Pool boundary, Enbridge Gas thoroughly reviewed the completions and abandonment methods, and the wells were subjected to a qualitative risk ranking evaluation. The review indicated that there will be no impact on the integrity of the storage zone from the wells (both active and abandoned) located within 1 kilometer and/or existing operations located within 5 kilometers of the Crowland Storage Pool boundary.

Engineering and Construction Risk Management

20. The drilling activities will require the Crowland Storage Pool to be taken out of service and the reservoir to be below 2,100 kPa. This will provide a suitable and safe environment to complete the proposed work. The reservoirs must be returned to normal operation by late December 2022 to ensure that there is no disruption to services for storage injections. If Enbridge Gas is not able to complete construction within the allotted window, the Project will need to be deferred to the following year.

21. Risks to the Project scope have been mitigated through geological evaluation to select the most suitable well location for a stratigraphic test well in the Crowland Storage Pool (EC 1). These techniques assess the permeability, porosity, and

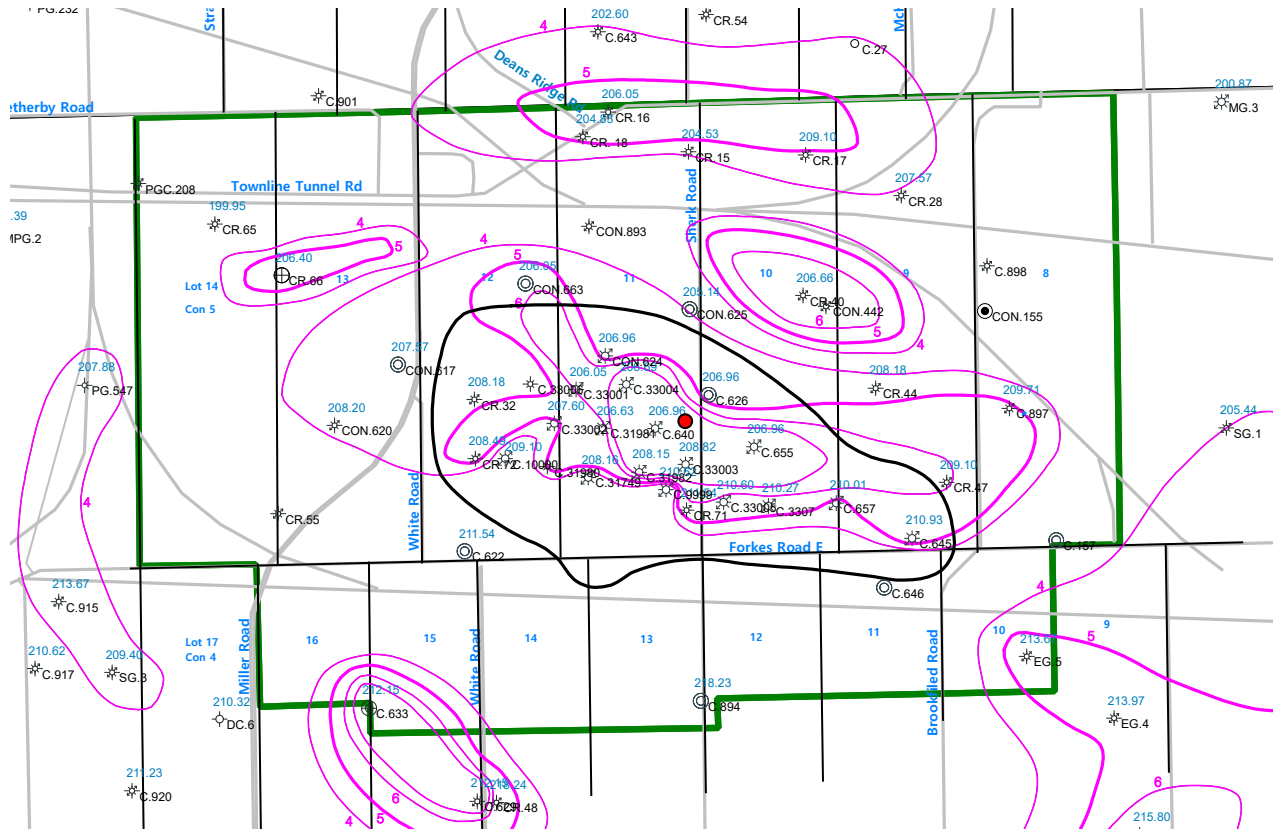
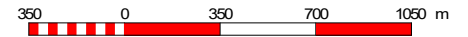
thickness of the storage formation to determine the best location for the stratigraphic test well.



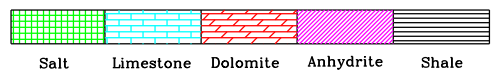
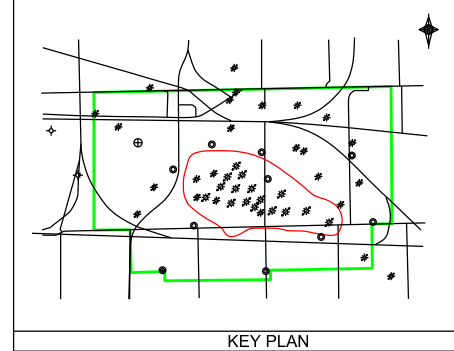
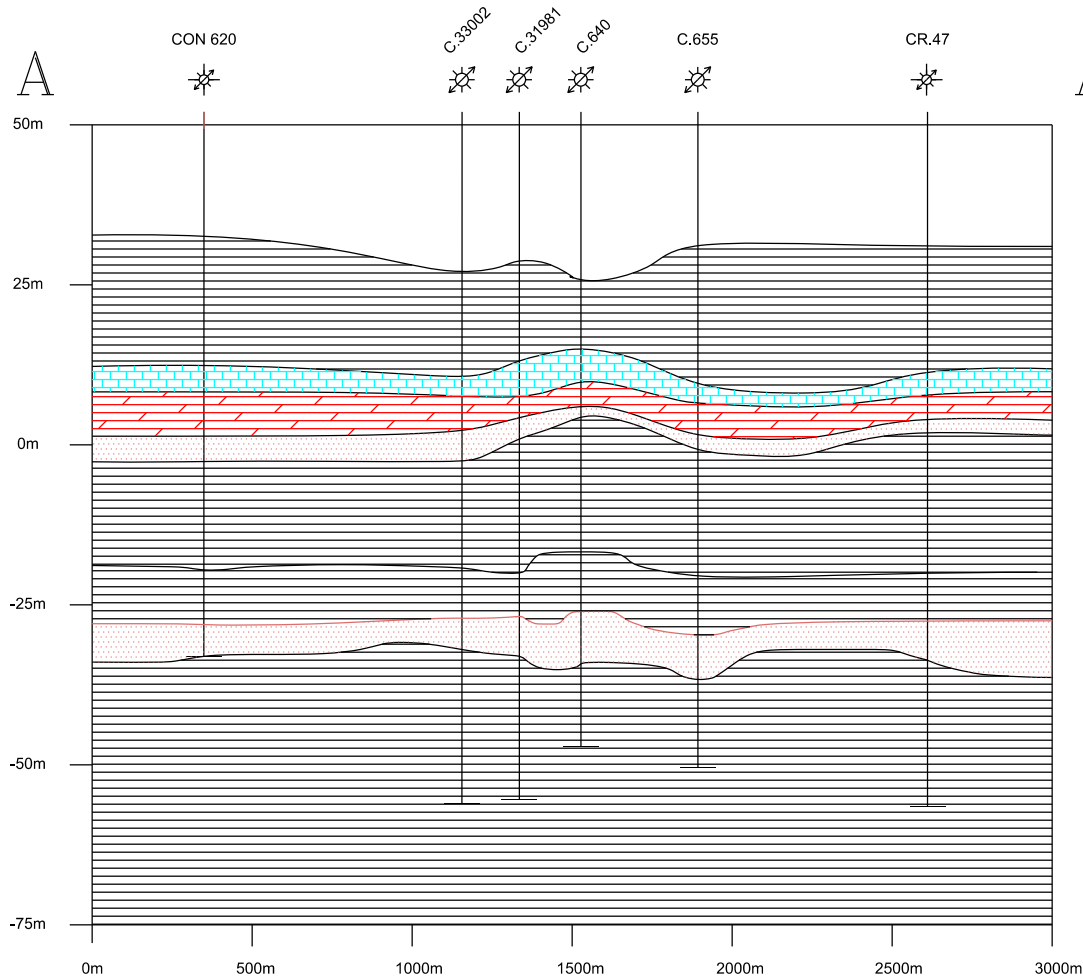
LEGEND

- 208.18** WHIRLPOOL DEPTH TO RESERVOIR
- 6** WHIRLPOOL THICKNESS
- WHIRLPOOL ISOPACH CONTOUR
- DSA- ENBRIDGE GAS INC
- POOL OUTLINE
- NATURAL GAS STORAGE
- NATURAL GAS STORAGE, ABANDONED
- OBSERVATION WELL
- OBSERVATION WELL, ABANDONED
- PROPOSED WELL LOCATION

SCALE



REMARKS	CROWLAND POOL		
	WHIRLPOOL ISOPACH MAP AND DEPTH TO RESERVOIR		
	DATE	DATE	SCALE AS SHOWN
	CHECKED BY	DATE	PROJECT CODE



REMARKS		CROWLAND POOL
VERTICAL EXAGGERATION = 20X		
HORIZONTAL SCALE SHOWN		
DEPTH OF QUEENSTON ASSUMED FOR C640		
REYNALVES AND THOROLD FORMATION DEPTHS ASSUMED FOR: CON,620, C,640, C,655 AND CR,47		CROSS SECTION A-A'
DRAWN BY	DATE	SCALE As Shown
CHECKED BY	DATE	ACDRAW CODE

From: [Michael Learn](#)
To: [POSRecords](#)
Subject: Drilling Application EC#1
Date: Friday, April 29, 2022 7:48:56 PM
Attachments: [EC1 Drilling program 4-29-2022 Signed.pdf](#)

Hello Danielle,

Please find attached the drilling program for EC#1, Humberstone 5-11-5.

Please call me on my cell for payment via Mastercard.

Michael Learn, P.Eng.

Drilling and Reservoir Engineer,
Underground Storage

—

ENBRIDGE

TEL: 519-436-4600 | CELL: 519-350-5351

50 Keil Drive N Chatham, Ontario N7M 5M1

enbridge.com

Safety. Integrity. Respect.

Application For Well Licence

***EC#1 - Humberstone - 5 -11 - 5
Crowland Pool***

**Enbridge Gas Inc.
Geology and Reservoir Engineering**

April 29, 2022



Oil, Gas and Salt Resources Act

Application for a Well Licence

Form 1

To the Minister of Natural Resources

v.2015-12-15

The undersigned operator applies for a well licence under the Oil, Gas and Salt Resources Act and the Regulations thereunder and submits the following #

1. WELL NAME EC#1 - Humberstone - 5 -11 - 5 Target Formation Queenston

Purpose of Proposed Well (Well Type) Stratigraphic Test

2. OPERATOR Enbridge Gas Inc. Tel # 519 436-4600 Fax # 519 436-4560

Street Address 50 Keil Drive North City Chatham Prov. On Postal Code N7M 5M1

Mailing Address _____ City _____ Prov. _____ Postal Code _____

Contact Name Mike Learn Contact Tel # 519-436-4600 x5002815

Email michael.learn@enbridge.com

3. LOCATION County Lambton Township Humberstone

Tract 5 Lot 5 Concession 11 Offshore: Block _____ Tract _____ Licence/Lease No. _____

Surface location, 493.8 m North South Latitude 42° 57' 6.25" Bottom-hole Lat. 42° 57' 6.25"

Lot Boundaries 54.8 m East West Longitude 79° 10' 26.94" Bottom-hole Long. 79° 10' 26.94"

Within 1.6 km of Designated Storage Area? Yes No Off-target? Yes No

4. WELL PARTICULARS Vertical Horizontal Directional Deepening Re-entry Lateral

Rig Type: Rotary Cable Well to be cored? Yes No Formation at TD Queenston

Ground Elevation 179.6 Proposed Depth 237.6 Proposed Depth TVD 237.6 Proposed Start Date Nov-22

5. POOLING

Pooling of the Spacing Unit or unitization of the Unit Area shown on the attached well location plan has been completed (see Ont. Reg. 245/97 definitions for "pooled spacing unit" and "unitize") Yes No

6. DRILLING CONTRACTOR Predator Drilling Inc. Tel # 403-264-6712

Address 2120, 500 4th Ave S.W. City Calgary Prov. AB Postal Code T2P 2V6

7. PROPOSED CASING AND CEMENTING PROGRAM

Hole Size (mm)	Casing O.D. (mm)	Weight (kg/m)	Grade	New, Used or in-hole	Setting Depth TVD	Setting Formation	CASING SETTING INFORMATION		
							How Set	Cement Type	Cement Top KB / RF
374.0	298.45	69.94	H-40	New	41.1	E Unit Carbonate	Cemented	0:1:0	4
269.9	219.10	35.70	J-55	New	157.1	Rochester	Cemented	0:1:8; 0:1:0	4
200.0	139.10	23.10	J-55	New	237.1	Queenston	Cemented	0:1:0	4

8. BLOW-OUT PREVENTION EQUIPMENT
Diverter, Annular Preventer; Blind Rams, Pipe Rams

9. WELL SECURITY Name of Trustee 1236596 Ontario Limited Total # Unplugged Wells 366 Current Balance \$70,000
Harrison Pensa & Associates

10. REMARKS

11. ENCLOSURES Fee Location Plan (Land wells only) Drilling Program

12. NOTICE OF COLLECTION

The Ministry of Natural Resources and Forestry is collecting your personal information under the authority of the *Oil, Gas and Salt Resources Act*. Any personal information provided on this application will be used for licensing and law enforcement purposes only and will be protected in accordance with the Freedom of Information and Protection of Privacy Act. If you have questions about use of your personal information, please contact the Policy and Program Officer, Petroleum Operations Section, Ministry of Natural Resources and Forestry, 659 Exeter Road, London N6E1L3, 519-873-4638.

13. AUTHORITY

The undersigned certifies that the information provided herein is complete and accurate, the operator has the right to drill or operate a well in the above location, and he/she has authority to bind the operator.

Date (d/m/y) 29-Apr-22 Name Mike Learn Signature Michael Learn Digitally signed by Michael Learn Date: 2022.04.29 19:08:23 -04'00'
 Company Enbridge Gas Inc. Title Principal Drilling and Reservoir Engineer

4346 Stauth Rd
Port Colborne, ON L3K 5V5

Take Forks Rd to Miller Rd/Regional Rd 84

- ↑ 1. Head south on Stauth Rd toward Forks Rd 3 min (2.2 km)
- ↪ 2. Turn right onto Forks Rd 500 m
- ↪ 3. Turn right onto White Rd 1.0 km

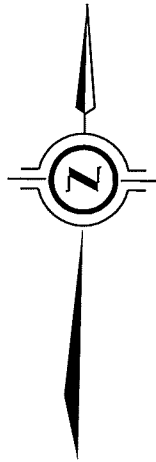
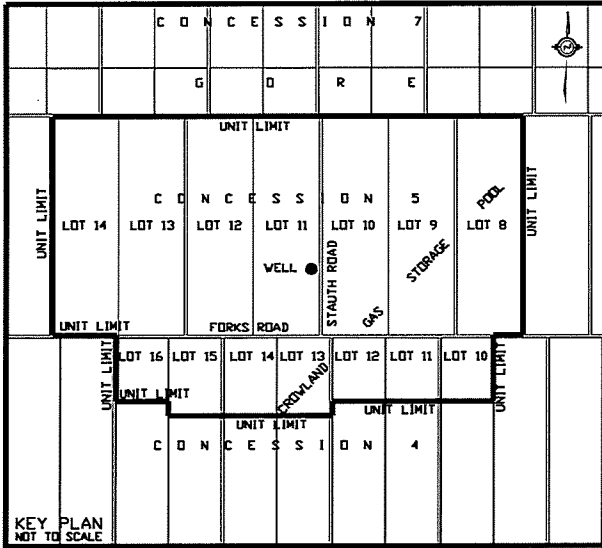
Take Townline Tunnel Rd to Third St in Welland

- ↪ 4. Turn right onto Miller Rd/Regional Rd 84 9 min (9.3 km)
- ↪ 5. Turn right onto Keefer Dr 900 m
- ↪ 6. Turn right onto Townline Tunnel Rd/Regional Rd 525 350 m
- 📍 Continue to follow Townline Tunnel Rd 5.6 km
- ↪ 7. Turn right onto Canal Bank St 1.4 km
- ↪ 8. Turn right onto Ontario Rd 300 m
- ↩ 9. Turn left onto King St 700 m

Continue on Third St to your destination

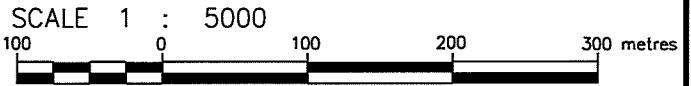
- ↪ 10. Turn right onto Third St 1 min (350 m)
- ↪ 11. Turn right 210 m
- ↪ 12. Turn right 61 m
- 📍 Destination will be on the right 98 m





PLAN OF PROPOSED WELL SITE
 WELL NAME: ENBRIDGE CROWLAND 1
 LOT 11
 CONCESSION 5
 GEOGRAPHIC TOWNSHIP OF HUMBERSTONE
 CITY OF PORT COLBORNE
 REGIONAL MUNICIPALITY OF NIAGARA
 J.D. BARNES LIMITED
 © COPYRIGHT 2022

METRIC DISTANCES AND/OR COORDINATES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048.



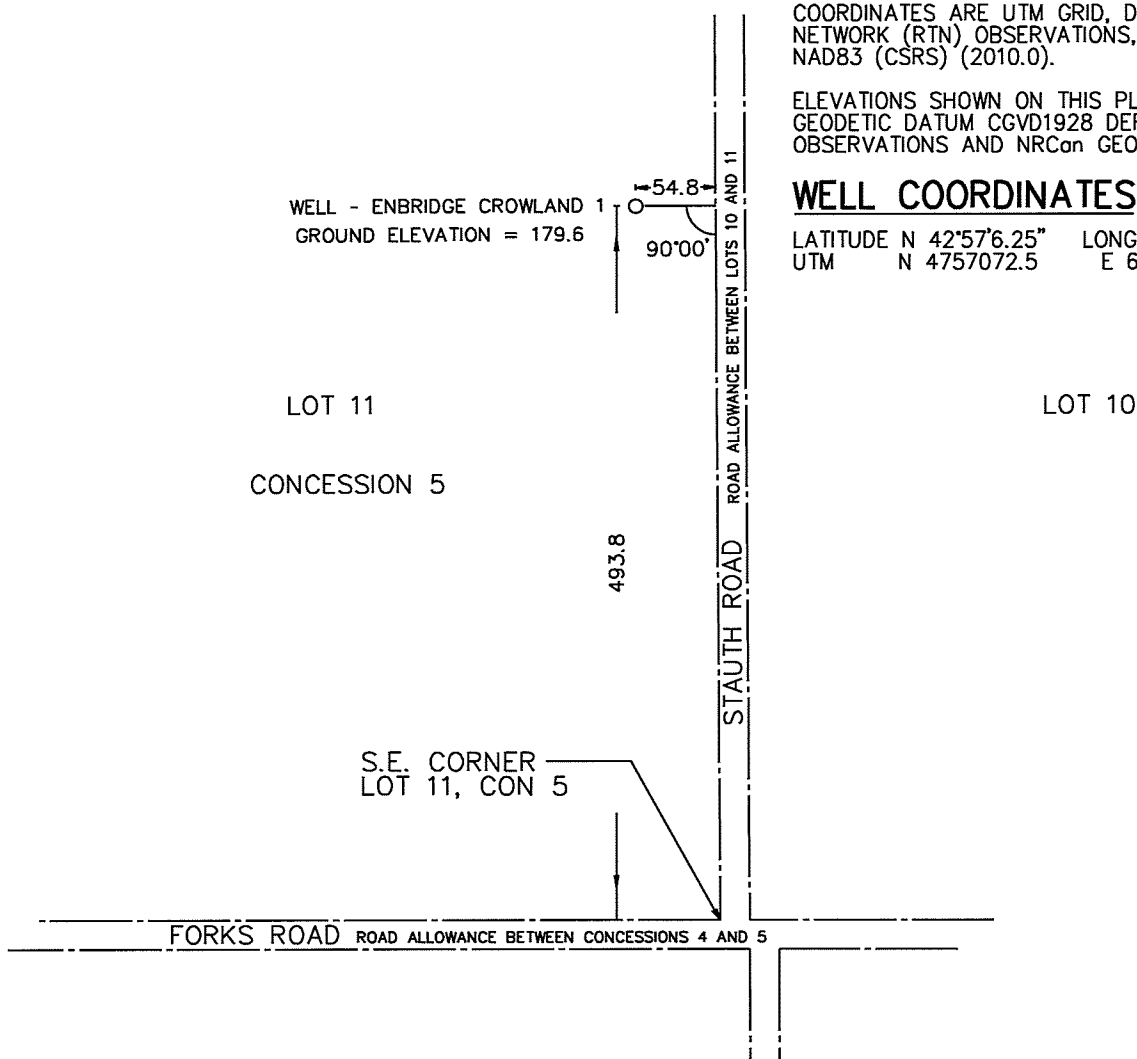
NOTES

COORDINATES ARE UTM GRID, DERIVED FROM REAL TIME NETWORK (RTN) OBSERVATIONS, UTM ZONE 17, NAD83 (CSRS) (2010.0).

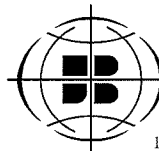
ELEVATIONS SHOWN ON THIS PLAN ARE RELATED TO GEODETIC DATUM CGVD1928 DERIVED FROM GNSS OBSERVATIONS AND NRCan GEOID MODEL HTv2.0

WELL COORDINATES

LATITUDE N 42°57'6.25" LONGITUDE W 79°10'26.94"
 UTM N 4757072.5 E 648940.2



PREPARED FOR: ENBRIDGE GAS INC.
 PREPARED BY: PAWEL BIENKOWSKI, O.L.S.
 DATE: 29/04/2022
 REF: 22-12-166-00



J.D. BARNES
 LIMITED
 LAND INFORMATION SPECIALISTS
 140 RENFREW DRIVE, SUITE 100, MARKHAM, ON L3R 6B3
 T: (905) 477-3600 F: (905) 477-3882 www.jdbarnes.com

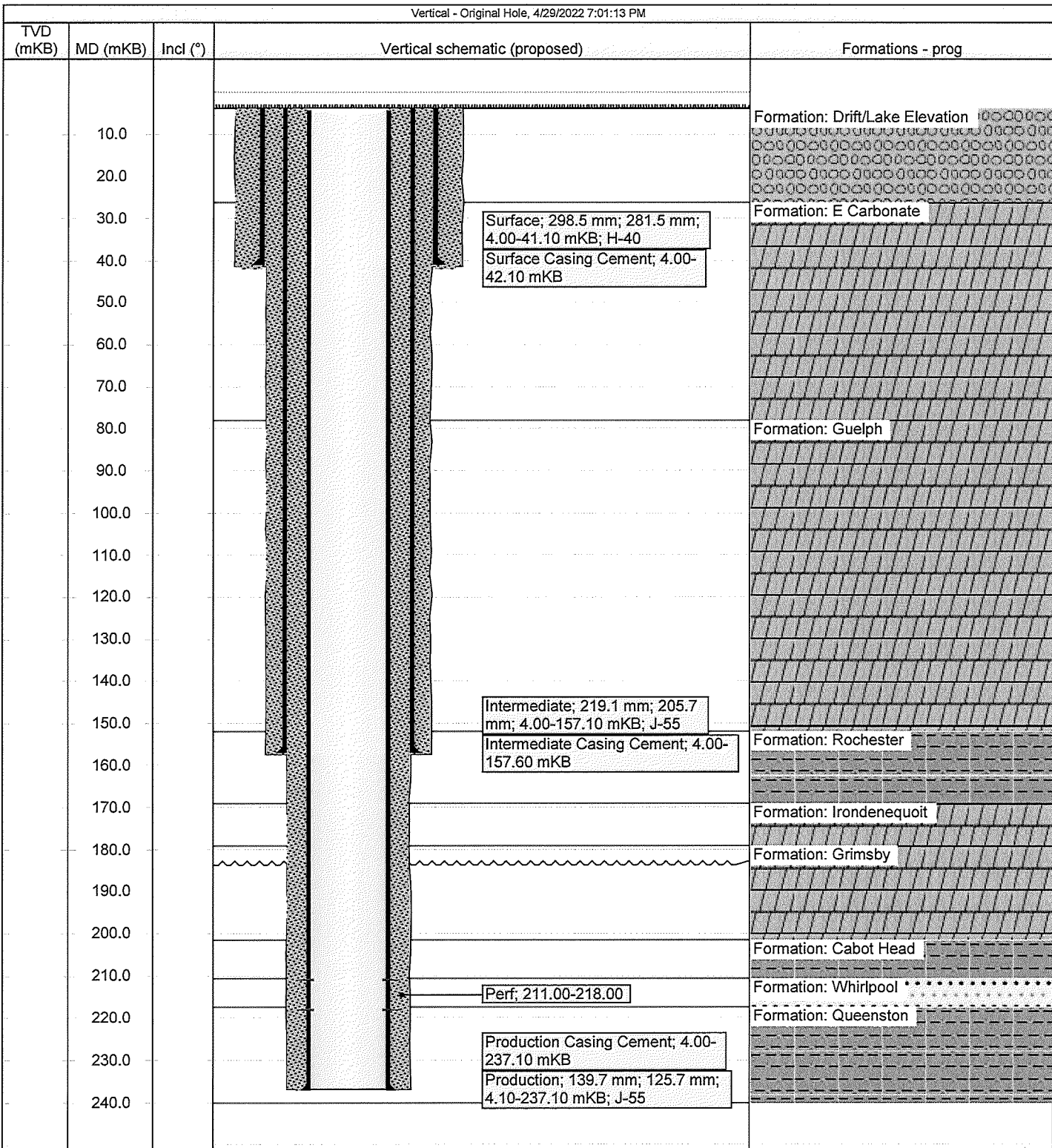
SURVEYING
 MAPPING
 GIS

Well Name: EC #1, Humberstone 5-11-5
 License Number:

Most Recent Job

Job Category Drilling	Primary Job Type Drilling - original	Secondary Job Type	Start Date	End Date
--------------------------	-----------------------------------------	--------------------	------------	----------

TD: 237.00



Contacts	
EC#1 - Humberstone - 5 -11 - 5	
Police Fire & Ambulance	911
911 Address	6399 Tecumseh Road, St. Clair Township
Tecumseh Control Room	519-862-6012
M.O.E. Spills Hotline	1-800-268-6060
MNR Contact	519-873-4645
MOL	1-877-202-0008

ENBRIDGE GAS CONTACTS

Rob Newport -	Storage Superintendent	519-683-4468 x5102178 519-365-0897	Rob.Newport@enbridge.com
Shelie Cascadden	Geologist	519-818-7008	Shelie.Cascadden@enbridge.com
Mike Learn	Drilling and reservoir engineer	519-436-4600 x5002815 519-350-5351 519-251-9701	michael.learn@enbridge.com
Kathy McConnell	Technical Manger storage and reservoir	519-862-6032 519-312-2168	kathy.mcconnell@enbridge.com
Chris Pincombe	Land Agent	519-862-6092 519-381-1408	Chris.pincombe@enbridge.com

Contractors

Contractor	Contact	Phone	Email
<u>Drilling and Cementing</u>			
Predator Drilling	Jon Picray, Tool Push	403-801-1824	jpicyray@predatordrilling.com
	Paulo Facca	403-264-6712 403-669-1372	PFacca@predatordrilling.com
Terry Marsh Well Drilling	Terry Marsh	519-695-6060 519-695-9804	
Black Creek	Ian Veen	519-834-2941 519-383-4645	
<u>Wellheads</u>			
Wellmaster	Brian DeJaegher	519-688-0500	bdejaegher@wellmaster.ca
Stream-Flo	Karen Derrick	832-647-0710	kderrick@streamflo.com
ECAN	Robert Wainwright	519-627-3824 519-468-3922	
<u>Drill Bits:</u>			
Brad Takenaka	Varel Rock Bits Canada Sales Manager	Office: 403-968-9369 Cell: 403-303-2533	btakenaka@varelintl.com
Mike Kellar	Trendon Bit Service Ltd. Director, Sales	Office: 403-990-1299	mkellar@trendoninc.com
<u>Wireline Services:</u>			
Baker Hughes	Dapo Laniya	Office: 519-332-8030 Cell: 519-339-6783	Dapo.Laniya@bakerhughes.com
Weatherford	Dave Tipping	Office: 519-683-2010 Cell: 519-436-3541	dave.tipping@canada.weatherford.com
<u>Water Hauling:</u>			
McKeegan	Melvin McKeegan	519-864-1782 519-332-7676	

Contacts

EC#1 - Humberstone - 5 -11 - 5

Harold Marcus Limited	Denis Marcus	Office: 519-695-3735 Cell: 519-380-5238	dmarcus@haroldmarcus.com
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Rental Equipment:

Dale Holland	Wheatley Wireline Services Ltd.	Office: 519-825-3680 Fax: 519-825-9348 Cell: 519-322-8015	
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Keith Davis	Ecan Energy Services Inc.	Office: 519-627-3824 Fax: 519-627-5306 Cell: 519-437-7038	kmecanen@kent.net
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Vern Anger	Canfish Services Inc. Fishing Supervisor	Office: 780-955-2600 Cell: 403-845-0012	
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Orval Beam	Orval L. Beam Limited Operations Manager Tank Rentals	Office: 519-436-0164 Fax: 519-436-0164 Cell: 519-436-4801	
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Welders:

St. Clair Mechanical President	John Dawson	Office: 519-864-0927 Cell: 519-330-9672	
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Government & Other Agencies

MNRF	Petroleum Resources Centre	Office: 519-873-4634 Fax: 519-873-4645	ogsr.mnrf.gov.on.ca
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MOECC	Spill Reporting	1-800-268-6060	
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MOL	Health & Safety	1-800-265-1676	
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Oil, Gas & Salt Resources Library		Office: 519-686-2772 Fax: 519-686-7225	
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Geological Prognosis of:

EC#1 - Humberstone - 5 -11 - 5

Lot: 5
Conc: 11
Tract: 5
Pool: Crowland

Township: Humberstone
County: Welland
Objective: Stratigraphic Test
Coordinates: 493.8 m. **North**
 54.8 m. **West**
UTM Coords: 648940.2, 4757072.5

Geology Contacts: Shelie Cascadden 436-4600 x5002153 (work) 519-818-7008 (cell)

Remarks: Base of Gas -534
 Tops derived from Tops derived from C640 and C626

Contacts	Top (m.)	Elev.(m.)	Thickness	Gas	Oil	H2O	Remarks/Expected Pressure
Rig Floor	0.0	183.6	4.0				
Ground Elevation	4.0	179.6	22.1				Actual
E Unit Carbonate	26.1	157.5	52.0			x	Fresh Water @ 26.5m
C Unit Shale			0.0				
A-2 Unit Carbonate			0.0				
Guelph	78.1	105.5	74.0				Sulpher water possible
Goat Island			0.0				
Rochester	152.1	31.5	17.0				
Irondonequoit	169.1	14.5	10.0				
Reynales/Fossil Hill			0.0				
Thorold			0.0				
Grimsby	179.1	4.5	22.5				
Cabot head	201.6	-18.0	9.0				
Whirlpool	210.6	-27.0	7.0				
Queenston	217.6	-34.0	20.0				
Total Depth	237.6	-54.0					

Sample Requirements:

One sample shall be collected every 3 meters of formation drilled once the E Carbonate/bedrock is reached

WELLBORE, CASING AND CEMENTING SUMMARY

EC#1 - Humberstone - 5-11 - 5

Description	Hole Size (mm)	MD / TVD (mKB)	Drilling Fluids	Casing Size, Grade, Weight kg/m	Formation @ Depth	Depth Into Formation (m)	How Set
Conductor Hole	374	27.1	n/a	406	E Unit Carbonate	1	Driven - Cement squeeze if necessary. If a rotary rig is used for the drilling of the well conduction casing will not be run
		27.1		LP			
				n/a			
Surface Hole	374	41.6	n/a or water	298.45	E Unit Carbonate	15.5	Cement to surface with 6.96 Class G 0-1-0 cement with 2-3% CaCl2. See Cement Program for volumes
		41.6		H-40			
				69.94			
Intermediate Hole	269.9	157.6	Fresh Water	219.10	Rochester	5.5	Cement to Surface with 0.21 Tonne Class G 0-1-8 plus 1-3% CaCl2 followed by 8.67 Class G with 1-3% CaCl2. Depending on hole conditions, consideration may be given to running tixotropic cement or additional loss circulation materials
		157.6		J-55			
				35.70			
Production Hole	200	237.6	Fresh Water	139.10	Queenston	20	Cement to surface with 9.74 Tonnes Class G, 0-1-0 with 2% CaCl2+10% NaCl. See Cement Program for details
		237.6		J-55			
				23.10			
All depths referenced to 4.0 mKB							

DRILLING PROCEDURE

EC#1 - Humberstone - 5 -11 - 5

Pre Spud

Fresh Water Well samples

Obtain samples from all fresh water wells located within a minimum radius of 750m of the proposed well. Perform water analysis and keep copies of the results.

Site Preparation

Prepare drilling location.
Locate all drainage tiles crossing lease area.
Strip and stockpile all top soil from lease.
Construct adequate berms around lease and access road as required.
Cut, block and divert drainage tile as required.

Government Notification

Underground Storage to notify M.N.R.F. 48 hours prior to spud and prior to resumption of drilling activities.

Signs

Install rig sign on access road to lease.

Safety Meeting

Conduct a pre-spud safety meeting for all crews. Rig Manager and all crew members must be present.

Additional safety meetings shall be conducted at the Well Site Supervisor's discretion.

DRILLING PROCEDURE

EC#1 - Humberstone - 5 -11 - 5

CONDUCTOR AND SURFACE HOLE - CABLE TOOL

1. Move in and rig up cable tool drilling rig.

Note: All depths referenced to 4.0 mKB

2. Drill and drive 406 mm conductor pipe 1 m into E Unit Carbonate (27.1 mKB) with a 374 mm bit. Ensure that fresh water is shut off before proceeding.

Note: Record fresh water interval

3. Record conductor casing OD, weight, grade and set depth.
4. Drill minimum 15.5 m into E Unit Carbonate (41.6 mKB) with a 374 mm bit.

Note: One sample shall be collected every 3 m once E Unit Carbonate is reached.

5. Hold Safety Meeting
6. Run 298.45 mm surface casing to bottom (41.6 mKB) with centralizers 2m above shoe and at joints 2, 4 and 8. Tack weld guide shoe on bottom. The optimum makeup torque is 4170 N-m (3070 ft-lb) and the maximum makeup torque is 5210 N-m (3840 ft-lb).
7. Record surface casing OD, weight, grade, placement of cementing hardware and set depth.
8. Raise surface casing 0.5 m off bottom and set in slips. Cement 298.45 mm surface casing to surface as per cementing program.
9. Wait on cement (W.O.C.) for 24 hours.
10. Record cement top in casing.
11. Rig out cable tool rig.
12. Rig in rotary rig.

Measure height of rig floor to ground and adjust drilling program

SURFACE HOLE - ROTARY

1. Move in and rig up rotary drilling rig.
Measure height of rig floor to ground and adjust drilling program
2. Drill minimum 15.5 m into E Unit Carbonate (41.6 mKB) with a 374 mm bit.
One sample shall be collected every 3 m once E Unit Carbonate is reached.
3. Hold Safety Meeting
4. Run 298.45 mm surface casing to bottom (41.6 mKB) with centralizers 2m above shoe and at joint 2. Tack weld guide shoe on bottom. The optimum makeup torque is 4170 N-m (3070 ft-lb) and the maximum makeup torque is 5210 N-m (3840 ft-lb).
5. Record surface casing OD, weight, grade, placement of cementing hardware and set depth.
6. Raise surface casing 0.5 m off bottom and set in slips. Cement 298.45 mm surface casing to surface as per cementing program.
7. Wait on cement (W.O.C.) for 24 hours.
8. Record cement top in casing.

DRILLING PROCEDURE

EC#1 - Humberstone - 5 -11 - 5

INTERMEDIATE HOLE - ROTARY

1. Pressure Test entire BOP system and surface casing to 1225 kPag for 10 minutes and record results in log according to OGSRA Operating Standards v 2.0 sec. 4.5.2.1
2. Drill out cement with 269.9 mm bit.
3. Drill 0.5 m of new formation.
4. Hold safety meeting. Pressure Test surface casing and BOP in accordance with Pressure Test Program - Surface Casing-Pressure Test
5. Drill until at the top of Grimsby formation (179.1 mKB) with 269.9 mm bit, surveying every 30 m.

Note: Geologist must be on site to verify top of Grimsby.

6. Drill 5.5m into the Grimsby formation to 157.6m with 269.9 mm bit or as directed by company personnel
7. Hold safety meeting. Run the 219.1 mm intermediate casing to (157.1 mKB) with a float collar at top of bottom joint. Centralizers should be placed 2 m above shoe, at joints 2, 4 and 5 and every 5th joint to surface. Cement basket should be placed above Detroit River formation. Threadlock guide shoe on bottom.
8. The optimum makeup torque is 6480 N-m (4770 ft-lb) and the maximum makeup torque is 8090 N-m (5960 ft-lb). Land casing at proper elevation for thread-on type casing bowl.
9. Record intermediate casing OD, weight, grade, placement of cementing hardware and set depth.
10. Prepare to cement 219.1 mm intermediate casing to surface.
11. Hold safety meeting with all on-site personnel.
12. Pressure test surface equipment to 15 MPag for 1 minute. Ensure no leaks.
13. Pump citric acid followed by fresh water pre-flush. Cement to surface as per cementing program. Ensure cement returns to surface. Take a minimum of four cement samples. Record all circulating pressures and volumes.
14. W.O.C. for 48 hours.
15. Hold Safety Meeting. Cased Hole Logging. See *LOGGING PROGRAM, Log Run 1*.
16. Pressure Test Pipe Rams to 1400 kPag for ten minutes. Pressure Test the entire BOP system to 7000 kPag for 10 minutes and record results in log according to OGSRA Operating Standards
(This pressure test also tests the casing and casing bowl requirement of 5,500 kPag.)

DRILLING PROCEDURE

EC#1 - Humberstone - 5 -11 - 5

Production Hole

1. Drill a maximum of 0.5 m of new formation with 200 mm bit.
2. Prepare for Pressure Integrity Test (P.I.T.). Using a low volume, high pressure pump, pressure test the formation at a pressure equivalent to a gradient of 18 kPa/m for 10 min using an incompressible fluid.
3. Drill 1 m into the Grimsby formation to 180.1 m with 200 mm bit or as directed by company personnel
4. Rig in Coring contractor.

Note: Geologist will be onsite to retrieve and package core samples and ensure that the core is preserved for analysis.

5. Run into hole with 159 mm X 88 mm core barrel. The core will be retrieved by wireline in 9 m sections.
6. Core to 220 mKb as per CORING PROGRAM

Note Geologist will be onsite to verify top of Queenston formation.

7. Rig out coring contractor
8. Drill 20 m into the Queenston (237.6m) with 200 mm bit. Survey every 30m
10. Hold Safety Meeting. Open Hole Logging. See *LOGGING PROGRAM, Log Run 2.*
11. Run 139.1 mm production casing to 237.1mKB with insert float at top of bottom joint. Centralizers to be placed 2 m above shoe, at joints 2, 3, 4 and 5 and every 4th joint to surface. Tack weld guide shoe on bottom. The optimum makeup torque is 2740 N-m (2020 ft-lb) and the maximum makeup torque is 3440 N-m (2530 ft-lb). Ensure that a collar is not positioned where the wellhead seals need to be installed.
12. Record production casing OD, weight, grade, placement of cementing hardware and set depth.
13. Hold safety meeting.
14. Prepare to cement 139.1 mm production casing to surface.
15. Pressure test surface equipment to 15 MPag for 1 minute. Ensure no leaks.
16. Pump citric acid followed by fresh water pre-flush. Cement to surface as per Cementing Program - 139.7mm PRODUCTION CASING. Displace cement with fresh water. Ensure cement returns to surface or arrange for remedial cementing from surface. Take a minimum of four cement samples to verify setup time and density. Record all circulating pressures and volumes.
17. Lift BOP and set casing slips.
18. Set primary seals. Cut off casing to proper height. Install casing spool.
19. Install master valve and suspend the well with wireline retrievable bridge plug in accordance with Section 5 of the OGSRA Operating Standards v.2.0.
20. Rig out rotary drilling rig.
21. Rig in Service rig
22. Drill out cement to 225 mKb
23. Rig in wireline company.
24. Perforate well from 211 mKb to 218 mKb with 10 shots per meter.
25. Hold Safety Meeting. Cased Hole Logging. See *LOGGING PROGRAM, Log Run 3.*
26. Rig out wireline company.
27. Bail hole dry
28. rig out service rig
29. Install blind flange on top of master valve.

