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**Enbridge Gas Inc.**  
500 Consumers Rd.  
North York, ON M1K 5E3  
Canada

November 22, 2023

**VIA EMAIL and RESS**

Nancy Marconi  
Registrar  
Ontario Energy Board  
2300 Yonge Street, 27th Floor  
Toronto, ON M4P 1E4

Dear Nancy Marconi:

**Re: Enbridge Gas Inc. (“Enbridge Gas”)  
Ontario Energy Board (“OEB”) File: EB-2022-0157  
Panhandle Regional Expansion Project (“Project”)  
Updated Interrogatory Responses**

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On Day 2 of the Hybrid Hearing, Enbridge Gas noted corrections to three interrogatory responses (Exhibit I.FRPO.5, Exhibit I.FRPO.18, and Exhibit I.FRPO.29). Enclosed please find the updated interrogatory responses.

Additionally, enclosed please find the updated interrogatory response to Exhibit I.PP.38, which Enbridge Gas had committed to updating once the Company received approval from NRCAN regarding the public submission of information related to the NRCAN initiative.

If you have any questions, please contact the undersigned.

Sincerely,

(Original Digitally Signed)

Haris Ginis  
Technical Manager, Leave to Construct Applications

c.c. Charles Keizer (Torys)  
Tania Persad (Enbridge Gas Counsel)  
Zora Crnojacki (OEB Staff)  
Intervenors (EB-2022-0157)

ENBRIDGE GAS INC.

Answer to Interrogatory from  
OEB Staff ("STAFF")

INTERROGATORY

Reference:

Exhibit B, Tab 2, Schedule 1, pages 1-2

Preamble:

The proposed Panhandle Regional Expansion Project (Project) consists of two distinct projects: Panhandle Loop and Leamington Interconnect. These two projects are part of the Panhandle System expansion but are geographically separated and the construction schedule and in-service dates are one year apart. The construction of the Panhandle Loop which includes NPS 36 pipeline and ancillary measurement, pressure regulation and station facilities are planned to commence in Q1 of 2023 and be placed into service by November 2023.

The construction of the Leamington Interconnect which includes NPS 16 pipeline and valve-site station (tie-in) facilities is planned to commence in Q2 of 2024 and be placed into service by November 2024.

Question:

- a) Please discuss the rationale for proposing the construction start and in-service date of the Leamington Interconnect, sequentially, approximately one year after the proposed construction start and in-service date for the Panhandle Loop.
- b) Please explain why the Panhandle Loop and Leamington Interconnect could not be constructed simultaneously to achieve a single in-service date for the Project with its full incremental capacity achieved in the Winter 2023/2024.

**Response**

- a) and b)  
Enbridge Gas determined that constructing the Panhandle Loop in 2023 and the Leamington Interconnect in 2024 (i.e., staging the Project builds) was preferred compared to constructing both in 2023.

Staging construction in the manner proposed will allow Enbridge Gas to meet the Panhandle System design day demand in both Winter 2023/24 and Winter 2024/25 while ensuring that the deployment of capital is aligned with the timing of the system shortfall.

At this time it is not possible to construct the Leamington Interconnect for a November 1, 2023 in-service date as project development activities, specifically procurement of long-lead materials and lands, have been scheduled to support the proposed November 1, 2024 in-service date.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
OEB Staff ("STAFF")

INTERROGATORY

Reference:

Exhibit B, Tab 1, Schedule 1, pages 8 and 9

Preamble:

Enbridge Gas stated that email notice of a follow-up Binding Reverse Open Season to all contract customers in the Area of Benefit was issued on September 29, 2021 and closed on October 15, 2021 (16-business days), that indicated it received no requests for turn-back of capacity. Further, Enbridge Gas stated that it did not receive any communications from customers requesting to reduce their existing firm or interruptible contract demands since the close of the Binding Reverse Open Season.

Enbridge Gas further stated that in addition to the Expression of Interest and Binding Reverse Open Season, customers can de-contract firm or interruptible capacity provided that they meet the notice requirements per the terms and conditions of their distribution contract.