DRILLING PROCEDURE

EC#1 - Humberstone - 5 -11 - 5

30. Drilling department to notify M.N.R.F. within 48 hours of reaching TD.

CASING PROGRAM

EC#1 - Humberstone - 5-11-5

CONDUCTOR CASING SUMMARY (Cable Tool: 1.9 m KB-GL) (CABLE TOOL ONLY)

Description	Metric		Imperial	
	Value	Unit	Value	Unit
Top	0.0	mKB	0.0	ftKB
Bottom	27.1	mKB	88.9	ftKB
Outside Diameter	406.00	mm	15.984	inches
Weight	96.70	kg/m	65.0	lb/ft
Drift Diameter	382.60	mm	15.063	inches
Inside Diameter	488.95	mm	19.250	inches
Grade	H40		H40	
Thread	N/A		N/A	
Coupling	Welded		Welded	
Burst	N/A		N/A	psi
Collapse	N/A	kPa	N/A	psi
Pipe Body Yield Strength	N/A	daN	N/A	lb-f
Joint Strength	N/A	daN	N/A	lb-f
Torque - Optimum	N/A	N-m	N/A	ft-lb
Torque - Maximum	N/A	N-m	N/A	ft-lb
Condition	New			
Float Equipment	None			
Shoe	Drive			
Threadlock	Tack weld drive shoe on bottom joint of casing			

SURFACE CASING SUMMARY (Cable Tool: 1.9 m KB-GL)

Description	Metric		Imperial	
	Value	Unit	Value	Unit
Top	0.0	mKB	0.0	ftKB
Bottom	41.1	mKB	134.8	ftKB
Outside Diameter	298.45	mm	11.750	inches
Weight	69.94	kg/m	47.0	lb/ft
Drift Diameter	277.60	mm	10.929	inches
Inside Diameter	281.50	mm	11.083	inches
Grade	H-40		H-40	
Thread	8 Rd.		8 Rd.	
Coupling	N/A		N/A	
Burst	11,310	kPa	1,640	psi
Collapse	10,410	kPa	1,510	psi
Pipe Body Yield Strength	478,000	daN	736,000	lb-f
Joint Strength	136,600	daN	307,000	lb-f
Torque - Optimum	4,170	N-m	3,070	ft-lb
Torque - Maximum	5,210	N-m	3,840	ft-lb
Condition	New			
Float Equipment	None			
Centralizers	Joints 2, 4 and 8			
Shoe	Guide			
Threadlock	Threadlock guide shoe on bottom joint of casing			

CASING PROGRAM

EC#1 - Humberstone - 5-11 - 5

INTERMEDIATE CASING SUMMARY

Description	Metric		Imperial	
	Value	Unit	Value	Unit
Top	0.0	mKB	0.0	ftKB
Bottom	157.1	mKB	515.4	ftKB
Outside Diameter	219.10	mm	8.626	inches
Weight	35.70	kg/m	24.0	lb/ft
Drift Diameter	202.50	mm	7.972	inches
Inside Diameter	205.60	mm	8.094	inches
Grade	J-55		J-55	
Thread	8 Rd.		8 Rd.	
Coupling	ST & C		ST & C	
Burst	21,170	kPa	3,070	psi
Collapse	9,450	kPa	1,370	psi
Pipe Body Yield Strength	169,500	daN	381,000	lb-f
Joint Strength	108,500	daN	244,000	lb-f
Torque - Optimum	6,480	N-m	4,770	ft-lb
Torque - Maximum	8,090	N-m	5,960	ft-lb
Condition	New			
Float Equipment	Float Collar (Top of 1 st joint)			
Centralizers	Joints 2,4 & 5; every 4 th joint & 10 m from surface			
Cement Basket	Run above Detroit River formation			
Shoe	Guide			
Threadlock	Threadlock guide shoe on bottom joint of casing			

PRODUCTION CASING SUMMARY

Description	Metric		Imperial	
	Value	Unit	Value	Unit
Top	0.0	mKB	0.0	ftKB
Bottom	237.1	mKB	777.9	ftKB
Outside Diameter	139.10	mm	5.476	inches
Weight	23.10	kg/m	15.5	lb/ft
Drift Diameter	122.60	mm	4.827	inches
Inside Diameter	125.70	mm	4.949	inches
Grade	J-55		J-55	
Thread	8 RD		8 RD	
Coupling	ST & C		ST & C	
Burst	27,100	kPa	3,930	psi
Collapse	27,850	kPa	4,040	psi
Pipe Body Yield Strength	110,300	daN	248,000	lb-f
Joint Strength	96,500	daN	217,000	lb-f
Torque - Optimum	2,740	N-m	2,020	ft-lb
Torque - Maximum	3,440	N-m	2,530	ft-lb
Condition	New			
Float Equipment	Float Collar (Top of 1 st joint)			
Centralizers	Joints 2,4 & 5; every 4 th joint & 10 m from surface			
Shoe	Guide			
Threadlock	Threadlock guide shoe on bottom joint of casing			

CEMENTING PROGRAM

EC#1 - Humberstone - 5-11-5

SURFACE CASING

Equipment

- Pumping unit
- Cementing head (plug loading type)
- One 406.0 mm wiper plug

CEMENT SPECIFICATIONS

Description	Cable Tool Value Unit	Rotary Value Unit
Top	0.0 mKB	0 mKB
Bottom	41.1 mKB	41.1 mKB
Pre-sweep (Fresh Water)	2.00 m ³	2.00 m ³
Cement Excess (Openhole)	100%	100%
Cement Excess (Cased Hole)	30%	30%
Cement Type	0:1:0	0:1:0
Mix Water	Fresh	Fresh
Additives	3% CaCl ₂	3% CaCl ₂
Density	1901 kg/m ³	1901 kg/m ³
Water Requirement	0.440 m ³ /t	0.440 m ³ /t
Yield	0.757 m ³ /t	0.757 m ³ /t
Cement Volume	5.27 m ³	3.28 m ³
Cement Yield	6.96 tonnes	4.33 tonnes
Displacement #1 (Fresh Water)	0.50 m ³	0.50 m ³
Displacement #2 (Brine)	2.06 m ³	2.06 m ³
Displacement Rate	0.6 - 0.8 m ³ /min	0.6 - 0.8 m ³ /min
W.O.C.	24 hrs	24 hrs
24 Hr. Compressive Strength	20,684 kPa	20,684 kPa

CEMENTING PROCEDURE

1. Run casing.
2. Pump pre-sweep, pump cement, drop top plug. DO NOT PUMP OUT LINES.
3. Displace plug with water. DO NOT OVERDISPLACE MORE THAN 1/2 SHOE JOINT VOLUME.
Bump plug 3,500 kPa over pumping pressure.
4. Maintain a constant pump rate throughout the cement job.
5. Catch cement slurry samples while mixing and set aside.
6. Observe setting time and cement quality.
7. If no cement returns to surface, consult with Storage Operations Supervisor regarding re-cementing from top with macaroni string using Class 'G' cement + 3% CaCl₂.
8. Obtain a 1 litre sample of the dry cement used in the cement job. This will be used for testing if subsequent cement problems occur (i.e. flash setting).

CEMENTING PROGRAM

EC#1 - Humberstone - 5-11-5

INTERMEDIATE CASING

Equipment

- Pumping unit
- Cementing head (plug loading type)
- One 298.5 mm wiper plug

NOTE:

Lead Cement: Surface to top of Bois Blanc
 Tail Cement: Top of Bois Blanc to casing shoe

CEMENT SPECIFICATIONS

Description	Lead		Tail	
	Value	Unit	Value	Unit
Top	0.0	mKB	0.0	mKB
Bottom	0.0	mKB	157.1	mKB
Pre-sweep #1 (Citric Acid)	3.00	m ³		N/A
Pre-sweep #2 (Fresh Water)	1.00	m ³		N/A
Cement Excess (Openhole)	100%		100%	
Cement Excess (Cased Hole)	30%		30%	
Cement Type	0:1:8	Class 'G'	0:1:0	Class 'G'
Mix Water		Fresh		Fresh
Celloflakes	2	bags		N/A
Prehydrated Gel		2%		N/A
Additives	0.75%	T-10	2% CaCl ₂ ;	0.75% T-10
Density	1604	kg/m ³	1901	kg/m ³
Water	0.864	m ³ /t	0.440	m ³ /t
Yield	1.212	m ³ /t	0.757	m ³ /t
Cement Volume	0.25	m ³	6.56	m ³
Cement Yield	0.21	tonnes	8.67	tonnes
Pump Rate	0.6 - 0.8	m ³ /min	0.6 - 0.8	m ³ /min
Displacement #1 (Fresh Water)	N/A	m ³	0.50	m ³
Displacement #2 (Brine)	N/A	m ³	4.40	m ³
W.O.C.	48	hrs	48	hrs
24 Hr. Compressive Strength	1379	kPa	15,858	kPa

CEMENTING PROCEDURE

1. Run casing.
2. Pump pre-sweep, pump Lead cement, pump Tail Cement and drop wiper plug. DO NOT PUMP OUT LINES.
3. Displace plug with fresh water and then brine. DO NOT OVERDISPLACE MORE THAN 1/2 SHOE JOINT VOLUME. Bump plug 3,500 kPa over pumping pressure.
4. Maintain a constant pump rate throughout the cement job.
5. Catch cement slurry samples while mixing and set aside.
6. Observe setting time and cement quality.
7. If no cement returns to surface, consult with Storage Operations Supervisor regarding re-cementing from top with macaroni string using Class 'G' cement + 3% CaCl₂.
8. Obtain a 1 litre sample of the dry cement used in the cement job. This will be used for testing if subsequent cement problems occur (i.e. flash setting).
9. Run a Cement Bond Log (CBL) to evaluate the integrity of the cement bond and to locate the position of the cement top.

CEMENTING PROGRAM

EC#1 - Humberstone - 5-11 - 5

PRODUCTION CASING

Equipment

- Pumping unit
- Cementing head (plug loading type)
- One 219.1 mm wiper plug

CEMENT SPECIFICATIONS

Description	Value	Unit
Top	0.0	mKB
Bottom	237.1	mKB
Pre-sweep (Citric Acid)	3.00	m ³
Pre-sweep (Fresh Water)	1.00	m ³
Cement Excess (Openhole)	100%	
Cement Excess (Cased Hole)	30%	
Cement Type	0:1:0	Class 'G'
Mix Water	10%	Salt Water
Fluid loss/Dispersant	0.75%	T-10
Gas Block (if required)	0.4%	D-24
Density	1901	kg/m ³
Water Requirement	0.440	m ³ /t
Yield	0.772	m ³ /t
Cement Volume	7.52	m ³
Cement Yield	9.74	tonnes
Pump Rate	0.6 - 0.8	m ³ /min
Displacement (Brine)	0.75	m ³
W.O.C.	48	hrs
24 Hr. Compressive Strength	6,895	kPa

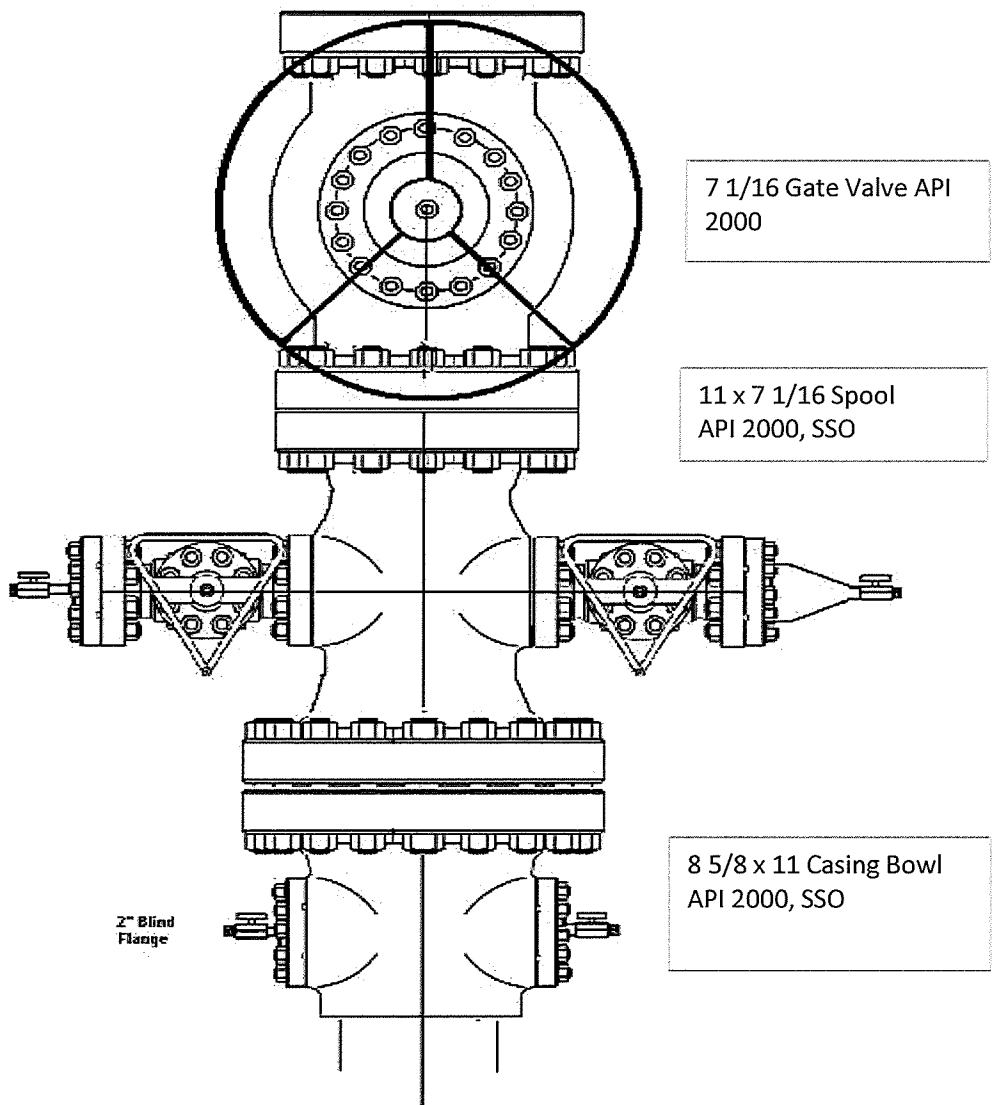
NOTE: Cement program may be changed if well integrity conditions dictate

CEMENTING PROCEDURE

1. Run casing and set casing slips.
2. Pump pre-sweep, pump cement, drop top plug. PUMP OUT LINES.
3. Displace plug with brine. DO NOT OVERDISPLACE MORE THAN 1/2 SHOE JOINT VOLUME.
Bump plug 3,500 kPa over pumping pressure.
4. Maintain a constant pump rate throughout the cement job.
5. Catch cement slurry samples while mixing and set aside.
6. Observe setting time and cement quality.
7. If no cement returns to surface, consult with Storage Operations Supervisor regarding re-cementing from top with macaroni string using Class 'G' cement + 3% CaCl₂.
8. Obtain a 1 litre sample of the dry cement used in the cement job. This will be used for testing if subsequent cement problems occur (i.e. flash setting).
9. Run a Cement Bond Tool to evaluate the integrity of the cement bond and to locate the position of the cement top.

WELLHEAD

EC#1 - Humberstone - 5 -11 - 5



PRESSURE TEST PROGRAM

EC#1 - Humberstone - 5 -11 - 5

SURFACE CASING - PRESSURE TEST

1. Pressure Test surface casing to 1380 kPag for 10 minutes and pressure test BOP system to a pressure equivalent to one- half its working pressure. Record results in log according to OGSRA Operating Standards v 2.0 sec. 4.5.21.

INTERMEDIATE CASING - PRESSURE TEST

1. Pressure Test Intermediate casing to 1380 kPag for 10 minutes and pressure test annular preventer to a pressure equivalent to one- half its working pressure. Record results in log according to OGSRA Operating Standards v 2.0 sec. 4.5.21.

PRODUCTION HOLE - PRESSURE INTEGRITY TEST (PIT)

1. Drill 0.5 m of new formation.
2. Using a low volume, high pressure pump, pressure test the formation at a pressure equivalent to a gradient of 18 kPa/m for a duration of ten (10) minutes using an incompressible fluid.

PRODUCTION CASING - PRESSURE TEST

1. Pressure test wellhead and production casing to 13,790 kPa for four (4) hours.
2. Install Wellhead and Master Valve and 177.8 mm BOP. The lubricator and components shall have a minimum pressure rating of 120% of the formation pressure. Pressure test annular preventer to 1380kPa for 10 minutes. Pressure test annular preventer to 7000 kPa for 10 minutes

LOGGING PROGRAM

EC#1 - Humberstone - 5 - 11 - 5

#	Logging Interval	Hole Condition		Comments
		Fluid Filled	Gas Filled	
1	Intermediate-Surface	Gamma Ray Cement Bond Log		Logs run after 48 hr WOC
2	TD-185 Open hole	Gamma Ray Compensated Neutron Z-Density* Sonic Resistivity Magnetic Resonance	Gamma Ray Linear Porosity Neutron* Z-Density*	
3	Production - Surface	Cement Bond Log High Res Vertilog Gamma Ray		Logs run after 48 hr WOC

NOTE: * open hole section only

CORING PROGRAM

EC#1 - Humberstone - 5-11-5

General Information:	Value	Unit	Comments
Core Interval (Top):	180.1	mKB	
Core Interval (Bottom):	220.0	mKB	
Core Length	39.9	m	
Core Bit Diameter:	143.0	mm	
R.F.- Ground:	4.0	m	

NOTE: Hold safety meeting prior to making up core barrel
Coring will 24 hours per day.

Procedure:

1. Head up wellhead and BOP including pipe rams, blind rams and annular preventor.
2. Function test all preventors. Record results.
3. Ensure geologist is on-site.
4. Hold safety meeting with all on-site personnel.
5. Prepare for coring.
6. Run into hole with 158.8 mm OD core bit, 121 mm x 88.9 mm barrel, eight (8) 114.3 mm drill collars and drill pipe to surface.
7. Core with brine from 180.1 - 220 mKB in 9 m intervals.

ABANDONMENT PROGRAM

EC#1 - Humberstone - 5-11 - 5

If drilling results prove unsuccessful, the well will be plugged and abandoned as follows:

- 1 Notify MNRF by fax 48 hrs prior to commencing plugging operations
- 2 Run tubing to TD and cement to surface with 13.5 m³ total of 0:1:0 Class 'G' neat cement. Multiple cement job may be required
- 3 Pull all tubing from well.
- 4 Wait on cement overnight.
- 5 Tag cement top, repeat cementing if necessary
- 6 Ensure cement top is at surface.
- 7 Cut all casing strings off a minimum of 1.0 m below grade and weld on steel plate.
- 8 Restore surface location to original condition.

Executive Summary

Date: February 2022

**Title: "What if" Analysis of Hazards and Operability Issues
New Well Drilling Project 2022 - Crowland Pool - Stratigraphic Well CRW 01**

Authors: Gordon Cowan, P.Eng., Mohamad Ardati, U G M Engineering Ltd.

U G M Engineering was contracted to prepare a "What if" Analysis for the Crowland Pool concerning the New Well Drilling Project 2022.

U G M qualitative HAZOP assessments consider the Crowland Pool facilities as a whole, in its examination of natural gas storage reservoir risk. Qualitative HAZOP assessments are modelled from, and derivatives of, qualitative risk assessment methodologies used in the chemical process industry that have been adapted for natural gas storage application. Such assessments are focused on large scale releases of natural gas through upset events.

The "What if" Analysis report describes the virtual "What if" hazard assessment session that took place on January 11th, 2022.

This Crowland Z341 exercise used a substantially different methodology from previous CSA Z341.1-18 Drilling Project qualitative risk assessments, in that the Reservoir Considerations System was covered by electronic file management between UGM and EGI geology experts; the Site Considerations and New Well Drilling Systems were covered by a two hour virtual meeting session, and the remaining Systems were covered by using the previous DR21 TKC 68V session records altered by the team leader to provide specific coverage of Crowland Pool. This treatment is specific for this single stratigraphic well drilling exercise and Revision O report. The remainder Revision 1.0 report will be covered by in-room sessions to be held in Q3 2022 on EGI premises. The intent of this treatment is to provide valid hazard assessment for the stratigraphic well through virtual sessions, with further coverage over the larger DR22 project to be provided by a Revision 1.0 release. Confidence in public protection is provided by previous complete Z341 Crowland work in 2016, and Revision O quantified consideration of the Crowland Pool.

The session was attended by the "What if" Leader and three technical experts. The preparation for the session, selection of the project scope systems, subsystems, session conduction, and reporting function for the "What if" analysis was performed by UGM team leader Gordon W. Cowan, P.Eng., using PHA Pro 8.8 software for recording, organizing and reporting functions.

A total of 268 "What ifs" concerning Crowland Pool were generated from the scope of the CSA Z341.1-18, and examined in the session. Risk ranking was performed for each "What if," using the 7+7 Enbridge Standardized Operational Risk Matrix as a relative risk expression.

Risk, as expressed by the 7+7 matrix, is a qualitative expression made up of the session group's assignment of values for likelihood and severity (labelled "Consequence" on the matrix), which are then added together to provide an expression of risk.

The operability, and storage aspects of the project were of primary concern for the "What if" examinations. Financial, safety, environmental, public impact, and personnel protection issues were also addressed. For all the systems examined, the group as a whole determined whether the system/question/topic had been covered in adequate depth.

It was concluded that the "What if" session records and risk rankings, consideration of the development location, and the review of qualitative aspects of the Crowland Pool formed a complete study of the Crowland Pool Drilling Revision Original Stratigraphic well Project, within the scope of the CSA Z341.1-18 regulation. It was agreed that the sessions had examined safety, operability and technical integrity in a responsible and diligent manner.

Executive Summary

Title: Assessment of Neighbouring Activities
2022 Crowland Test Well Drilling Project

Authors: Enbridge Gas Inc.

The “Assessment of Neighbouring Activities” report has been completed to comply with the requirements of Clause 5.2 of Standard CSA Z341.1-22 – Storage of Hydrocarbons in Underground Formations – Reservoir Storage (“CSA Z341.1-22”) in support of an application to drill a stratigraphic test well in the Crowland Storage Pool.

The Crowland Storage Pool is protected by a Designated Storage Area (DSA) which was approved by the Ontario Energy Board in 1964 by Ontario Regulation 299/64. Authority to inject gas into, store gas in and remove gas from the Crowland Pool was granted by E.B.O. 8 in 1965 with gas injections starting in 1965. The DSA is comprised of approximately 758 hectares. Enbridge is confident that the DSA adequately protects the Crowland Pool. In addition, Ontario Regulation 245/97 under the Oil, Gas and Salt Resources Act provides protection of the reservoir against the performance of any well work, within a 1.6 km of the DSA boundary, that will or is likely to fracture the storage reservoir or to result in communication between the well and the storage reservoir.

The report reviews the geology, the existing and abandoned wells within 1 kilometre of the storage zone, subsurface operations within 5 kilometres of the storage zone, and wells penetrating the storage zone. The 1-kilometre and 5-kilometre analysis areas were created based on the Crowland Pool storage boundary. This boundary is defined as the Pool’s porosity and permeability pinch-out edge.

Well drilling records from the Oil, Gas and Salt Resources Library (OGSRL) indicate that 56 wells have been drilled within the 1 km radius of the Crowland Pool storage boundary. Of the 56 wells, 24 wells are associated with current Crowland Pool operations (16 natural gas storage wells and 8 observation wells) and the remaining 32 wells have been abandoned. 5 of the abandoned wells were within the storage pool and the remaining 27 wells are outside the storage pool, but within the 1 km radius. Enbridge has conducted a review and a qualitative risk ranking of the 56 wells and is satisfied that there is no “impact on the integrity of the storage facility” as required by CSA Z341.1-22 Clause 5.2(a).

A review of records from the OGSRL for subsurface activities within 5 kilometres of the Crowland Pool indicates that there are 24 subsurface operations, including natural gas production operations. Enbridge is satisfied that there is no “impact on the integrity of the storage zone” as required by the CSA Z341.1-22 Clause 5.2(b).

In conclusion, the Crowland Pool has been safely operated as a natural gas storage pool since 1965 and is protected by an approved DSA. The technical information reviewed, indicates that there is minimal risk regarding the potential migration of natural gas between any known existing or abandoned wells within 1 km, and existing operations within 5 km, of the Crowland Pool. All active wells that penetrate the storage zone within the Crowland Pool are utilized as part of storage operations.

All the active wells are operated and maintained in accordance with CSA Z341.1-22 Storage of Hydrocarbons in Underground Formations and in accordance with the Oil, Gas and Salt Resources Act, its regulations and Provincial Operating Standards. Enbridge is satisfied that the drilling of the stratigraphic test well will not compromise the integrity of the Crowland Pool or any associated facilities.

PROJECT COST AND ECONOMICS

Project Costs

1. The total cost for the Project is estimated to be \$2,255,000, as set out in Table 1 below.

Table 1: Project Costs

<u>Type of expenditure</u>	<u>Cost estimate</u>
Material Costs	\$ 390,000
Labour Costs	\$ 60,000
External Permitting	\$ 20,000
Land	\$ 30,000
Contractors	\$1,350,000
Internal Labour	\$ 200,000
Contingency Costs	\$ 205,000
Total Costs	\$2,255,000

2. The cost estimate set out above includes a 10% contingency for the Project, which will be applied to all direct capital costs to reflect the preliminary design stage of the Project. The contingency amount has been calculated based on the risk profile of the Project and is consistent with contingency amounts calculated for similar projects completed by Enbridge Gas and approved by the OEB.¹
3. The total estimated Project costs set out above are lower than a recent comparable project completed by Enbridge Gas and approved by the OEB. In EB-2019-0012, Enbridge Gas estimated the total capital cost for drilling, coring, and testing a stratigraphic test well in Enbridge Gas's Ladysmith Storage Pool (TL 9, Moore 8-20-V) to be \$3.72 million.²

¹ For example, a recent Enbridge Gas project with similar contingency is the Coveny and Kimball-Colinville Well Drilling Project (EB-2021-0248).

² EB-2019-0012, Exhibit D, Tab 1, Schedule 1, Table 1.

4. TL 9 well costs were higher than the estimated costs of EC 1 because TL 9 was drilled to a depth of 616.5m, whereas EC 1 is proposed to be drilled to a depth of 238m. Furthermore, the larger casing used for TL 9 increases the drilling and equipment costs relative to EC 1.

5. Enbridge Gas is not seeking cost recovery of the Project as part of this application. Upon rebasing, Enbridge Gas expects the capital costs associated with the Project will be included within rate base, as the Project solely benefits Enbridge Gas's regulated storage business. Enbridge Gas will allocate Project costs to rate classes according to the applicable OEB-approved cost allocation methodology in place at the time the Company applies for such rate recovery.

Project Economics

6. A Discounted Cash Flow report has not been completed as the Project is not expected to result in additional revenues for Enbridge Gas. As discussed in Exhibit B, Tab 1, Schedule 1, the Project is part of a broader integrity project for the Crowland Storage Pool.

ENVIRONMENTAL MATTERS

Environmental Report

1. An Environmental Report (“ER”) for the Project was prepared by Stantec Consulting Ltd. (“Stantec”). The ER conforms to the OEB’s *Environmental Guidelines for the Location, Construction and Operation of Hydrocarbon Pipelines and Facilities in Ontario, 7th Edition, 2016* (“Guidelines”). A copy of the ER is set out as Attachment 1 to this Exhibit.

2. The principal objective of the ER was to outline the various environmental mitigation and protection measures for the construction and operation of the Project while meeting the intent of the Guidelines. To meet this objective, the ER was prepared to:
 - Describe the proposed work necessary for the Project;
 - Implement a consultation program to receive input from interested and potentially affected parties;
 - Assess potential environmental impacts of the Project on environmental features, and establish mitigation and protective measures that may be used to reduce and eliminate, where possible and feasible, potential environmental impacts of the Project; and
 - Identify any necessary supplemental studies and monitoring and contingency plans.

3. The ER identified that there is potential for the presence of 17 species at risk (“SAR”) within the study area of the Project. Through a comparison of available habitat, there are 6 potential present species: Barn Swallow, Red-headed Woodpecker, Little Brown Myotis, Northern Myotis, Eastern Flowering Dogwood,

and Blanding's Turtle. Additional field surveys will occur to confirm potential habitat and identify species presence/absence. General mitigation and protective measures for potential impacts on wildlife, wildlife habitat, and SAR are included in Table 4.1 in the ER. These measures and those developed in consultation with the Ministry of Environment, Conservation and Parks will be adhered to by Enbridge Gas. With the implementation of such mitigation and protective measures, no significant adverse residual impacts on wildlife habitat, wildlife, and SAR are anticipated.

4. The ER concluded that with the implementation of its recommendations, on-going communication and consultation, environmental and supplementary studies and adherence to permit, regulatory and legislative requirements, potential adverse residual environmental and socio-economic impacts of the Project are not anticipated to be significant.
5. Notice of Study Commencement letters were provided to the Ontario Pipeline Coordinating Committee ("OPCC") and other applicable agencies on April 22, 2022, and to Mississaugas of the Credit First Nation and landowners within vicinity of the project on April 25, 2022. These letters introduced the Project and invited the parties to provide or coordinate comments regarding the Project to assist in the environmental study process. Copies of the letters can be found in Appendix B3 of the ER.
6. The ER was provided to the OPCC and other applicable agencies on May 6, 2021. No comments from the OPCC have been received to date. An updated summary of OPCC comments and Enbridge Gas responses will be filed following the completion of the review period.

Archaeological Assessment

7. A Stage 1 Archaeological Assessment (“AA”) was completed on the proposed work area and concluded that a Stage 2 AA is required. The Stage 1 Report was submitted to the Ministry of Heritage, Sport, Tourism and Culture Industries (“MHSTCI”) on April 6, 2022. Enbridge Gas received a clearance letter from MHSTCI on April 8, 2022.

Built Heritage Resources and Cultural Heritage Landscapes

8. Completion of the checklist titled “Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes for the Project” identified no indicators of cultural heritage value or interest in the Study Area. The completed Checklist can be found in Appendix F of the ER.



**2022 CROWLAND TEST WELL DRILLING
PROJECT: ENVIRONMENTAL REPORT**

FINAL REPORT

May 6, 2022

Prepared for:
Enbridge Gas Inc.

Prepared by:
Stantec Consulting Ltd.
300W-675 Cochrane Drive
Markham, ON L3R 0B8

Project Number:
160961469

2022 Crowland Test Well Drilling Project: Environmental Report
May 6, 2022

Limitations and Sign-off

This document entitled 2022 Crowland Test Well Drilling Project: Environmental Report was prepared by Stantec Consulting Ltd. (“Stantec”) for the account of Enbridge Gas Inc. (the “Client”). Any reliance on this document by any third party is strictly prohibited. The material in it reflects Stantec’s professional judgment in light of the scope, schedule and other limitations stated in the document and in the contract between Stantec and the Client. The opinions in the document are based on conditions and information existing at the time the document was published and do not take into account any subsequent changes. In preparing the document, Stantec did not verify information supplied to it by others. Any use which a third party makes of this document is the responsibility of such third party. Such third party agrees that Stantec shall not be responsible for costs or damages of any kind, if any, suffered by it or any other third party as a result of decisions made or actions taken based on this document.

Prepared by: Matthew Gasser
Signature

Matt Gasser, BES
Printed Name

Reviewed by: Mark Knight
Signature

Mark Knight, MA, RPP, MCIP
Printed Name



2022 Crowland Test Well Drilling Project: Environmental Report

May 6, 2022

Executive Summary

To ensure the continued safe and reliable delivery of natural gas to existing and future Enbridge Gas Inc. (Enbridge Gas) customers, Enbridge Gas is proposing the 2022 Crowland Test Well Drilling Project (the Project). The Project is proposing to drill a new geological test well in the Crowland Designated Storage Area (as defined in s. 36.1 (1)(a) of the *Ontario Energy Board Act*) located in Port Colborne, Ontario. The Project will involve the construction of a temporary approximately 8100 metres squared gravel drilling pad. Upon completion of drilling activities, a new permanent 6 metres wide access laneway and 8 metres x 8 metres gravel pad will remain in place.

Enbridge Gas has retained Stantec Consulting Ltd. (Stantec) to undertake an environmental study of the construction and operation of the Project. The environmental study included a consultation program, impact assessment, and a cumulative impact assessment.

A consultation program was conducted for the Project to engage with federal and provincial agencies, conservation authorities, municipal staff, Indigenous communities, landowners, and other interested parties. Enbridge Gas and Stantec have also been in direct contact with agency and municipal staff. Enbridge Gas has committed to on-going consultation with directly affected and interested parties through detailed design and construction phases and will continue to respond to concerns through the life of the Project.

The potential effects and impacts of the Project on physical, biophysical, and socio-economic features have been assessed. In the opinion of Stantec, the recommended program of supplemental studies, mitigation and protective measures, and contingency measures are considered appropriate to protect the features encountered. Monitoring will assess whether mitigation and protective measures were effective in both the short and long term.

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

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



2022 Crowland Test Well Drilling Project: Environmental Report
 May 6, 2022

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May 6, 2022

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2022 Crowland Test Well Drilling Project: Environmental Report

May 6, 2022

Land Acknowledgement

We respectfully and thoughtfully acknowledge that the 2022 Crowland Test Well Drilling Project is being completed on land that has been inhabited by and cared for by people Indigenous to Turtle Island since time immemorial. We recognize and respect the historic connection to and harmonious stewardship by the Indigenous peoples over this shared land and, as such, we have a responsibility to preserve and care for the land, learn from the original inhabitants and move forward together in the spirit of healing, reconciliation and partnership.



2022 Crowland Test Well Drilling Project: Environmental Report
May 6, 2022

Acronyms / Abbreviations

AA	Archaeological Assessment
ANSI	Area of Natural and Scientific Interest
DFO	Fisheries and Oceans Canada
DSA	Designated Storage Area
Enbridge Gas	Enbridge Gas Inc.
ER	Environmental Report
ESA	<i>Endangered Species Act</i>
ESC	Erosion and sediment control
MECP	Ministry of the Environment, Conservation and Parks
MHSTCI	Ministry of Heritage, Sport, Tourism and Culture Industries
NDMNRF	Ministry of Northern Development, Mines, Natural Resources and Forestry
NPCA	Niagara Peninsula Conservation Authority
OEB	Ontario Energy Board
OHA	<i>Ontario Heritage Act</i>
O.HG	Orthic Humic Gleysol
OMAFRA	Ontario Ministry of Agricultural, Food and Rural Affairs
OPCC	Ontario Pipeline Coordinating Committee
O. Reg.	Ontario Regulation
OWES	Ontario Wetland Evaluation System
PSW	Provincially Significant Wetland
SAR	Species at Risk
SCN	Soybean Cyst Nematode
Stantec	Stantec Consulting Ltd.



2022 Crowland Test Well Drilling Project: Environmental Report

May 6, 2022

The Project

Crowland Storage Enhancement Project



2022 Crowland Test Well Drilling Project: Environmental Report

1 Introduction

May 6, 2022

1 Introduction

1.1 Project Description

To ensure the continued safe and reliable delivery of natural gas to existing and future Enbridge Gas Inc. (Enbridge Gas) customers, Enbridge Gas is proposing to drill a new geological test well in the Crowland designated storage area (DSA), as defined in s. 36.1(1)(a) of the *Ontario Energy Board Act* (OEB Act), in Port Colborne, Ontario. The 2022 Crowland Test Well Drilling Project (the Project) will commence with the construction of a temporary approximately 8100 m² gravel drilling pad. Upon completion of drilling activities, a permanent 6m wide access laneway and 8m x 8m gravel pad will remain in place.

The Project location is shown in **Appendix A**.

Enbridge Gas has retained Stantec Consulting Ltd. (Stantec) to undertake an environmental study of the construction and operation of the Project.

1.2 Environmental Study

1.2.1 OBJECTIVES

A multidisciplinary team of environmental planners and scientists from Stantec conducted the environmental study. Enbridge Gas provided environmental support and engineering expertise throughout the study.

The environmental study was completed in accordance with the OEB *Environmental Guidelines for the Location, Construction and Operation of Hydrocarbon Pipelines and Facilities in Ontario, 7th Edition* (OEB Environmental Guidelines) (2016), as well as relevant federal and provincial environmental guidelines and regulations.

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

- Implement a consultation program to receive input from interested and potentially affected parties
- Assess potential impacts of the Project on environmental features, and establish mitigation and protective measures that may be used to reduce and eliminate, where possible and feasible, those potential impacts
- Identify any necessary supplemental studies, monitoring, and contingency plans



2022 Crowland Test Well Drilling Project: Environmental Report

1 Introduction

May 6, 2022

1.2.2 PROCESS

The environmental study was divided into two main phases:

Phase I: Consultation and Gathering Background Environmental Information

Phase I began with notifying impacted and potentially interested parties regarding the Project. Concurrent with consultation, environmental and socio-economic features at the Project location were mapped and characterized using relevant published literature, maps, and digital data.

Phase II: Environmental Report

Phase II involved determining potential environmental and socio-economic impacts and cumulative effects that may result from the Project and recommending mitigation and protective measures, supplemental studies, monitoring, and contingency plans to reduce or avoid potential impacts. The environmental study concluded with the preparation of this Environmental Report (ER) as well as Environmental Alignment Sheets to identify site-specific mitigation and protective measures to be implemented during construction (see **Appendix D**).

1.2.3 THE ENVIRONMENTAL REPORT

The environmental study has relied on a technically sound and consistently applied approach that is replicable and transparent. The ER, which documents the environmental study, will form the basis for future environmental management activities related to the Project.

The ER is organized into the following sections:

- 1 **Introduction:** provides a description of the project and the environmental study
- 2 **Consultation Program:** describes the consultation program
- 3 **Existing Conditions:** describes the environmental and socio-economic existing conditions
- 4 **Impact Identification, Assessment, and Mitigation:** predicts potential effects and impacts, recommends supplemental studies, mitigation, and protective measures, and considers net impacts
- 5 **Cumulative Effects:** provides an analysis of potential cumulative effects associated with the Project
- 6 **Monitoring and Contingency Plans:** describes monitoring and contingency plans to address potential environmental impacts of the Project
- 7 **Conclusion:** provides a conclusion on the significance of the potential environmental impacts associated with the Project

The ER also includes references and appendices for documentation.



2022 Crowland Test Well Drilling Project: Environmental Report

1 Introduction

May 6, 2022

1.2.4 THE OEB REGULATORY PROCESS

Once complete, the ER is circulated to the Ontario Pipeline Coordinating Committee (OPCC) for their review and comment. The OPCC is an inter-ministerial committee that includes provincial government ministries, boards, and authorities with potential interest in the construction and operation of hydrocarbon transmission and storage facilities. The ER will accompany a future Enbridge Gas application to the OEB for the proposed Project.

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

1.2.5 ADDITIONAL ENVIRONMENTAL REGULATORY PROCESSES

Enbridge Gas will also be required to obtain additional environmental permits and approvals from provincial agencies and municipalities, as outlined in Table 1.1 below. This ER will serve to support these permit and approval applications.

Table 1.1 Summary of Potential Environmental Permit and Approval Requirements

Permit/Approval Name	Administering Agency	Description
PROVINCIAL PERMITS AND APPROVALS		
Development Permits under Ontario Regulation (O. Reg.) 155/06 (Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses), as per the <i>Conservation Authorities Act</i> (1990)	Niagara Peninsula Conservation Authority (NPCA)	Required for works in NPCA Regulated Areas, including shorelines, watercourses, wetlands, and hazardous lands (flooding and erosion hazards, and unstable soils and bedrock).
Permitting or registration under the <i>Endangered Species Act</i> (ESA) (2007)	Ministry of the Environment, Conservation, and Parks (MECP)	<p>An ESA permit or registration is required for activities that could impact species and/or their habitat protected under the ESA. Should it be determined that activities will occur that could impact species and/or their habitat protected under the ESA, conformance with the Act will be required.</p> <p>As indicated in Section 9 (1) a of the ESA (2007), “No person shall kill, harm, harass, capture or take a living member of a species that is listed on the Species at Risk in Ontario List as an extirpated, endangered or threatened species.”</p> <p>As indicated in Section 17 (1), “the Minister may issue a permit to a person that, with respect to a species specified in the permit that is listed on the Species at Risk in Ontario List as an extirpated, endangered or</p>



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1 Introduction

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Table 1.1 Summary of Potential Environmental Permit and Approval Requirements

Permit/Approval Name	Administering Agency	Description
		threatened species, authorizes the person to engage in an activity specified in the permit that would otherwise be prohibited by section 9 or 10."
Archaeological clearance under the <i>Ontario Heritage Act</i> (OHA) (1990)	Ministry of Heritage, Sport, Tourism and Culture Industries (MHSTCI)	An archaeological assessment (AA) is required to identify areas of archaeological potential prior to any ground disturbances and/or site alterations. Depending on the results of the AA, further stages of archaeological work may be required. The completed AA reports are forwarded to the MHSTCI for review and comment.
Review of Built Heritage Resource and Cultural Heritage Landscapes under the OHA (1990)	MHSTCI	A review will be completed to determine the presence of built heritage resources and cultural heritage landscapes. If identified, further studies are required to determine the effects of the Project and recommend mitigation measures as necessary.
MUNICIPAL PERMITS AND APPROVALS		
Noise By-Law No. 4588/119/04	City of Port Colborne	Project activities should adhere to the local noise by-law.



**2022 Crowland Test Well Drilling Project: Environmental Report
2 Consultation and Engagement Program**

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2 Consultation and Engagement Program

2.1 Objectives

Consultation is an important component of the OEB *Environmental Guidelines* (2016). As noted by the OEB (2016), consultation is the process of identifying interested and potentially affected parties and informing them about the Project, soliciting information about their values and local environmental and socio-economic circumstances, and receiving input into key Project decisions before those decisions are finalized.

Stantec believes that community involvement and consultation is a critical and fundamental component of this environmental study, and that Indigenous community participation is essential to the Project. We also recognize that each potentially affected Indigenous community has unique conditions and needs and that the process followed may not satisfy the “duty to consult” component from an Indigenous community’s perspective. To demonstrate that we respect this view, we will use the term “engagement” throughout the remainder of this Report when we refer to seeking input from Indigenous communities.

The consultation and engagement program for the Project included the following objectives:

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

2.2 Identifying Interested and Potentially Affected Parties

As part of the consultation and engagement process, Indigenous and stakeholder Contact Lists (including Agency, Municipal, and Interest Groups), were developed.

2.2.1 IDENTIFYING INDIGENOUS COMMUNITIES

Engagement with Indigenous communities was guided by the OEB *Environmental Guidelines* (2016), as noted above, but also by the Enbridge Gas’ Indigenous Peoples Policy. Enbridge Gas is committed to creating processes that support meaningful engagement with potentially affected Indigenous groups (First Nations and Métis). Enbridge Gas works to build an understanding of project related interests,



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ensure regulatory requirements are met, mitigate or avoid project-related impacts on Indigenous interests including rights, and provide mutually beneficial opportunities where possible.

Indigenous engagement commenced with the submission of a Project description to the Ministry of Energy. The response (see **Appendix B1**) from the Ministry indicated that, based on the Crown's assessment, no duty to consult was triggered. Regardless of whether the duty to consult is triggered, Enbridge Gas routinely engages with Indigenous groups potentially affected by Enbridge Gas projects and operations.

2.2.2 IDENTIFYING INTERESTED AND POTENTIALLY AFFECTED PARTIES

Identification of interested and potentially affected parties was undertaken using a variety of sources, including the OEB's OPCC Members List, the MECP's Environmental Assessment Government Review Team Master Distribution List, and the experience of Enbridge Gas and Stantec.

The parties listed below were among those considered when developing the initial stakeholder Contact List:

- Federal and provincial agencies and authorities
- Municipal personnel
- Landowners
- Special interest groups

As the environmental study progressed, the initial Contact Lists evolved, and updates were made in response to changes in personnel, correspondence, and feedback gathered from the Notice of Study Commencement. The Project Indigenous and stakeholder Contacts Lists are provided in **Appendix B2**.

2.3 Consultation Activities

Letters and emails were sent to those identified on the Contact Lists on April 22, 2022, to inform them of the commencement of the Project and outline the environmental study process. The letters and emails sent to stakeholders solicited information on planning principles or guidelines that may affect the project, background environmental and socio-economic information, and other developments proposed in the area. Letters were also hand-delivered to landowners within 500m of the Project location on April 25, 2022. The letters and emails sent to Indigenous communities requested information on adverse impacts that the Project may have on constitutionally protected Indigenous or treaty rights and measures for mitigating those adverse impacts. Appended to the letters and emails was a map of the Project location.

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



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2.4 Input Received

The consultation and engagement program allowed interested or potentially affected parties to provide input into the Project. Input was evaluated and integrated into the Project. One comment was received from an agency at the time of writing this ER. Comments were as follows:

- The Ministry of Northern Development, Mines, Natural Resources and Forestry (NDMNRF) provided information to guide identification and assessment of natural features and resources as required by applicable policies and legislation.

A copy of the correspondence is provided in **Appendix B4**.

2.5 Refinements Based on Input

Consultation with Indigenous communities and stakeholders is ongoing. It is anticipated that, as the Project progress, additional comments/input will be received. As input is received it will be compiled, reviewed, and incorporated into project planning. Responses will be provided, as applicable, to questions and comments on the Project. Enbridge Gas has committed to on-going consultation with directly affected and interested parties through detailed design and construction and will continue to respond to concerns through the life of the Project.



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3.1 Study Area

A Study Area is the area in which direct interactions with the environment could occur. For the purposes of the environmental study, the Study Area was defined as a 100 m boundary around the temporary construction pad, extended to 500 m for hydrogeological features. A map of the 100 m and 500 m Study Area boundary is provided in Figure 1, **Appendix A**.

3.2 Data Sources

The existing conditions maps (**Appendix C**) have been generated from base mapping provided from Enbridge Gas and data obtained from government databases. Scales have been adjusted from the original source to better represent the features mapped. Stantec has digitally reproduced features added to the base maps. Additional mapping sources are identified on the respective map, and in the references. For the socio-economic elements of the assessment, the most recent economy and employment statistics are provided in the 2016 Census of Population (Statistics Canada 2021a and 2021b). The selected census divisions included Ontario, the Region Municipality of Niagara (also known as Niagara Region), and the City of Port Colborne.

3.3 Physical Features

3.3.1 BEDROCK GEOLOGY AND DRIFT THICKNESS

The bedrock geology in the Study Area is comprised predominantly of thin-bedded, argillaceous dolostones and shales, with beds and nodules of gypsum in the near-surface and thick salt beds in the deep subsurface as a result of the Salina Formation (Armstrong and Dodge 2007). A map of bedrock geology is provided in **Figure 1, Appendix C**.

To determine the drift thickness in the Project location, general depth from the soil surface to the bedrock was reviewed. In the Study Area, drift thickness is within the range of 19-20 m (NDMNRF 2022) (see **Figure 2, Appendix C**). A review of available Water Well Records identified none within 500 m of the Project location, with the closest well recording a bedrock depth of 25 m (MECP 2021a).

3.3.2 PHYSIOGRAPHY AND SURFICIAL GEOLOGY

The topography of the Study Area (see **Figure 3, Appendix C**) is in the Haldimand Clay Plain physiographic region of southern Ontario, a region that was submerged by glacial Lake Warren and covered by fine-textured glaciolacustrine deposits (NDMNRF 2022; NPCA 2011).

As shown in surficial geology mapping (see **Figure 4, Appendix C**), the Study Area is composed of fine-textured glaciolacustrine deposits (silt and clay, minor sand, and gravel) that are massive to well laminated (NDMNRF 2022).



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3.3.3 GROUNDWATER

Mapping provided by the MECP (2021), the draft Niagara Official Plan (2022), and the City of Port Colborne Official Plan (2013) identifies vulnerable areas, potential threats to drinking water, and source water protection areas and policies in and adjacent to the Study Area. As shown on mapping from these sources, no Intake Protection Zones, Significant Groundwater Recharge Areas, or Wellhead Protection Areas are in the Study Area.

In interpreting the data provided by MECP (2021), groundwater in the Project location flows in two different directions in flowing eastward towards the Niagara River and westward towards the Welland Canal. As shown on Schedule 'E' of the draft Niagara Official Plan (2022), municipal drinking water intakes predominately use surface water from Lake Erie, Welland Canal, and the Niagara River. Intake Protection Zones are thus concentrated along these features and are well outside the Study Area.

As noted in Section 3.3.1 of this Report, MECP Water Well Records (2021a) indicate there are none located within 500m of the Project Location.

A map of groundwater conditions surrounding the Study Area is provided in **Figure 5, Appendix C**.

3.3.4 AGGREGATES AND PETROLEUM RESOURCES

Schedules "H1-H3" and "I" in the draft Niagara Official Plan (2022) and Schedule C of the City of Port Colborne Official Plan (2013) identify mineral and aggregate resources present throughout the Region and City. The draft Niagara Region Official Plan (2022) indicates that there is a known sand and gravel deposit located approximately 1 km northwest of the Study Area. The City of Port Colborne Official Plan (2013) indicates that there is an Aggregate Potential Area for Sand and Gravel located approximately 3 km southwest of the Study Area and a Mineral Operation located approximately 5 km southwest of the Study Area close to downtown Port Colborne.

The Project is located in a DSA. These are lands that contain geological formations used for subsurface storage of natural gas. The location of the DSA is shown on the draft Niagara Official Plan (2022) Schedule 'I' and the City of Port Colborne Official Plan (2013) Schedule "C". As the Project is located in a DSA there are active and abandoned wells surrounding the Study Area.

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

3.3.5 SOIL AND SOIL CAPABILITY

Welland Soil, classified as Orthic Humic Gleysol (O.HG), is the only soil type identified in the Study Area (Agriculture and Agri-Food Canada 2022; Kingston and Presant, n.d.; LIO 2019) (see **Figure 7, Appendix C**). O.HG soils have the general properties specified for the Gleysolic order and the Humic Gleysol great group (Agriculture and Agri-Food Canada 2022). More specifically, they have a well-developed Ah horizon that overlays gleyed B and C horizons, and possibly also have organic surface horizons, an eluvial horizon, and a C horizon which does not have the dull colours and mottling that indicate gleying. The soil type is poorly drained, most likely disturbed by agriculture over time, consists of



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glaciolacustrine material that are Very Fine (more than 60% clay) in texture, and have chemical properties that are Moderately/Very Strongly Calcareous (6-40 CaCO₃ equivalent (%)) (Agriculture and Agri-Food Canada 2022).

Soil capability for agriculture is mapped by Agriculture and Agri-Food Canada (2005). Lands classified as Class 1 are the most agriculturally productive, while those classified as Class 7 have the lowest capability for agriculture. Class 1 to 5 agricultural lands are generally arable, while Classes 1 through 3 are defined by the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) to be prime agricultural soils for common field crop production. Soils in the Study Area have been classified at Class 3. Class 3 soils have moderately severe limitations that restrict the range of crops or require special conservation practices (Agriculture and Agri-Food Canada 2022; LIO 2019). Soil capabilities in the Study Area are illustrated in **Figure 8, Appendix C**.

3.3.6 AGRICULTURAL TILE DRAINS

As illustrated in **Figure 9, Appendix C** and OMAFRA (2019), there is no portion of the Study Area containing agricultural tile drainage.

3.3.7 SOYBEAN CYST NEMATODE

In southern Ontario, soybean cyst nematode (SCN) is present in the topsoil of many agricultural fields in populations large enough to impact soybean yields. SCN can be spread in many ways such as wind, animals, or in topsoil stuck to machinery as the machinery passes from an impacted field to a non-impacted field. SCN is continuing to grow in agricultural/farming lands in the Niagara Region (Flammini 2020). Once a field has been infested, there is significant potential for soybean crop yield reductions (Olechowski 1990).

3.3.8 NATURAL HAZARDS

Natural hazards are elements of the physical environment that have the potential to affect a Project in an adverse manner. Potential natural hazards are limited but may include flooding and seismic hazard.

The NPCA offers watershed programs and services such as flood and hazard management, source water protection, species protection, ecosystem restoration, community stewardship, and land management (NPCA 2022). According to online mapping from the NPCA, the Study Area is located in a regulated floodplain area and is located adjacent to a regulated wetland area (NPCA, n.d.) (see **Figure 10, Appendix C**).

The Study Area lies in the Southern Great Lakes Seismic Zone (Natural Resources Canada 2019). This zone has a low to moderate level of seismicity when compared to the more active seismic zones to the east, such as the Western Quebec Seismic Zone which captures the area along the Ottawa River and Quebec. According to data from Natural Resources Canada (2019), over the last 30 years, on average, 2 to 3 magnitude 2.5 or larger earthquakes have been recorded in the Southern Great Lakes region. By comparison, over the same time period, the smaller region of Western Quebec experienced 15 magnitude 2.5 or greater earthquakes per year. Three moderately sized (magnitude 5) events have



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occurred in the past 250 years of European settlement of this region, all of them in the United States - 1929, Attica, New York, 1986, near Cleveland, Ohio, and 1998, near the Pennsylvania/Ohio border. All three earthquakes were widely felt but caused no damage in Ontario.

3.4 Biophysical Features

3.4.1 AQUATIC FEATURES

3.4.1.1 Watercourses

The Study Area is in the South Niagara Falls watershed. GeoHub/Land Information Ontario (NDMNRF 2022a) identifies the Howie Drain in the Study Area, immediately south of the existing access road (**Figure 11, Appendix C**).

3.4.1.2 Fish and Fish Habitat

According to OMAFRA (2020), Howie Drain is a Class F drain. Class F drains are intermittent watercourses and are considered to have restricted in-water activity window to protect spring spawning species (generally March 15 – July 15).

The only identified aquatic species at risk (SAR) in the Howie Drain is the Grass Pickerel (*Esox americanus*), which is classified as Special Concern under both the *ESA* (2007) and *Species at Risk Act* (2002) (DFO 2022). Under both Acts, species listed as threatened or endangered are afforded individual and habitat protection. Special concern species are not afforded these protections.

3.4.2 DESIGNATED NATURAL AREAS AND VEGETATION

Wetlands

The Ontario Wetland Evaluation System (OWES) is an established process used to evaluate wetlands in Ontario and determine their significance (e.g., Provincially Significant Wetlands (PSW)). Evaluated wetlands may be one contiguous unit or a series of smaller wetlands determined by a set of criteria to be functioning together as a whole. Evaluated wetlands that do not qualify for PSW designation may still be designated locally significant and may be protected through local planning and policy measures. There may also be wetlands that have not been evaluated or even identified in an area.

While the Project location is on agricultural land, in the Study Area the locally significant Forkes Road Northeast Slough Forest Wetland Complex is located to the west, south, and east of the Project location (NDMNRF 2019) (**Figure 12, Appendix C**).

Woodlands

A woodland is defined as a treed area, woodlot, or forested area. The Natural Heritage Reference Manual notes that the local planning authority has a responsibility for designating significant woodlands, using criteria that include size, ecological function, uncommon characteristics, and economic and social functional values (NDMNRF 2010). The criteria for designating significant woodlands at a provincial level



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includes: woodland size; ecological function (shape, proximity to other woodlands or natural features, linkages); species diversity; uncommon characteristics; and, economic and social values (NDMNR 2010).

The City of Port Colborne’s Official Plan (2013) defines significant woodlands as an area “...*ecologically important in terms of features such as species composition, age of trees and stand history; functionally important due to its contribution to the broader landscape because of its location, size or due to the amount of forest cover in the planning area; or economically important due to site quality, species composition, or past management history*”. The forest located in the Study Area to the west, south, and east of the Project location is classified as a Significant Woodland in Schedule B2 of the City of Port Colborne’s Official Plan (2013).

Areas of Natural and Scientific Interest (ANSI)

Life science areas of natural and scientific interest (ANSIs) are significant representative segments of Ontario’s biodiversity and natural landscapes, including specific types of forests, valleys, prairies, savannahs, alvars and wetlands, their native plants and animals, and their supporting environments. They contain relatively undisturbed vegetation and landforms, and their associated species and communities. Provincially significant life science ANSIs include the most significant and best examples of the natural heritage features in the province, and many will correspond to other significant features and areas such as wetlands, valleylands, and woodlands (NDMNR 2010).

A review of NDMNR LIO mapping (2022a) did not identify ANSIs in the Study Area. The nearest ANSI, the Humberstone Muck Basin Swamp Forest, is located 4km south of the Study Area.

3.4.3 WILDLIFE HABITAT, WILDLIFE, AND TERRESTRIAL SPECIES AT RISK

3.4.3.1 Wildlife Habitat and Wildlife

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

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

Seasonal Concentration Areas

Seasonal concentration areas are those sites where large numbers of a species gather together at one time of the year, or where several species congregate.



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As illustrated in **Figure 12, Appendix C**, Deer Wintering Areas have been identified in the south, west and east ends of the Study Area. The surrounding wetlands/woodlands have the potential for Raptor Wintering Area, Bat Maternity Colonies, Turtle Overwintering Areas, and Colonial Nesting Bird Breed Habitat.

Animal Movement Corridors

Animal movement corridors are elongated, naturally vegetated parts of the landscape used by animals to move from one habitat to another (NDMNRF 2000). Rivers, creeks, and drains may be used as movement corridors. Hedgerows may also serve as small linkages (NDMNRF 2000). The hedgerow at the south end of the Project location, and Howie Drain, may both act as animal movement corridors.

Rare Vegetation Communities or Specialized Habitats

Rare or specialized habitats are two separate components. Rare habitats are those with vegetation communities that are considered rare in the province. SRANKS are rarity rankings applied to species at the “state”, or in Canada at the provincial level, and are part of a system developed under the auspices of the Nature Conservancy. Generally, community types with SRANKS of S1 to S3 (i.e., extremely rare to rare – uncommon in Ontario) could qualify. It is assumed that these habitats are at risk and that they are also likely to support additional wildlife species that are considered significant.

Specialized habitats are microhabitats that are critical to some wildlife species. The *Significant Wildlife Habitat Technical Guide* (NDMNRF 2000) identifies eight potential specialized habitats associated with the eco-region (7E) of Ontario in which the Project is located:

- Waterfowl Nesting Area
- Bald Eagle and Osprey Nesting, Foraging and Perching Habitat
- Woodland Raptor Nesting Habitat
- Turtle Nesting Areas
- Seeps and Springs
- Amphibian Breeding Habitat (Woodland)
- Amphibian Breeding Habitat (Wetlands)
- Woodland Area-Sensitive Bird Breeding Habitat

Based on a preliminary review of background information and available aerial imagery, there is the potential for Woodland Raptor Nesting Habitat, Turtle Nesting Areas, Seeps and Springs, Amphibian Breeding Habitat (Woodland), and Woodland Area - Sensitive Bird Breeding Habitat in the wetlands/woodlands surrounding the Study Area.

Habitat for Species of Conservation Concern

There are four types of species of conservation concern: those which are rare, those with significantly declining populations, those which have been identified as being at risk from certain common activities and those with relatively large populations in Ontario compared to the remainder of the globe.



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Rare species are considered at five levels: globally rare, federally rare, provincially rare (with designations by Committee on the Status of Species at Risk in Ontario), regionally rare (at the Site Region level), and locally rare (in the municipality or Site District). This is also the order of priority that should be assigned to the importance of maintaining species. Some species have been identified as being susceptible to certain practices, and their presence may result in an area being designated significant wildlife habitat. Examples include species vulnerable to habitat loss and species such as woodland raptors that may be vulnerable to forest management or human disturbance. The final group of species of conservation concern includes species that have a high proportion of their global population in Ontario. Although they may be common in Ontario, they are found in low numbers in other jurisdictions.

Records of terrestrial species of conservation concern in the vicinity of the Study Area are outlined in the table below.

Table 3.1 Terrestrial Species of Conservation Concern Potentially Present in the Study Area

Common Name	Scientific Name	S-RANK	Provincial Status	National Status	Source
Birds					
Common Nighthawk	<i>Chordeiles minor</i>	S4B	Special Concern	Special Concern	Cadman et al. 2007
Eastern Wood-Pewee	<i>Contopus virens</i>	S4B	Special Concern	Special Concern	Cadman et al. 2007
Grasshopper Sparrow	<i>Ammodramus savannarum</i>	S4B	Special Concern	Special Concern	Cadman et al. 2007; iNaturalist 2021
Bald Eagle	<i>Haliaeetus leucocephalus</i>	S4B, S2N	Special Concern	Not at Risk	eBird 2022; Cadman et al. 2007; iNaturalist 2021
Wood Thrush	<i>Hylocichla mustelina</i>	S4B	Special Concern	Threatened	Cadman et al. 2007
Insects					
Monarch	<i>Danaus plexippus</i>	S4B, S2N	Special Concern	Special Concern	Ontario Butterfly Atlas 2022 and 2022a
Plants					
Common Hoptree	<i>Ptelea trifoliata</i>	S3	Special Concern	Special Concern	iNaturalist 2021
Reptiles					
Eastern Ribbon Snake	<i>Thamnophis sauritus</i>	S3	Special Concern	Special Concern	Ontario Reptile and Amphibian Atlas 2022 and 2022a



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Table 3.1 Terrestrial Species of Conservation Concern Potentially Present in the Study Area

Common Name	Scientific Name	S-RANK	Provincial Status	National Status	Source
Eastern Milksnake	<i>Lampropeitis triangulum</i>	S3	Not at Risk	Special Concern	Ontario Reptile and Amphibian Atlas 2022 and 2022a; iNaturalist 2021
Northern Map Turtle	<i>Graptemys geographica</i>	S3	Special Concern	Special Concern	Ontario Reptile and Amphibian Atlas 2022 and 2022a
Snapping Turtle	<i>Chelydra serpentina</i>	S3	Special Concern	Special Concern	Ontario Reptile and Amphibian Atlas 2022 and 2022a; iNaturalist 2021

S2: Very rare in Ontario, 5 and 20 occurrences in the province, susceptible to extirpation
 S3: Vulnerable—Vulnerable in the province, relatively few populations (often 80 or fewer)
 S4: Apparently Secure—Uncommon but not rare
 S#B - Breeding status rank
 S#N - Non-Breeding status rank

Upon reviewing terrestrial species of conservation concern potentially present in the Study Area, habitat is available for Eastern Wood-Pewee, Bald Eagle, Wood Thrush, Eastern Ribbon Snake, Eastern Milksnake, and Snapping Turtle to be present in the surrounding wetlands/woodlands, with Monarch habitat potentially present in hedgerows.

3.4.3.2 Terrestrial Species at Risk

Records of terrestrial SAR in the vicinity of the Study Area are outlined in the Table below.

Table 3.2 Terrestrial Species at Risk Potentially Present in the Study Area

Common Name	Scientific Name	SRANK	Provincial Status	National Status	Source
Birds					
Bank Swallow	<i>Riparia riparia</i>	S4B	Threatened	Threatened	Cadman et al. 2007
Barn Swallow	<i>Hirundo rustica</i>	S4B	Threatened	Threatened	Cadman et al. 2007
Bobolink	<i>Dolichonyx oryzivorus</i>	S4B	Threatened	Threatened	Cadman et al. 2007
Chimney Swift	<i>Chaetura pelagica</i>	S4B, S4N	Threatened	Threatened	Cadman et al. 2007



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Table 3.2 Terrestrial Species at Risk Potentially Present in the Study Area

Common Name	Scientific Name	SRANK	Provincial Status	National Status	Source
Eastern Meadowlark	<i>Sturnella magna</i>	S4B	Threatened	Threatened	Cadman et al. 2007
Red-headed Woodpecker	<i>Melanerpes erythrocephalus</i>	S4B	Endangered	Endangered	Cadman et al. 2007
Acadian Flycatcher	<i>Empidonax vireescens</i>	S2S3B	Endangered	Endangered	Cadman et al. 2007
Henslow's Sparrow	<i>Centronyx henslowii</i>	SHB	Endangered	Endangered	Cadman et al. 2007
Northern Bobwhite	<i>Colinus virginianus</i>	S1	Endangered	Endangered	Cadman et al. 2007
Least Bittern	<i>Ixobrychus exilis</i>	S4B	Threatened	Threatened	Cadman et al. 2007
Eastern Whip-poor-will	<i>Antrostomus vociferus</i>	S4B	Threatened	Threatened	Cadman et al. 2007
Mammals					
Little Brown Myotis	<i>Myotis lucifugus</i>	S4	Endangered	Endangered	Dobbyn 1994
Northern Myotis	<i>Myotis septentrionalis</i>	S3?	Endangered	Endangered	Dobbyn 1994
Plants					
Eastern Flowering Dogwood	<i>Cornus florida</i>	S2?	Endangered	Endangered	NHIC 2019
Ridged Yellow Flax	<i>Linum striatum</i>	S1	-	-	iNaturalist 2021
Reptiles					
Eastern Massasauga (Carolinian)	<i>Sistrurus catenatus catenatus</i>	S3	Endangered	Endangered	Ontario Reptile and Amphibian Atlas 2022 and 2022a
Blanding's Turtle	<i>Emydoidea blandingi</i>	S3	Threatened	Threatened	Ontario Reptile Amphibian Atlas 2022 and 2022a

S1: Extremely rare in Ontario, 5 or fewer occurrences in the province, vulnerable to extirpation

S2: Very rare in Ontario, 5 and 20 occurrences in the province, susceptible to extirpation

S3: Vulnerable—Vulnerable in the province, relatively few populations (often 80 or fewer)

S4: Apparently Secure—Uncommon but not rare

SH: Possible extirpated

S#B - Breeding status rank

S#N - Non-Breeding status rank

SARO - Species at Risk in Ontario List



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Upon reviewing terrestrial SAR potentially present in the Study Area, habitat is available for Barn Swallow, Red-headed Woodpecker, Little Brown Myotis, Northern Myotis, Eastern Flowering Dogwood and Blanding's Turtle to be present in the surrounding wetlands/woodlands.

3.5 Socio-Economic Environment

3.5.1 RESIDENTS

The population near the Study Area in 2016 is presented in Table 3.3 below.

Table 3.3 Population, 2016

Location	Total Population	Land Area (km ²)	Population Density per km ²	Percent Change from 2011
Ontario	13,448,494	908,699	14.8	4.6
Niagara (Regional Municipality)	447,888	1,854	241.5	3.8
Port Colborne (City)	18,306	122	150.1	-0.6

Source: Statistics Canada 2021a, 2021b

The Regional Municipality of Niagara has a small population relative to the province of Ontario. The population of the City of Port Colborne accounts for is 4.1% of the population of Niagara Region. The Study Area is not densely populated and reflects a rural environment.

There was a decrease in population in the City of Port Colborne between 2011 and 2016, in contrast to a slight increase in Niagara Region overall. The population change in the City of Port Colborne and Niagara Region overall was all less than that of the wider province of Ontario.

Information regarding the demographics of the population is presented in Table 3.4.

Table 3.4 Density, Age and Indigenous Peoples, 2016

Location	Male ¹	Female ¹	Median Age	Population Identifying as Aboriginal ^{2,3}
Ontario	6,559,390	6,889,105	41.3	374,395
Niagara (Regional Municipality)	216,920	230,970	45.7	12,250
Port Colborne (City)	8,870	9,440	50.0	920

Notes:

- ¹ Numbers are rounded by Statistics Canada and are reported herein exactly as they are reported by Statistics Canada. Totals may not necessarily add up as a result of rounding.
- ² Estimates associated with this variable are more affected than most by the incomplete enumeration of certain Indian reserves and Indian settlements in the 2016 Census of Population.
- ³ Aboriginal identity includes persons who are First Nations (North American Indian), Métis or Inuk (Inuit) and/or those who are Registered or Treaty Indians (that is, registered under the *Indian Act* of Canada) and/or those who have membership in a First Nation or Indian band. Aboriginal peoples of Canada are defined in the *Constitution Act, 1982*, section 35 (2) as including the Indian, Inuit and Métis peoples of Canada.

Source: Statistics Canada 2021a, 2021b



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There were more individuals identifying as female than male in the City of Port Colborne and Niagara Region overall, which is consistent with the province of Ontario. The median age in the City of Port Colborne is higher than Niagara Region overall. The median age in the area is higher than in the wider province of Ontario.

As shown in Table 3.3 and Table 3.4, approximately 5.0% of the population of the City of Port Colborne identifies as Indigenous and, on a broader scale, approximately 2.7% of people in Niagara Region identify as Indigenous.

3.5.2 EMPLOYMENT AND BUSINESS

The most recent economy and employment statistics are provided in the 2016 Census of Population (Statistics Canada 2021a.). Table 3.5 summarizes the unemployment and employment rate, participation rate, and the median income of persons over the age of 15 captured at the time of census in Ontario, Niagara Region, and the City of Port Colborne.

Table 3.5 Labour Characteristics for Persons > 15 years, 2016

Location	Total Population 15 years and Over	Labour Force	Employed	Participation Rate (%)	Employment Rate (%)	Unemployment Rate (%)
Ontario	11,038,440	7,141,675	6,612,150	64.7	59.9	7.4
Niagara (Regional Municipality)	371,555	226,595	209,890	61.0	56.5	7.4
Port Colborne (City)	15,415	8,640	7,825	56.0	50.8	9.5

Source: Statistics Canada 2021a, 2021b

As shown in Table 3.5, in 2016 the City of Port Colborne and Niagara Region overall had lower participation and employment rates than the wider province of Ontario. Meanwhile, Niagara Region had a similar unemployment rate to the City of Port Colborne; both having a higher unemployment rate than the wider province of Ontario.

The high unemployment rate in places throughout Niagara Region such as the City of Port Colborne have happened for many reasons, including job seasonality and an aging population making it difficult to attract businesses to the area as staffing needs will not be met (GNCC 2018; MDB Insight 2018). Some businesses throughout the Niagara Region have faced a labour shortage with workers choosing not to work or having switched their career path due to factors such as pay, workplace conditions, and the need for more specialized jobs in larger centers (Howard 2021; MDB Insight 2018).

Median income for households and individuals is presented in Table 3.6.



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Table 3.6 Median Income, 2015

Location	Median Total Income of Households (\$)	Median Total Income of Individuals (\$)
Ontario	\$74,287	\$33,539
Niagara (Regional Municipality)	\$65,086	\$31,601
Port Colborne (City)	\$57,244	\$29,977

Source: Statistics Canada 2021a, 2021b

Median income of households in Niagara Region overall was less than the provincial median by \$9,201. Median income of individuals in Niagara Region was less than the provincial median by \$1,938. Median income of households and median income of individuals were lower in the City of Port Colborne than in Niagara Region as a whole.

The top three occupation classifications in Niagara Region included: sales and service occupations (28.6%), trades, transport and equipment operators and related occupations included (14.6%) and business, finance, and administration occupations (12.9%). These are the same top three occupation classifications in Ontario overall (Statistics Canada 2021b). At the time of the Census, the top 3 industry labour forces in the City Port Colborne included: Retail Trade (13.3%), Manufacturing (13.0%), and Health Care and Social Assistance (11.2%) (Statistics Canada 2021a).

The City of Port Colborne has been able to capitalize on its location which provides a competitive advantage due to its proximity to waterways such as the Great Lakes, Welland Canal, and Atlantic Ocean for shipping cargo (City of Port Colborne 2020). The City of Port Colborne’s strategic direction is also focused on innovation, entrepreneurship and workforce development through co-op opportunities and partnerships between local industries and local high schools, colleges, and universities. In the recent years, the City of Port Colborne has also added manufacturing jobs which is not the norm compared to the North American trend. The City of Port Colborne itself has large-scale, capital-intensive manufacturing facilities, custom production drop forges, and machine and welding shops, therefore offering many advantages to producers looking to contract fabricated metals work. Furthermore, there is a locally-owned and operated railway, docks and stevedoring facilities, and transportation/logistics companies located throughout the City which gives a comparative advantage for producers in sending products to markets across North America and internationally (City of Port Colborne 2020).

3.5.3 COMMUNITY SERVICES & INFRASTRUCTURE

Permanent and Temporary Accommodations

In the City of Port Colborne there are 8,015 occupied private dwellings, the majority are single-detached houses (5,850), the average household size is 2.2 persons. The majority of occupants were owners and not renters (74.2%) (Statics Canada 2021a).



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In Niagara Region overall, there are 183,825 occupied private dwellings, the majority are single-detached houses (123,700), the average household size is 2.4 persons. The majority of occupants were owners and not renters (74.0%) (Statistics Canada 2021b).

The City of Port Colborne is in Provincial Tourism Region 2 (Niagara Canada) (MHSTCI 2017). In 2020, the hotel occupancy rate (temporary accommodations) in the Region 2 was 27.9%, a decrease from 54.2% in 2008 (MHSTCI 2021). In 2020 there was a total of 411 temporary accommodations establishments in the Provincial Tourism Region 2. The majority of the establishments were hotels (including motor hotels, motels, and casino hotels) which numbered 178 (43.3%), followed by bed and breakfasts which numbered 151 (36.7%). There were also 23 RV parks (5.6%), and 15 camps (including hunting and fishing and recreational vacation camps) (3.6%). The remaining accommodation types included housekeeping cottages/cabins, and all other traveller accommodation (MHSTCI 2021).

Temporary accommodations in and adjacent to the Study Area are not present. However, there are bed-and-breakfasts and hotels located in downtown Port Colborne and Welland, and campgrounds and RV parks located further southeast of the Study Area.

Even though there was a hotel occupancy rate of 64.7% in 2019 for Provincial Tourism Region 2, the COVID-19 pandemic impacted travel and tourism in Ontario which was evident in 2020 for the hotel occupancy rate for Provincial Tourism Region 2 at 27.9% (MHSTCI 2021; MHSTCI 2021a). The number of operating establishments offering temporary accommodations could therefore change from the time this data was collected.

Municipal Services and Infrastructure

Drinking water in the City of Port Colborne is provided by the city-owned water distribution system which receives it from Niagara Region through treatment processes (City of Port Colborne 2020). Port Colborne's wastewater collection system is made up of 90 km of sewer mains which collects the City's wastewater, empties into one of the Region's 17 sewage pumping stations, pumped to the Region's Seaway Wastewater Treatment Plant, and discharges into the Welland Canal (City of Port Colborne 2020).

Health and Education Services

There are currently no hospitals in the Project Study Area. However, there is an Urgent Care Centre located in downtown Port Colborne along the Lake Erie waterfront (located at 260 Sugarloaf Street), and the Niagara Health-Welland Site hospital (located at 65 Third Street) (City of Port Colborne 2020). Other medical facilities and centres located in Port Colborne include the Bridges Community Health Services (located at 380 Elm Street), Mapleview Medical Clinic (located at 340 Elgin Street), and Niagara South Family Medicine (located at 200 Catharine Street, Second Floor). Specialty services are also provided by the Niagara Health System at their partner locations throughout the Regional Municipality of Niagara, Hamilton, and Buffalo (City of Port Colborne 2020).



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Throughout the Regional Municipality of Niagara there are 4 major school boards: The District School Board of Niagara, The Niagara Catholic District School Board, Conseil scolaire Viamonde, and Conseil scolaire catholique MonAvenir which cumulatively operates 139 elementary schools and 30 secondary schools (Niagara College 2020). Two post-secondary institutions also located in the Regional Municipality of Niagara include Brock University and Niagara College (Niagara College 2020). No elementary schools or high schools are located in the Project Study Area.

Roads, and Highways

The City of Port Colborne’s road network totals 292.12 km in length with 242.59 km of city owned roads and the rest being regional and provincially owned roadways (City of Port Colborne 2020). Port Colborne’s roads are inspected on a yearly basis based on a pavement evaluation system which was developed by the Ministry of Transportation. City of Port Colborne staff ensure that road maintenance maintains top priority as other capital projects (e.g., watermain and sewer construction projects) with \$1,072,000 allocated towards the Roads Resurfacing Program for 2022. Access to the Project location is from Forkes Road East which travels east-west, and then turning onto Stauth Road which travels north-south. The Project location is east of another Regional Road (Miller Road also known as Regional Road 84) which runs north-south, other local roads, and is also located southeast from where Highway 140 and Highway 58A intersect (City of Port Colborne 2020).

Policing, Fire and Emergency Response Services

Fire and Emergency Response Services in the City of Port Colborne are provided by the Port Colborne Fire and Emergency Services (located at 3 Killaly Street West) with the department also participating in the Regional Mutual Aid System whereby they are dispatched by the City of St. Catharines because of the regional wide enhanced 911 system (City of Port Colborne 2020). Policing services are provided by the Niagara Regional Police Service at their 6 District Office (located at 501 Fielden Avenue) in the City of Port Colborne (Niagara Regional Police 2019).

3.5.4 CULTURE, TOURISM AND RECREATIONAL FACILITIES

Culture, tourism, and recreational facilities are widespread throughout the Niagara Region despite most being far from the Study Area. In Niagara Falls which is located approximately 30 km northeast of the Study Area, different types of recreational and tourism activities to enjoy include the Butterfly Conservatory, Niagara Glen trail, Fallsview Casino, Great Wolf Lodge, and Clifton Hill (Tourism Niagara Canada 2021). In Niagara-on-the-Lake, which is located approximately 40 km northeast of the Study Area, activities include winery tours/tastings, culinary (e.g., farm to table), bed and breakfasts, spas, Fort George, the Niagara Parkway, and the old town. In St. Catharines, which is located approximately 30 km northwest of the Study Area, there is shopping at The Pen Centre and sporting and concert events at the Meridian Centre (Tourism Niagara Canada 2021).



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In close proximity to the Study Area, the City of Welland (located approximately 12 km northwest of the Study Area) and the City of Port Colborne (located approximately 13 km southwest of the Study Area) have local festivals, local walking trails, historical museums, arts and theatre events, and farmer’s markets (City of Port Colborne 2020; City of Welland 2022). Located approximately 20 km southwest of the Study Area, the Wainfleet Bog Conservation Area can be explored where activities such as bird watching and hiking can occur (NPCA 2022). Approximately 12 to 13 km southwest of the Study Area, there are a number of beaches such as Nickel Beach and Centennial Park Cedar Bay Beach where swimming, boating, and playing sports take place (City of Port Colborne 2020). A list of other places located close to the Study Area include Sun Retreats Sherkston Shores which is a Beachfront RV Resort (located 12 km southeast), and Safari Niagara, a 150-acre nature park, located 13 km east of the Study Area which provides interactive educational shows, tours, animal feedings, and a petting zoo (Safari Niagara 2022; Sun Retreats Sherkston Shores 2022).

3.5.5 AIR QUALITY AND NOISE

The landscape in the Study Area consists of agricultural land and environmental features. Although the Study Area does not have a high population density, air emissions will be released through personal and agricultural vehicle use.

According to the Environmental Noise Guideline (MOECC 2013), the landscape in the Study Area would most likely be categorized as a Class 3 area. This means “a rural area with an acoustical environment that is dominated by natural sounds having little or no road traffic, such as a small community; agricultural area; a rural recreational area such as a cottage or a resort area; or a wilderness area.”

The Study Area is expected to experience a low traffic volume that represents a minimal source of noise. Other minor noise sources in the Study Area include occasional sounds due to agricultural activities and domestic activities such as property maintenance and recreation.

3.5.6 LAND USE DESIGNATIONS

Municipal land uses, policies, and practices at the Project location is governed by the draft Niagara Official Plan (2022), and the City of Port Colborne Official Plan (2013).

At the Project location there is a natural gas storage area comprising existing Enbridge Gas pipelines, natural gas storage wells, and associated infrastructure. The Project is situated on lands which are also used for agricultural purposes. No change in existing property use and zoning are proposed.

As identified in Schedule “A” of the City of Port Colborne Official Plan (2013), the Study Area is primarily Agricultural land with the draft Niagara Official Plan (2022) also identifying it in their Schedule “F” as a prime agricultural area (Classes 1-3 soils, Canada Land Inventory), including specialty crop areas that are suitable to produce fruits and vegetables. The Provincial Policy Statement (2020), which the Niagara Official Plan must conform to and be consistent with, establishes that planning authorities may permit non-agricultural uses in prime agricultural areas for extraction of minerals, petroleum resources, and mineral aggregate resources (see policy 2.3.6.1).



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As identified in Schedule “B-B2” of the City of Port Colborne Official Plan (2013) and Schedule “C1-C2” of the Niagara Region Official Plan (2022), there is a natural heritage feature identified in the Study Area. The Natural Heritage Feature is an Environmental Conservation Area which consists of Significant Woodlands, Environmental Corridors, and Non-Provincially Significant Wetlands located west, south, and east of the Project location. The City of Port Colborne’s Official Plan (2013) notes that “The predominant uses for lands designated Environmental Conservation Area shall include existing uses, conservation uses, flood and erosion control, fish, forestry and wildlife management, as well as passive recreational activities”. Within the Niagara Region, and other municipalities such as the City of Port Colborne, official plans have the intent of preserving, enhancing, and restoring linkages to maintain long-term biodiversity and ecological function within the natural heritage system (consists of natural heritage features) (City of Port Colborne 2013; Niagara Official Plan 2022).

3.5.7 LANDFILLS AND CONTAMINATED SITES

Landfills

In accordance with the MECP’s Guideline D-4 Land Use on or Near Landfills and Dumps (1994), active and closed landfills within 500 m of the Project location were reviewed. The potential location of these was determined by reviewing the City of Welland Official Plan (2010), City of Port Colborne Official Plan (2013), draft Niagara Region Official Plan (2022), the MECP’s Small and Large Landfill Sites listed on the MECP website (2022; 2021b), and aerial mapping. No landfills have been identified within 500 of the Project location.

Contaminated Sites

The Project location occurs on agricultural lands, surrounded by an active DSA. The Treasury Board of Canada Secretariat’s Federal Contaminated Sites Inventory (2010) noted there are no Federal Contaminated Sites in the Study Area. The MECP Record of Site Condition Registry (2018) noted that there are no registered properties in the Study Area, the closest being 1 km northwest.

3.5.8 ARCHAEOLOGICAL RESOURCES

A Stage 1 AA (**Appendix E**) has been conducted for the Study Area. A copy of the completed Stage 1 AA was accepted by the MHSTCI for inclusion into the Ontario Public Register of Archaeological Reports on April 8, 2022.

Archaeological potential is established by determining the likelihood that archaeological resources may be present on a subject property. Stantec applied archaeological potential criteria commonly used by the MHSTCI (Government of Ontario 2011) to determine areas of archaeological potential within the region under study. These variables include proximity to previously identified archaeological sites, distance to various types of water sources, soil texture and drainage, glacial geomorphology, elevated topography, and the general topographic variability of the area.



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Distance to modern or ancient water sources is generally accepted as the most important determinant of past human settlement patterns and considered alone may result in a determination of archaeological potential. However, any combination of two or more other criteria, such as well-drained soils or topographic variability, may also indicate archaeological potential. Finally, extensive land disturbance can eradicate archaeological potential (Government of Ontario 2011).

An examination of the Ontario Archaeological Sites Database has shown that there are no registered archaeological sites or site components within one km of the Study Area. However, the Study Area does exhibit characteristics that identify the potential for the recovery of archaeological resources. The Study Area is located approximately 50 metres north of an unnamed seasonal tributary of Tea Creek, is located northwest of the Humberstone Marsh Conservation Area, and is approximately 12 km west of the Niagara River. Moreover, additional ancient and/or relic tributaries of the various water sources may have existed. Soil conditions in the Study Area may have been suitable for Indigenous and Euro-Canadian agriculture, especially after additional drainage measures were in place. Mapping from the early-to-late 19th century demonstrates that the Study Area was occupied by Euro-Canadian farmers by the mid-19th century and, possibly, the early 19th century. The Study Area is also in close proximity to early road and rail transportation routes, and the original Welland Canal is located approximately six km to the west.

3.5.9 BUILT HERITAGE RESOURCES AND CULTURAL HERITAGE LANDSCAPES

The MHSTCI *Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes* (the Checklist) was completed for the Study Area. The Checklist is used to identify protected and potential cultural heritage resources and make recommendations for future work, as appropriate. The Checklist completed for the Project identified no indicators of cultural heritage value or interest in the Study Area. Results of the Checklist are included in Table 3.7 and the completed Checklist is included in **Appendix F**.

Table 3.7 Screening for Known (or recognized) Cultural Heritage Value According to MHSTCI Checklist

Indicators of Cultural Heritage Value or Interest	Identified within the Study Area
Property identified, designated or otherwise protected under the OHA as being of cultural heritage value	Not Identified
A National Historic Site (or part of)	Not Identified
Designated under the <i>Heritage Railway Stations Protection Act</i>	Not Identified
Designated under the <i>Heritage Lighthouse Protection Act</i>	Not Identified
Identified as a Federal Heritage Building by the Federal Heritage Buildings Review Office	Not Identified
Located within a United Nations Educational, Scientific and Cultural Organization World Heritage Site	Not Identified
Is subject of a municipal, provincial or federal commemorative or interpretative plaque	Not Identified
Has or is adjacent to a known burial site and/or cemetery	Not Identified
Is in a Canadian Heritage River watershed	Not Identified



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Table 3.7 Screening for Known (or recognized) Cultural Heritage Value According to MHSTCI Checklist

Indicators of Cultural Heritage Value or Interest	Identified within the Study Area
Contains buildings or structures that are 40 or more years old	Not Identified
Is considered a landmark in the local community or contains any structures or sites that are important in defining the character of the area	Not Identified
Has a special association with a community, person or historical event	Not Identified
Contains or is part of a cultural heritage landscape	Not Identified

3.5.10 INDIGENOUS INTERESTS

The Study Area is in Treaty 3, Between the Lakes Purchase (Ministry of Indigenous Affairs 2018). The original Between the Lakes Purchase was signed in 1784, but due to uncertainties with the description of the lands in the original surrender, Treaty 3 was entered into the Purchase on December 7, 1792 to clarify what was ceded and eventually signed by representatives of the Crown and certain Mississauga peoples. The territory described in the treaty covers approximately 3 million acres and is given the name “Between the Lakes” as the lands associated with the treaty are between Lake Ontario and Lake Erie (Ministry of Indigenous Affairs 2018).

While the Crown has determined that there is no duty to consult trigger, Enbridge Gas has initiated outreach with the Mississaugas of the Credit First Nation, Six Nations of the Grand River, and Haudenosaunee Development Institute.



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4 Potential Impacts, Mitigation and Protective Measures, and Net Impacts

4.1 Methodology

4.1.1 OVERVIEW

The potential effects and impacts of the project on physical, biophysical, and socio-economic features have been assessed in the Study Area upon review of the existing conditions outlined in Sections 3.3-3.5. With an understanding of construction and operation/maintenance activities (see Sections 4.1.2 and 4.1.3, respectively) the assessment:

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

The determination of effects, impacts, and mitigation and protective measures considered:

- Comments expressed during the consultation program
- Information available from published and unpublished literature
- Maps and digital data
- Mitigation guidance documents
- The oil and gas development experience of Enbridge Gas and Stantec

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

There are instances where field investigations are recommended before construction. Given the location of the Project components and experience of Stantec in providing environmental services for the oil and gas sector, these supplemental studies are not expected to change the conclusions regarding potential adverse residual impacts.

Table 4.1 below summarizes the potential impacts, mitigation and protective measures, including recommended supplemental studies, and net impacts for the existing conditions described in Section 3.



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4.1.2 CONSTRUCTION

Construction activities at the Project location involve a temporary approximately 8100 m² gravel drilling pad, later replaced by a permanent 6m wide access laneway and 8 m x 8 m gravel pad. All activities will occur on agricultural land.

Construction will start with clearing vegetation where the permanent access laneway will eventually be located and installing environmental silt fencing at required locations. The temporary gravel drilling pad will involve excavation of topsoil and placement of crushed gravel on top of geotextile material.

The new natural gas storage well will be drilled with either a rotary tool (with a rotating bit) or cable tool (with a chisel-type bit). Either method will involve the removal of drill cuttings via a fluid. Drill cuttings and the medium to remove them will be stored in tanks on the drilling pad, prior to testing for contaminants and subsequent removal to an appropriate facility.

Following construction of the new natural gas storage well, the temporary gravel drilling pad will be reduced in size by removing extraneous crushed gravel and the underlying geotextile cloth and replacing the stockpiled topsoil. The remaining area is a new access laneway, and a permanent graveled well pad with storage well.

4.1.3 OPERATION AND MAINTENANCE

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

- Completing inspection by Enbridge Gas at least once a year to check for evidence of damage to aboveground equipment, evidence of damage to underground piping and gas leaks, and identify any unassociated construction activity near the Project.
- Reviewing operating conditions of facilities.