Question:

- a) For Area of Benefit existing contract customers, please provide the total:
  - i. number of customers
  - ii. contract demand in 10<sup>3</sup>m<sup>3</sup>/day
  - iii. volume weighted average remaining contract term in years as of the projected in-service date of the Project
  
- b) For the Binding Reverse Open Season, please provide:
  - i. the number of customers notified and total contract demand in 10<sup>3</sup>m<sup>3</sup>/day in the Area of Benefit
  - ii. the number of customers and total contract demand in 10<sup>3</sup>m<sup>3</sup>/day that confirmed that they did not wish to turn-back capacity
  - iii. the number of customers and total associated contract demand in 10<sup>3</sup>m<sup>3</sup>/day that did not respond to the September 29, 2021 notice



**Response**

- a)
  - i. There were 129 existing distribution contract rate accounts, as well as 11 telemetered Large Volume rate M2 general service accounts in the PREP Area of benefit at the time the Expression of Interest process was launched.
  - ii. See table below.

<b>Contract Demand</b>	<b>10<sup>3</sup>m<sup>3</sup>/day</b>
Firm	9,379
Interruptible	2,398
<b>Total Contract Demand</b>	<b>11,777</b>

- iii. Distribution contracts do not expire. They are evergreen (i.e., automatically renew annually) unless a customer provides notice to Enbridge Gas that they wish to terminate the contract prior to the end of the “Initial Term” of the contract, or prior to the annual renewal date of the contract.

Enbridge Gas has no basis for which to assume that existing distribution contracts will not be renewed. In fact, the current Application provides evidence of continued growth in demand for natural gas in the Panhandle market area. This growth is supported by the results of the two reverse open seasons conducted for this Project, for which no bids to turnback capacity were received from existing contract customers in the Area of Benefit.

After the “Initial Term” of a distribution contract has passed, as defined in the contract terms and conditions, the contracts are renewed on a year-to-year basis unless written notice to terminate is provided at least 3 months prior to the end of the Initial Term of the contract, or before the annual renewal date.

Customers on distribution contracts that are currently renewed annually will be required to contract for another initial term for a minimum of 5 years up to a maximum of 20 years if they are expanding their operations and have requested incremental capacity that will be provided through this Project.

- b)
  - i. All contract customers noted in part a) i) above were contacted, representing all contract demand noted in part a) ii) above.

ii. and iii.

No bids to turnback capacity were received from either of the concurrent EOI/reverse open season, or the binding reverse open season.

- c) Enbridge Gas did not receive any bids to turnback capacity during the concurrent EOI/reverse open season process, which was open from February 17, 2021 to March 31, 2021 (47 days). Existing contract rate customers within the PREP Area of Benefit all have assigned Enbridge Gas account managers that directly communicate updates and serve their needs.

If Enbridge Gas had received any requests for turnback or to reduce contracted firm or interruptible capacity, and needed more time, Enbridge Gas would have worked with the customer either before or after the binding reverse open season.

As no requests for capacity turnback were received during the EOI/reverse open season process, and no requests were received between the time of the close of the EOI/reverse open season process and the binding reverse open season process, the 16-business day period for the binding reverse open season process was deemed to be appropriate.

Customers were not explicitly provided advance notice of the Binding Reverse Open Season. The binding reverse open season was sent out via email from the Enbridge Gas Large Volume Customer Communications mailbox and a notice was posted on the Enbridge Gas website.

- d) The term de-contract refers to a customer's ability to reduce the firm or interruptible parameters in their distribution contract.

Provided notice is given by the customers per the terms and conditions of their contract, customers can request to terminate their contract (will not take gas distribution service from Enbridge Gas after the annual renewal date), terminate their distribution contract and request to be moved to a non-contract general service rate (most commonly Rate M2 in the Union South Rate Zone) or reduce/de-contract their current levels of firm and/or interruptible service based on a reduction of peak gas demands.