4.2 Summary Table



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Table 4.1 Potential Impacts and Recommended Mitigation and Protective Measures

Environmental Feature(s)	Potential Impact(s)	Mitigation and Protective Measures	Net Impacts
PHYSICAL FEATURES			
Bedrock Geology and Drift Thickness <i>Section 3.3.1</i>	Based on the deep location of bedrock, it is likely that it will only be encountered during drilling of the new well, for which bedrock removal will be required. Potential impacts include sensory disturbance to residents and wildlife.	<ul style="list-style-type: none"> • Mitigation and protective measures for disturbance to residents are outlined in Section 3.5. • Mitigation and protective measures for disturbance to wildlife are outlined in Section 3.4. 	With the implementation of the mitigation and protective measures, no significant adverse residual impacts from encountering bedrock are anticipated.
Surficial Geology and Physiography <i>Section 3.3.2</i>	Disturbance to the overburden may cause surface soil erosion.	<ul style="list-style-type: none"> • The location of erosion and sediment control (ESC) measures are anticipated to be outlined in the permit obtained from the NPCA. • When land is exposed, the exposure should be kept to the shortest practical period. • The contractor should obtain adequate quantities of materials to control erosion. Additional supplies should be maintained in a readily accessible location for maintenance and contingency purposes. ESC structures should be monitored to maintain their effectiveness through the life of construction and post-construction rehabilitation. • Even with ESC measures, extreme precipitation events could result in collapse of silt fencing, overflow or bypass of barriers, and other situations which could lead to erosion. When site conditions permit, permanent protection measures should be installed on erosion susceptible surfaces. If the erosion is resulting from a construction-related activity, the activity should be halted immediately until the situation is rectified. • ESC and stabilization measures should be maintained during construction, restoration, and rehabilitation until the site is established. Where evidence of erosion exists, corrective control measures should be implemented as soon as conditions permit. 	With the implementation of the mitigation and protective measures, no significant adverse residual impacts to or from the overburden material are anticipated.



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Table 4.1 Potential Impacts and Recommended Mitigation and Protective Measures

Environmental Feature(s)	Potential Impact(s)	Mitigation and Protective Measures	Net Impacts
Groundwater <i>Section 3.3.3</i>	Project activities do not anticipate requiring dewatering. Where excavation encounters shallow groundwater conditions or following a large precipitation event, removing water (known as dewatering) may be necessary. During dewatering, discharge water will be released to the environment. An uncontrolled discharge of water could cause downstream flooding, erosion, sedimentation, or contamination. Other potential effects of uncontrolled discharge may include introduction of foreign aquatic organism to a drainage basin and introduction of hazardous materials or pollutants to soils or bodies of water.	<ul style="list-style-type: none"> For groundwater dewatering, the MECP allows registration for construction dewatering projects where groundwater takings will be greater than 50,000 L/day and less than 400,000 L/day; however, should groundwater takings exceed 400,000 L/day, a permit may be required from the MECP. To reduce the potential for erosion and scouring at discharge locations during construction dewatering, energy dissipation techniques should be used. Discharge piping should be free of leaks and should be properly anchored to prevent bouncing or snaking during surging. Protective measures may include dewatering at low velocities, dissipating water energy by discharging into a filter bag or diffuser, and using protective riprap or equivalent. If energy dissipation measures are found to be inadequate, the rate of dewatering should be reduced or dewatering discontinued until satisfactory mitigation measures are in place. Discharge should be monitored to make sure that no erosion or flooding occurs. To assess the potential for the introduction of contaminated water to soils or bodies of water, testing of discharge water should be completed. 	With the implementation of the mitigation and protective measures, no significant adverse residual impacts on groundwater are anticipated.
Aggregates and Petroleum Resources <i>Section 3.3.4</i>	The Study Area is located in a DSA, and therefore Project construction may interact with existing infrastructure.	<ul style="list-style-type: none"> Enbridge Gas will follow internal procedures and communication protocols to identify and avoid adverse impacts to existing infrastructure in the DSA. 	With following procedures and communication, no significant adverse residual impacts on aggregates and petroleum resources are anticipated.
Soil and Soil Capability <i>Section 3.3.5</i>	Excess soil may be generated on-site during construction activities that will require off-site management. Construction activities have the potential to affect soil quality. The movement of heavy machinery on	<p><u>Excess Soil</u></p> <ul style="list-style-type: none"> It is noted that the MECP has new regulations for the movement of excess soils in the province of Ontario. Though the Project is not expected to generate significant quantities of excess soil, Enbridge Gas should retain or consult with a qualified person who is knowledgeable in the current excess 	With the implementation of the mitigation and protective measures, no significant adverse residual impacts on soil or soil capability are anticipated.



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Table 4.1 Potential Impacts and Recommended Mitigation and Protective Measures

Environmental Feature(s)	Potential Impact(s)	Mitigation and Protective Measures	Net Impacts
	<p>wet soil may cause rutting and mixing of topsoil with subsoil. When exposed, soils are more prone to erosion due to the loss of vegetative cover. Improperly salvaged topsoil can result in topsoil and subsoil mixing, rutting, and erosion.</p>	<p>soils guidelines, to make recommendations for the management of excess soils.</p> <p><u>Wet Soil Shutdown</u></p> <ul style="list-style-type: none"> • To the extent feasible, construction activities should occur during drier times of the year. Lands affected by heavy rainfall events should be monitored for wet soil conditions, to avoid the potential for topsoil and subsoil mixing and loss of structure. Construction activities should be temporarily halted on lands where excessively wet soil conditions are encountered. Enbridge Gas' on-site inspection team should determine when construction activities may be resumed. • If a situation develops that necessitates construction during wet soil conditions, soil protection measures should be implemented, such as confining construction activity to the narrowest area practical, installing surface protection measures, and using wide tracked or low ground pressure vehicles. <p><u>High Winds</u></p> <ul style="list-style-type: none"> • During construction activities, weather should be monitored to identify the potential onset of high wind conditions and to preserve topsoil. In the event that high winds occur, the contractor should implement protective measures such as: <ul style="list-style-type: none"> – Suspend earth moving operations – Apply dust suppressants or vegetate the piles – Protect soil stockpiles with a barrier or windscreen • In conjunction with the above measures, all required materials and equipment should be readily accessible and available for use as required. <p><u>Soil Stripping</u></p> <ul style="list-style-type: none"> • Enbridge Gas should review the construction footprint and determine if soil stripping is feasible. If stripping is undertaken, 	



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Table 4.1 Potential Impacts and Recommended Mitigation and Protective Measures

Environmental Feature(s)	Potential Impact(s)	Mitigation and Protective Measures	Net Impacts
		<p>topsoil layer and subsoil should be stripped and stockpiled separately to avoid mixing.</p> <ul style="list-style-type: none"> If clean-up is not practical during the construction year, it should be undertaken in the year following construction, starting once the soils have sufficiently dried. Interim soil protection measures should be implemented in sensitive areas to stabilize the soil for over-wintering. <p><u>Soil Compaction</u></p> <p>Where soil has been compacted by the construction process, an agrologist should determine where decompaction may be necessary. Compaction can be alleviated by using farm equipment such as an agricultural subsoiler prior to replacing the topsoil. Sub-soiling with an agricultural subsoiler, followed by discing, chisel ploughing and cultivating, to smooth the surface, should be considered on agricultural lands. Where deep compaction persists, additional deep tillage or subsoiling may be required on a site-specific basis. Soil density and/or penetrometer measurements on and off the easement may be used as a means of assessing the relative degree of soil compaction caused by construction as well as determining that soil has been sufficiently de-compacted.</p>	
<p>Agricultural Tile Drains <i>Section 3.3.6</i></p>	<p>As no agricultural tile drains have been identified, no impacts are anticipated.</p>	<ul style="list-style-type: none"> As no impacts to agricultural tile drains are anticipated, no mitigation or protective measures are recommended. 	<p>As no impacts are anticipated, no net impacts will occur.</p>
<p>SCN <i>Section 3.3.7</i></p>	<p>Lands with SCN or other pests and/or diseases have the potential to impact soil productivity, and to be transported by construction equipment from infected to non-infected locations.</p>	<ul style="list-style-type: none"> Enbridge Gas should implement their clean equipment protocol. Any imported topsoil used for rehabilitation will have a composite sample analyzed for identified concerns. 	<p>With the implementation of the mitigation and protective measures, no significant adverse residual impacts from SCN or other pests and/or diseases are anticipated.</p>



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Table 4.1 Potential Impacts and Recommended Mitigation and Protective Measures

Environmental Feature(s)	Potential Impact(s)	Mitigation and Protective Measures	Net Impacts
Natural Hazards <i>Section 3.3.8</i>	The likelihood of a flooding event interfering with Project construction is reduced by construction occurring outside of the spring freshet. A flooding event during construction could result in construction delays, soil erosion, sedimentation of a watercourse, and damage or loss of construction equipment and contamination of a watercourse as a result of equipment entering a watercourse. The nature of these impacts would depend on the spatial extent, duration, and magnitude of the flooding event. The probability of significant seismic activity in the Study Areas is low; therefore, no potential impacts are anticipated.	<ul style="list-style-type: none"> • If flooding necessitates a change in the construction schedule, affected landowners and regulatory agencies should be notified and construction should continue at non-affected locations. • Temporary workspaces should be located above the floodplain to the extent practical. • All work in the floodplain will be subject to a permit from the NPCA. 	With the implementation of the mitigation and protective measures, no significant adverse residual impacts from natural hazards are anticipated.
BIOPHYSICAL FEATURES			
Aquatic Features <i>Section 3.4.1</i>	Indirect impacts may occur through sedimentation and/or spills.	<ul style="list-style-type: none"> • Mitigation and protective measures for ESC are outlined in Section 3.3.2. Contingency measures for accidental spills are outlined in Section 6.2.2. 	With the implementation of the mitigation and protective measures, no significant adverse residual impacts to aquatic features are anticipated.
Designated Natural Areas and Vegetation <i>Section 3.4.2</i>	Project activities will occur on agricultural land and therefore direct impacts are not anticipated to designated natural areas. The hedgerow will require clearing to facilitate the access road. Indirect	<ul style="list-style-type: none"> • Vegetation clearing should be reduced to the greatest extent possible. • A field investigation should occur to confirm vegetation in the area to be cleared, and approval/mitigation measures implanted as warranted. 	With the implementation of the mitigation and protective measures, no significant adverse residual impacts to designated



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Table 4.1 Potential Impacts and Recommended Mitigation and Protective Measures

Environmental Feature(s)	Potential Impact(s)	Mitigation and Protective Measures	Net Impacts
	impacts may occur through sedimentation and/or spills into the adjacent wetland/woodland.	<ul style="list-style-type: none"> Mitigation and protective measures for ESC are outlined in Section 3.3.2. Contingency measures for accidental spills are outlined in Section 6.2.2. 	natural areas and vegetation are anticipated.
Wildlife Habitat, Wildlife, and Species at Risk <i>Section 3.4.3</i>	There is the potential for 6 species of conservation concern, and 6 SAR, to occur in the wetlands/woodlands surrounding the Project Location. There is potential for Monarch habitat to be in the hedgerow that will require clearing to facilitate the access road, and for Barn Swallow to use the agricultural field for foraging. Potential impacts on wildlife, wildlife habitat, and SAR from construction include habitat loss, direct mortality from construction vehicles and/or adults abandoning young due to disturbance, habitat degradation through spills, and sensory disturbance.	<ul style="list-style-type: none"> A field investigation should occur to confirm vegetation in the area to be cleared, and approval/mitigation measures implanted as warranted. Mitigation and protective measures for Red-headed Woodpecker are: <ul style="list-style-type: none"> When conducting activities for the Project, avoid clearing within habitat of Red-headed Woodpecker between the second week of May and late August. This timing window corresponds with the main breeding season for the species so the best mitigation option is to avoid potentially harmful activities while birds are breeding on site. All persons entering the site should be provided training on Red-headed Woodpecker and proper steps to take upon encountering the species. Continual awareness and avoidance of nesting areas will be encouraged through training programs for those individuals with access to the Project footprint. Prior to clearing, the work area will be walked and staked, and no personnel or equipment will exceed these limits. If work will take place between the second week of May and late August 2022, targeted Red-headed Woodpecker breeding surveys should be completed between the last week of May and the first week of July, prior to construction, to assess presence of breeding pairs. If Red-headed Woodpeckers are not present, work can proceed. If the species is present adjacent to the work site, measures should be developed with a qualified professional, which may include buffers, noise mitigation and/or postponing of components of the work until after the breeding season. However, if the species is present 	With the implementation of the mitigation and protective measures, no significant adverse residual impacts on wildlife habitat, wildlife, and SAR are anticipated.



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Table 4.1 Potential Impacts and Recommended Mitigation and Protective Measures

Environmental Feature(s)	Potential Impact(s)	Mitigation and Protective Measures	Net Impacts
		<p>within the work area, construction will need to be delayed until after August 31.</p> <ul style="list-style-type: none"> - Observations of Red-headed Woodpeckers on the site should be recorded and submitted to the MECP. • Mitigation and protective measures for Little Brown Myotis and Northern Myotis are: <ul style="list-style-type: none"> - All persons entering the site should be provided training on Little Brown Myotis and Northern Myotis and proper steps to take upon encountering either species. Handling of native bat species is not recommended. It is very unlikely that a bat will be encountered during construction, however, in the event that one is, a wildlife rehabilitator will be contacted. - Candidate bat trees (i.e., trees with loose bark, cavities and/or snags) will be identified during field investigations prior to construction. - Where candidate trees are proposed for removal, conduct bat exit surveys within three (3) days of clearing. - Observations of Little Brown Myotis or Northern Myotis on the site should be recorded and submitted to the MECP. • Mitigation and protective measures for Blanding’s Turtle are: <ul style="list-style-type: none"> - All persons entering the site should be provided training about Blanding’s Turtle and proper steps to take upon encountering either species. Continual awareness and avoidance of Blanding’s Turtles nesting on, or crossing, roadways will be encouraged through training programs for those individuals with access to the Project Location. - Prior to construction, the work area will be walked and staked within potential Blanding’s Turtle. The contractor should oversee that no disturbance occurs beyond the staked/fenced limits. 	



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Table 4.1 Potential Impacts and Recommended Mitigation and Protective Measures

Environmental Feature(s)	Potential Impact(s)	Mitigation and Protective Measures	Net Impacts
		<ul style="list-style-type: none"> - If clearing is to take place during the turtle active season (May-September) exclusion fencing should be installed. A qualified biologist should develop a fencing plan that include turtle appropriate fence specifications. - In the unlikely event that a Blanding’s Turtle enters the work area and is in immediate danger, a 30 m buffer should be placed on the work area and construction activities should cease until the individual has vacated the work area on its own accord before recommencing construction activity. Alternately, the turtle should be relocated by a qualified biologist and the MECP should be contacted within 2 business days. - If a nesting Blanding’s Turtle is observed or if a turtle nest is identified within the Project footprint either during construction or operation of the Project, the MECP should be contacted immediately. A 5 m buffer should be applied to the nest site, or 30 m to a nesting female, and maintained until the MECP provides additional direction. Turtle nests should not be touched as it can damage eggs. - Observations of Blanding’s Turtle on the site should be recorded and submitted to the MECP. • Mitigation and protective measures for Eastern Flowering Dogwood are: <ul style="list-style-type: none"> - Field investigations to determine the presence or absence of eastern flowering dogwood within the Project footprint will be undertaken prior to vegetation clearing activities in 2022. - If eastern flowering dogwood is observed, an assessment should be made as to whether the individual(s) can be retained, while not risking the integrity of the pipeline. 	



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Table 4.1 Potential Impacts and Recommended Mitigation and Protective Measures

Environmental Feature(s)	Potential Impact(s)	Mitigation and Protective Measures	Net Impacts
		<ul style="list-style-type: none"> - If the tree cannot be retained, a qualified biologist will undertake an assessment as to the feasibility of relocating the individual. - Removal or relocation of eastern flowering dogwood during its reproductive season (April 1 to October 31) is not permitted. • General mitigation and protective measures for potential impacts on wildlife, wildlife habitat, and SAR are: <ul style="list-style-type: none"> - Equipment and vehicles should yield to wildlife. - The contractor should inform their personnel to not threaten, harass, or injure wildlife. - If wildlife are encountered during construction, personnel are required to move away from the animal and wait for the animal to move off the construction site. • Mitigation and protective measures for noise are outlined in Section 3.5.1. Mitigation and protective measures for ESC are outlined in Section 3.3.2. Contingency measures for accidental spills are outlined in Section 6.2.2. 	
SOCIO-ECONOMIC ENVIRONMENT			
Residents <i>Section 3.5.1</i>	Despite the lack of residents in vicinity to the project (only 3 residences within 500m), those living and travelling near the area during construction may experience nuisance concerns of increased noise, equipment exhaust, and dust.	<ul style="list-style-type: none"> • During construction, motorized construction equipment should be equipped with mufflers. Company and construction personnel should avoid idling of vehicles; vehicles or equipment should be turned off when not in use unless required for operation of the vehicle or equipment. To the greatest extent activities that could create noise should be restricted to daylight hours and adhere to local noise by-laws. Sources of continuous noise, such as portable generators, should be shielded or situated to reduce disturbance to residents and businesses. • Site practices during construction should be implemented that are in line with the document 'Best Practices for the Reduction of Air Emissions from Construction and Demolition Activities' 	With the implementation of the mitigation and protective measures, no significant adverse residual impacts on residents are anticipated.



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Table 4.1 Potential Impacts and Recommended Mitigation and Protective Measures

Environmental Feature(s)	Potential Impact(s)	Mitigation and Protective Measures	Net Impacts
		prepared by Cheminfo Services Inc. for Environment Canada (Cheminfo Services Inc. 2005), which may include: <ul style="list-style-type: none"> - Maintaining equipment in compliance with regulatory requirements - Protecting stockpiles of friable material with a barrier or windscreen in the event of dry conditions and dust - Dust suppression of source areas - Covering loads of friable materials during transport - Watering for dust control must not result in the formation of puddles, rutting by equipment or vehicles, the tracking of mud onto roads, or the siltation of watercourses 	
Employment and Business <i>Section 3.5.2</i>	Project demands for labour and goods and services can result in both beneficial and adverse effects. Positive effects may not be evenly distributed among populations, with some residents in a better position to receive economic benefits than others. Similarly, adverse effects may affect some residents more than others. Residual effects on employment are related to the project's labour demand compared to the labour supply. Three types of employment are considered: <ul style="list-style-type: none"> • Direct employment: labour that is hired directly for the Project • Indirect employment: labour hired by companies in order to produce and provide goods and services needed for the Project 	<ul style="list-style-type: none"> • Overall, it is expected that the Project will generally result in positive effects on employment by providing work opportunity for local and Indigenous people and increasing the employment rate. These positive effects do not require mitigation, but Enbridge Gas will identify and implement various mechanisms to enhance project benefits. • To further increase the positive effects generated from the Project, contractors should make all reasonable efforts, where practicable, to procure services and materials from local suppliers, where services or materials are available in required quantity and at competitive prices. To help encourage further local and Indigenous content on the Project, it is recommended that Enbridge Gas post purchasing requirements in advance, so that businesses can position themselves to effectively bid to supply goods and services needed for construction and operation. Increased participation of local and Indigenous businesses will enhance positive local economic effects. • To mitigate adverse impacts to existing businesses, see the measures recommended above for 'Residents'. 	With the initiatives to encourage local participation on the Project, it is anticipated that the effects from the Project on employment and business will generate positive economic activity through new direct, indirect, and induced employment. Project expenditures on local businesses and suppliers also have the potential to positively affect the economy. Additionally, those who have worked on the Project will gain transferrable skills and experience that could help them gain employment in other industries. Mitigation measures will any unlikely



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Table 4.1 Potential Impacts and Recommended Mitigation and Protective Measures

Environmental Feature(s)	Potential Impact(s)	Mitigation and Protective Measures	Net Impacts
	<ul style="list-style-type: none"> Induced employment: labour hired by industries that produce and provide consumer items and services purchased by people who are directly or indirectly employed by the Project <p>During all phases of the Project, labour conditions will be affected by direct, indirect, and induced employment.</p> <p>The required workforce will create work opportunity for those living in Port Colborne and will result in increased employment income and municipal government revenue.</p> <p>Local businesses, including businesses owned by Indigenous peoples, will also likely benefit from the project through purchases of labour, goods, and services that will be needed to complete construction of the Project.</p> <p>While construction will generally result in positive effects on employment, some local businesses may be temporarily adversely impacted by increases in noise and traffic volumes during construction.</p>		<p>nuisance impacts on existing businesses.</p> <p>With the implementation of the Project, local procurement, and mitigation and protective measures, positive residual impacts on the economy and employment are anticipated.</p>



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Table 4.1 Potential Impacts and Recommended Mitigation and Protective Measures

Environmental Feature(s)	Potential Impact(s)	Mitigation and Protective Measures	Net Impacts
Community Services and Infrastructure <i>Section 3.5.3</i>	The presence of temporary workers during the construction period has the potential to increase the demand on local community services and infrastructure.	<ul style="list-style-type: none"> The contractor should have emergency response equipment and trained personnel on-site during construction. In addition, an Emergency Response Plan should be developed and implemented, which will address field health services, emergency call-out procedures and fire response plans. Contact information for a designated Enbridge representative will be available to address questions and concerns during construction. Consultation has been initiated and will continue with municipal personnel. 	Community services and infrastructure appear to have additional capacity to absorb potential increased temporary demands that may result from the Project. Given the available capacity of the local community services and infrastructure, along with the implementation of the mitigation and protective measures, no significant adverse residual impacts on community services and infrastructure are anticipated.
Culture, Tourism and Recreational Facilities <i>Section 3.5.4</i>	No culture, tourism, or recreational facilities were identified in the vicinity of the Project.	<ul style="list-style-type: none"> As no impacts to culture, tourism, and recreational facilities are anticipated, no mitigation or protective measures are recommended. 	As no impacts are anticipated, no net impacts will occur.
Air Quality and Noise <i>Section 3.5.5</i>	Residential and business properties may experience noise, dust and equipment exhaust associated with construction activity. Drilling of the new well may also require blow down/flaring of natural gas. During operation, no substantial air or noise emissions are anticipated to occur.	<ul style="list-style-type: none"> Mitigation and protective measures for air quality and noise are outlined in Section 3.5.1. 	With the implementation of the mitigation and protective measures, no significant adverse residual impacts from air quality and noise are anticipated.
Land Use Designations <i>Section 3.5.6</i>	Natural gas facilities/structures are permitted land uses, and therefore no impacts are anticipated.	<ul style="list-style-type: none"> As no impacts to land use designations are anticipated, no mitigation or protective measures are recommended. 	As no impacts are anticipated, no net impacts will occur.



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Table 4.1 Potential Impacts and Recommended Mitigation and Protective Measures

Environmental Feature(s)	Potential Impact(s)	Mitigation and Protective Measures	Net Impacts
Landfills and Contaminated Sites <i>Section 3.5.7</i>	Improper disposal of waste material generated during construction may result in contamination to soil, groundwater, and/or surface water resources. Litter generated during construction may also become a nuisance to adjacent properties if not contained. There is also the potential to encounter contaminated soil and/or water.	<ul style="list-style-type: none"> • The construction contractor should implement a site-specific waste collection and disposal management plan, which may include: <ul style="list-style-type: none"> – Waste materials (including drilling cuttings and fluid), sanitary waste, and recycling transported off-site by private waste contractors licensed by the MECP. – Contractors required to remove their excess materials from the site. – Labelling and storage of hazardous and liquid wastes in a secure area that would contain material in the event of a spill. – Implementation of a waste management program consisting of reduction, reuse, and recycling of materials. • Section 6.2.3 outlines contingency measures to be implemented should contaminated soils be encountered. 	With the implementation of the mitigation and protective measures, no significant adverse residual impacts from landfills and contaminated sites are anticipated.
Archaeological Resources <i>Section 3.5.8</i>	Construction has the potential to interact with archaeological resources.	<ul style="list-style-type: none"> • A Stage 2 AA will be conducted on all lands disturbed by the Project. The results of the assessment will determine appropriate mitigation and protective measures. Where feasible for the Project, archaeological sites that are determined to retain further cultural heritage value and interest may be mitigated in whole or in part by avoidance and protection/preservation measures. Where avoidance and protection/preservation measures are not feasible, archaeological resources may be mitigated in whole or in part by excavation. 	With the implementation of the AA and subsequent mitigation measures, including avoidance and protection/preservation (where feasible) and excavation, no significant adverse residual impacts on archaeological resources are anticipated.
Built Heritage Resources and Cultural Heritage Landscapes <i>Section 3.5.9</i>	The cultural heritage checklist identified no heritage features or landscapes, and therefore no impacts are anticipated.	<ul style="list-style-type: none"> • As no impacts to cultural heritage resources are anticipated, no mitigation or protective measures are recommended. 	As no impacts are anticipated, no net impacts will occur.



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Table 4.1 Potential Impacts and Recommended Mitigation and Protective Measures

Environmental Feature(s)	Potential Impact(s)	Mitigation and Protective Measures	Net Impacts
Indigenous Interests <i>Section 3.5.10</i>	The Project may affect traditional territories of Indigenous communities, and during construction harvesting and hunting in the construction area could be impeded. Archaeological surveys could also result in the finding of Indigenous artifacts.	<ul style="list-style-type: none"> Enbridge Gas has sought input from the identified Indigenous communities and will continue engaging with Indigenous communities as the Project moves forward. Enbridge Gas will also continue to work with their respective Economic Development departments and Enbridge Gas' contractors to find opportunities for their participation in providing goods and services during construction. 	By undertaking the engagement and archaeological assessments, no significant adverse residual impacts on Indigenous interests are anticipated.



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5 Cumulative Effects Assessment**

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5 Cumulative Effects Assessment

The recognition of cumulative effects assessment as a best practice is reflected in many regulatory and guidance documents. Regarding the development of oil and gas infrastructure in Ontario, the *OEB Environmental Guidelines* (2016) notes that cumulative effects should be identified and discussed in the ER.

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

5.1 Methodology

The cumulative effects assessment describes the potential cumulative effects resulting from the interaction of residual effects of constructing and operating the Project with the effects of other unrelated projects. The other projects assessed are those that are either existing or approved and that have a high likelihood of proceeding.

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

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

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

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

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



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5.2 Study Boundaries

Spatial

To make assumptions about the magnitude and probability of effects, an approximate 100 m boundary around the Project location was used for the cumulative effects assessment. The 100 m boundary has been found, through previous experience with oil and gas infrastructure construction, to be appropriate for the most encountered net effects.

Temporal

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

1. ER and technical design – 2022
2. Construction – 2022
3. Operation and Maintenance – 2022 to 2072*

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

Based upon these milestone activities, two time periods were selected for evaluation: 2022 and 2027. The year 2022 was selected to represent the construction period, and the year 2027 was selected to represent the operation and maintenance period. Forecasting beyond 2027 increases the uncertainty in predicting whether projects will proceed, and the effects associated with these projects.

5.3 Project Inclusion List

As part of the study of cumulative effects, projects that are either currently existing, and those that have been approved and are scheduled (or are likely to be scheduled) during the construction period and early operation and maintenance of the Project, were reviewed and added to the project inclusion list. The list was developed by reviewing publicly available information for projects and activities with the potential for effects to interact with the identified effects of the proposed Project in the spatial and temporal study boundaries. The following resources were reviewed:

- Canada Energy Regulator, Major Applications and Projects (CER 2022)
- Canadian Environmental Assessment Agency, Canadian Environmental Assessment Registry (CEA Agency 2022)
- eSCRIBE Agenda Package- City of Port Colborne (2021)
- Government of Ontario, Environmental Assessment Projects by Category (Government of Ontario 2021a)
- Government of Ontario, Renewable Energy Approval Projects (Government of Ontario 2021b)



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- Infrastructure Ontario, Infrastructure Ontario Projects – Interactive Map (Government of Ontario 2022)
- MTO, Southern Highways Program (2017-2021) (MTO, n.d.)
- 2021 Niagara Region Budget (n.d.)
- OEB Applications Currently Before the Board (facilities applications only) (OEB 2022)

Based on the review of publicly available resources, no projects have been identified for the project inclusion list. The closest identified projects are two bridge and culvert rehabilitation projects being undertaken by the Ministry of Transportation approximately 3 km northwest of the Study Area (MTO, n.d.). However, it is assumed that on-going improvements to Stauth Road, and to the DSA itself, may occur in the spatial and temporal study boundaries.

5.4 Analysis of Cumulative Effects

The ER considers the potential impacts of the Project on specific features and conditions and proposes mitigation and protective measures to eliminate or reduce the potential impacts. The cumulative effects assessment evaluates the significance of residual impacts (after mitigation) of the Project along with the effects of other unrelated projects.

5.4.1 CONSTRUCTION – 2022

Residual Project impacts which may occur during Project construction are outlined in Table 4.1. To consider the additive and interactive effects at their maximum intensity, the cumulative effects assessment assumes that Project construction and Stauth Road improvements will occur concurrently. Potential cumulative effects resulting from the two potential projects are additive effects on air quality and the acoustic environment. The construction of the Project will result in an increase in air pollutants, increased noise, and an increase in dust from the operation of vehicles and equipment. These potential effects on air quality and the acoustic environment may be felt by nearby wildlife, residents, and businesses, and would be compounded by work being undertaken by municipal public works. Provided that the mitigation and protective measures outlined in this ER are implemented, and that the unrelated project undertakes similar measures, significant changes to existing conditions and adverse cumulative residual effects are not anticipated to occur.

5.4.2 OPERATION AND MAINTENANCE – YEAR 2027

Operation and maintenance of the proposed Project will have relatively little impact on the environment. On a day-to-day basis there is no operational noise that is anticipated to occur following Project construction. Should well maintenance be necessitated, this is the only anticipated instance when the Project would have potential temporary impacts during its operation. These impacts are an increase in air pollutants, increased noise, and an increase in dust from the operation of vehicles and equipment. These potential effects on air quality and the acoustic environment may be felt by nearby wildlife, residents, and businesses, and would be compounded by work being undertaken by municipal public works, and other unrelated activities in the DSA. Provided maintenance activities be completed in coordination with the



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5 Cumulative Effects Assessment**

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Enbridge Gas Environmental Planning Team, and that unrelated projects undertake standard mitigation, significant changes to existing conditions and adverse cumulative residual effects are not anticipated to occur.

5.5 Summary of Cumulative Effects

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

The cumulative effects assessment determined that, provided the mitigation and protective measures outlined in this report are implemented and that concurrent projects implement similar mitigation and protective measures, potential cumulative effects are not anticipated to occur, or if they do occur are not anticipated to be significant.



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6 Monitoring and Contingency Plans

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6 Monitoring and Contingency Plans

6.1 Monitoring

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

Previous construction experience, and a review of post-construction monitoring reports from other projects, indicates that impacts from oil and gas construction are for the most part temporary. The mitigation and protective measures to eliminate or reduce impacts are well known and have been shown to be effective. With this in mind, Enbridge Gas should adhere to the following general monitoring practices:

- Trained personnel should be on-site to monitor construction and should be responsible for checking that the mitigation and protective measures and monitoring requirements in the ER are executed.
- Recommendations and commitments made in this ER should become part of the contract specification with the contractor selected to construct the Project.
- A walking inspection of the Project area should be done approximately one year after construction to determine whether areas require further rehabilitation or as required by OEB conditions of approval.

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

6.1.1 EXPOSED SOILS

Monitoring of potential effects on exposed soils should occur during construction by Enbridge Gas' on-site inspection team.

6.1.2 SPECIES AT RISK

Should SAR be identified during field investigations, construction monitoring may be required. The exact nature of monitoring will be determined in consultation with the MECP and will depend on the species present.

6.1.3 RESIDENTS AND BUSINESSES

Construction activities may impact surrounding residents and businesses. During construction, a designated Enbridge Gas representative should be available to monitor and respond to requests and concerns voiced by residents and business owners.



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6 Monitoring and Contingency Plans

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6.2 Contingency

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

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

6.2.1 WATERCOURSE SEDIMENTATION

Even with properly installed ESC measures, extreme runoff events could lead to sedimentation of Howie Drain. If sedimentation occurs, immediate action should be taken under the direction of Enbridge Gas environmental personnel to install temporary measures that will contain the erosion as quickly and effectively as practical. Notification should occur to the NPCA regarding the incident and the corrective actions being implemented. When site conditions permit, permanent protection measures should be reinstalled on erosion susceptible surfaces. If the erosion and sedimentation results from a construction-related activity, the activity should be halted immediately until the situation is rectified.

6.2.2 ACCIDENTAL SPILLS

During construction, accidental spill of fluids may occur of hydrocarbon-based construction fluid, or well drilling fluid. The impact of the spill will depend upon the type of fluid, the magnitude and extent of the spill, and the environmental and socio-economic conditions in which it takes place. Upon release of a fluid, Enbridge Gas should immediately determine the magnitude and extent of the spill and rapidly take measures to contain it. Release of sediment should also be treated as a potential spill depending on the magnitude and extent. Spills should be immediately reported to Enbridge Gas' environmental personnel. If necessary, the MECP Spills Action Centre should be notified at 1-800-268-6060.

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



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6 Monitoring and Contingency Plans

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6.2.3 UNEXPECTED FINDS: ARCHAEOLOGICAL OR HERITAGE RESOURCES AND UNKNOWN CONTAMINATED SOILS

Should previously unidentified archaeological or heritage resources be uncovered or suspected of being uncovered during construction, ground disturbance in the find location should cease immediately. An archaeologist licensed in the Province of Ontario should be notified immediately. As needed, the licensed archaeologist will consult with the MHSTCI, and other relevant stakeholders, i.e., Indigenous communities, to develop a site-specific response plan. A site-specific response plan for the newly identified archaeological or heritage resource should then be employed following further investigation of the specific find. The response plan would indicate under which conditions the ground disturbance activity in the find location may resume. If human remains are uncovered or suspected of being uncovered during ground disturbance, the above measures should be implemented along with notifying local police, the coroner's office, and the Cemeteries Regulation Unit of the Ontario Ministry of Government and Consumer Services (1-800-889-9768).

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



2022 Crowland Test Well Drilling Project: Environmental Report

7 Conclusion

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7 Conclusion

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

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



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Appendix A

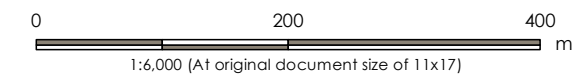
Figures





Legend

- Proposed Storage Well (EC 1)
- Proposed Permanent Pad
- Proposed Temporary Pad
- Proposed Permanent Access Road
- 100 m Study Area
- 500 m Hydrogeological Study Area
- Minor Road
- Existing Gathering Line
- Watercourse
- Waterbody



- Notes**
1. Coordinate System: NAD 1983 UTM Zone 17N
 2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2022.
 3. Orthophoto 2018.



Project Location: 160961469 REV B
 Regional Municipality of Niagara: Prepared by AW on 2022-03-07
 Technical Review by MK on 2022-02-18

Client/Project: ENBRIDGE GAS INC
 CROWLAND STORAGE WELL

Figure No.: **1**

Title: **Study Area**

W:\GIS\enr\160961469\03_data\gis_crowland\mxd\APC\sector_figures\ER_160961469_er_0307.aprx A_Fig01_StudyArea.mxd Revised: 2022-03-07 By: cwhite

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Appendix B

Consultation



2022 Crowland Test Well Drilling Project: Environmental Report
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Appendix B.1

Letter of Delegation



Ministry of Energy

Ministère de l'Énergie

Energy Networks and Indigenous Policy
Branch

Direction Générale des Réseaux
Énergétiques et des Politiques
Autochtones



Indigenous Energy Policy

Politique Énergétique Autochtones

77 Grenville Street, 6th Floor
Toronto, ON M7A 67C
Tel: (416) 315-8641

77 Rue Grenville, 6^e Étage
Toronto, ON M7A 67C
Tel: (416) 315-8641

March 31, 2022

VIA EMAIL

Mr. Dave Janisse, Technical Manager
Leave to Construct Applications Regulatory Affairs
Enbridge Gas Incorporated
P.O. Box 2001, 50 Keil Drive N.
Chatham, ON N7M 5M1

Re: 2022 Crowland Test Well

Dear Mr. Janisse

Thank you for your email dated January 21, 2022, notifying the Ministry of Energy of Enbridge Gas Incorporated's proposal to drill the 2022 Crowland Test Well and requesting clarification on Duty to Consult requirements.

We understand that Enbridge Gas Incorporated is planning to to drill a well in an existing Designated Storage Area ("DSA") within the Geographic Township of Humberstone, City of Port Colborne, Region of Niagara, Ontario. Enbridge Gas's 2022 Crowland Test Well Drilling Project (the "Project") will involve drilling a stratigraphic test well in the Crowland Storage Pool for the purpose of obtaining core and installation of instrumentation, to characterize the rock properties of the storage zone and the geological formations above and below the storage zone. The proposed well will not be connected to the main gathering system and no pipeline will be installed.

Based on the information Enbridge has provided to date, the Ministry is of the view that the project will not result in any appreciable adverse impact on the asserted or established rights of First Nation or Métis communities. Should new project information become available that indicates a potential to impact Aboriginal and treaty rights (e.g., the result of the archeological assessment), I request that you notify the Ministry as appropriate.

Given that the Ministry has determined, based on currently available information, that no duty to consult has been triggered it will not be necessary for the Ministry to provide a letter of opinion regarding the sufficiency of consultation.

Also, the Ministry recommends that Enbridge Gas Incorporated continue to maintain a record of its interactions with Indigenous communities about the project it has engaged on an interests-basis. If an Indigenous community provides Enbridge Gas Incorporated

with information indicating a potential adverse impact of this project on its Aboriginal or Treaty rights, I request that you notify the Ministry as appropriate.

Please contact me at (416) 315-8641 or amy.gibson@ontario.ca if you have any questions or if you wish to discuss the matter in more detail.

Sincerely,

A handwritten signature in blue ink that reads "Amy Gibson". The signature is fluid and cursive, with a long horizontal flourish extending to the right.

Amy Gibson, Manager
Indigenous Energy Policy

cc: Ontario Energy Board
Ontario Pipeline Coordinating Committee

2022 Crowland Test Well Drilling Project: Environmental Report
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Appendix B.2

Project Contact List



**Enbridge Gas Inc.
2022 Crowland Test Well Drilling Project - Agency and Municipal Contact List**

TITLE	FIRST NAME	SURNAME	ORGANIZATION	DEPARTMENT	POSITION	ADDRESS	CITY/TOWN	POSTAL CODE	TELEPHONE	FAX	E-Mail	CC'ed E-Mail
ELECTED OFFICIALS												
	Jeff	Burch	Constituency Office	Niagara Centre	MPP	60 King Street - Unit 102	Welland, Ontario	L3B 6A4	905-732-6884	905-732-9782	JBurch-CO@ndp.on.ca	
	Vance	Badawey	Constituency Office	Niagara Centre	MP	136 East Main Street - Suite 103	Welland, Ontario	L3B 3W6	905-788-2204	905-788-0071	vance.badawey@parl.gc.ca	
FEDERAL AGENCIES												
	Wes	Plant	Environment and Climate Change Canada	Environmental Protection Branch-Ontario Region	Manager - Environmental Assessment Section	4905 Dufferin St.	Downsview, ON	M3H 5T4	416-739-4272		wesley.plant@ec.gc.ca	
ONTARIO PIPELINE COORDINATING COMMITTEE												
	Zora	Crnojacki	Ontario Energy Board	Applications and Regulatory Audit	Project Advisor	2300 Yonge Street, 26th Floor, PO Box 2319	Toronto, ON	M4P 1E4	416-440-8104	416-440-7656	Zora.Crnjacki@oeb.ca	
	Helma	Geerts	Ministry of Agriculture, Food and Rural Affairs	Land Use Policy and Stewardship	Policy Advisor (Land Use)	1 Stone Road West, 3rd Floor, SE	Guelph, ON	N1G 4Y2	519-546-7423		Helma.Geerts@ontario.ca	
	Karla	Barboza	Ministry of Heritage, Sport, Tourism, and Culture Industries	Heritage Planning Unit	Team Lead	400 University Avenue, 5th Floor	Toronto, ON	M7A 2R9	416-660-1027		karla.barboza@ontario.ca	
	James	Hamilton	Ministry of Heritage, Sport, Tourism, and Culture Industries	Heritage Planning Unit	Manager	400 University Avenue, 5th Floor	Toronto, ON	M7A 2R9	416-995-8404		James.hamilton@ontario.ca	
	Tony	DiFabio	Ministry of Transportation	Corridor Management	Team Lead	301 St Paul Street, 2nd Floor	St. Catharines, ON	L2R 7R4	905-704-2656		Tony.DiFabio@ontario.ca	
	Kourosh	Manouchehri	Technical Standards and Safety Authority	Risk Reduction Group	Engineer Specialist	345 Carlingview Drive	Toronto, ON	M9W 6N9	416-734-3539	416-231-7525	kmanouchehri@tssa.org	
	Keith	Johnston	Ministry of Northern Development, Mines, Natural Resources and Forestry	Land Use and Environmental Planning Section	Environmental Planning Team Lead (Acting)	3rd Flr S, 300 Water Street	Peterborough, ON	K9J 3C7	705-313-6960		Keith.Johnston@ontario.ca	
	Maya	Harris	Ministry of Municipal Affairs and Housing	Community Planning and Development	Manager	777 Bay Street, 13th floor	Toronto, ON	M5G 2E5	416-585-6063		maya.harris@ontario.ca	
	Jonathon	Wilkinson	Ministry of Energy Northern Development and Mines	Indigenous Energy Policy Unit	Senior Advisor	6th Floor, 77 Grenville Street	Toronto, ON	M7A 2C1	416-526-2963		Jonathon.Wilkinson@ontario.ca	
	To whom it may concern		Ministry of the Environment, Conservation and Parks	Regional Contact - West Central	Notices for streamlined environmental assessments						eanotification.wcregion@ontario.ca	
	Debbie	Scanlon	Ministry of Environment, Conservation and Parks	Source Protection Program Branch	Manager Approvals Section	40 St. Clair Ave. W., 14th Floor	Toronto, ON	M4V 1M2	647-627-5917		sourceprotectionscreening@ontario.ca	
	Cory	Ostrowka	Infrastructure Ontario		Environmental Specialist, Environmental Management	1 Dundas St West, Suite 2000	Toronto, ON	M5G 2L5	M: 416-571-8294 D: 647-264-3331		cory.ostrowka@infrastructureontario.ca	
REGIONAL MUNICIPALITY OF NIAGARA												
	Jim	Bradley	Niagara Region		Regional Chair	1815 Sir Isaac Brock Way	Thorold, ON	L2V 4T7	905-980-6000 ext. 3600		jim.bradley@niagararegion.ca	
	Barbara	Butters	Niagara Region		Councillor - Port Colborne	1152 Weaver Rd.	Port Colborne, ON	L3K 5V3	905-834-4005		barbara.butters@niagararegion.ca	
	Michelle	Sergi	Niagara Region	Planning and Development Services	Commissioner	1815 Sir Isaac Brock Way	Thorold, ON	L2V 4T7	905-980-6000 ext. 3390		michelle.sergi@niagararegion.ca	
	To whom it may concern		Niagara Region	Office of the Regional Clerk	Regional Clerk	1815 Sir Isaac Brock Way	Thorold, ON	L2V 4T7	905-980-6000 ext. 3222	905-687-4977	-	
CITY OF PORT COLBORNE												
	Bill	Steele	City of Port Colborne		Mayor	66 Charlotte Street	Port Colborne, ON	L3K 3C8	905-835-2900 ext.302		mayor@portcolborne.ca	
	Amber	LaPointe	City of Port Colborne	Planning and Development	Director of Planning and Legislative Services	66 Charlotte Street	Port Colborne, ON	L3K 3C8	905-835-2900 ext.106		cityclerk@portcolborne.ca	
	To whom it may concern		City of Port Colborne		Senior Planner	66 Charlotte Street	Port Colborne, ON	L3K 3C8	905-835-2900 ext.202		planner@portcolborne.ca	
	Ron	Bodner	City of Port Colborne	City Council	Ward 4 City Councillor	66 Charlotte Street	Port Colborne, ON	L3K 3C8	905-834-6269		ron.bodner@portcolborne.ca	
	Harry	Wells	City of Port Colborne	City Council	Ward 4 City Councillor	66 Charlotte Street	Port Colborne, ON	L3K 3C8	905-835-1178		harry.wells@portcolborne.ca	
CONSERVATION AUTHORITY												
	Taran	Lennard	Niagara Peninsula Conservation Authority	Watershed Management	Watershed Planner - Grimsby, Lincoln, St. Catharines	250 Thorold Road West, 3rd floor	Welland, ON	L3C 3W2	905-788-3135 ext. 277		tlennard@npca.ca	
	Nikolas	Wensing	Niagara Peninsula Conservation Authority	Watershed Management	Watershed Planner- W. Lincoln, Wainfleet, Haldimand, Hamilton	250 Thorold Road West, 3rd floor	Welland, ON	L3C 3W2	905-788-3135 ext. 228		nwensing@npca.ca	
INTEREST GROUPS/OTHER												
	Ian	Nokes	Ontario Federation of Agriculture		Policy Analyst	100 Stone Road West, Suite 206	Guelph, ON	N1G 5L3	519-821-8883 ext. 253	519-821-8810	ian.nokes@ofa.on.ca	

2022 Crowland Test Well Drilling Project: Environmental Report
May 6, 2022

Appendix B.3

Notification Letters





April 22, 2022

Reference: Enbridge Gas Inc. – Notice of Study Commencement for the 2022 Crowland Test Well Drilling Project

To ensure the continued safe and reliable delivery of natural gas to existing and future Enbridge Gas Inc. (Enbridge Gas) customers, Enbridge Gas is proposing to drill a new geological test well in the Crowland Designated Storage Area in Port Colborne, Ontario. The 2022 Crowland Test Well Drilling Project (the Project) will commence with the construction of a temporary approximately 8100 m² gravel drilling pad. Upon completion of drilling activities, a permanent 6m wide access laneway and 8m x 8m gravel pad will remain in place. For further details, please refer to the attached map.

Enbridge Gas has retained Stantec Consulting Ltd. (Stantec) to undertake an Environmental Study of the construction and operation of the Project. The Environmental Study will fulfill the requirements of the Ontario Energy Board's (OEB) "Environmental Guidelines for the Location, Construction, and Operation of Hydrocarbon Pipelines and Facilities in Ontario, 7th Edition (2016)".

It is anticipated that the Environmental Report for the study will be completed in Spring 2022, after which Enbridge Gas will file an application for the Project to the OEB. The OEB's review and approval is required before the proposed Project can proceed. If approved, the Project is currently anticipated to begin construction in Fall 2022.

As an agency with jurisdiction or potential interest in developments in that area, you are invited to provide or coordinate comments regarding the proposed Project. Specifically, Stantec is seeking information regarding planning principles or guidelines implemented by your agency that may affect the routing, construction and/or operation of the proposed Project. Stantec is also seeking background environmental, socio-economic, and archaeological/cultural heritage information that may be useful in compiling the inventory of the Environmental Study Area. To support the quality of the assessment process, we also request that you provide us with information regarding other proposed developments within the Environmental Study Area. This information will be incorporated into the Environmental Study and related report as a component of the cumulative effect's assessment. Please contact us to discuss the most efficient way to obtain this information.

If you have questions or comments regarding the Crowland Storage Enhancement Project, please do not hesitate to contact the undersigned.

Yours truly,

Stantec Consulting Ltd.

Mark Knight

Mark Knight MA, MCIP, RPP
Senior Associate, Environmental Planner
Mobile: (519) 400-9618
Mark.Knight@stantec.com

Attachment: Map of Project Area
c. Ryan Park, Sr. Advisor, Environment, Enbridge Gas



April 25, 2022

Reference: Enbridge Gas Inc. – Notice of Study Commencement for the 2022 Crowland Test Well Drilling Project

To ensure the continued safe and reliable delivery of natural gas to existing and future Enbridge Gas Inc. (Enbridge Gas) customers, Enbridge Gas is proposing to drill a new geological test well in the Crowland Designated Storage Area in Port Colborne, Ontario. The 2022 Crowland Test Well Drilling Project (the Project) will commence with the construction of a temporary approximately 8100 m² gravel drilling pad. Upon completion of drilling activities, a permanent 6m wide access laneway and 8m x 8m gravel pad will remain in place. For further details, please refer to the attached map.

You are receiving this letter because the project location is in proximity to your property

Enbridge Gas has retained Stantec Consulting Ltd. (Stantec) to undertake an Environmental Study of the construction and operation of the Project. The Environmental Study will fulfill the requirements of the Ontario Energy Board's (OEB) "Environmental Guidelines for the Location, Construction, and Operation of Hydrocarbon Pipelines and Facilities in Ontario, 7th Edition (2016)". It is anticipated that the Environmental Report for the study will be completed in Spring 2022, after which Enbridge Gas will file an application for the Project to the OEB. The OEB's review and approval is required before the proposed Project can proceed. If approved, the Project is currently anticipated to begin construction in Fall 2022.

Consultation with indigenous communities and engagement with landowners, government agencies, the general public, and other interested persons is an integral component of the planning process. If you have questions or comments regarding the Project, please do not hesitate to contact the undersigned.

Yours truly,

Stantec Consulting Ltd.

Mark Knight

Mark Knight MA, MCIP, RPP
Senior Associate, Environmental Planner
Mobile: (519) 400-9618
Mark.Knight@stantec.com

Attachment: Map of Project Area

c. Ryan Park, Sr. Advisor, Environment, Enbridge Gas



April 22, 2022

To Whom it May Concern
Haudenosaunee Confederacy Chiefs Council
Haudenosaunee Development Institute
P.O. Box 714
Oshweken ON N0A 1M0
Sent Via Email: info@hdi.land

Dear To Whom it May Concern,

Reference: Enbridge Gas Inc. – Notice of Study Commencement for the 2022 Crowland Test Well Drilling

I am writing to advise you of an upcoming project in Port Colborne and to begin engagement on the proposed work. To ensure the continued safe and reliable delivery of natural gas to existing and future Enbridge Gas Inc. (Enbridge Gas) customers, Enbridge Gas is proposing to drill a well in the Crowland Designated Storage area. The 2022 Crowland Test Well Drilling Project (the Project) will involve drilling a new geological test well. Project activities will commence with the construction of a temporary approximately 8100 m² gravel drilling pad. Upon completion of drilling activities, a permanent 6m wide access laneway and 8m x 8m gravel pad will remain in place.

For more details, please refer to the attached map.

Enbridge Gas has retained Stantec Consulting Ltd. (Stantec) to undertake an Environmental Study of the construction and operation of the Project. The Environmental Study will fulfill the requirements of the Ontario Energy Board's (OEB) "Environmental Guidelines for the Location, Construction, and Operation of Hydrocarbon Pipelines and Facilities in Ontario, 7th Edition (2016)".

It is anticipated that the Environmental Report for the study will be completed in Spring 2022, after which Enbridge Gas will file an application for the Project to the OEB. The OEB's review and approval is required before the proposed Project can proceed. If approved, the Project is currently anticipated to begin construction in Fall 2022.

As an Indigenous community with a potential interest in the study area, we are inviting the Haudenosaunee Development Institute to provide comments and feedback regarding the project. We are also seeking information about areas that may be culturally significant to your community in the study area and information about potential effects that the project may have on asserted or established Aboriginal and treaty rights. Stantec is presently compiling an environmental, socio-economic, and archaeological/cultural heritage inventory of the project location. We would welcome your feedback and comments regarding the proposed project as we undertake the requisite environmental study.

As you know, Enbridge Gas is committed to meaningful engagement with Indigenous communities. As such, we would be interested in holding a conference call with the Haudenosaunee Development Institute consultation office to share project related information, should you wish. If you have any questions, would like to provide feedback, or share knowledge or would be interested in setting up a briefing on this project please feel free to contact me directly.

April 22, 2022

To Whom it May Concern

Page 2 of 2

Reference: Enbridge Gas Inc. – Notice of Study Commencement for the 2022 Crowland Test Well Drilling

If you have any questions or want to discuss the project, please feel free to contact me at any time. We look forward to engaging with you to ensure your community's interests are being considered and represented.

Respectfully,

Kevin Berube

ENBRIDGE GAS INC.

Sr. Advisor, Community & Indigenous Engagement

Public Affairs and Communications

416-666-6759

Kevin.Berube@enbridge.com

Attachment: Map of Project Area

- c. Ryan Park, Sr. Advisor, Environment, Enbridge Gas
Mark Knight, Senior Associate, Environmental Planner, Stantec Consulting Ltd.



April 22, 2022

Mark Laforme
Director, Department of Consultation and Accommodation
Mississaugas of the Credit First Nation
2789 Mississauga Road, R.R. #6
Hagersville ON N0A 1H0
Sent Via Email: mark.laforme@mcfnc.ca

Dear Mark Laforme,

Reference: Enbridge Gas Inc. – Notice of Study Commencement for the 2022 Crowland Test Well Drilling

I am writing to advise you of an upcoming project in Port Colborne and to begin engagement on the proposed work. To ensure the continued safe and reliable delivery of natural gas to existing and future Enbridge Gas Inc. (Enbridge Gas) customers, Enbridge Gas is proposing to drill a well in the Crowland Designated Storage area. The 2022 Crowland Test Well Drilling Project (the Project) will involve drilling a new geological test well. Project activities will commence with the construction of a temporary approximately 8100 m² gravel drilling pad. Upon completion of drilling activities, a permanent 6m wide access laneway and 8m x 8m gravel pad will remain in place.

For more details, please refer to the attached map.

Enbridge Gas has retained Stantec Consulting Ltd. (Stantec) to undertake an Environmental Study of the construction and operation of the Project. The Environmental Study will fulfill the requirements of the Ontario Energy Board's (OEB) "Environmental Guidelines for the Location, Construction, and Operation of Hydrocarbon Pipelines and Facilities in Ontario, 7th Edition (2016)".

It is anticipated that the Environmental Report for the study will be completed in Spring 2022, after which Enbridge Gas will file an application for the Project to the OEB. The OEB's review and approval is required before the proposed Project can proceed. If approved, the Project is currently anticipated to begin construction in Fall 2022.

As an Indigenous community with a potential interest in the study area, we are inviting the Mississaugas of the Credit First Nation to provide comments and feedback regarding the project. We are also seeking information about areas that may be culturally significant to your community in the study area and information about potential effects that the project may have on asserted or established Aboriginal and treaty rights. Stantec is presently compiling an environmental, socio-economic, and archaeological/cultural heritage inventory of the project location. We would welcome your feedback and comments regarding the proposed project as we undertake the requisite environmental study.

As you know, Enbridge Gas is committed to meaningful engagement with Indigenous communities. As such, we would be interested in holding a conference call with the Mississaugas of the Credit First Nation consultation office to share project related information, should you wish. If you have any questions, would like to provide feedback, or share knowledge or would be interested in setting up a briefing on this project please feel free to contact me directly.

April 22, 2022
Mark Laforme
Page 2 of 2

Reference: Enbridge Gas Inc. – Notice of Study Commencement for the 2022 Crowland Test Well Drilling

If you have any questions or want to discuss the project, please feel free to contact me at any time. We look forward to engaging with you to ensure your community's interests are being considered and represented.

Respectfully,

Kevin Berube
ENBRIDGE GAS INC.
Sr. Advisor, Community & Indigenous Engagement
Public Affairs and Communications
416-666-6759
Kevin.Berube@enbridge.com

Attachment: Map of Project Area

- c. Ryan Park, Sr. Advisor, Environment, Enbridge Gas
Mark Knight, Senior Associate, Environmental Planner, Stantec Consulting Ltd.



April 22, 2022

Lonny Bomberry
Lands & Resources
Six Nations of the Grand River
P.O. Box 5000
Oshweken ON N0A 1M0
Sent Via Email: Lonny.bomberry@sixnations.ca

Dear Lonny Bomberry,

Reference: Enbridge Gas Inc. – Notice of Study Commencement for the 2022 Crowland Test Well Drilling

I am writing to advise you of an upcoming project in Port Colborne and to begin engagement on the proposed work. To ensure the continued safe and reliable delivery of natural gas to existing and future Enbridge Gas Inc. (Enbridge Gas) customers, Enbridge Gas is proposing to drill a well in the Crowland Designated Storage area. The 2022 Crowland Test Well Drilling Project (the Project) will involve drilling a new geological test well. Project activities will commence with the construction of a temporary approximately 8100 m² gravel drilling pad. Upon completion of drilling activities, a permanent 6m wide access laneway and 8m x 8m gravel pad will remain in place.

For more details, please refer to the attached map.

Enbridge Gas has retained Stantec Consulting Ltd. (Stantec) to undertake an Environmental Study of the construction and operation of the Project. The Environmental Study will fulfill the requirements of the Ontario Energy Board's (OEB) "Environmental Guidelines for the Location, Construction, and Operation of Hydrocarbon Pipelines and Facilities in Ontario, 7th Edition (2016)".

It is anticipated that the Environmental Report for the study will be completed in Spring 2022, after which Enbridge Gas will file an application for the Project to the OEB. The OEB's review and approval is required before the proposed Project can proceed. If approved, the Project is currently anticipated to begin construction in Fall 2022.

As an Indigenous community with a potential interest in the study area, we are inviting the Six Nations of the Grand River to provide comments and feedback regarding the project. We are also seeking information about areas that may be culturally significant to your community in the study area and information about potential effects that the project may have on asserted or established Aboriginal and treaty rights. Stantec is presently compiling an environmental, socio-economic, and archaeological/cultural heritage inventory of the project location. We would welcome your feedback and comments regarding the proposed project as we undertake the requisite environmental study.

As you know, Enbridge Gas is committed to meaningful engagement with Indigenous communities. As such, we would be interested in holding a conference call with the Six Nations of the Grand River consultation office to share project related information, should you wish. If you have any questions, would like to provide feedback, or share knowledge or would be interested in setting up a briefing on this project please feel free to contact me directly.

April 22, 2022
Lonny Bomberry
Page 2 of 2

Reference: Enbridge Gas Inc. – Notice of Study Commencement for the 2022 Crowland Test Well Drilling

If you have any questions or want to discuss the project, please feel free to contact me at any time. We look forward to engaging with you to ensure your community's interests are being considered and represented.

Respectfully,

Kevin Berube
ENBRIDGE GAS INC.
Sr. Advisor, Community & Indigenous Engagement
Public Affairs and Communications
416-666-6759
Kevin.Berube@enbridge.com

Attachment: Map of Project Area

- c. Ryan Park, Sr. Advisor, Environment, Enbridge Gas
Mark Knight, Senior Associate, Environmental Planner, Stantec Consulting Ltd.

2022 Crowland Test Well Drilling Project: Environmental Report
May 6, 2022

Appendix B.4

Project Correspondence



From: [Wagner, Kristen \(NDMNRF\)](#)
To: [Gasser, Matthew](#)
Subject: NDMNRF Comments - Notice of Study Commencement for the 2022 Crowland Test Well Drilling Project
Date: Monday, May 2, 2022 12:26:15 PM
Attachments: [2022-05-02_NDMNRF Comments - Enbridge Gas Ltd. - Notice of Study Commencement for the Crowland Test Well Drilling Project.pdf](#)

Good Afternoon,

Attached please find NDMNRF's comments for the Notice of Study Commencement for the Crowland Test Well Drilling Project.

If you have any questions, please do not hesitate to contact me.

Thanks,
Kristen

Kristen Wagner, B.Sc.
District Planner

Ministry of Northern Development, Mines, Natural Resources and Forestry (NDMNRF) | Pembroke District
(613) 504-2254 | kristen.wagner@ontario.ca



“As part of providing [accessible customer service](#), please let me know if you have any accommodation needs or require communication supports or alternate formats.”

Ministry of Northern
Development, Mines,
Natural Resources
and Forestry

ministère du
Développement du Nord,
des Mines, des Richesses
naturelles et des Forêts



31 Riverside Drive
Pembroke, ON
K8A 8R6

May 2, 2022

By email only

Dear Mark:

**SUBJECT: NDMNRF Comments – Enbridge Gas Ltd. – Notice of Study
Commencement for the Crowland Well Drilling Project**

The Ministry of Northern Development, Mines, Natural Resources and Forestry (NDMNRF) received the Enbridge Gas Ltd., Notice of Study Commencement for the Crowland Well Drilling Project on April 22, 2022. Thank you for circulating this to our office. Please note that we have not completed a screening of natural heritage or other resource values for the project at this time. This response, however, does provide information to guide you in identifying and assessing natural features and resources as required by applicable policies and legislation, as well as engaging with the Ministry for advice as needed.

Please also note that it is the proponent's responsibility to be aware of, and comply with, all relevant federal or provincial legislation, municipal by-laws or other agency approvals.

Natural Heritage

NDMNRF's natural heritage and natural resources GIS data layers can be obtained through the Ministry's [Land Information Ontario \(LIO\)](#) website. You may also view natural heritage information online (e.g., Provincially Significant Wetlands, ANSI's, woodlands, etc.) using the [Make a Map: Natural Heritage Areas](#) tool.

We recommend that you use the above-noted sources of information during the review of your project proposal.

Petroleum Wells & Oil, Gas and Salt Resources Act

There may be petroleum wells within the proposed project area. Please consult the Ontario Oil, Gas and Salt Resources Library website (www.ogsrlibrary.com) for the best-known data on any wells recorded by NDMNRF. Please reference the 'Definitions and Terminology Guide' listed in the publications on the library website to better understand the well information available. Any oil and gas wells in your project area are regulated by the *Oil, Gas and Salt Resource Act*, and the supporting regulations and operating standards. If any unanticipated wells are encountered during development of the project, or if the proponent has questions regarding petroleum operations, the proponent should contact the Petroleum Operations Section at POSRecords@ontario.ca or 519-873-4634.

"To serve you better, please call ahead to make an appointment with our staff"

Fish and Wildlife Conservation Act

Please note, that should the project require:

- The relocation of fish outside of the work area, a Licence to Collect Fish for Scientific Purposes under the *Fish and Wildlife Conservation Act* will be required.
- The relocation of wildlife outside of the work area (including amphibians, reptiles, and small mammals), a Wildlife Collector's Authorization under the *Fish and Wildlife Conservation Act* will be required.

If you have identified the potential need for applying for one of the above permits, please contact Guelph District a scp.guelph@ontario.ca.

Public Lands Act & Lakes and Rivers Improvement Act

Some Project may be subject to the provisions of the *Public Lands Act* or *Lakes and River Improvement Act*. Please review the information on NDMNRF's web pages provided below regarding when an approval is, or is not, required. Please note that many of the authorizations under the *Lakes and Rivers Improvement Act* are administered by the local Conservation Authority.

- For more information about the *Public Lands Act*: <https://www.ontario.ca/page/crown-land-work-permits>
- For more information about the *Lakes and Rivers Improvement Act*: <https://www.ontario.ca/page/lakes-and-rivers-improvement-act-administrative-guide>

After reviewing the information provided, if you have not identified any of NDMNRF's interested stated above, there is no need to circulate any subsequent notices to our office. If you have identified any of NDMNRF's interests and may require permit(s) or further technical advice, please contact scp.guelph@ontario.ca.

If you have any questions or concerns, please feel free to contact me.

Best Regards,

[original signed by]

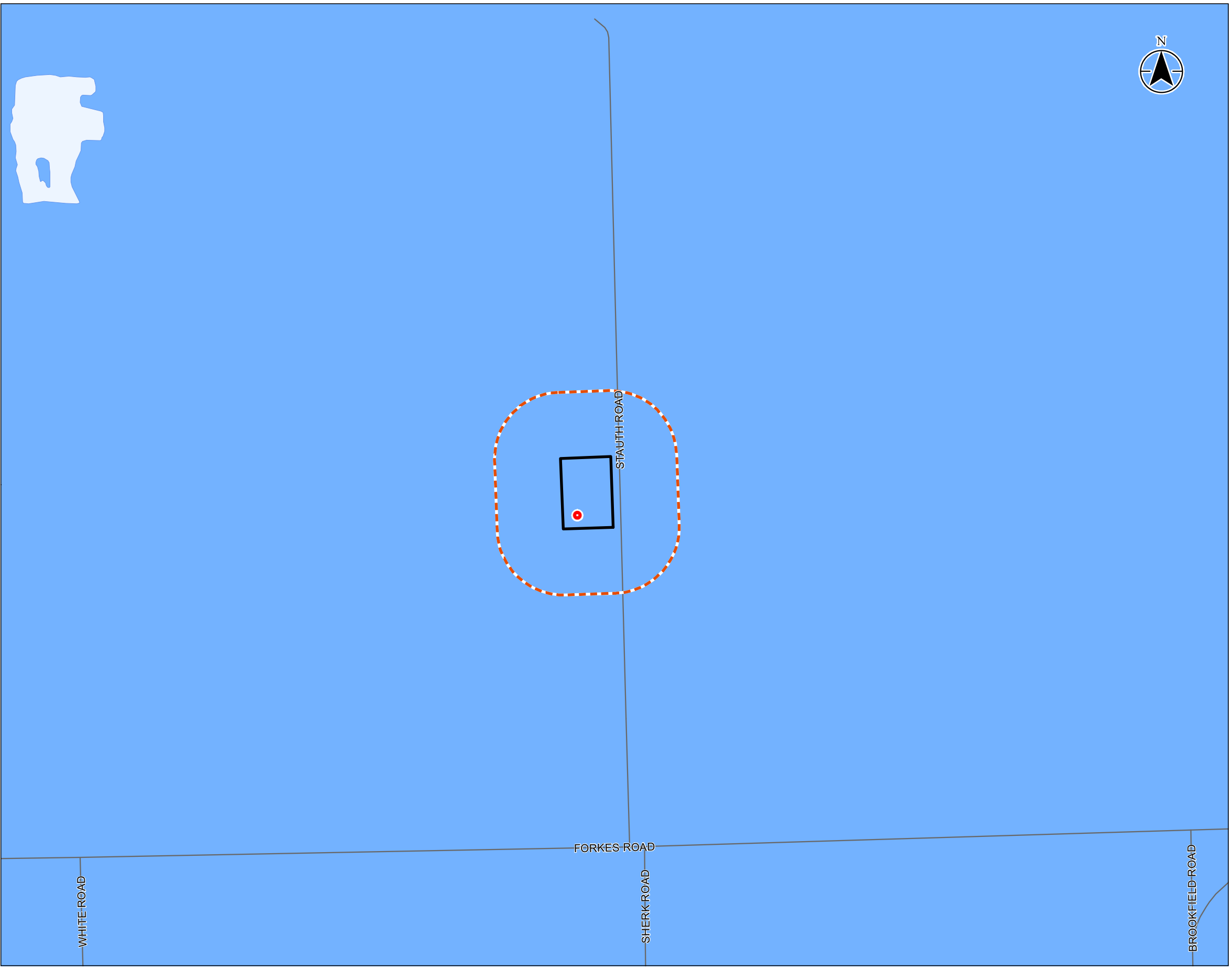
Kristen Wagner
District Planner
Ministry of Northern Development, Mines, Natural Resources and Forestry (NDMNRF)
(613) 504-2254
kristen.wagner@ontario.ca

2022 Crowland Test Well Drilling Project: Environmental Report
May 6, 2022

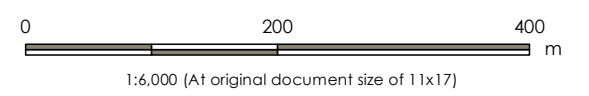
Appendix C

Existing Conditions Figures





- Legend
- Proposed Storage Well (EC 1)
 - 100 m Study Area
 - Temporary Pad
 - Waterbody
- Physiography**
- 12: Clay Plains



- Notes**
1. Coordinate System: NAD 1983 UTM Zone 17N
 2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2022.
 3. Physiography data source: Chapman, L.J. and Putnam, D.F. 2007. Physiography of southern Ontario; Ontario Geological Survey, Miscellaneous Release—Data 228.

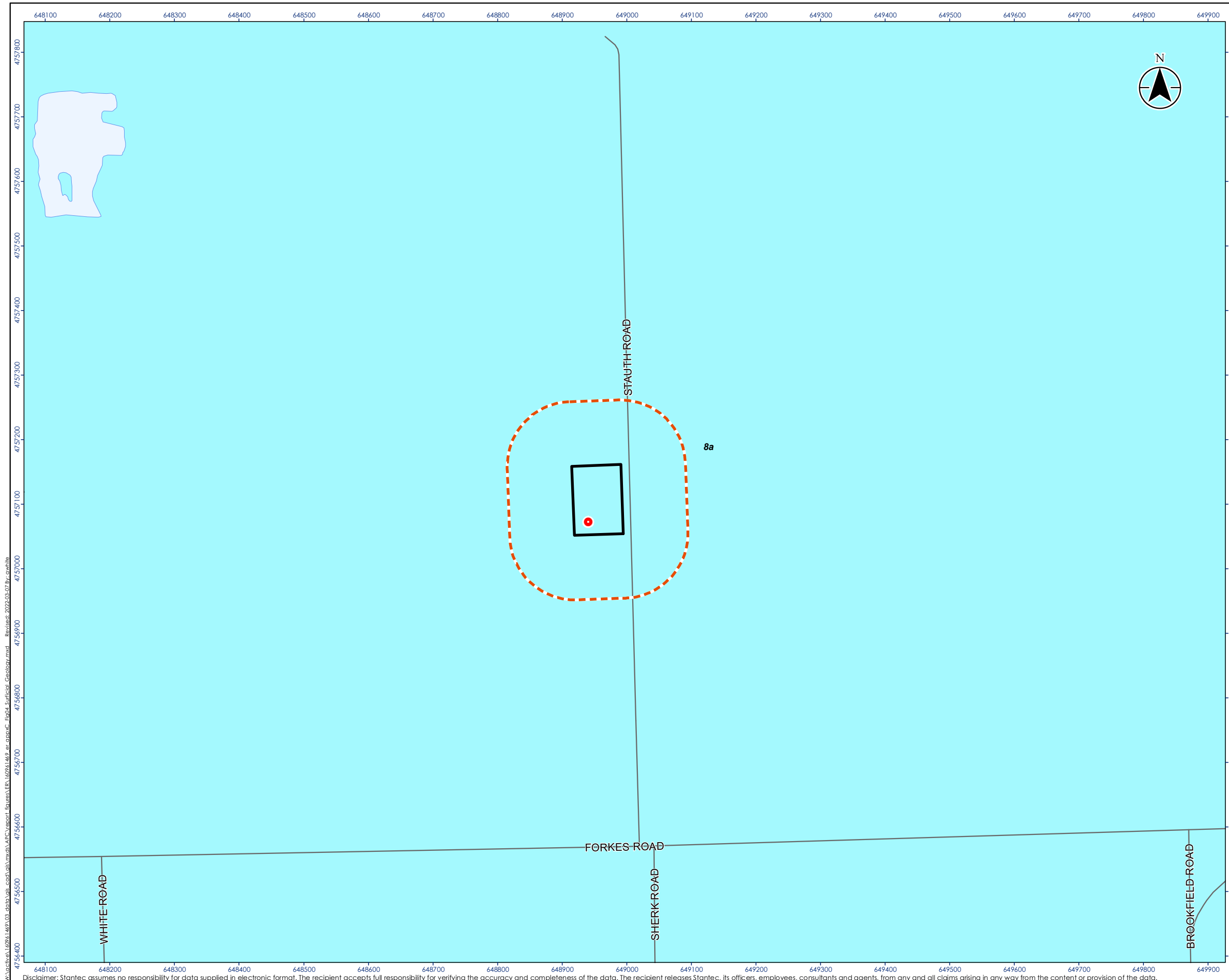


Project Location: Regional Municipality of Niagara
 Prepared by AW on 2022-03-07
 Technical Review by MK on 2022-02-25
 160961469 REVA

Client/Project: ENBRIDGE GAS INC. CROWLAND STORAGE WELL

Figure No. **3**
 Title **Physiography**

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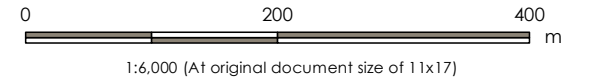


Legend

- Proposed Storage Well (EC 1)
- 100 m Study Area
- Temporary Pad
- Waterbody

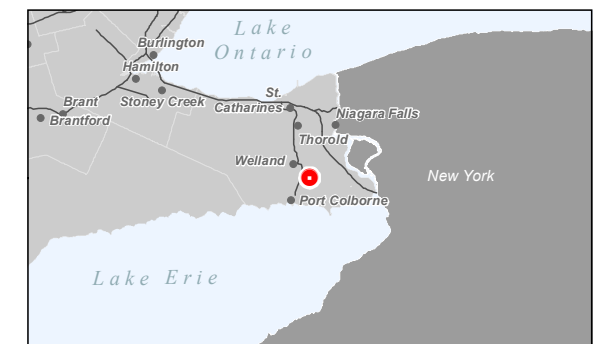
Surficial Geology

- 8a: Fine-textured glaciolacustrine deposits (Massive-well laminated)



Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2022.
3. Surficial geology data source: Ontario Geological Survey 2010, Surficial geology of Southern Ontario; Ontario Geological Survey, Miscellaneous Release-Data 128-REV ISBN 978-1-4435-2483-4.



Project Location: 160961469 REVA
 Regional Municipality of Niagara Prepared by AW on 2022-03-07
 Technical Review by MK on 2022-02-25

Client/Project:
 ENBRIDGE GAS INC.
 CROWLAND STORAGE WELL

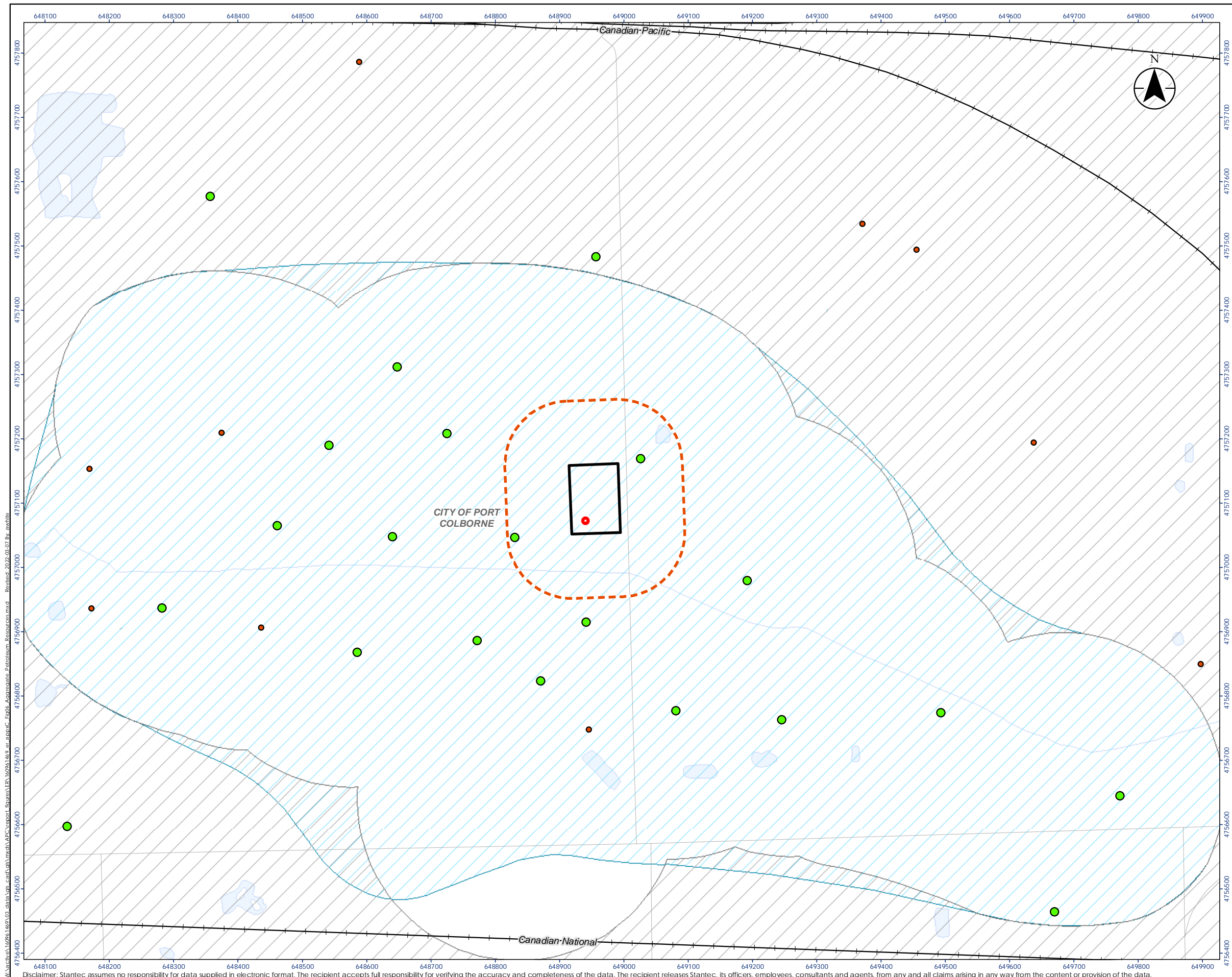
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4

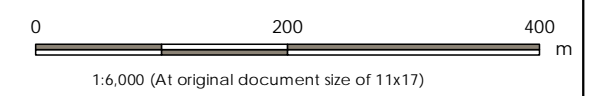
Title

Surficial Geology

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- Legend**
- Proposed Storage Well (EC 1)
 - 100 m Study Area
 - Temporary Pad
 - Minor Road
 - Railway
 - Watercourse
 - Waterbody
 - Municipal Boundary, Lower
- Well Mode**
- Abandoned Well
 - Active Well
- Petroleum Pool**
- Natural Gas Storage Pool - Active
 - Natural Gas Pool - Abandoned



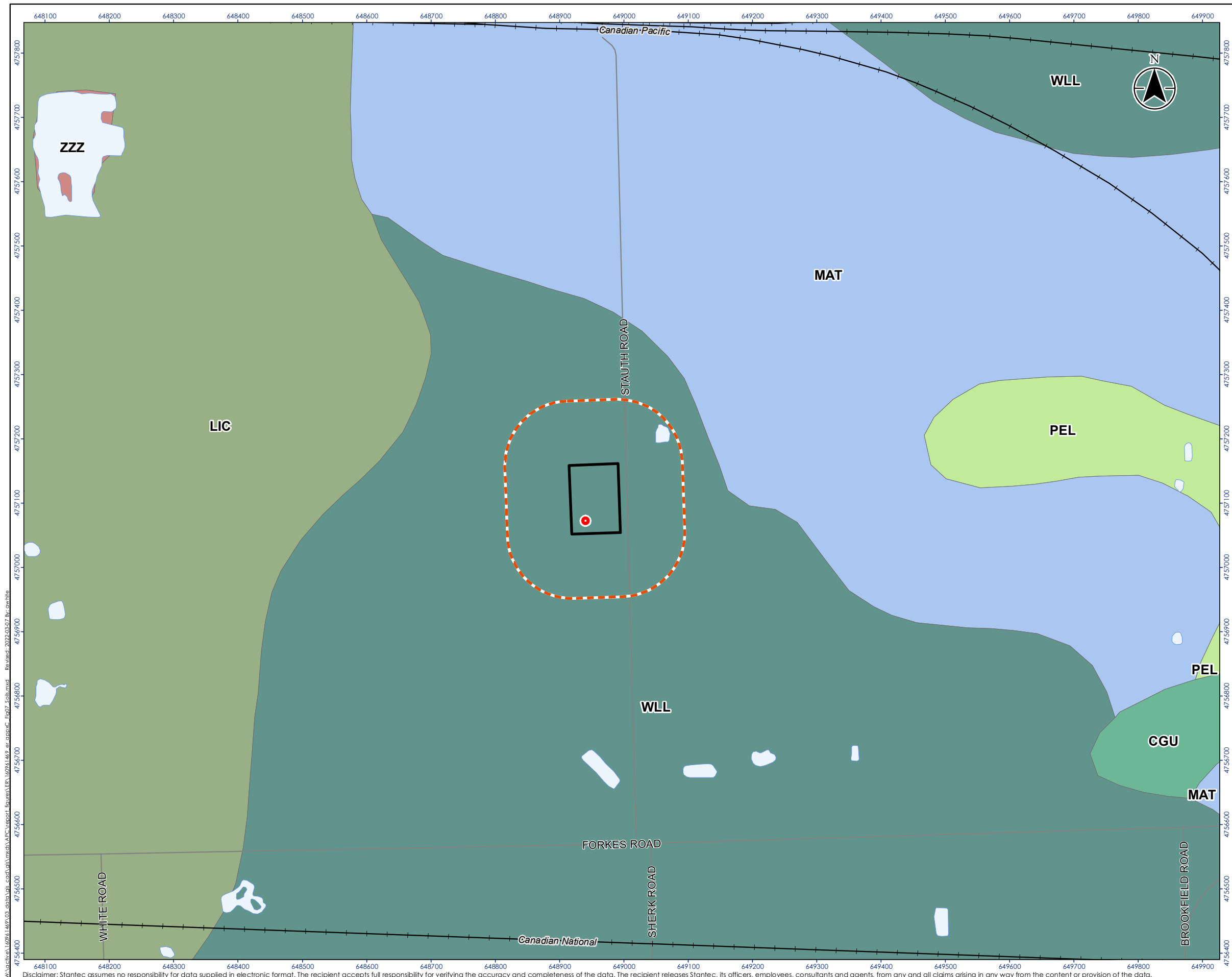
Notes
 1. Coordinate System: NAD 1983 UTM Zone 17N
 2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2022.



Project Location: Regional Municipality of Niagara
 Prepared by AW on 2022-03-07
 Technical Review by MK on 2022-02-25

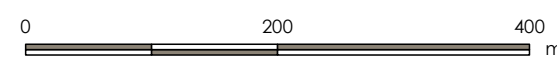
Client/Project: ENBRIDGE GAS INC., CROWLAND STORAGE WELL

Figure No.: 6
 Title: Aggregate and Petroleum Resources



Legend

- Railway
- 100 m Study Area
- Temporary Pad
- Waterbody
- Soilcode1, Soil Name1**
- CGU, CHINGUACOUSY - RED PHASE
- LIC, LINCOLN
- MAT, MALTON - HEAVY RED PHASE
- PEL, PEEL - HEAVY RED PHASE
- WLL, WELLAND
- ZZZ, WATER



1:6,000 (At original document size of 11x17)

- Notes**
1. Coordinate System: NAD 1983 UTM Zone 17N
 2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2022.



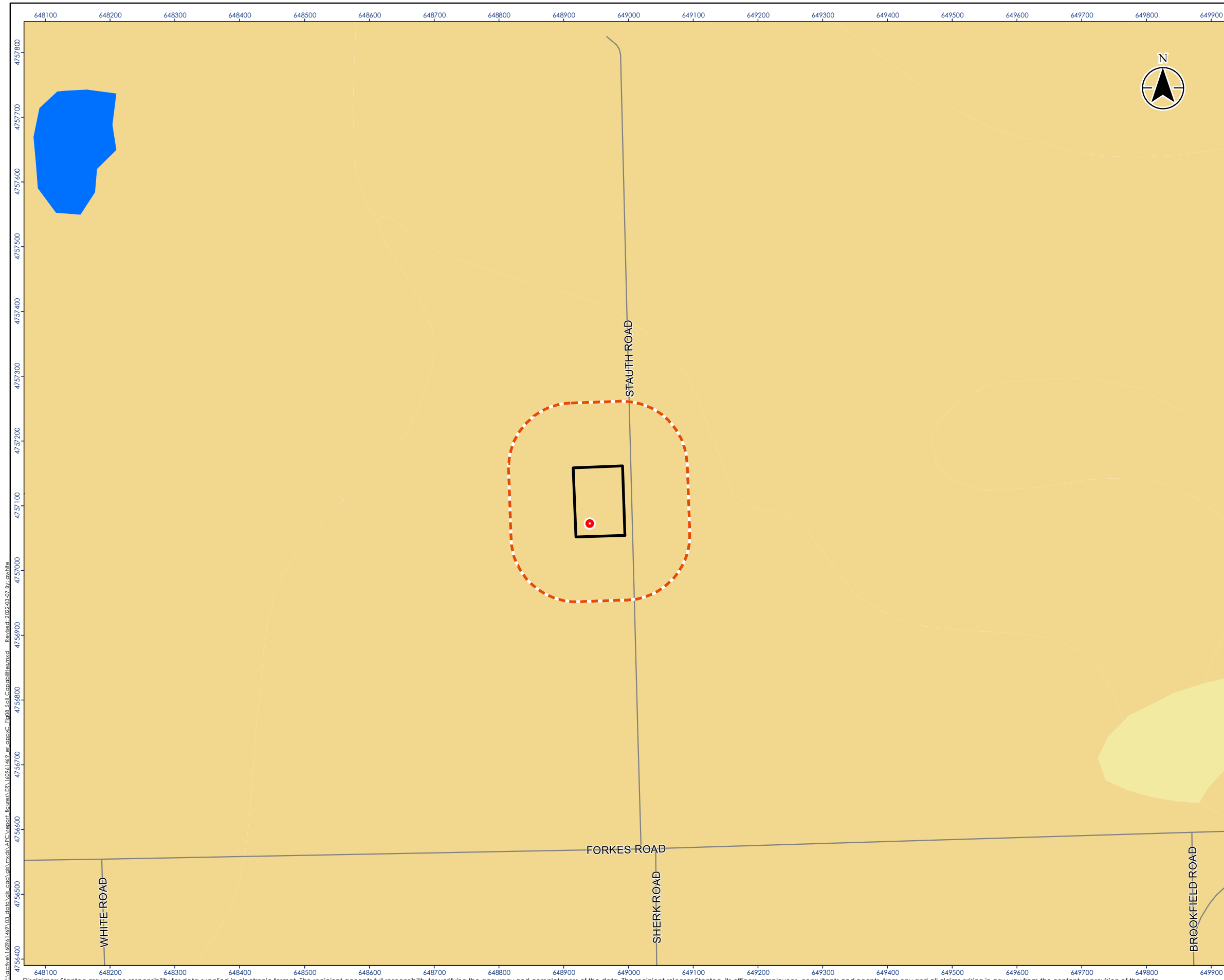
Project Location: Regional Municipality of Niagara
 Prepared by AW on 2022-03-07
 Technical Review by MK on 2022-02-25

Client/Project: ENBRIDGE GAS INC., CROWLAND STORAGE WELL

Figure No. **7**

Title: **Soil Types**

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 Revised: 2022-03-07 By: cwhlie

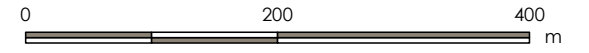


Legend

- Proposed Storage Well (EC 1)
- 100 m Study Area
- Temporary Pad
- Minor Road

Soil Capability Classification of Agriculture

- 2: Soils in this class have moderate limitations that restrict the range of crops or require moderate conservation practices
- 3: Soils in this class have moderately severe limitations that restrict the range of crops or require special conservation practices
- Water



1:6,000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2022.



Project Location: 160961469 REVA
 Regional Municipality of Niagara Prepared by AW on 2022-03-07
 Technical Review by MK on 2022-02-25

Client/Project:
 ENBRIDGE GAS INC.
 CROWLAND STORAGE WELL

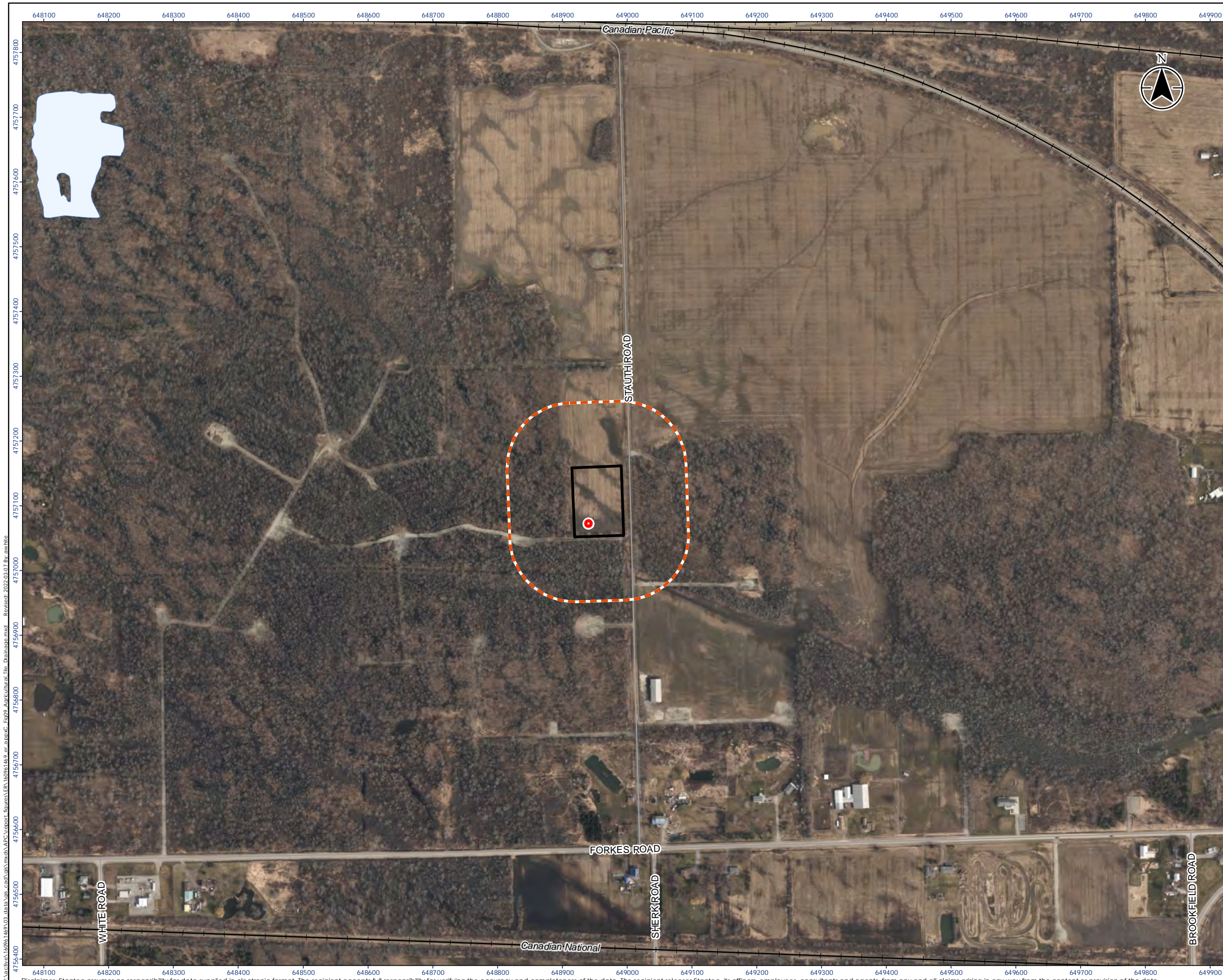
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8

Title

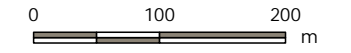
Soil Capabilities

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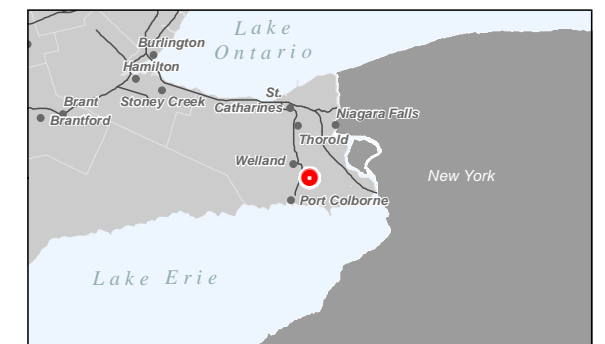
Legend

- Proposed Storage Well (EC 1)
- 100 m Study
- Temporary Pad
- Minor Road
- Railway
- Waterbody



1:6,000 (At original document size of 11x17)

- Notes
1. Coordinate System: NAD 1983 UTM Zone 17N
 2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2022.



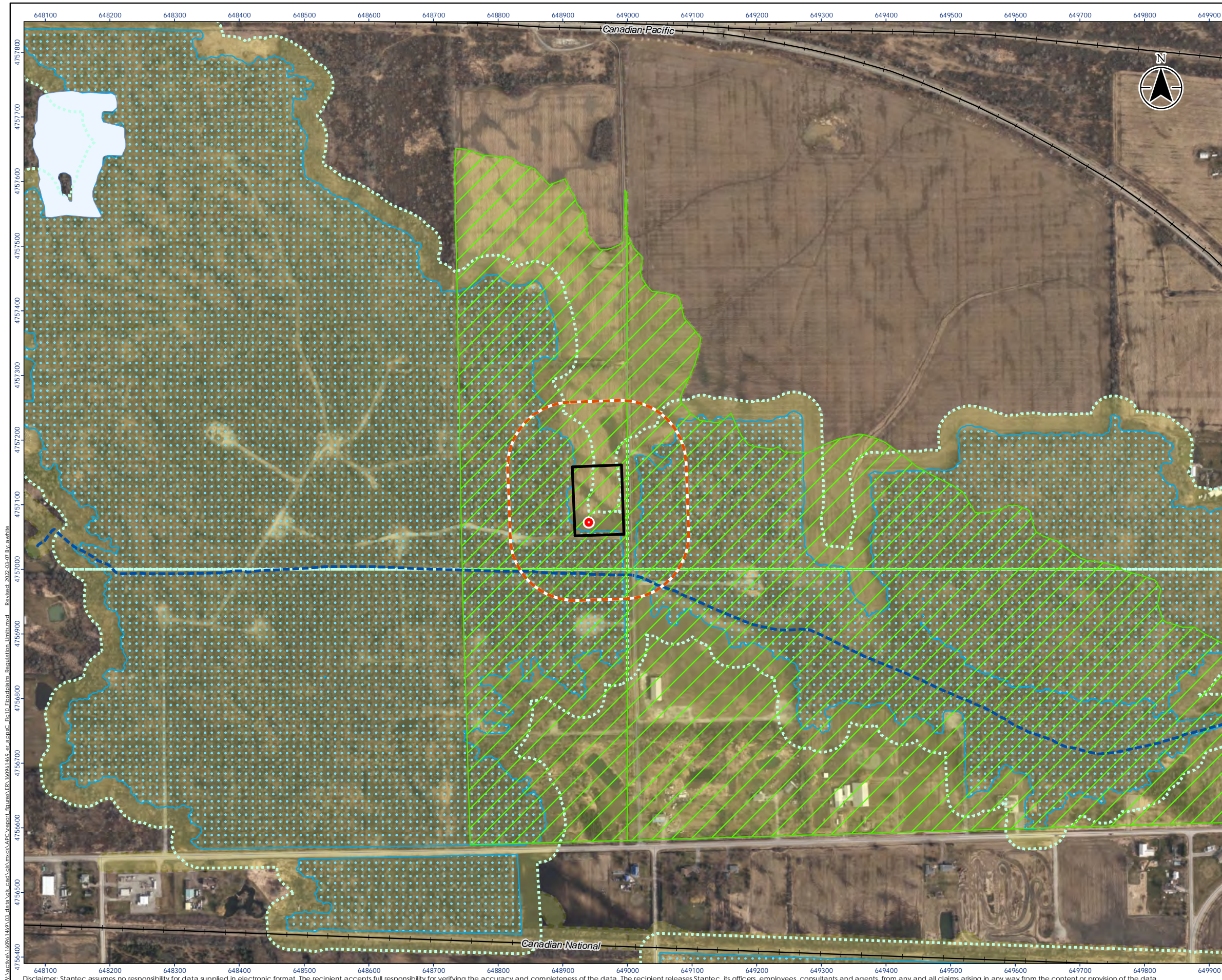
Project Location: Regional Municipality of Niagara
 Prepared by AW on 2022-03-07
 Technical Review by MK on 2022-02-25

Client/Project:
 ENBRIDGE GAS INC.
 CROWLAND STORAGE WELL

Figure No.
 9

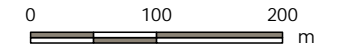
Title
 Agricultural Tile Drainage

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Legend

- Proposed Storage Well (EC 1)
- 100 m Study
- Temporary Pad
- Minor Road
- +— Railway
- - - Watercourse (Intermittent)
- Waterbody
- NPCA Approximate Regulated
- NPCA Wetland
- NPCA Regulation Wetland
- NPCA Regulated Floodplain



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Notes

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Project Location: Regional Municipality of Niagara
 Prepared by AW on 2022-03-07
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Client/Project: ENBRIDGE GAS INC., CROWLAND STORAGE WELL

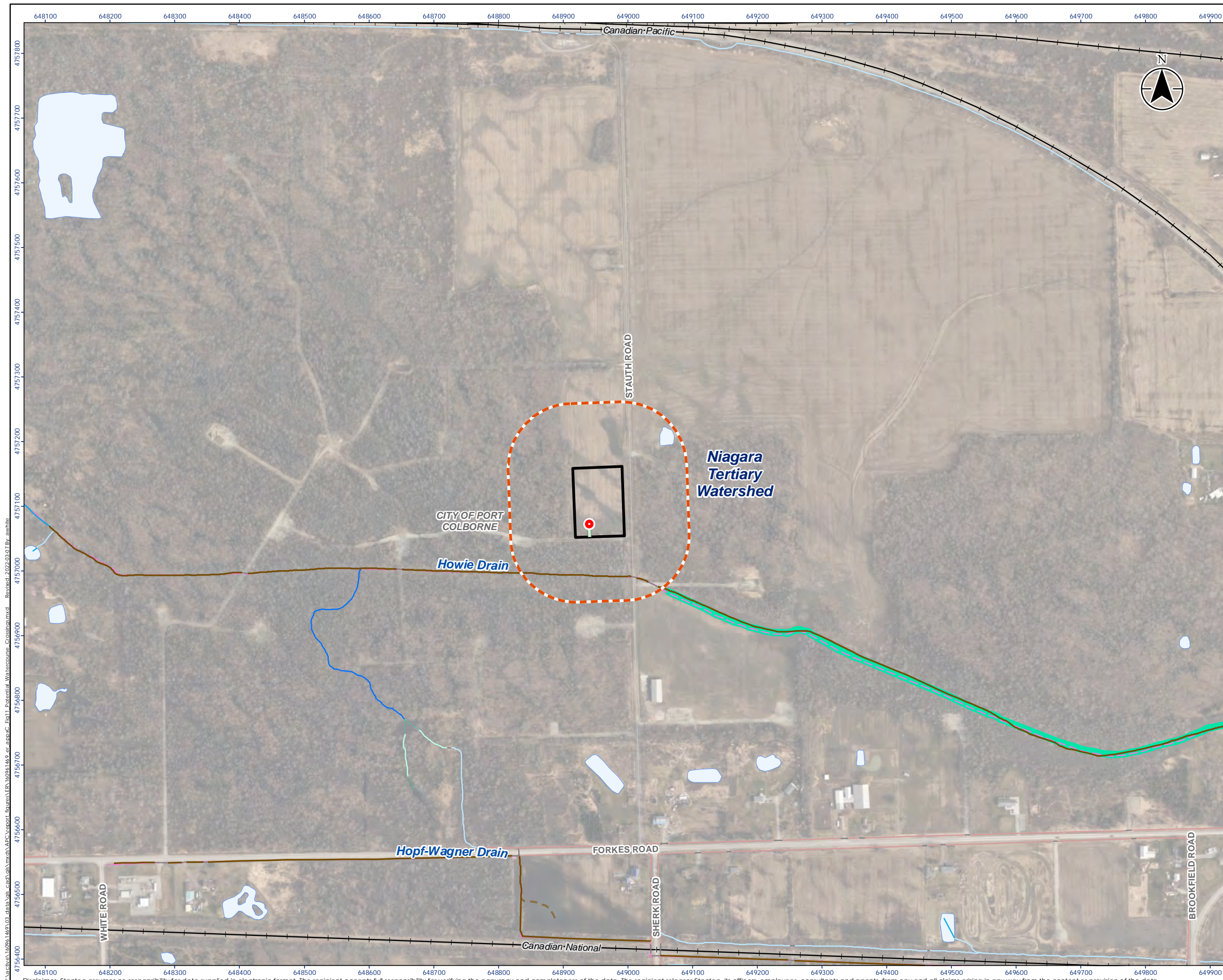
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Title

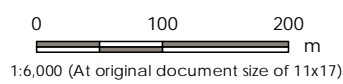
Floodplain and Regulated Area

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Legend

- Proposed Storage Well (EC 1)
- 100 m Study Area
- Temporary Pad
- Minor Road
- Railway
- Watercourse (Intermittent)
- DFO Aquatic Species at Risk - Fish
- Waterbody
- Municipal Boundary, Lower
- Subwatershed
- DFO Drain Class F
- NPCA Watercourse/Drain Slough
- Rural Drainage
- Culvert
- Ditch - Agricultural
- Ditch - Other
- Ditch - Roadside
- Pond - Other
- Stream/Creek
- Waterbody - Seasonal



- Notes
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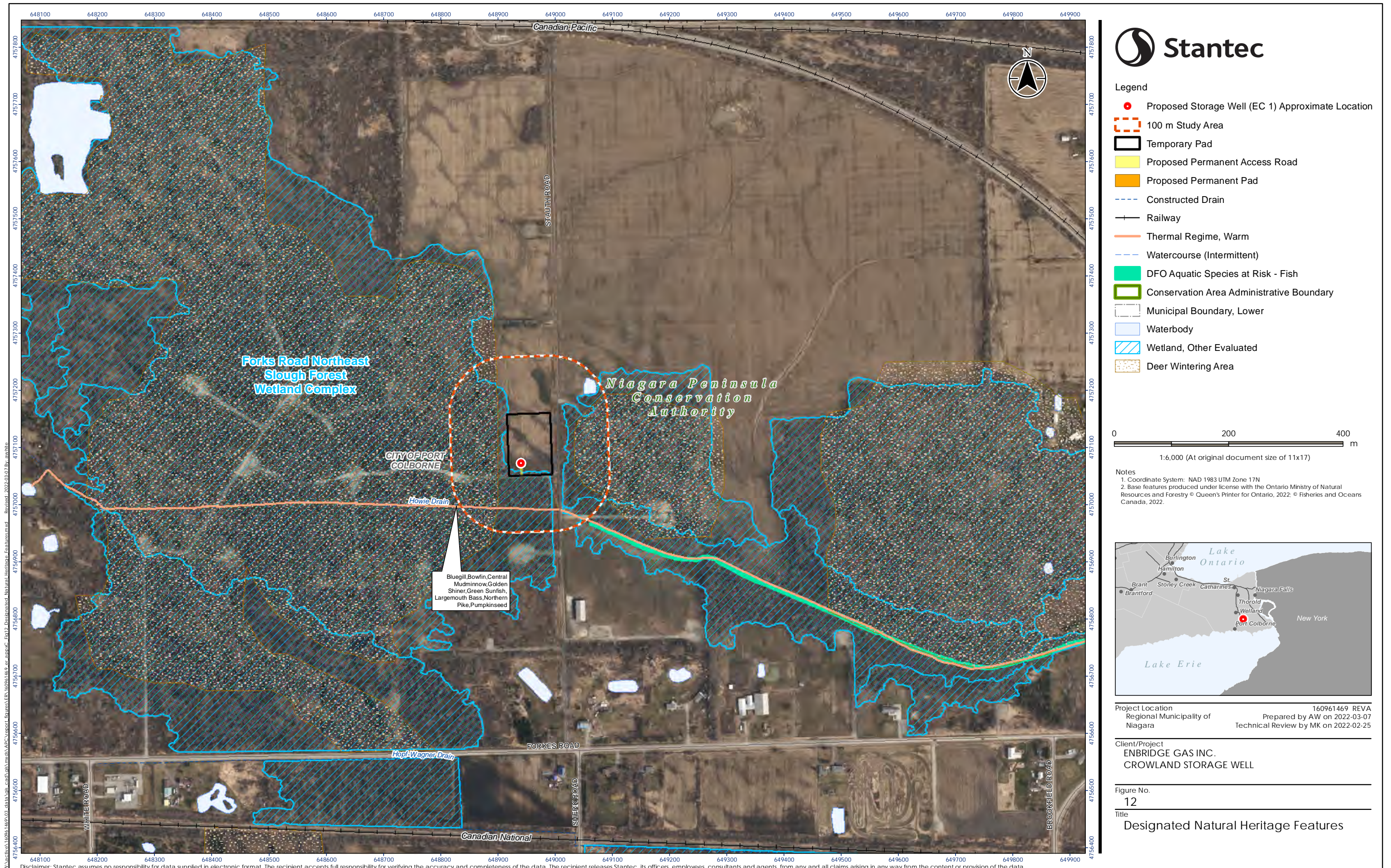


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Figure No.: 11

Title: Potential Watercourse Crossings



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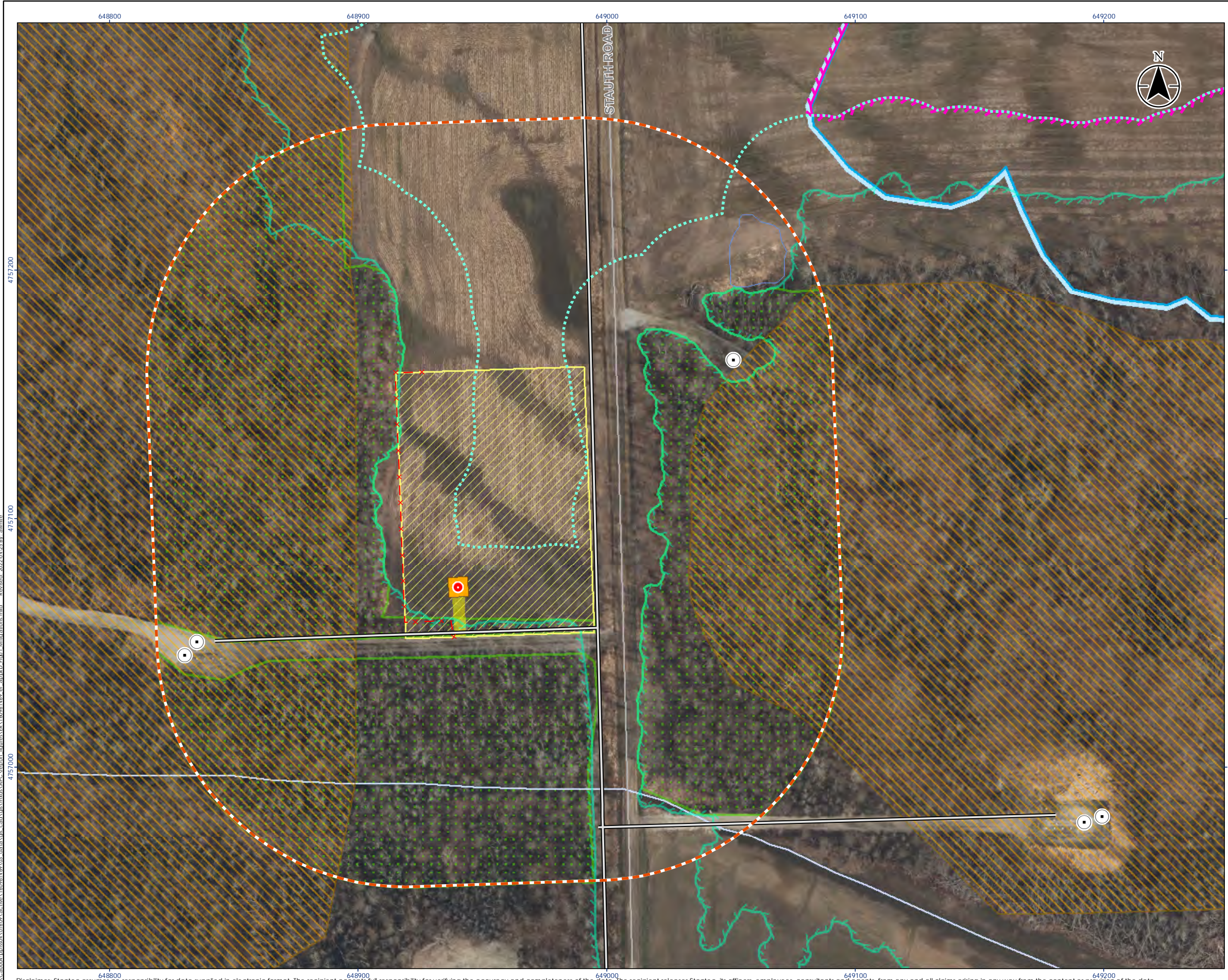
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2022 Crowland Test Well Drilling Project: Environmental Report
May 6, 2022

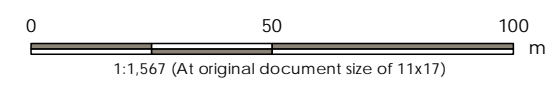
Appendix D

Mitigation Photomosaic





- Legend**
- Proposed Storage Well (EC 1) - See Note 1
 - EC 1 Study Area - See Notes 2-5, 7-9, 12, 15-24
 - Proposed Permanent Pad
 - Proposed Temporary Pad
 - Proposed Permanent Access Road
 - x - Sediment Control Fence
 - Existing Well - See Note 6
 - Minor Road
 - Existing Gathering Line - See Note 6
 - Watercourse - See Note 11
 - Waterbody - See Note 11
 - NPCA Regulation Wetland - See Notes 11, 14
 - NPCA Wetland Allowance
 - NPCA Regulated Floodplain - See Note 10
 - NPCA Approximate Regulated
 - Deer Wintering Area - See Note 13
 - Wooded Area - See Notes 13-14



- Notes**
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Project Location: Regional Municipality of Niagara
 Prepared by AW on 2022-04-25
 Technical Review by MK on 2022-02-18

Client/Project: ENBRIDGE GAS INC
 CROWLAND STORAGE WELL

Figure No.: D-1
 Title: Mitigation Photomosaic
 EC 1 Project Location



Mitigation Notes

PHYSICAL FEATURES

1. During the drilling of EC1, bedrock maybe encountered. Refer to Section 3.3.1, Table 4.1 of the Environment Report (ER).
2. Where there is potential for soil erosion, the need for and location of erosion and sediment control (ESC) measures should be determined by an inspector with appropriate qualifications and installed prior to the commencement of work in the area. Refer to Section 3.3.2, Table 4.1 of the ER. The location of the ESC measures may also be outlined in the anticipated Niagara Peninsula Conservation Authority (NPCA) permit. Refer to permit conditions for additional and applicable measures on ESC.
3. The contractor should obtain adequate quantities of materials to control erosion. Additional supplies should be maintained in a readily accessible location for maintenance and contingency purposes. ESC structures should be monitored to maintain their effectiveness through the life of construction and post-construction rehabilitation. Refer to Section 3.3.2, Table 4.1 of the ER.
4. ESC and stabilization measures should be maintained during construction, restoration, and rehabilitation until the site is established. Where evidence of erosion exists, corrective control measures should be implemented as soon as conditions permit. Refer to Section 3.3.2, Table 4.1 of the ER.
5. Refer to Section 3.3.3, Table 4.1 of the ER for applicable mitigation and protective measures for groundwater.
6. Enbridge Gas will follow internal procedures and communication protocols to identify and avoid adverse impacts to existing infrastructure in the Designated Storage Areas (DSAs). Refer to Section 3.3.4, Table 4.1 of the ER.
7. It is noted that the Ministry of the Environment, Conservation Parks (MECP) has new regulations for the movement of excess soils in the province of Ontario. Though the Project is not expected to generate significant quantities of excess soil, Enbridge Gas should retain or consult with a qualified person who is knowledgeable in the current excess soils guidelines, to make recommendations for the management of excess soils. Refer to Section 3.3.5, Table 4.1 of the ER.
8. In the event of high rains or winds refer to Section 3.3.5, Table 4.1 of the ER, subsection "Wet Soil Shutdown" and "High Winds". For all other mitigations on Soil and Soil Capability, refer to section 3.3.5, Table 4.1 of the ER.
9. To reduce the potential for the spread of pests/diseases that are known to occur, including Soybean Cyst Nematode (SCN), Enbridge Gas should implement their clean equipment protocol. Imported soil used for rehabilitation will have a composite sample analyzed for identified concerns. Refer to Section 3.3.7, Table 4.1 of the ER.
10. All work within the floodplain will be subject to permit from NPCA. All work should follow the conditions outlined in the permit. Temporary Workspaces to be located above the floodplain, refer to Section 3.3.8, Table 4.1 of the ER.

BIOPHYSICAL FEATURES

11. To reduce impacts to aquatic features, follow mitigation and protective measures outlined in Section 3.4.1, Table 4.1 of the ER.
12. Equipment and vehicles should yield to wildlife, fencing should be erected around deep excavations to prevent wildlife entrapment, and if wildlife are encountered during construction, personnel are required to move away from the animal and wait for the animal to move off the construction site.
13. Vegetation clearing should be reduced to greatest extent possible prior to construction, a field investigation should occur to confirm vegetation in the area to be cleared, and approved mitigation measures should be implementation as warranted. Refer to Section 3.4.2, Table 4.1 of the ER.
14. There is potential for species of conservation concern, and species at risk, to occur in the wetlands/woodlands surrounding the Project Location, and in the agricultural field. Specific mitigation measures for these species are outlined in Section 3.4.3, Table 4.1 of the ER.
15. To reduce impacts to Wildlife Habitat, Wildlife, and Species at Risk, implement the general mitigation and protective measures as outlined in Section 3.4.3, Table 4.1 of the ER.

SOCIO-ECONOMIC ENVIRONMENT

16. Motorized construction equipment should be equipped with mufflers. Company and construction personnel should avoid idling of vehicles; vehicles or equipment should be turned off when not in use unless required for operation of the vehicle or equipment. To the greatest extent activities that could create noise should be restricted to daylight hours and adhere to local noise by-laws. Site practices during construction should be implemented that are in line with the document 'Best Practices for the Reduction of Air Emissions from Construction and Demolition Activities' prepared by Cheminfo Services Inc. for Environment Canada (Cheminfo Services Inc. 2005). Sources of continuous noise, such as portable generators, should be shielded or situated to reduce disturbance to residents and businesses. To reduce noise and air emissions that may result from Project construction, refer to mitigation measures outlined in Section 3.5.1, Table 4.1 of the ER.
17. Construction should be restricted to daylight hours where possible to minimize disturbances to residents and businesses, refer to mitigation measures outlined in Section and 3.5.1 and 3.5.2, Table 4.1 of the ER.
18. Follow mitigation measures outlined in Section 3.5.3, Table 4.1 of the ER to reduce impacts on community services and infrastructure.
19. The contractor should have emergency response equipment and trained personnel on-site during construction. In addition, an Emergency Response Plan should be developed and implemented, which will address field health services, emergency call-out procedures and fire response plans. Refer to Section 3.5.3, Table 4.1 of the ER.
20. The construction contractor should implement a site-specific waste collection and disposal management plan. See Section 3.5.7 for details on what this management plan should include.
21. A Stage 2 Archaeological Assessment will be conducted on lands disturbed by the Project. The results of the assessments will determine appropriate mitigation and protective measures for the sites. Where feasible for the Project, archaeological sites that are determined to retain further cultural heritage value and interest may be mitigated in whole or in part by avoidance and protection/preservation measures. Where avoidance and protection/preservation measures are not feasible, archaeological resources may be mitigated in whole or in part by excavation.

GENERAL NOTES

22. Construction should be kept to the shortest practical period.
23. All required approvals and permits will be obtained prior to construction.
24. The Project is located a NPCA regulated area. Enbridge Gas will be required to follow the mitigation and protection measures outlined in the NPCA permit.

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- Notes**
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Project Location 160961469 REV B
 Regional Municipality of Niagara Prepared by AW on 2022-04-26
 Technical Review by MK on 2022-02-18

Client/Project
 ENBRIDGE GAS INC
 CROWLAND STORAGE WELL

Figure No.

D-1

Title

**Mitigation Photomosaic
 EC 1 Project Location**

2022 Crowland Test Well Drilling Project: Environmental Report
May 6, 2022

Appendix E

Stage 1 Archaeological Assessment



**Ministry of Heritage, Sport, Tourism, and
Culture Industries**

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Programs and Services Branch
Heritage, Tourism and Culture Division
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**Ministère des Industries du patrimoine, du sport, du
tourisme et de la culture**

Unité des programme d'archéologie
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Apr 8, 2022

Parker S. Dickson (P256)
Stantec Consulting
171 Queens London ON N6A 5J7

RE: Entry into the Ontario Public Register of Archaeological Reports: Archaeological Assessment Report Entitled, "Stage 1 Archaeological Assessment: Crowland Storage Well EC1, Part of Lot 11, Concession 5, Geographic Township of Humberstone, former Welland County, now City of Port Colborne, Regional Municipality of Niagara Region, Ontario ", Dated Apr 6, 2022, Filed with MHSTCI Toronto Office on Apr 6, 2022, MHSTCI Project Information Form Number P256-0710-2022, MHSTCI File Number 0016348

Dear Mr. Dickson:

The above-mentioned report, which has been submitted to this ministry as a condition of licensing in accordance with Part VI of the *Ontario Heritage Act*, R.S.O. 1990, c 0.18, has been entered into the Ontario Public Register of Archaeological Reports without technical review.¹

Please note that the ministry makes no representation or warranty as to the completeness, accuracy or quality of reports in the register.

Should you require further information, please do not hesitate to send your inquiry to Archaeology@Ontario.ca

cc. Archaeology Licensing Officer
Ryan Park, Enbridge Gas Inc.
Zora Crnojacki, Ontario Energy Board

1In no way will the ministry be liable for any harm, damages, costs, expenses, losses, claims or actions that may result: (a) if the Report(s) or its recommendations are discovered to be inaccurate, incomplete, misleading or fraudulent; or (b) from the issuance of this letter. Further measures may need to be taken in the event that additional artifacts or archaeological sites are identified or the Report(s) is otherwise found to be inaccurate, incomplete, misleading or fraudulent.



**Stage 1 Archaeological Assessment:
Crowland Storage Well EC1**

Part of Lot 11, Concession 5,
Geographic Township of Humberstone,
former Welland County, now City of Port
Colborne, Regional Municipality of Niagara
Region, Ontario

April 6, 2022

Prepared for:

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Licensee: Parker Dickson, MA
License Number: P256
Project Information Form Number:
P256-0710-2022
Project Number: 160961469

ORIGINAL REPORT

STAGE 1 ARCHAEOLOGICAL ASSESSMENT: CROWLAND STORAGE WELL EC1

Executive Summary

Stantec Consulting Ltd. was retained by Enbridge Gas Inc. to complete a Stage 1 archaeological assessment for a new observation well, EC1 (the Project), to be constructed within the existing Crowland Designated Storage Area (CDSA). The Project is located in part of Lot 11, Concession 5, Geographic Township of Humberstone, former Welland County, now City of Port Colborne, Regional Municipality of Niagara, Ontario. The study area for the Project is approximately 0.81 hectares and includes a new access road, drill pad, and well pad, as well as additional lands possibly required for temporary construction activities. The Stage 1 archaeological assessment was carried out in accordance with the provisions of the *Ontario Heritage Act* (Government of Ontario 1990a) and the Ontario Energy Board's (OEB) established guidelines for the expansion of natural gas service in its *Guidelines for Assessing and Reporting on Natural Gas System Expansion in Ontario* (OEB 2019).

The Stage 1 archaeological assessment was conducted in accordance with the Ministry of Heritage, Sport, Tourism and Culture Industries' (MHSTCI) 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011) under archaeological Project Information Form number P256-0710-2022 issued to Parker Dickson, MA, by the MHSTCI.

The Stage 1 archaeological assessment of the study area for the Project determined that the study area retains potential for the identification and documentation of archaeological resources. In accordance with Section 1.3.1 and Section 7.7.4 of the MHSTCI's 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011), **Stage 2 archaeological assessment is required for the study area.**

The MHSTCI is asked to review the results presented and to accept this report into the *Ontario Public Register of Archaeological Reports*.

The Executive Summary highlights key points from the report only; for complete information and findings, the reader should examine the complete report.



STAGE 1 ARCHAEOLOGICAL ASSESSMENT: CROWLAND STORAGE WELL EC1

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STAGE 1 ARCHAEOLOGICAL ASSESSMENT: CROWLAND STORAGE WELL EC1

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Licensed Archaeologist:	Parker Dickson, MA (P256)
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Mapping:	Andrew White, GIS Specialist
Quality Review:	Parker Dickson, MA (P256)
Independent Review:	Tracie Carmichael, BA, B.Ed. (R140)

Acknowledgements

Proponent Contact:	Ryan Park – Sr. Advisor, Environment, Enbridge Gas Inc.
Ministry of Heritage, Sport, Tourism and Culture Industries:	Robert von Bitter – Archaeological Data Coordinator



STAGE 1 ARCHAEOLOGICAL ASSESSMENT: CROWLAND STORAGE WELL EC1

Project Context
April 6, 2022

1.0 PROJECT CONTEXT

1.1 DEVELOPMENT CONTEXT

Stantec Consulting Ltd. (Stantec) was retained by Enbridge Gas Inc. (Enbridge) to complete Stage 1 archaeological assessment for a new storage and observation well (the Project) to be constructed within the existing Crowland Designated Storage Area (CDSA). To ensure the continued safe and reliable delivery of natural gas to existing and future Enbridge customers, and to enhance the capacity and deliverability of their existing storage operations, Enbridge has identified the need to drill a new natural gas storage well at the CDSA, Humberstone 5-11-V (EC 1). The Project is located in part of Lot 11, Concession 5, Geographic Township of Humberstone, former Welland County, now City of Port Colborne, Regional Municipality of Niagara, Ontario (Figure 1).

The archaeological assessment is being completed during the preliminary planning phase of the Project. The study area for the Project is approximately 0.81 hectares and includes a new access road, drill pad, and well pad, as well as additional lands possibly required for temporary construction activities (Figure 2). The Stage 1 archaeological assessment was carried out in accordance with the provisions of the *Ontario Heritage Act* (Government of Ontario 1990a) and the Ontario Energy Board's (OEB) established guidelines for the expansion of natural gas service in its *Guidelines for Assessing and Reporting on Natural Gas System Expansion in Ontario* (OEB 2019).

1.1.1 Objectives

In compliance with the provincial standards and guidelines set out in the Ministry of Heritage, Sport, Tourism and Culture Industries' (MHSTCI) 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011), the objectives of the Stage 1 are as follows:

- To provide information about the study areas' geography, history, previous archaeological fieldwork and current land conditions.
- To evaluate the study area's archaeological potential which will support recommendations for Stage 2 survey for all or parts of the property.
- To recommend appropriate strategies for Stage 2 survey.

To meet these objectives, Stantec archaeologists employed the following research strategies:

- A review of relevant archaeological, historical, and environmental literature pertaining to the study area.
- A review of the land use history, including pertinent historical maps.
- An examination of the MHSTCI's *Ontario Archaeological Sites Database* to determine the presence of registered archaeological sites in and around the project area.
- A query of the MHSTCI's *Ontario Public Record of Archaeological Reports* to identify previous archaeological assessments completed within, or within 50 metres of, the study area.

No property inspection was completed as part of this archaeological assessment; thus, no permission to enter the study area was required.



STAGE 1 ARCHAEOLOGICAL ASSESSMENT: CROWLAND STORAGE WELL EC1

Project Context
 April 6, 2022

1.2 HISTORICAL CONTEXT

1.2.1 Post-contact Indigenous Resources

“Contact” is typically used as a chronological benchmark when discussing Indigenous archaeology in Canada and describes the contact between Indigenous and European cultures. The precise moment of contact is a constant matter of discussion. Contact in what is now the province of Ontario is broadly assigned to the 16th century (Loewen and Chapdelaine 2016).

Broadly, the post-contact Indigenous occupation of southern Ontario was heavily influenced by the dispersal of various Iroquoian-speaking communities by the New York State Iroquois and the subsequent arrival of Algonkian-speaking groups from northern Ontario at the end of the 17th century and the beginning of the 18th century (Konrad 1981; Schmalz 1991). Numerous Indigenous groups and communities are associated with the post-contact occupation of southern Ontario and the general area of the Project.

At the turn of the 17th century, the region of the study area was occupied by Iroquoian populations who are historically described as the *Neutre* (by the French) or the *Attiwandaron* (by the Huron-Wendat) and are generally referred to in English as the Neutral; their autonym is not conclusively known (Birch 2015). This group may be ancestral Haudenosaunee as they had similar culture, language, and ceremonies and were considered by the Haudenosaunee to be under the Great Law governance (Hill 2017). To the north was territory occupied by the Wendat-Tionantaté (Huron-Petun) (Heidenreich 1978). The Five Nations Iroquois, located in present-day upstate New York, failed to convince the Wendat-Tionantaté to join them in an alliance (Warrick 2013). In 1649, the Seneca and the Mohawk led a campaign into southern Ontario and dispersed the Neutral and the Wendat-Tionantaté, and established dominance over the region (Heidenreich 1978; Konrad 1981).

In 1667, surviving Huron-Wendat warriors joined alliance with the French-allied Ojibwa and Mississaugas to counterattack the Iroquois who had settled along the north shore of Lake Ontario. By 1690, Ojibwa (Anishinaabe) speaking people had begun moving south into the lower Great Lakes basin (Konrad 1981; Rogers 1978). Mississauga oral traditions, as told by Chief Robert Paudash and recorded in 1905, indicate that after the Mississauga defeat of the Mohawk, the Mohawk retreated to their homeland south of Lake Ontario and a peace treaty was negotiated between those groups around 1695 (Paudash 1905). Upon the Mississaugas’ return they decided to settle permanently in southern Ontario. The Mississaugas’ settled and inhabited a large area at the western end of Lake Ontario throughout the 1700s and into the 1800s. Between 1695 and the mid-1820s, the Mississaugas’ continued to follow a yearly cycle of resource harvest and movement throughout their southern Ontario territory (Praxis Research Associates n.d.).

With the end of the American Revolutionary War in 1783, the Six Nations Iroquois (Haudenosaunee) were forced to leave their traditional homeland in the New York State and elsewhere after the British failed to secure the needs of the Six Nations Iroquois in the 1783 Treaty of Paris and surrendered their land to the Americans (Hill 2017). The Six Nations Iroquois (Haudenosaunee) therefore moved into their previous hunting grounds of southern Ontario in land provided by the British who were presuming control of the lands. The largest group settled in the Grand River watershed near Brantford, Ontario, to become



STAGE 1 ARCHAEOLOGICAL ASSESSMENT: CROWLAND STORAGE WELL EC1

Project Context

April 6, 2022

the Six Nations of the Grand River. The Indigenous economy from the turn of the 18th century focused on fishing and the fur trade, supplemented by agriculture and hunting.

Despite the differentiation among these groups in Euro-Canadian sources, there was a considerably different view by Indigenous groups concerning their self-identification during the first few centuries of European contact. These peoples relied upon kinship ties that cut across European notions of nation identity (Bohaker 2006:277-283). Many of the British-imposed nation names such as Chippewa, Ottawa, Potawatomi, or Mississauga artificially separated how self-identified Indigenous peoples' classified themselves; these groups were culturally and socially more alike than contemporary European documentation might indicate (Bohaker 2006:1-8).

The study area falls within the historical and traditional territory of several Indigenous communities, including but not limited to the Mississaugas of the Credit First Nation (Wybenga and Dalton 2018), the Six Nations of the Grand River, and the Haudenosaunee Confederacy. Since contact with European explorers and immigrants, and, later, with the establishment of provincial and federal governments (the Crown), the lands within Ontario and the Niagara peninsula have been included in various treaties, land claims, and land cessions. Though not an exhaustive list, Morris (1943) provides a general outline of some of the treaties within the Province of Ontario from 1783 to 1923. While it is difficult to exactly delineate treaty boundaries today, an approximate outline of the treaty lands described by Morris (1943) is provided in Figure 3.

The study area is located within the 1792 indenture of the 1784 Between the Lakes Purchase between the Crown and the Mississaugas, later described as Treaty Number 3. Treaty Number 3 was:

...made with the Mississa[ug]a Indians 7th December, 1792, though purchased as early as 1784. This purchase in 1784 was to procure for that part of the Six Nation Indians coming into Canada a permanent abode. The area included in this Treaty is, Lincoln County excepting Niagara Township; Saltfleet, Binbrook, Barton, Glanford and Ancaster Townships, in Wentworth County; Brantford, Onondaga, Tusc[a]r[o]ra, Oakland and Burford Townships in Brant County; East and West Oxford, North and South Norwich, and Dereham Townships in Oxford County; North Dorchester Township in Middlesex County; South Dorchester, Malahide and Bayham Township in Elgin County; all Norfolk and Haldimand Counties; Pelham, Wainfleet, Thorold, Cumberland and Humberstone Townships in Welland County.

(Morris 1943:17-18)

As demonstrated above, the nature of Indigenous settlement size, population distribution, and material culture shifted as European settlers encroached upon their territory. Despite this shift, however, "written accounts of material life and livelihood, the correlation of historically recorded villages to their archaeological manifestations, and the similarities of those sites to more ancient sites have revealed an antiquity to documented cultural expressions that confirms a deep historical continuity to ... systems of ideology and thought" (Ferris 2009:114). As a result, Indigenous peoples have left behind archaeological resources throughout southern Ontario which show continuity with past peoples, even if they have not been recorded in historical Euro-Canadian documentation.



STAGE 1 ARCHAEOLOGICAL ASSESSMENT: CROWLAND STORAGE WELL EC1

Project Context
April 6, 2022

1.2.2 Euro-Canadian Resources**1.2.2.1 Niagara Region**

At its inception, Upper Canada was only sparsely settled and its land had not been officially surveyed to any great extent. Thus, there was an urgency, by the then Lieutenant Governor of Upper Canada, Colonel John Graves Simcoe, to survey this new province for establishing military roads and for preventing settlers from clearing and settling land not legally belonging to them. In 1791, the Provinces of Upper Canada and Lower Canada were created from the former Province of Quebec by an act of British Parliament (Craig 1963:17). At this time, Simcoe was appointed as the Lieutenant Governor of Upper Canada and was tasked with governing the new province, directing its settlement and establishing a constitutional government modelled after that of Britain (Coyne 1895). The change was affected at the behest of United Empire Loyalists, who wished to live under the British laws and customs they were familiar with in Great Britain and the former American Colonies (Craig 1963:10-11). In 1792, Simcoe divided Upper Canada into 19 counties consisting of previously settled lands, new lands opened for settlement, and lands not yet acquired by the Crown. These new counties stretched from Essex in the west to Glengarry in the east.

The earliest written European record of the Niagara Peninsula dates to an account of Niagara Falls published in 1604. The account was written by Samuel de Champlain based on the stories of Indigenous populations he encountered during his first trip to what is now Canada in 1603 (de Volpi 1966). Etienne Brûlé may have visited the Niagara Region as early as 1611, but it was not until 1615 that Champlain explored Lake Ontario. The Niagara River, between Lake Ontario and Lake Erie, was outlined in the 1632 *Les Voyages de la Nouvelle France Occidentale, Dicte Canada, Faits par le Sr. De Champlain* (de Volpi 1966). In 1678, Father Jean Louis Hennepin sketched the Falls (de Volpi 1966). The sketch was reproduced in 1697 in Father Hennepin's *Nouvelle découverte d'un très grand pays situé dans l'Amerique, entre le Nouveau Mexique et la mer glaciale*. An illustration, showing a ladder ascending the falls, accompanied a story in a 1751 edition of *The Gentleman's Magazine*. Although French explorers, missionaries, and traders would continue to pass through the area during the 17th and 18th centuries, no concerted effort was made by the French to settle the region. However, a series of forts, blockhouses, and fortified trading posts were constructed near present-day Youngstown, New York at the mouth of Niagara River, including Fort Conti, 1678-1679 (destroyed by fire); Fort De Nonville, 1687-1688 (abandoned); and Fort Niagara, 1726 (captured by British forces in 1759) (Porter 1896).

Owing to its close proximity to the United States, the region was one of the first settled at the end of the American Revolutionary War by United Empire Loyalists, German mercenaries, Pennsylvania German settlers, Indigenous populations, and those wishing to take advantage of generous land grants and low tax rates aimed at stimulating settlement along the Canadian-United States border. During the War of 1812, the Niagara Peninsula was the setting for several pivotal battles, including those at Queenston Heights, Fort George, Chippewa, Lundy's Lane, Fort Niagara, and Fort Erie. Following the War of 1812, the Niagara Peninsula, including the Fort Erie area, became a significant terminus for slaves using the Underground Railroad (Niagara Parks 2017).



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1.2.2.2 Welland County

From 1841 to 1851, the entire Niagara Peninsula comprised a single county municipality, administered by a District Council whose headquarters were located at Niagara-on-the-Lake. During that time, Welland County was part of Lincoln County. In 1851, the southern section of the district broke away to be governed by a provisional council under Warden John Fraser (Mika and Mika 1983:612).

The municipality of the County of Welland ceased to exist on January 1, 1970, when it became part of the newly created Regional Municipality of Niagara, a union which again combined Welland and Lincoln counties under one governing body (Mika and Mika 1983:613).

Township of Humberstone

Humberstone Township was named after the town of Humberstone in Lincolnshire, England. Humberstone Township was opened for European settlement in 1787 after Philip Frey surveyed the Niagara tract and created 14 townships (Hughes 1994). Humberstone was officially surveyed in 1811 by Thomas Ridout (Ridout 1811). Figure 4 illustrates a portion of the 1811 survey plan of the township and notes that Robert Hamilton was the landowner of Lot 11, Concession 5 around that time (Ridout 1811). However, the first Euro-Canadian settlers had arrived prior to official survey in 1785 (Page and Co. 1876). Some of the earliest settlers included Christian Stoner, Abraham Neff, Christian Knisley, William Steele, and John Near, primarily United Empire Loyalists from New York and Pennsylvania (Welland Tribune 1887).

By 1817, the township had 75 homesteads, one grist mill, and one sawmill (Page and Co. 1876). The settlement of Gravelly Bay, on Lake Erie, was established in 1832 and later renamed Port Colborne. By 1850, the population of the township was 2,377, and there were eight schools, three sawmills, two churches, and one foundry. The population of the township outside of Port Colborne had increased to 3,200 by 1875. Port Colborne was incorporated as a village in 1870 with a population of 1,200 (Page and Co. 1876). Port Colborne became the largest community in the township, largely due to its location at the southern terminus of the Welland Canal.

Welland Canal

The first Welland Canal from Port Dalhousie to Port Robinson and then the Welland River, was completed in 1829 (Andreae 1997). The canal provided a safe route for shipping traffic between Lake Erie and Lake Ontario which bypassed the Niagara Falls. By 1833, the canal had undergone several modifications including construction of a more direct route from Port Robinson to Port Colborne. The canal continued to be modified throughout the 19th century, with the current version completed by 1932 (Andreae 1997).

Canadian Southern Railway

The Canadian Southern Railway crosses the northern part of Humberstone Township. It was completed in 1873, as the Ontario component of the Chicago-Buffalo route, crossing the international border at Buffalo-Fort Erie and Windsor-Detroit (Andreae 1997:128). Soon after it opened, it was acquired by New York Central Railway and operated by a subsidiary, Michigan Central. The line served as a shortcut



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through southern Ontario for American-owned rail companies, and there were few local lines or stations constructed (Andreae 1997:128).

1.2.2.3 Historical Mapping

Although some landowner information is available on historical mapping, it should be recognized that historical county atlases were produced primarily to identify factories, office, residences and landholdings of subscribers and were funded by subscriptions fees and therefore, landowners who did not subscribe were not always listed on the maps (Caston 1997:100). Moreover, associated structures were not necessarily depicted or placed accurately (Gentilcore and Head 1984). Further, review of historical mapping has inherent accuracy difficulties due to potential error in geo-referencing. Geo-referencing is conducted by assigning spatial coordinates to fixed locations and using these points to spatially reference the remainder of the map. Due to changes in ‘fixed’ locations over time (e.g., road intersections, road alignments, watercourses, etc.), errors/difficulties of scale and the relative idealism of the historical cartography, historical maps may not translate accurately into real space points. This may provide obvious inconsistencies during historical map review.

The original survey map of Humberstone Township (Ridout 1811) does not illustrate any Indigenous features near Lot 11, Concession 5 (Figure 4). To southeast of the study area, in Concession 3 and 4, there is a large area labeled as “The Great Tamarack and Cranberry Swamp.” This roughly corresponds to Humberstone Marsh Conservation Area today. A landowner’s name, Robert Hamilton, was added to the map for Lot 11 sometime after 1811. Later, probably sometime around 1873 when it was completed, the Canadian Southern Railway was added to the map in pencil, and crosses the northern portion of Lot 11, Concession 5.

The 1862 Map of Humberstone Township (Tremaine 1862) depicts a rural landscape with numerous farmsteads, homesteads, a local road and railway system, and a number of villages and hamlets. Figure 5 illustrates a portion of the 1862 map (Tremaine 1862). The Welland Railroad and the Welland Canal are illustrated within the township west of the study area; however, the Canadian Southern Railway, which had been penciled in on the 1811 survey, is not illustrated on the 1862 map. Jacob Brookfield is noted as the landowner for Lot 11, Concession 5. No structures are depicted on the lot.

The map of Humberstone Township in the 1876 *Illustrated Historical Atlas of the Counties of Lincoln and Welland, Ontario* depicts a similar landscape as the 1862 map (Page and Co. 1876). Figure 6 illustrates a portion of the 1876 map (Page and Co. 1876). On the 1876 map, Lot 11, Concession 5 is shown as divided into west and east halves. The west half is owned by James Henderson, and the east half is owned by John Zavitz. A structure and orchard are depicted in the east half of Lot 11 at the north end, fronting Netherby Road. The Canadian Southern Railway crosses the northern portion of the lot, and a schoolhouse is depicted nearby on Lot 13, Concession 5.



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1.3 ARCHAEOLOGICAL CONTEXT

1.3.1 The Natural Environment

The study area is located within the Haldimand Clay Plain physiographic region (Chapman and Putnam 1984:156). The Haldimand Clay Plain region was previously the bed of glacial Lake Warren. The physiographic region consists of till that emerges from layers of stratified clay in low morainic ridges to the north (Chapman and Putnam 1984:156). The northern part of the Haldimand Clay Plain generally has more relief than the southern part. The study area is located in the southern part of the area, closer to Lake Erie, which remained after Lake Warren drained.

The surficial geology of the region consists of coarse-textured glaciolacustrine deposits, including sand, gravel, minor silt, clay, and littoral deposits. Littoral deposits are created when shorelines shift and, at this location, are a result of the changing water levels of the Great Lakes cause by glacial movement (Ontario Geological Society 2003). The study area soils consist of Welland Clay, a dark grey to reddish brown clay or clay loam over compact, mottled, reddish brown clay subsoil. They have fair to poor drainage and smooth or undulating topography (Kingston and Presant 1989). The soils are classified as Class 3, meaning they have moderately severe limitations that reduce the choice of crops or require special conservation practices (Government of Ontario 2016). These soils may have been used for Indigenous or early Euro-Canadian agriculture but would have presented challenges for cultivation without improved drainage.

The study area is located approximately 50 metres north of an unnamed seasonal tributary of Tea Creek. Additional ancient and/or relic tributaries of the various primary and secondary water sources may have existed but are not identifiable today and may not be indicated on historical mapping. The study area is approximately 12 kilometres west of the Niagara River, which was the primary transportation route between Lake Erie and Lake Ontario until the construction of the Welland Canal in the early 19th century.

1.3.2 Pre-contact Indigenous Resources

As the Laurentide ice sheet receded from southern Ontario by approximately 11,000 years ago, the land was opened up and those parts of it not submerged under glacial lakes were available for human occupation (Ellis and Ferris 1990; Lothrop *et al.* 2016). Much of what is understood about the lifeways of the Indigenous peoples who first populated the land that is currently known as southern Ontario is derived from archaeological evidence and ethnographic analogy.

In Ontario, Indigenous occupation prior to the period of contact with European peoples has been divided by archaeologists into archaeological culture periods based on observed changes in material culture. These archaeological culture periods are largely based on observed changes in formal lithic tools, and are classified as Early Paleoindian, Late Paleoindian, Early Archaic, Middle Archaic, and Late Archaic periods. Following the advent of ceramic technology in the Indigenous archaeological record in Ontario, archaeological culture periods are classified as Early Woodland, Middle Woodland, and Late Woodland periods, distinguished primarily on observed changes in formal ceramic decoration. It should be noted that archaeological culture periods do not represent specific Indigenous cultural identities but are, rather, a useful paradigm for categorizing changes in Indigenous material culture practice through time.



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The current understanding of Indigenous archaeological culture periods in southern Ontario is summarized in Table 1, based on Ellis and Ferris (1990) and more recent advances in late Pleistocene radiocarbon calibration techniques (Ellis 2013; Lothrop *et al.* 2016; Munson 2013). The provided time periods are based on the “Common Era” calendar notation system, i.e., Before Common Era (BCE) and Common Era (CE).

Table 1: Generalized Cultural Chronology of the Study Area

Period	Characteristics	Time Period	Comments
Early Paleo-Indian	Fluted Projectiles	9000 – 8400 BCE	Spruce parkland/caribou hunters
Late Paleo-Indian	Hi-Lo Projectiles	8400 – 8000 BCE	Smaller but more numerous sites
Early Archaic	Kirk and Bifurcate Base Points	8000 – 6000 BCE	Slow population growth
Middle Archaic	Brewerton-like points	6000 – 2500 BCE	Environment similar to present
Late Archaic	Narrow Points	2500 – 1800 BCE	Increasing site size
	Broad Points	1800 – 1500 BCE	Large chipped lithic tools
	Small Points	1500 – 1100 BCE	Introduction of bow hunting
Terminal Archaic	Hind Points	1100 – 950 BCE	Emergence of true cemeteries
Early Woodland	Meadowood Points	950 – 400 BCE	Introduction of pottery
Middle Woodland	Dentate/Pseudo-Scallop Pottery	400 BCE – 500 CE	Increased sedentism
	Princess Point	550 – 900 CE	Introduction of corn
Late Woodland	Early Ontario Iroquoian	900 – 1300 CE	Emergence of agricultural villages
	Middle Ontario Iroquoian	1300 – 1400 CE	Long longhouses (100+ metres)
	Late Ontario Iroquoian	1400 – 1650 CE	Tribal warfare and displacement
Contact Indigenous	Various Algonkian Groups	1650 – 1875 CE	Early written records and treaties
Late Historical	Euro-Canadian	1796 CE – present	European settlement

Between 9000 and 8000 BCE, Indigenous populations were sustained by hunting, fishing, and foraging and lived a relatively mobile existence across an extensive geographic territory. Despite these wide territories, social ties were maintained between groups. One method of maintaining social ties was through gift exchange, evident through exotic lithic material documented on many sites (Ellis 2013:35-40).

By approximately 8000 BCE, evidence exists and becomes more common for the production of ground-stone tools such as axes, chisels, and adzes. These tools themselves are believed to be indicative specifically of woodworking. This evidence can be extended to indicate an increase in craft production and arguably craft specialization. This latter statement is also supported by evidence, dating to approximately 7000 BCE of ornately carved stone objects which would be laborious to produce and have explicit aesthetic qualities (Ellis 2013:41). This is indirectly indicative of changes in social organization which permitted individuals to devote time and effort to craft specialization. Since 8000 BCE, the Great Lakes basin experienced a low-water phase, with shorelines significantly below modern lake levels (Stewart 2013: Figure 1.1.C). It is presumed that the majority of human settlements would have been focused along these former shorelines. At approximately 6500 BCE the climate had warmed considerably since the recession of the glaciers and the environment had grown more similar to the present day. By approximately 4500 BCE, evidence exists from southern Ontario for the utilization of native copper



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(naturally occurring pure copper metal) (Ellis 2013:42). The known origin of this material along the north shore of Lake Superior indicates the existence of extensive exchange networks across the Great Lakes basin.

At approximately 3500 BCE, the isostatic rebound of the North American plate following the melt of the Laurentide glacier had reached a point which significantly affected the watershed of the Great Lakes basin. Prior to this, the Upper Great Lakes had drained down the Ottawa Valley via the French-Mattawa River valleys. Following this shift in the watershed, the drainage course of the Great Lakes basin had changed to its present course. This also prompted a significant increase in water-level to approximately modern levels (with a brief high-water period); this change in water levels is believed to have occurred catastrophically (Stewart 2013:28-30). This change in geography coincides with the earliest evidence for cemeteries (Ellis 2013:46). By 2500 BCE, the earliest evidence exists for the construction of fishing weirs (Ellis *et al.* 1990: Figure 4.1). Construction of these weirs would have required a large amount of communal labour and are indicative of the continued development of social organization and communal identity. The large-scale procurement of food at a single location also has significant implications for permanence of settlement within the landscape. This period is also marked by further population increase and by 1500 BCE evidence exists for substantial permanent structures (Ellis 2013:45-46).

By approximately 950 BCE, the earliest evidence exists for populations using ceramics. Populations are understood to have continued to seasonally exploit natural resources. This advent of ceramic technology correlated, however, with the intensive exploitation of seed foods such as goosefoot and knotweed as well as mast such as nuts (Williamson 2013:48). The use of ceramics implies changes in the social organization of food storage as well as in the cooking of food and changes in diet. Fish also continued to be an important facet of the economy at this time. Evidence continues to exist for the expansion of social organization (including hierarchy), group identity, ceremonialism (particularly in burial), interregional exchange throughout the Great Lakes basin and beyond, and craft production (Williamson 2013:48-54).

By approximately 550 CE, evidence emerges for the introduction of maize into southern Ontario. This crop would have initially only supplemented Indigenous peoples' diet and economy (Birch and Williamson 2013:13-14). Maize-based agriculture gradually became more important to societies and by approximately 900 CE permanent communities emerge which are primarily focused on agriculture and the storage of crops, with satellite locations oriented toward the procurement of other resources such as hunting, fishing, and foraging. By approximately 1250 CE, evidence exists for the common cultivation of historic Indigenous cultigens, including maize, beans, squash, sunflower, and tobacco. The extant archaeological record demonstrates many cultural traits similar to historical Indigenous nations (Williamson 2013:55). The study area is located within the understood territory of the ancestral Neutral, specifically the Eastern Niagara Escarpment (Birch 2015). The pre-contact component of the Eastern Niagara Escarpment settlement cluster has documented occupation from the 16th to 17th centuries (Lennox and Fitzgerald 1990: Table 13.1).

1.3.3 Registered Archaeological Sites and Surveys

In Canada, archaeological sites are registered within the Borden system, a national grid system designed by Charles Borden in 1952 (Borden 1952). The grid covers the entire surface area of Canada and is divided into major units containing an area that is two degrees in latitude by four degrees in longitude.



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Major units are designated by upper case letters. Each major unit is subdivided into 288 basic unit areas, each containing an area of 10 minutes in latitude by 10 minutes in longitude. The width of basic units reduces as one moves north due to the curvature of the earth. In southern Ontario, each basic unit measures approximately 13.5 kilometres east-west by 18.5 kilometres north-south. In northern Ontario, adjacent to Hudson Bay, each basic unit measures approximately 10.2 kilometres east-west by 18.5 kilometres north-south. Basic units are designated by lower case letters. Individual sites are assigned a unique, sequential number as they are registered. These sequential numbers are issued by the MHSTCI who maintain the *Ontario Archaeological Sites Database*. The study area under review is located within Borden Block AfGt.

Information concerning specific site locations is protected by provincial policy and is not fully subject to the *Freedom of Information and Protection of Privacy Act* (Government of Ontario 1990b). The release of such information in the past has led to looting or various forms of illegally conducted site destruction. Confidentiality extends to 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.

An examination of the *Ontario Archaeological Sites Database* has shown that there are no registered archaeological sites within one kilometre of the study area for the Project (Government of Ontario 2022a). A query of the *Ontario Public Register of Archaeological Reports* indicates there are no previously completed archaeological surveys within 50 metres of the study area (Government of Ontario 2022b).

1.4 EXISTING CONDITIONS

The Stage 1 archaeological assessment for the study area was conducted under Project Information Form (PIF) number P256-0710-2022 issued to Parker Dickson, MA, by the MHSTCI. The study area for the archaeological assessment comprises approximately 0.81 hectares of active agricultural field in Lot 11, Concession 5, Geographic Township of Humberstone, former Welland County, now City of Port Colborne, Regional Municipality of Niagara, Ontario.



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Field Methods

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2.0 FIELD METHODS

Initial background research compiled information concerning registered and/or potential archaeological resources within the study area. A property inspection was not conducted for the Stage 1 archaeological assessment and therefore there are no field methods to describe.



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Analysis and Conclusions

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3.0 ANALYSIS AND CONCLUSIONS

Archaeological potential is established by determining the likelihood that archaeological resources may be present on a subject property. Stantec applied archaeological potential criteria commonly used by the MHSTCI (Government of Ontario 2011) to determine areas of archaeological potential within the region under study. These variables include proximity to previously identified archaeological sites; distance to various types of water sources; soil texture and drainage; glacial geomorphology; elevated topography; and the general topographic variability of the area. However, it is worth noting that extensive land disturbance can eradicate archaeological potential (Government of Ontario 2011).

Potable water is the single most important resource for any extended human occupation or settlement and since water sources in southern Ontario have remained relatively stable over time, proximity to drinkable water is regarded as a useful index for the evaluation of archaeological site potential. In fact, distance to current water is one of the most commonly used variables for predictive modeling of archaeological site location in Ontario. Distance to modern or ancient water sources is generally accepted as the most important determinant of past human settlement patterns and considered alone, may result in a determination of archaeological potential. However, any combination of two or more other criteria, such as well-drained soils or topographic variability, may also indicate archaeological potential.

As discussed above, distance to water is an essential factor in archaeological potential modeling. When evaluating distance to water it is important to distinguish between water and shoreline, as well as natural and artificial water sources, as these features affect site locations and types to varying degrees. The MHSTCI categorizes water sources in the following manner:

- Primary water sources: lakes, rivers, streams, creeks.
- Secondary water sources: intermittent streams and creeks, springs, marshes, and swamps.
- Past water sources: glacial lake shorelines, relic river or stream channels, cobble beaches, shorelines of drained lakes or marshes.
- Accessible or inaccessible shorelines: high bluffs, swamp or marshy lake edges, and sandbars stretching into marsh.

As detailed in Section 1.3.1, the study area is located approximately 50 metres north of a secondary water source, an unnamed seasonal tributary of Tea Creek. The Humberstone Marsh Conservation Area is located to the southeast of the study area. The study area is approximately 12 kilometres west of the Niagara River, which was the primary transportation route between Lake Erie and Lake Ontario until the construction of the Welland Canal in the early 19th century. Moreover, additional ancient and/or relic tributaries of the various water sources may have existed. Soil conditions within the study area may have been suitable for Indigenous and Euro-Canadian agriculture, especially after additional drainage measures were in place.

As detailed in Section 1.3.3, an examination of the *Ontario Archaeological Sites Database* has shown that there are no archaeological sites registered within one kilometre of the study area associated with this report (Government of Ontario 2022a). However, the Niagara peninsula was an important region for Indigenous population movements and settlement throughout history.



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Archaeological potential can be extended to areas of early Euro-Canadian settlement, including places of military or pioneer settlements, early transportation routes, and properties listed on the municipal register or designated under the *Ontario Heritage Act* (Government of Ontario 1990a), or property that local histories or informants have identified with possible historical events. Mapping from the early-to-late 19th century demonstrates that the study area and its associated environs were occupied by Euro-Canadian farmers by the mid-19th century and, possibly, the early 19th century. The Niagara region was one of the first parts of Upper Canada that was surveyed and settled. Moreover, the study area is in close proximity to early road and rail transportation routes, and the original Welland Canal is located approximately six kilometres to the west. Much of the established transportation networks and agricultural settlement from the 19th century is still visible today.

When the above listed criteria are applied, the study area retains potential for the identification of Indigenous and Euro-Canadian archaeological resources. Thus, in accordance with Section 1.3.1 of the MHSTCI's 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011), Stage 2 archaeological assessment is required. Figure 7 illustrates the areas of archaeological potential within the study area.



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Recommendations

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4.0 RECOMMENDATIONS

The Stage 1 archaeological assessment of the study area for the Project determined that the entirety of the study area retains potential for the identification and documentation of archaeological resources. In accordance with Section 1.3.1 and Section 7.7.4 of the MHSTCI's 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011), **Stage 2 archaeological assessment is required for the study area (Figure 7).**

The objective of a Stage 2 archaeological assessment will be to document archaeological resources within the study area and to determine whether these archaeological resources require further assessment. As the study area comprises agricultural field, the Stage 2 archaeological assessment will include the systematic walking of open ploughed fields as outlined in Section 2.1.1 of the MHSTCI's 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011). The MHSTCI standards require that agricultural land, both active and inactive, be recently ploughed and sufficiently weathered to improve the visibility of archaeological resources. Ploughing must be deep enough to provide total topsoil exposure, but not deeper than previous ploughing, and must provide at least 80% ground surface visibility.

Should any portion of the study area be inaccessible for ploughing, the Stage 2 archaeological assessment will include a test pit survey as outlined in Section 2.1.2 of the MHSTCI's 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011). The MHSTCI standards require that each test pit be at least 30 centimetres in diameter, excavated to at least five centimetres into subsoil, and have soil screened through six-millimetre hardware cloth to facilitate the recovery of any cultural material that may be present. Prior to backfilling, each test pit will be examined for stratigraphy, cultural features, or evidence of fill.

If the archaeological field team determines any lands to be low and wet, steeply sloped, or disturbed during the course of the Stage 2 field work, those areas will not require survey, but will be photographically documented in accordance with Section 2.1 of the MHSTCI's 2011 *Standards and Guidelines for Consultant Archaeologists* (Government of Ontario 2011).

The MHSTCI is asked to review the results presented and to accept this report into the *Ontario Public Register of Archaeological Reports*.



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Advice on Compliance with Legislation
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6.0 ADVICE ON COMPLIANCE WITH LEGISLATION

In accordance with Section 7.5.9 of the MHSTCI's 2011 Standards and Guidelines for Consultant Archaeologists (Government of Ontario 2011), the following standard statements are a required component of archaeological reporting and are provided verbatim from the MHSTCI's 2011 Standards and Guidelines for Consultant Archaeologists (Government of Ontario 2011).

This report is submitted to the Minister of Heritage, Sport, Tourism and Culture Industries as a condition of licensing in accordance with Part VI of the *Ontario Heritage Act*, R.S.O. 1990, c. O.18 (Government of Ontario 1990a). The report is reviewed to ensure that it complies with the standards and guidelines that are issued by the Minister, and that the archaeological fieldwork and report recommendations ensure the conservation, protection and preservation of the cultural heritage of Ontario. When all matters relating to archaeological sites within the 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* (Government of Ontario 1990a) for any party other than a licensed archaeologist to make any alteration to a known archaeological site or to remove any artifact or other physical evidence of past human use or activity from the site, until such time as a licensed archaeologist has completed fieldwork on the site, submitted a report to the Minister stating that the site has no further cultural heritage value or interest, and the report has been filed in the *Ontario Public Register of Archaeological Reports* referred to in Section 65.1 of the *Ontario Heritage Act* (Government of Ontario 1990a).

Should previously undocumented archaeological resources be discovered, they may be a new archaeological site and therefore subject to Section 48(1) of the *Ontario Heritage Act* (Government of Ontario 1990a). The proponent or person discovering the archaeological resources must cease alteration of the site immediately and engage a licensed consultant archaeologist to carry out archaeological fieldwork, in compliance with Section 48(1) of the *Ontario Heritage Act* (Government of Ontario 1990a).

The *Funeral, Burial and Cremation Services Act*, 2002, S.O. 2002, c. 33 (Government of Ontario 2002) requires that any person discovering human remains must notify the police or coroner and the Registrar of Cemeteries at the Ministry of Government and Consumer Services.

Archaeological sites recommended for further archaeological fieldwork remain subject to Section 48(1) of the *Ontario Heritage Act* (Government of Ontario 1990a) and may not be altered, or have artifacts removed, except by a person holding an archaeological license.



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STAGE 1 ARCHAEOLOGICAL ASSESSMENT: CROWLAND STORAGE WELL EC1

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STAGE 1 ARCHAEOLOGICAL ASSESSMENT: CROWLAND STORAGE WELL EC1

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STAGE 1 ARCHAEOLOGICAL ASSESSMENT: CROWLAND STORAGE WELL EC1

Maps

April 6, 2022

8.0 MAPS

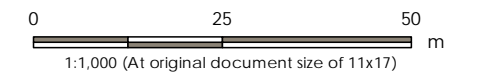
Maps of the study area follow on succeeding pages.





Legend

- Study Area
- Proposed Storage Well (EC 1)
- Proposed Permanent Pad
- Proposed Temporary Pad
- Proposed Permanent Access Road
- Existing Well
- Existing Gathering Line
- Minor Road
- Waterbody



- Notes
1. Coordinate System: NAD 1983 UTM Zone 17N
 2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2022.
 3. Orthophoto 2018.



Project Location: Regional Municipality of Niagara
 Prepared by AMW on 2022-03-14
 Technical Review by MK on 2022-02-18

Client/Project:
 ENBRIDGE GAS INC
 CROWLAND STORAGE WELL
 STAGE 1 ARCHAEOLOGICAL ASSESSMENT

Figure No.

2

Title

Location of Study Area

W:\Archive\160961469\03_data\03a_cad\03a_mxd\Archaeology\Report_Figures\Stage1\160961469_Sm1_E002_StudyArea.mxd - Revised: 2022-03-14 By: awwhite

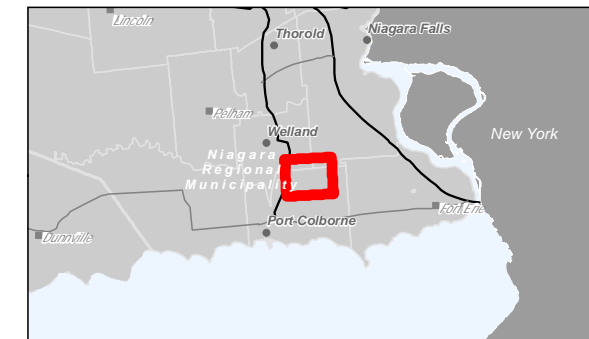
648800 648900 649000 649100 4757000 4757100



Legend
 Study Area

Figure Not to Scale

Notes
 1. Ridout, Thomas. 1811. Survey Plan of Humberstone Township. Map B17. Ontario Ministry of Northern Development, Mines, Natural Resources and Forestry.



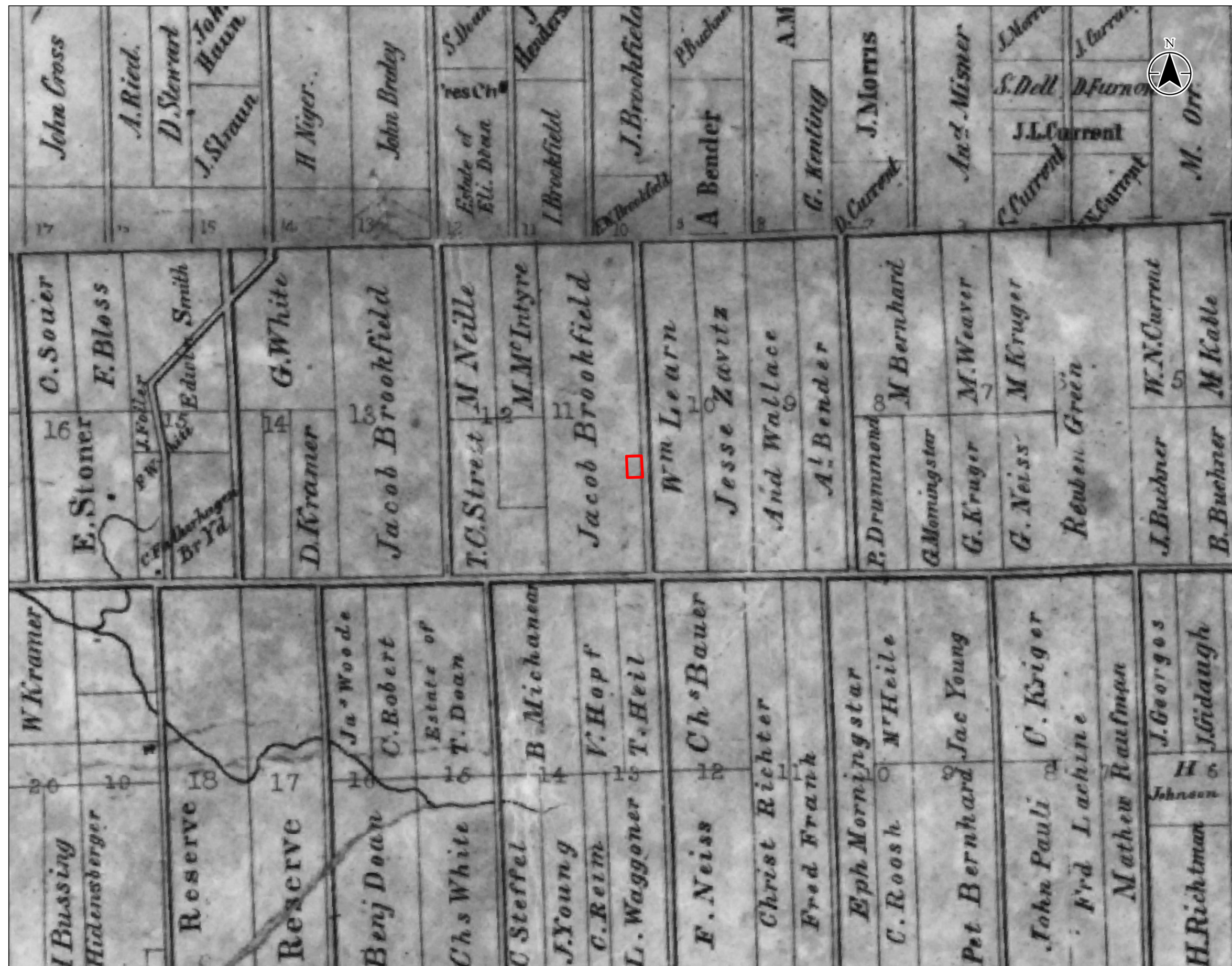
Project Location: Regional Municipality of Niagara
 Prepared by AMW on 2022-02-28
 Technical Review by RD on 2022-02-28

Client/Project: ENBRIDGE GAS INC. CROWLAND STORAGE WELL STAGE 1 ARCHAEOLOGICAL ASSESSMENT

Figure No.: 4

Title: Portion of the 1811 Survey Plan of Humberstone Township

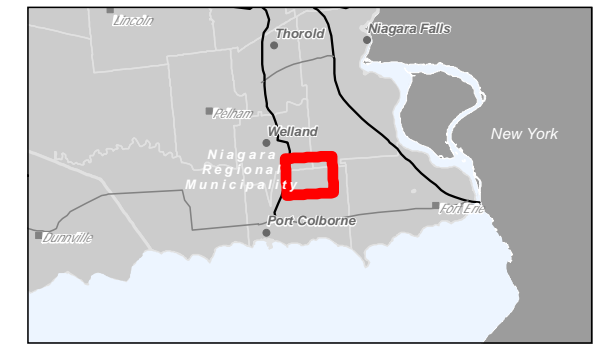
W:\dcl\enr\160961469\03_data\atl_cad\enr\mxd\Archaeo\Map\Map of Welland County.mxd Reviewed: 2022-02-28 by: cwhite



Legend
 Study Area

Figure Not to Scale

Notes
 1. Tremaine, George R. 1862. Tremaine's Map of the Counties of Lincoln and Welland, Canada West. Toronto: George R and G.M. Tremaine.



Project Location: 160961469 REVA
 Regional Municipality of Niagara Prepared by AMW on 2022-02-28
 Technical Review by RD on 2022-02-28

Client/Project: ENBRIDGE GAS INC. CROWLAND STORAGE WELL STAGE 1 ARCHAEOLOGICAL ASSESSMENT

Figure No. **5**
 Title: **Portion of the 1862 Tremaine's Map of Welland County**



Legend
 Study Area

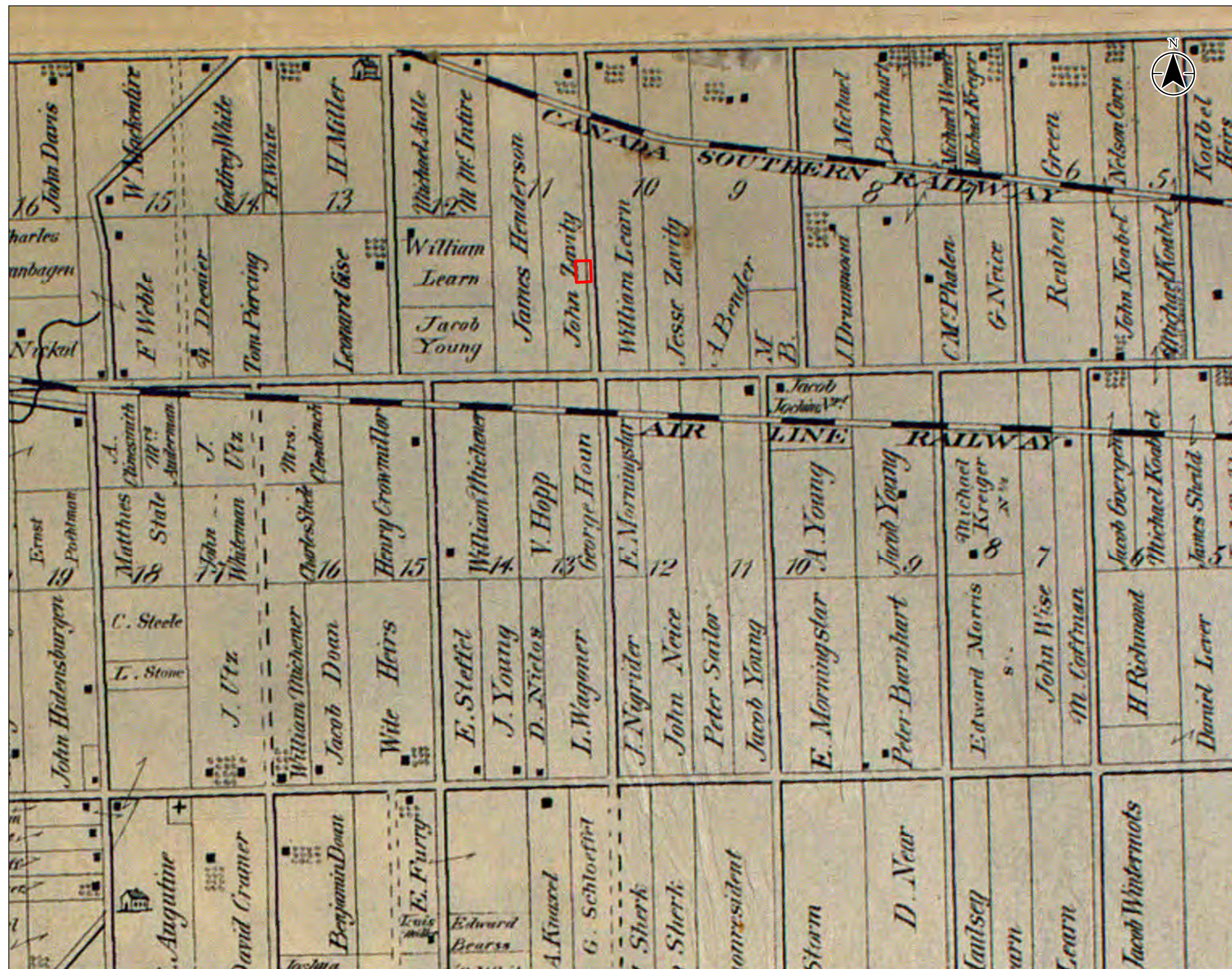
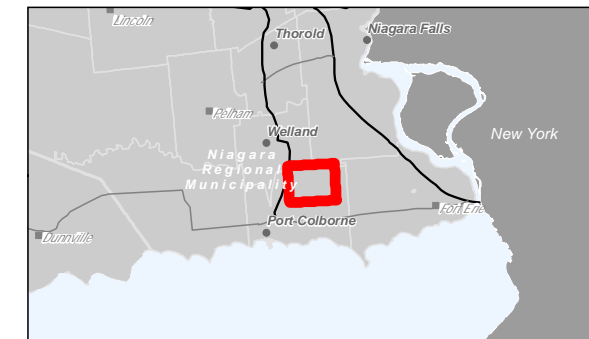


Figure Not to Scale

Notes
 1. Page. H.R. & Co. 1876. Illustrated Historical Atlas of the Counties of Lincoln and Welland, Ontario. Toronto: H.R. Page & Co.



Project Location: 160961469 REVA
 Regional Municipality of Niagara Prepared by AMW on 2022-02-28
 Technical Review by RD on 2022-02-28

Client/Project: ENBRIDGE GAS INC.
 CROWLAND STORAGE WELL
 STAGE 1 ARCHAEOLOGICAL ASSESSMENT

Figure No.: 6
 Title: Portion of the 1876 Map of Humberstone Township

STAGE 1 ARCHAEOLOGICAL ASSESSMENT: CROWLAND STORAGE WELL EC1

Closure
April 6, 2022


9.0 CLOSURE

This report documents work that was performed in accordance with generally accepted professional standards at the time and location in which the services were provided. No other representations, warranties or guarantees are made concerning the accuracy or completeness of the data or conclusions contained within this report, including no assurance that this work has uncovered all potential archaeological resources associated with the identified property.

All information received from the client or third parties in the preparation of this report has been assumed by Stantec to be correct. Stantec assumes no responsibility for any deficiency or inaccuracy in information received from others.

Conclusions made within this report consist of Stantec's professional opinion as of the time of the writing of this report and are based solely on the scope of work described in the report, the limited data available and the results of the work. The conclusions are based on the conditions encountered by Stantec at the time the work was performed. Due to the nature of archaeological assessment, which consists of systematic sampling, Stantec does not warrant against undiscovered environmental liabilities nor that the sampling results are indicative of the condition of the entire property.

This report has been prepared for the exclusive use of the client identified herein and any use by any third party is prohibited. Stantec assumes no responsibility for losses, damages, liabilities, or claims, howsoever arising, from third party use of this report. We trust this report meets your current requirements. Please do not hesitate to contact us should you require further information or have additional questions about any facet of this report.

Quality Review _____
 Dickson, Parker
2022.04.06
14:50:26 -04'00'
(signature)

Parker Dickson – Senior Associate, Senior Archaeologist

Independent Review _____
 Tracie Carmichael
2022.04.06
14:51:46 -04'00'
(signature)

Tracie Carmichael – Managing Principal, Environmental Services



2022 Crowland Test Well Drilling Project: Environmental Report
May 6, 2022

Appendix F

Heritage Checklist





Ministry of Tourism,
Culture and Sport

Programs & Services Branch
401 Bay Street, Suite 1700
Toronto ON M7A 0A7

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

Crowland DSA Enhancement Project

Project or Property Location (upper and lower or single tier municipality)

Town of Port Colborne, Regional Municipality of Niagara

Proponent Name

Enbridge Gas

Proponent Contact Information

Ryan Park

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 type="checkbox"/>	<input checked="" 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.:

- i. 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](#).

OPCC CONSULTATION LOG

1. An updated summary of OPCC comments and Enbridge Gas responses will be filed following the completion of the review period.

LAND MATTERS

1. Land use requirements for the Project consist of the construction of a gravel pad, temporary work space, and a permanent access lane.
2. For well EC 1, Enbridge Gas must construct the following features:
 - Temporary work space area for a gravel pad approximately 90 m x 90 m with a silt fence around the perimeter, which will be reduced to approximately 10 m x 6 m once the drilling of well EC 1 is complete.
 - A 6 m wide x 16 m long permanent gravel lane will be constructed off of an existing gravel lane in order to allow access to the new well site.
3. Exhibit F, Tab 1, Schedule 1, Attachment 1, Appendix A shows the features to be constructed for well EC 1.
4. Attachment 1 to this Exhibit lists those landowners in the Crowland DSA that are directly affected (construction activities occurring on their lands) by the Project work and landowners on the immediately adjacent properties. Enbridge Gas will provide notice of this application to all landowners listed in Attachment 1.

Authorizations and Permits Required

5. Enbridge Gas's preliminary work on the Project has identified the following potential required permits and/or authorizations:

Table 1: Potential Permits & Agreements Required

<u>Authority</u>	<u>Purpose</u>	<u>Status</u>
MHSTCI	Archaeological clearance under the <i>Ontario Heritage Act</i> (1990); and Review of Built Heritage and Cultural Heritage Resource Landscapes under the <i>Ontario Heritage Act</i> (1990)	Stage 1 AA clearance obtained on April 8, 2022. Stage 2 AA clearance anticipated by September 2022. Cultural Heritage Assessment Report acceptance letter is anticipated by September 2022.
Ministry of Environment, Conservation and Parks (“MECP”)	Permitting or registration under the <i>Endangered Species Act</i> (2007)	Need for permits are conditional upon results of SAR surveys and review by MECP, which are anticipated to be known by July 2022
Niagara Peninsula Conservation Authority	Development Permits under Ontario Regulation 155 /06 (Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses), as per <i>Conservation Authorities Act</i> (1990)	Any required permits are anticipated to be issued by September 2022.
City of Port Colborne	Noise By-Law	Assessment of any requirement to apply for an exemption to the noise by-law will be completed prior to Project construction.

6. Other authorizations, notifications, permits and/or approvals may be required in addition to those identified above.
7. Enbridge Gas will obtain all required permits if and as required for the route and location of the proposed facilities prior to the commencement of construction.

Negotiations to Date

8. Enbridge Gas owns the property upon which the well will be drilled. The lands are leased to a local farmer who was notified of the Project and will be notified again of the work once Enbridge Gas receives approval to drill the well. The tenant farmer has communicated no concerns to date.

EB-2022-

ONTARIO ENERGY BOARD

IN THE MATTER OF the *Ontario Energy Board Act*,
1998, S.O. 1998, c. 15 (Schedule B);

AND IN THE MATTER OF an application by
Enbridge Gas Inc. for permission for the 2022
Crowland Test Well Drilling Project, within the
Crowland Designated Storage Area.

AFFIDAVIT OF SEARCH OF TITLE

I, **Ann L. Gray**, of the City of Sarnia, Ontario, **MAKE OATH AND SAY AS
FOLLOWS:**

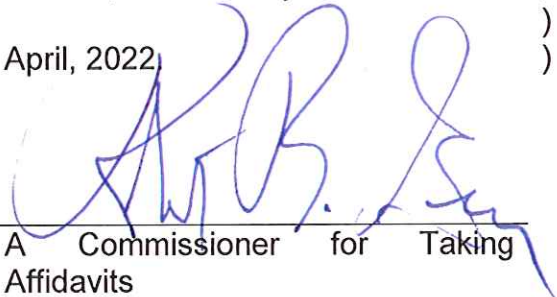
1. I am a Free-Lance Title Searcher retained by Enbridge Gas Inc. (the "**Applicant**"), and as such have knowledge of the matters hereinafter deposed to.
2. On or about April 14, 2022, I conducted a search of title and obtained abstracts of title and other documents from the Land Registry Office for the Land Titles and the Land Registry Division of Niagara South, in respect of the lands upon which the Applicant proposes to drill a test well in the Crowland Designated Storage Area, and the lands immediately adjacent thereto (the "**Subject Lands**"). The said searches were conducted for the purpose of determining the status of land tenure ownership and other registered interests of encumbrancers (collectively, "**Interested Parties**") of the Subject Lands.

3. As a result of the said searches conducted and information provided by the Applicant, I determined the Interested Parties of the Subject Lands are those set in the list at Exhibit "A" hereto. This list of Interested Parties was compiled on the basis of the information provided to me by the Applicant, including a map of the area where the proposed well will be drilled, and the searches of title undertaken therewith. Addresses for service for such Interested Parties were derived from the registered documents and from municipal directories, where applicable.

SWORN before me at Sarnia,)

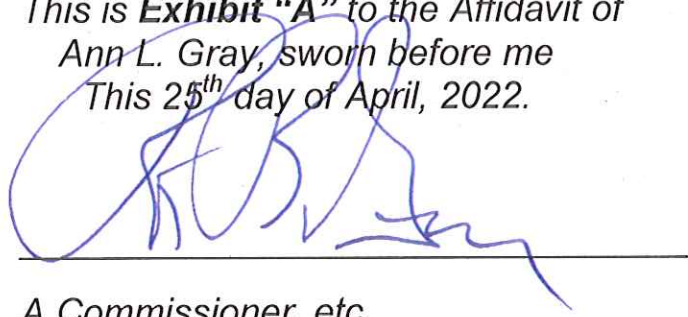
Ontario, this 25th day of)

April, 2022,)


A Commissioner for Taking)
Affidavits)


Ann L. Gray

This is **Exhibit "A"** to the Affidavit of
Ann L. Gray, sworn before me
This 25th day of April, 2022.

A handwritten signature in blue ink, consisting of several loops and a long horizontal stroke at the end, positioned above a solid black horizontal line.

A Commissioner, etc.

Directly Affected (D) Indirectly Affected (I)	PIN	First Name	Last Name	Company Name	Address Line 1	Address Line 2	City	Province	Postal Code	Property Description	Mortgage, Lien/Lease/Encumbrances	Address Line 1	Address Line 2	City	Province	Postal Code
D	64247-0183			Enbridge Gas Inc.	50 Keil Drive,		Chatham	ON	N7M 5M1	Part of Lot 11, Concession 5, Humberstone, Part 1, 59R3639 and as in RO755272; City of Port Colborne						
D	64247-0183									Part of Lot 11, Concession 5, Humberstone, Part 1, 59R3639 and as in RO755272; City of Port Colborne	Lease, Agreement, OEB Order--Enbridge Gas Inc.	50 Keil Drive,		Chatham	ON	N7M 5M1
D	64247-0183									Part of Lot 11, Concession 5, Humberstone, Part 1, 59R3639 and as in RO755272; City of Port Colborne	Mortgage--Canada Permanent Trust Company, Trustee					
D	64247-0183									Part of Lot 11, Concession 5, Humberstone, Part 1, 59R3639 and as in RO755272; City of Port Colborne	Mortgage--Montreal Trust Company of Canada					
I	64247-0036			Enbridge Gas Inc.	50 Keil Drive,		Chatham	ON	N7M 5M1	Part of Lot 12, Concession 5, Humberstone, Part 1, 59R7408 & Part 2, 59R3639; City of Port Colborne						
I	64247-0036									Part of Lot 12, Concession 5, Humberstone, Part 1, 59R7408 & Part 2, 59R3639; City of Port Colborne	Lease, Agreement, OEB Order--Enbridge Gas Inc.	50 Keil Drive,		Chatham	ON	N7M 5M1
I	64247-0036									Part of Lot 12, Concession 5, Humberstone, Part 1, 59R7408 & Part 2, 59R3639; City of Port Colborne	Mortgage--Canada Permanent Trust Company, Trustee					
I	64247-0036									Part of Lot 12, Concession 5, Humberstone, Part 1, 59R7408 & Part 2, 59R3639; City of Port Colborne	Mortgage--Montreal Trust Company of Canada					
I	64247-0037						Welland	ON	L3B 5N7	Part of Lot 12, Concession 5, Humberstone, Part 4, 59R9403; Port Colborne						
I	64247-0037						Welland	ON	L3B 2S2	Part of Lot 12, Concession 5, Humberstone, Part 4, 59R9403; Port Colborne						

Directly Affected (D) Indirectly Affected (I)	PIN	First Name	Last Name	Company Name	Address Line 1	Address Line 2	City	Province	Postal Code	Property Description	Mortgage, Lien/Lease/Encumbrances	Address Line 1	Address Line 2	City	Province	Postal Code
I	64247-0037									Part of Lot 12, Concession 5, Humberstone, Part 4, 59R9403; Port Colborne	Lease, Agreement, OEB Order--Enbridge Gas Inc.	50 Keil Drive,		Chatham	ON	N7M 5M1
I	64247-0037									Part of Lot 12, Concession 5, Humberstone, Part 4, 59R9403; Port Colborne	Mortgage--Canada Permanent Trust Company, Trustee					
I	64247-0037									Part of Lot 12, Concession 5, Humberstone, Part 4, 59R9403; Port Colborne	Mortgage--Montreal Trust Company of Canada					
I	64247-0037									Part of Lot 12, Concession 5, Humberstone, Part 4, 59R9403; Port Colborne	Mortgage--Meridian Credit Union Limited	75 Corporate Park Drive,		St. Catharines	ON	L2S 3W3
I	64247-0040						Welland	ON	L3B 5N7	Part of Lot 12, Concession 5, Humberstone, as in RO681133; Port Colborne						
I	64247-0040						Welland	ON	L3B 5N7	Part of Lot 12, Concession 5, Humberstone, as in RO681133; Port Colborne						
I	64247-0040									Part of Lot 12, Concession 5, Humberstone, as in RO681133; Port Colborne	Lease, Agreement, OEB Order--Enbridge Gas Inc.	50 Keil Drive,		Chatham	ON	N7M 5M1
I	64247-0040									Part of Lot 12, Concession 5, Humberstone, as in RO681133; Port Colborne	Mortgage--Canada Permanent Trust Company, Trustee					
I	64247-0040									Part of Lot 12, Concession 5, Humberstone, as in RO681133; Port Colborne	Mortgage--Montreal Trust Company of Canada					
I	64247-0041						Port Colborne	ON	L3B 5N7	Part of Lot 12, Concession 5, Humberstone, as in RO640739; Port Colborne						
I	64247-0041									Part of Lot 12, Concession 5, Humberstone, as in RO640739; Port Colborne	Lease, Agreement, OEB Order--Enbridge Gas Inc.	50 Keil Drive,		Chatham	ON	N7M 5M1

Directly Affected (D) Indirectly Affected (I)	PIN	First Name	Last Name	Company Name	Address Line 1	Address Line 2	City	Province	Postal Code	Property Description	Mortgage, Lien/Lease/Encumbrances	Address Line 1	Address Line 2	City	Province	Postal Code
I	64247-0041									Part of Lot 12, Concession 5, Humberstone, as in RO640739; Port Colborne	Mortgage--Canada Permanent Trust Company, Trustee					
I	64247-0041									Part of Lot 12, Concession 5, Humberstone, as in RO640739; Port Colborne	Mortgage--Montreal Trust Company of Canada					
I	64247-0041									Part of Lot 12, Concession 5, Humberstone, as in RO640739; Port Colborne	National Bank of Canada	500 Place D'armes,	22nd Floor	Montreal	QC	H2Y 2W3
I	64247-0042						Port Colborne	ON	L3K 5V5	Part of Lot 12, Concession 5, Humberstone, as in BB67209 (SECONDLY); Port Colborne						
I	64247-0042						Port Colborne	ON	L3K 5V5	Part of Lot 12, Concession 5, Humberstone, as in BB67209 (SECONDLY); Port Colborne						
I	64247-0042									Part of Lot 12, Concession 5, Humberstone, as in BB67209 (SECONDLY); Port Colborne	Lease, Agreement, OEB Order--Enbridge Gas Inc.	50 Keil Drive,		Chatham	ON	N7M 5M1
I	64247-0042									Part of Lot 12, Concession 5, Humberstone, as in BB67209 (SECONDLY); Port Colborne	Mortgage--Canada Permanent Trust Company, Trustee					
I	64247-0042									Part of Lot 12, Concession 5, Humberstone, as in BB67209 (SECONDLY); Port Colborne	Mortgage--Montreal Trust Company of Canada					
I	64247-0042									Part of Lot 12, Concession 5, Humberstone, as in BB67209 (SECONDLY); Port Colborne	Mortgage--Computershare Trust Company of Canada	c/o ResMor Trust Company,	400, 555-4th Avenue S.W.,	Calgary	AB	T2P 3E7
I	64247-0042									Part of Lot 12, Concession 5, Humberstone, as in BB67209 (SECONDLY); Port Colborne	Lien--Her Majesty the Queen in Right of Canada as represented by the Minister of National Revenue	Canada Revenue Agency	5800 Hurontario Street,	Mississauga	ON	L5R 4B4

Directly Affected (D) Indirectly Affected (I)	PIN	First Name	Last Name	Company Name	Address Line 1	Address Line 2	City	Province	Postal Code	Property Description	Mortgage, Lien/Lease/Encumbrances	Address Line 1	Address Line 2	City	Province	Postal Code
I	64247-0045						Port Colborne	On	L3K 5V5	Part of Lot 11, Concession 5, Humberstone, as in RO760425; Port Colborne						
I	64247-0045						Port Colborne	On	L3K 5V5	Part of Lot 11, Concession 5, Humberstone, as in RO760425; Port Colborne						
I	64247-0045									Part of Lot 11, Concession 5, Humberstone, as in RO760425; Port Colborne	Lease, Agreement, OEB Order--Enbridge Gas Inc.	50 Keil Drive,		Chatham	ON	N7M 5M1
I	64247-0045									Part of Lot 11, Concession 5, Humberstone, as in RO760425; Port Colborne	Mortgage--Canada Permanent Trust Company, Trustee					
I	64247-0045									Part of Lot 11, Concession 5, Humberstone, as in RO760425; Port Colborne	Mortgage--Montreal Trust Company of Canada					
I	64247-0045									Part of Lot 11, Concession 5, Humberstone, as in RO760425; Port Colborne	Mortgage--Meridian Credit Union Limited	75 Corporate Park Drive,		St. Catharines	ON	L2S 3W3
I	64247-0046			The Corporation of the City of Port Colborne	66 Charlotte Street		Port Colborne	ON	L3K 3C8	Part of the Road Allowance between Lots 10 & 11, Concession 5, Humberstone being Stauth Road lying south of Part 7, 59R1438 except RO140169; Port Colborne						
I	64247-0046									Part of the Road Allowance between Lots 10 & 11, Concession 5, Humberstone being Stauth Road lying south of Part 7, 59R1438 except RO140169; Port Colborne	OEB Order--Enbridge Gas Inc.	50 Keil Drive,		Chatham	ON	N7M 5M1
I	64247-0051					R.R.#3,	Port Colborne	ON	L3K 5V5	Part of Lot 10, Concession 5, Humberstone, as in RO624150; Port Colborne						

Directly Affected (D) Indirectly Affected (I)	PIN	First Name	Last Name	Company Name	Address Line 1	Address Line 2	City	Province	Postal Code	Property Description	Mortgage, Lien/Lease/Encumbrances	Address Line 1	Address Line 2	City	Province	Postal Code
I	64247-0051	[REDACTED]	[REDACTED]		[REDACTED]		Port Colborne	ON	L3K 5V5	Part of Lot 10, Concession 5, Humberstone, as in RO624150; Port Colborne						
I	64247-0051									Part of Lot 10, Concession 5, Humberstone, as in RO624150; Port Colborne	OEB Order--Enbridge Gas Inc.	50 Keil Drive,		Chatham	ON	N7M 5M1
I	64247-0051									Part of Lot 10, Concession 5, Humberstone, as in RO624150; Port Colborne	Mortgage--Canada Permanent Trust Company, Trustee					
I	64247-0051									Part of Lot 10, Concession 5, Humberstone, as in RO624150; Port Colborne	Mortgage--Montreal Trust Company of Canada					
I	64247-0051									Part of Lot 10, Concession 5, Humberstone, as in RO624150; Port Colborne	Mortgage--First Ontario Credit Union Limited	688 Queensdale Avenue East,		Hamilton	ON	L8V 1M1
I	64247-0051									Part of Lot 10, Concession 5, Humberstone, as in RO624150; Port Colborne	Mortgage--First Ontario Credit Union Limited	301, 970 South Service Road,		Stoney Creek	ON	L8E 6A2
I	64247-0135			The Corporation of the City of Port Colborne	66 Charlotte Street		Port Colborne	ON	L3K 3C8	Part of the Road Allowance between Concessions 4 & 5, Humberstone, being Forks Road lying between Chippawa Road & Holloway Bay Road; Port Colborne A.O.L.						
I	64247-0135									Part of the Road Allowance between Concessions 4 & 5, Humberstone, being Forks Road lying between Chippawa Road & Holloway Bay Road; Port Colborne A.O.L.	OEB Order--Enbridge Gas Inc.	50 Keil Drive,		Chatham	ON	N7M 5M1
I	64247-0156	[REDACTED]	[REDACTED]		[REDACTED]	[REDACTED]	Ridgeway	ON	L0S 1N0	Part of Lot 10, Concession 5, Humberstone, Part 2, 59R3545; S/T HU12518; Port Colborne						

Directly Affected (D) Indirectly Affected (I)	PIN	First Name	Last Name	Company Name	Address Line 1	Address Line 2	City	Province	Postal Code	Property Description	Mortgage, Lien/Lease/Encumbrances	Address Line 1	Address Line 2	City	Province	Postal Code
I	64247-0156						Ridgeway	ON	L0S 1N0	Part of Lot 10, Concession 5, Humberstone, Part 2, 59R3545; S/T HU12518; Port Colborne						
I	64247-0156									Part of Lot 10, Concession 5, Humberstone, Part 2, 59R3545; S/T HU12518; Port Colborne	Easement--The Hydro-Electric Power Commission of Ontario (Ontario Hydro)	185 Clegg Road,	P.O. Box 4300, Internal R32,	Markham	ON	L6G 1B7
I	64247-0156									Part of Lot 10, Concession 5, Humberstone, Part 2, 59R3545; S/T HU12518; Port Colborne	Lease, Agreement, OEB Order--Enbridge Gas Inc.	50 Keil Drive,		Chatham	ON	N7M 5M1
I	64247-0156									Part of Lot 10, Concession 5, Humberstone, Part 2, 59R3545; S/T HU12518; Port Colborne	Mortgage--Canada Permanent Trust Company, Trustee					
I	64247-0156									Part of Lot 10, Concession 5, Humberstone, Part 2, 59R3545; S/T HU12518; Port Colborne	Mortgage--Montreal Trust Company of Canada					
I	64247-0156									Part of Lot 10, Concession 5, Humberstone, Part 2, 59R3545; S/T HU12518; Port Colborne	Mortgage--1077206 Ontario Inc.	1706-1460 Ghent Avenue,		Burlington	ON	L7S 1X7
I	64247-0160						Ridgeway	ON	L0S 1N0	Part of Lot 9, Concession 5, Humberstone; Part of Lot 10, Concession 5, Humberstone, Part 1, 59R3545, Except Parts 1 & 2, 59R11689; Port Colborne						
I	64247-0160						Ridgeway	ON	L0S 1N0	Part of Lot 9, Concession 5, Humberstone; Part of Lot 10, Concession 5, Humberstone, Part 1, 59R3545, Except Parts 1 & 2, 59R11689; Port Colborne						

Directly Affected (D) Indirectly Affected (I)	PIN	First Name	Last Name	Company Name	Address Line 1	Address Line 2	City	Province	Postal Code	Property Description	Mortgage, Lien/Lease/Encumbrances	Address Line 1	Address Line 2	City	Province	Postal Code
I	64247-0160									Part of Lot 9, Concession 5, Humberstone; Part of Lot 10, Concession 5, Humberstone, Part 1, 59R3545, Except Parts 1 & 2, 59R11689; Port Colborne	Lease, Agreement, OEB Order--Enbridge Gas Inc.	50 Keil Drive,		Chatham	ON	N7M 5M1
I	64247-0160									Part of Lot 9, Concession 5, Humberstone; Part of Lot 10, Concession 5, Humberstone, Part 1, 59R3545, Except Parts 1 & 2, 59R11689; Port Colborne	Mortgage--Canada Permanent Trust Company, Trustee					
I	64247-0160									Part of Lot 9, Concession 5, Humberstone; Part of Lot 10, Concession 5, Humberstone, Part 1, 59R3545, Except Parts 1 & 2, 59R11689; Port Colborne	Mortgage--Montreal Trust Company of Canada					
I	64247-0160									Part of Lot 9, Concession 5, Humberstone; Part of Lot 10, Concession 5, Humberstone, Part 1, 59R3545, Except Parts 1 & 2, 59R11689; Port Colborne	Mortgage--1077206 Ontario Inc.	1706-1460 Ghent Avenue,		Burlington	ON	L7S 1X7
I	64247-0161						Hong Kong	China		Part of Lot 11, Concession 5, Humberstone, Part 6, 59R1438; Port Colborne						
I	64247-0161						Hong Kong	China		Part of Lot 11, Concession 5, Humberstone, Part 6, 59R1438; Port Colborne						
I	64247-0161									Part of Lot 11, Concession 5, Humberstone, Part 6, 59R1438; Port Colborne	Lease, Agreement, OEB Order--Enbridge Gas Inc.	50 Keil Drive,		Chatham	ON	N7M 5M1
I	64247-0161									Part of Lot 11, Concession 5, Humberstone, Part 6, 59R1438; Port Colborne	Mortgage--Canada Permanent Trust Company, Trustee					

Directly Affected (D) Indirectly Affected (I)	PIN	First Name	Last Name	Company Name	Address Line 1	Address Line 2	City	Province	Postal Code	Property Description	Mortgage, Lien/Lease/Encumbrances	Address Line 1	Address Line 2	City	Province	Postal Code
I	64247-0161									Part of Lot 11, Concession 5, Humberstone, Part 6, 59R1438; Port Colborne	Mortgage--Montreal Trust Company of Canada					
I	64247-0175			The St. Lawrence Seaway Authority	202 Pitt Street,		Cornwall	ON	K6J 3P7	Humberstone as in RO116794 lying b/n Pts 1 & 3, 59R3695 exc RO515687; Pt of Lt 10, Con 5, Humberstone, Pt 5, 59R1076 & as in RO130134 & RO104707, exc RO515687 & Pts 22 & 23, 59R1880, exc Pt 2, 59R3545; Pt Lt 11, Con 5, Humberstone, as in RO108343 (2ndly) exc Pt 1, 59R3639 & as in RO124664, exc RO515687; Pt Lt 12, Con 5, Humberstone, as in RO142632, RO127797 & RO127797 & RO140210 exc Pt 2, 59R3639 & as in RO112676 exc RO515687, Pts 4, 5, 6, 59R1183 & Part 2, 59R3639; Pt Rd Allnce						

Directly Affected (D) Indirectly Affected (I)	PIN	First Name	Last Name	Company Name	Address Line 1	Address Line 2	City	Province	Postal Code	Property Description	Mortgage, Lien/Lease/Encumbrances	Address Line 1	Address Line 2	City	Province	Postal Code
I	64247-0175									Humberstone as in RO116794 lying b/n Pts 1 & 3, 59R3695 exc RO515687; Pt of Lt 10, Con 5, Humberstone, Pt 5, 59R1076 & as in RO130134 & RO104707, exc RO515687 & Pts 22 & 23, 59R1880, exc Pt 2, 59R3545; Pt Lt 11, Con 5, Humberstone, as in RO108343 (2ndly) exc Pt 1, 59R3639 & as in RO124664, exc RO515687; Pt Lt 12, Con 5, Humberstone, as in RO142632, RO127797 & RO127797 & RO140210 exc Pt 2, 59R3639 & as in RO112676 exc RO515687, Pts 4, 5, 6, 59R1183 & Part 2, 59R3639; Pt Rd Allnce	Easement--The Hydro-Electric Power Commission of Ontario (Ontario Hydro)	185 Clegg Road,	P.O. Box 4300, Internal R32,	Markham	ON	L6G 1B7
I	64247-0175									Humberstone as in RO116794 lying b/n Pts 1 & 3, 59R3695 exc RO515687; Pt of Lt 10, Con 5, Humberstone, Pt 5, 59R1076 & as in RO130134 & RO104707, exc RO515687 & Pts 22 & 23, 59R1880, exc Pt 2, 59R3545; Pt Lt 11, Con 5, Humberstone, as in RO108343 (2ndly) exc Pt 1, 59R3639 & as in RO124664, exc RO515687; Pt Lt 12, Con 5, Humberstone, as in RO142632, RO127797 & RO127797 & RO140210 exc Pt 2, 59R3639 & as in RO112676 exc RO515687, Pts 4, 5, 6, 59R1183 & Part 2, 59R3639; Pt Rd Allnce	Lease, Agreement, OEB Order--Enbridge Gas Inc.	50 Keil Drive,		Chatham	ON	N7M 5M1

Directly Affected (D) Indirectly Affected (I)	PIN	First Name	Last Name	Company Name	Address Line 1	Address Line 2	City	Province	Postal Code	Property Description	Mortgage, Lien/Lease/Encumbrances	Address Line 1	Address Line 2	City	Province	Postal Code		
I	64247-0175									Humberstone as in RO116794 lying b/n Pts 1 & 3, 59R3695 exc RO515687; Pt of Lt 10, Con 5, Humberstone, Pt 5, 59R1076 & as in RO130134 & RO104707, exc RO515687 & Pts 22 & 23, 59R1880, exc Pt 2, 59R3545; Pt Lt 11, Con 5, Humberstone, as in RO108343 (2ndly) exc Pt 1, 59R3639 & as in RO124664, exc RO515687; Pt Lt 12, Con 5, Humberstone, as in RO142632, RO127797 & RO127797 & RO140210 exc Pt 2, 59R3639 & as in RO112676 exc RO515687, Pts 4, 5, 6, 59R1183 & Part 2, 59R3639; Pt Rd Allnce	Mortgage--Canada Permanent Trust Company, Trustee							
I	64247-0175									Humberstone as in RO116794 lying b/n Pts 1 & 3, 59R3695 exc RO515687; Pt of Lt 10, Con 5, Humberstone, Pt 5, 59R1076 & as in RO130134 & RO104707, exc RO515687 & Pts 22 & 23, 59R1880, exc Pt 2, 59R3545; Pt Lt 11, Con 5, Humberstone, as in RO108343 (2ndly) exc Pt 1, 59R3639 & as in RO124664, exc RO515687; Pt Lt 12, Con 5, Humberstone, as in RO142632, RO127797 & RO127797 & RO140210 exc Pt 2, 59R3639 & as in RO112676 exc RO515687, Pts 4, 5, 6, 59R1183 & Part 2, 59R3639; Pt Rd Allnce	Mortgage--Montreal Trust Company of Canada							

INDIGENOUS¹ CONSULTATION

1. Enbridge Gas is committed to creating processes that support meaningful engagement with potentially affected Indigenous groups (First Nations and Métis). Enbridge Gas works to build an understanding of project related interests, ensure regulatory requirements are met, mitigate or avoid project-related impacts on Indigenous interests including rights, and provide mutually beneficial opportunities where possible.
2. Pursuant to the OEB's Guidelines, Enbridge Gas provided the Ministry of Energy ("MOE") with a description of the Project to determine whether, in the MOE's opinion, the Project triggered the duty to consult. This correspondence, dated January 21, 2022, is included as Attachment 1 to this Exhibit.
3. On March 31, 2022, the MOE responded to Enbridge Gas's letter and confirmed that based on the information Enbridge Gas provided to date regarding the Project, the Project does not trigger the duty to consult. The MOE asked that Enbridge Gas notify them if new Project information becomes available that indicates a potential to impact Aboriginal and treaty rights. This correspondence is included as Attachment 2 to this Exhibit.

General Overview of Enbridge Gas's Indigenous Engagement Program Activities

4. The design of Enbridge Gas's Indigenous engagement program is based on adherence to the OEB's Guidelines and Enbridge Inc.'s company-wide *Indigenous Peoples Policy* ("Policy") (set out in Attachment 3 to this Exhibit). The Policy lays out

¹ Enbridge Gas has used the terms "Aboriginal" and "Indigenous" interchangeably in its application. "Indigenous" has the meaning assigned by the definition "aboriginal peoples of Canada" in subsection 35(2) of the *Constitution Act*, 1982.

key principles for establishing relationships with Indigenous groups, including recognizing the legal and constitutional rights possessed by Indigenous Peoples in Canada and the importance of the relationship between Indigenous Peoples and their traditional lands and resources.

5. Enbridge Gas strives to achieve meaningful relationships with Indigenous groups by providing timely exchanges of information, understanding and addressing Indigenous project-specific concerns, and ensuring it maintains ongoing dialogue with Indigenous groups regarding Enbridge Gas's projects, their potential impacts and benefits. Enbridge Gas aligns its interests with those of Indigenous communities through meaningful, direct Indigenous economic activity in projects corresponding to community capacity and project needs, where possible.
6. The Indigenous engagement program for the Project recognizes the rights of Indigenous groups and assists Enbridge Gas in engaging in meaningful dialogue with potentially affected Indigenous groups to address any Project-related concerns and interests.
7. Regardless of whether the duty to consult is triggered, the Company routinely engages with Indigenous groups potentially affected by Enbridge Gas's projects and operations. As a result of the MOE's determination that no duty to consult exists for the Project, Enbridge Gas has not completed an Indigenous Consultation Report for the Project; this is only required by the Guidelines in cases where a duty to consult is triggered. Should an Indigenous community identify itself as being potentially affected by the Project, Enbridge Gas will engage with that Indigenous community and notify the MOE.

8. Enbridge Gas has identified the Mississaugas of the Credit First Nation (“MCFN”) as an Indigenous community with potential interest in the Project and has communicated details about the Project and related environmental and archaeological reviews discussed in Exhibit F, Tab 1, Schedule 1. MCFN expressed an interest in participating in the Stage 2 archaeological work and Enbridge Gas has executed a related monitoring agreement with MCFN. Throughout the Company’s engagement activities to date, there have been no concerns identified by MCFN, or any other potentially affected Indigenous community, with respect to the Project.



Dave Janisse
Technical Manager,
Leave to Construct Applications
Regulatory Affairs

Tel: (519) 436-5442
Email: dave.janisse@enbridge.com

Enbridge Gas Inc.
P.O. Box 2001
50 Keil Drive N.
Chatham, Ontario, N7M 5M1
Canada

January 21, 2022

VIA EMAIL – amy.gibson@ontario.ca

Ministry of Energy
Amy Gibson
Manager, Indigenous Energy Policy
Unit 77 Grenville St.
6th Floor
Toronto, ON
M7A 1B3

Dear Ms. Gibson:

Re: 2022 Crowland Test Well Drilling Project (CONFIDENTIAL)

The *Environmental Guidelines for the Location, Construction and Operation of Hydrocarbon Pipelines and Facilities in Ontario, 7th Edition, 2016* (the “Guidelines”) issued by the Ontario Energy Board (“OEB”) indicate that a project applicant shall provide the Ministry of Energy (“MOE”) with a description of projects in the planning process, such that the MOE can determine if there are any Duty to Consult requirements.

The purpose of this letter is to inform the MOE that Enbridge Gas Inc. (“Enbridge Gas” or the “Company”) is planning to drill a well in an existing Designated Storage Area (“DSA”) within the Geographic Township of Humberstone, City of Port Colborne, Region of Niagara, Ontario. Enbridge Gas’s 2022 Crowland Test Well Drilling Project (the “Project”) will involve drilling a stratigraphic test well in the Crowland Storage Pool for the purpose of obtaining core and installation of instrumentation, to characterize the rock properties of the storage zone and the geological formations above and below the storage zone. The proposed well will not be connected to the main gathering system and no pipeline will be installed.

Enbridge Gas will be filing with the OEB a request for a favourable report to the Ministry of Northern Development, Mines, Natural Resources, and Forestry (“MNDMNR”) in support of the Project, pursuant to section 40(1) of the *Ontario Energy Board Act*. Enbridge Gas is therefore contacting the MOE to determine whether the Project triggers any Duty to Consult and, if so, to acquire a list of Indigenous communities that have or may have constitutionally protected Aboriginal or Treaty rights that could be adversely impacted by the proposed Project.

Attachment 1 contains a confidential description of the Project’s characteristics and its location for the MOE’s review and to assist it with its determination as to whether it will delegate the procedural aspects of the Duty to Consult to Enbridge Gas. While work on the Project is still in its early stages, Enbridge Gas would be pleased to discuss the Project with you should you have any questions.

Regards,

Dave Janisse Digitally signed by Dave Janisse
Date: 2022.01.21 11:39:31
-05'00'

Dave Janisse
Technical Manager, Leave to Construct Applications

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Attachment 1: Project Description

1.0 Project Summary

Enbridge Gas Inc. (“Enbridge Gas”) is proposing to drill one stratigraphic test well.

The stratigraphic test well will be drilled in the Crowland Designated Storage Area (“DSA”) – Enbridge Crowland 1 (“EC 1”). The well will be cored and upon completion of drilling activities, instrumentation will be installed in the well. The testing of the core and the information provided by the instrumentation will help Enbridge to determine rock properties of the storage formation and the confining geological formations.

The Crowland Storage Pool is part of Enbridge Gas’s storage operations. It is a DSA as defined in the Ontario Energy Board Act, 1998. It is proposed that the drilling of well EC 1 is expected to occur from September 2022 to October 2022.

Enbridge Gas plans to file an application with the Ontario Energy Board (“OEB”) which will request a favourable report from the Board to the Ministry of Northern Development, Mines, Natural Resources and Forestry (“MNDMNR”) for the drilling of the well.

Enbridge Gas will ensure that it has fulfilled all of the relevant requirements of CSA Z341, as they relate to the new stratigraphic test well, to the satisfaction of the MNDMNR.

Drilling of well EC 1, will occur on previously disturbed lands owned by Enbridge Gas. These lands are leased to a tenant farmer. Temporary gravel pads will be installed for the drilling of both wells and each pad is expected to occupy 8100 square metres or 0.0081 square kilometers. The final well site is expected to measure approximately 60 square metres or 0.00006 square kilometers. No pipeline is required for the stratigraphic test well.

Figure 1 below shows the location of the Crowland DSA and the proposed location of well EC 1.

Permanent easement and temporary working space may be required. Enbridge Gas will work with regulators and landowners to identify and secure appropriate working space and easements as required. Enbridge Gas either owns the lands within or has Gas Storage Lease Agreements and Petroleum & Natural Gas Lease Agreements in place for the Crowland DSA. A temporary gravel pad will be installed for the drilling of the well. Upon completion of drilling activities, the pad will be reduced, and a permanent well site will be established.

Work to prepare an Environmental Report (“ER”) for the Project has been initiated. The ER will examine the project scope from an environmental and socio-economic perspective. Engineering design is expected to be finalized during the permitting stage of the Project.

2.0 Environmental Report, Authorizations and Approvals Required

An ER for the Project will be prepared in accordance with the Ontario Energy Board’s (“OEB”) *Environmental Guidelines for the Location, Construction and Operation of Hydrocarbon Pipelines in Ontario, 7th Edition, 2016* (the “Guidelines”), with support provided by consultant

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archaeologists, cultural heritage specialists, and environmental professionals.¹ The ER will identify the potential authorizations required. The ER for this Project is anticipated to be completed in Q2 2022. Enbridge Gas's preliminary work on the Project has identified the following potential required authorizations:

Provincial:

- Ontario Energy Board;
- Niagara Peninsula Conservation Authority;
- Ministry of Heritage, Sport, Tourism and Culture Industries ("MHSTCI"); and
- Ministry of Northern Development, Mines, Natural Resources and Forestry
- Ministry of the Environment, Conservation and Parks.

Municipal:

- City of Port Colborne
- Region of Niagara

Other:

- Indigenous engagement; and
- Landowner agreements.

Other authorizations, notifications, permits and/or approvals may be required in addition to those identified above.

3.0 Project Activities

The drilling of the wells will be planned in accordance with the requirements of the latest addition of CSA Z341 – Storage of Hydrocarbons in Underground Formations. Pursuant to the requirements of CSA Z341 the following studies and reviews will be completed to support the Project:

- An assessment of neighbouring activities to determine the impact of the Project on a) wells within 1 km, b) operations within 5 km, and c) the integrity of all wells penetrating the storage zone; and
- A "what if" analysis of hazards and operability (HAZOP) for each of the storage pools.

Upon receiving a drilling license from the MNDMNRF Enbridge Gas will commence operations to drill well EC 1.

A copy of the application filed with the Board will be provided to all affected and adjacent landowners in the Crowland DSA.

¹ The ER will: (i) describe proposed Project works; (ii) describe construction procedures; (iii) identify potential environmental impacts and recommend mitigation measures; and (iv) describe consultation opportunities. An archaeological assessment will be conducted by a licensed archaeologist in accordance with MHSTCI guidelines to identify archaeological resources in the Project area and to develop appropriate mitigation plans, as required. A heritage specialist will review the Project area for potential cultural heritage landscapes and built heritage resources and will develop appropriate mitigation plans, as required. A qualified biologist will review the Project Area for potential species at risk that will be impacted by construction activities and will develop appropriate mitigation plans, as required.

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4.0 Potential Environmental Effects and Mitigation Measures

The area in which the Project is to be constructed is within agricultural lands within the geographic Township of Humberstone. It is expected that the majority of adverse environmental and/or socio-economic effects will be construction related. These effects are expected to be temporary and transitory, and likely avoided by locating the well within previously disturbed lands

Mitigation measures recommended in the ER will be followed in conjunction with Enbridge Gas's Construction and Maintenance standards. In addition, Enbridge Gas will use professional judgement, past experience, industry best practices and any additional feedback received through the consultation process when constructing the Project.

5.0 Project Benefits

The installation of the stratigraphic test well will allow Enbridge Gas to gain a better understanding of the geological and engineering properties of the storage zone and the underlying and overlying geological formations.

6.0 Contact Information

Regulatory Applications:

Dave Janisse

dave.janisse@enbridge.com

Office: (519) 436-5442

Cell: (226) 229-0980

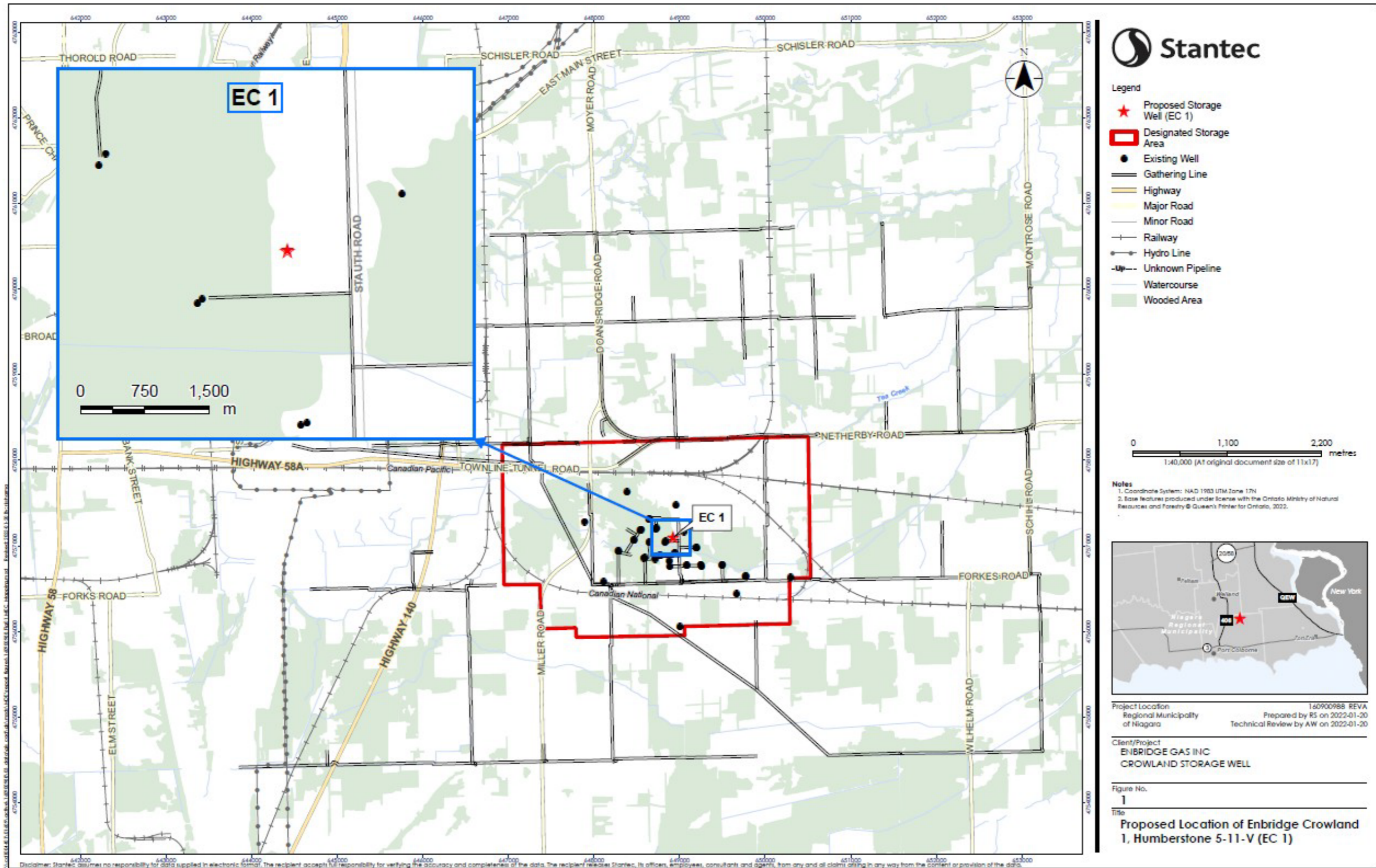
Community & Indigenous Engagement:

Kevin Berube

kevin.berube@enbridge.com

Office: (416) 495-6184

Figure 1: Project Area



Ministry of Energy

Energy Networks and Indigenous Policy
Branch

Indigenous Energy Policy

77 Grenville Street, 6th Floor
Toronto, ON M7A 67C
Tel: (416) 315-8641

Ministère de l'Énergie

Direction Générale des Réseaux
Énergétiques et des Politiques
Autochtones

Politique Énergétique Autochtones

77 Rue Grenville, 6^e Étage
Toronto, ON M7A 67C
Tel: (416) 315-8641



March 31, 2022

VIA EMAIL

Mr. Dave Janisse, Technical Manager
Leave to Construct Applications Regulatory Affairs
Enbridge Gas Incorporated
P.O. Box 2001, 50 Keil Drive N.
Chatham, ON N7M 5M1

Re: 2022 Crowland Test Well

Dear Mr. Janisse

Thank you for your email dated January 21, 2022, notifying the Ministry of Energy of Enbridge Gas Incorporated's proposal to drill the 2022 Crowland Test Well and requesting clarification on Duty to Consult requirements.

We understand that Enbridge Gas Incorporated is planning to to drill a well in an existing Designated Storage Area ("DSA") within the Geographic Township of Humberstone, City of Port Colborne, Region of Niagara, Ontario. Enbridge Gas's 2022 Crowland Test Well Drilling Project (the "Project") will involve drilling a stratigraphic test well in the Crowland Storage Pool for the purpose of obtaining core and installation of instrumentation, to characterize the rock properties of the storage zone and the geological formations above and below the storage zone. The proposed well will not be connected to the main gathering system and no pipeline will be installed.

Based on the information Enbridge has provided to date, the Ministry is of the view that the project will not result in any appreciable adverse impact on the asserted or established rights of First Nation or Métis communities. Should new project information become available that indicates a potential to impact Aboriginal and treaty rights (e.g., the result of the archeological assessment), I request that you notify the Ministry as appropriate.

Given that the Ministry has determined, based on currently available information, that no duty to consult has been triggered it will not be necessary for the Ministry to provide a letter of opinion regarding the sufficiency of consultation.

Also, the Ministry recommends that Enbridge Gas Incorporated continue to maintain a record of its interactions with Indigenous communities about the project it has engaged on an interests-basis. If an Indigenous community provides Enbridge Gas Incorporated

with information indicating a potential adverse impact of this project on its Aboriginal or Treaty rights, I request that you notify the Ministry as appropriate.

Please contact me at (416) 315-8641 or amy.gibson@ontario.ca if you have any questions or if you wish to discuss the matter in more detail.

Sincerely,

A handwritten signature in blue ink that reads "Amy Gibson". The signature is fluid and cursive, with a long horizontal flourish extending to the right.

Amy Gibson, Manager
Indigenous Energy Policy

cc: Ontario Energy Board
Ontario Pipeline Coordinating Committee

Enbridge Inc. Indigenous Peoples Policy

Enbridge Indigenous Peoples Policy

Enbridge recognizes the diversity of Indigenous Peoples who live where we work and operate. We understand that the history of Indigenous Peoples in both Canada and the United States has had destructive impacts on the social and economic wellbeing of Indigenous Peoples. Enbridge recognizes the importance of reconciliation between Indigenous communities and broader society. Positive relationships with Indigenous Peoples, based on mutual respect and focused on achieving common goals, will create constructive outcomes for Indigenous communities and for Enbridge.

Enbridge commits to pursuing sustainable relationships with Indigenous Nations and groups in proximity to where Enbridge conducts business. To achieve this, Enbridge will govern itself by the following principles:

- We recognize the legal and constitutional rights possessed by Indigenous Peoples in Canada and in the U.S., and the importance of the relationship between Indigenous Peoples and their traditional lands and resources. We commit to working with Indigenous communities in a manner that recognizes and respects those legal and constitutional rights and the traditional lands and resources to which they apply, and we commit to ensuring that our projects and operations are carried out in an environmentally responsible manner.
- We recognize the importance of the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) within the context of existing Canadian and U.S. law and the commitments that governments in both countries have made to protecting the rights of Indigenous Peoples.

- We engage in forthright and sincere consultation with Indigenous Peoples about Enbridge's projects and operations through processes that seek to achieve early and meaningful engagement so their input can help define our projects that may occur on lands traditionally used by Indigenous Peoples.
- We commit to working with Indigenous Peoples to achieve benefits for them resulting from Enbridge's projects and operations, including opportunities in training and education, employment, procurement, business development, and community development.
- We foster understanding of the history and culture of Indigenous Peoples among Enbridge's employees and contractors, in order to create better relationships between Enbridge and Indigenous communities.

This commitment is a shared responsibility involving Enbridge and its affiliates, employees and contractors, and we will conduct business in a manner that reflects the above principles. Enbridge will provide ongoing leadership and resources to ensure the effective implementation of the above principles, including the development of implementation strategies and specific action plans.

Enbridge commits to periodically reviewing this policy to ensure it remains relevant and meets changing expectations.