- e) Please see the response to part a) iii. for context regarding contract terms. Additionally, the response to part a) ii. provides the total amount of contract demand currently under contract by existing contract customers in the Area of Benefit for the Project.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
OEB Staff ("STAFF")

INTERROGATORY

Reference:

Exhibit B, Tab 2, Schedule 1, page 7, paragraph 20 and page 9, paragraph 26

Preamble:

The Project's incremental capacity is estimated to be 203 TJ/d. Approximately 98% of this capacity is expected to meet the demand of contract rate customers. Enbridge Gas asserted that, at the time of filing the application, 80% of the contract rate customer demand is subject to commitments by those customers. Binding commitments represent 159 TJ/d, including approximately 62 TJ/d of executed firm distribution contracts. Enbridge Gas noted that 100% of the 2023/2024 forecasted incremental demand on the Panhandle System is secured with binding customer commitments.

Question:

- a) Please clarify what the "binding commitments" that are not firm distribution contracts entail.
- b) Please provide any updates to the contract rate customers commitments or the executed contracts since filing the application.

Response

- a) A Commitment Letter ("CL") and/or a Letter of Indemnity ("LOI") are "binding commitments" that are not firm contracts, and can be utilized prior to the execution of a distribution contract. These binding commitments demonstrate a customer's commitment to the capacity they have expressed interest in or have formally requested from Enbridge Gas.

The use of CLs is a standard practice for Enbridge Gas and they have been used previously for the Chatham-Kent Rural Pipeline project (EB-



2018-0013). They are intended to provide further customer commitment to the requests for capacity received through an EOI process, prior to a customer executing an LOI or distribution contract.

There are no financial assurances required to execute a CL.

The use of LOIs is also standard practice for Enbridge Gas. They are commonly used prior to the execution of a distribution contract. Their usage allows Enbridge Gas to order long-lead time items and/or initiate project activities prior to the finalization of a distribution contract. Financial assurances are required for LOIs.

Refer to response to Exhibit I.PP.5 part b) for the LOI and CL templates.

- b) Table 1 below outlines the customer commitments to the Project as at the June 10, 2022 LTC application filing date, as well as the updated commitment numbers as at September 22, 2022, organized by commitment type.

Table 1

	TJ/d	
	As at Jun 10, 2022 (LTC filing)	As at Sep 22, 2022 (IR Responses)
<b>PREP Capacity Commitments</b>		
Executed Distribution Contracts	62	63
Executed Letters of Indemnity / Commitment Letters	97	104
<b>Total PREP Capacity Commitments</b>	<b>159</b>	<b>167</b>

ENBRIDGE GAS INC.

Answer to Interrogatory from  
OEB Staff ("STAFF")

INTERROGATORY

Reference:

Exhibit B, Tab 1, Schedule 1, Attachment 1, page 5; Exhibit B, Tab 1, Schedule 1, page 11

Preamble:

Enbridge Gas stated that over 318 TJ/day of interest for incremental firm and interruptible demand over the 2023/2033 period from 44 customers was indicated through an Expression of Interest (EOI). Enbridge Gas provided a table showing its Panhandle Design Day demand forecast.

Question:

- a) Please provide the annual results of the Expression of Interest in each of the three categories:
  - i) new firm natural gas needs
  - ii) conversion from interruptible distribution service to firm distribution service
  - iii) new interruptible natural gas needs
  
- b) Please describe how the results of the Expression of Interest have been incorporated into Enbridge Gas's Panhandle Design Day demand forecast; e.g., are 100% of the volumes from the first two categories in the EOI included within the demand forecast?

Response

- a) Please see Table 1 below.

/U

Table 1

2023 Panhandle Regional Expansion Project EOI Bid Summary - by year (m3/hr)

	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	Total
New/Incremental Firm		52,432	84,503	37,807	25,802	32,952	17,204	13,732	12,547	7,277	2,325	286,581
Interruptible to Firm Conversion		66	8,484	-	-	-	-	-	-	-	-	8,550
Firm Turnback		-	-	-	-	-	-	-	-	-	-	-
Firm to Interruptible Conversion		-	-	-	-	-	-	-	-	-	-	-
<b>Net New/Incremental Firm (by year)</b>		<b>52,498</b>	<b>92,987</b>	<b>37,807</b>	<b>25,802</b>	<b>32,952</b>	<b>17,204</b>	<b>13,732</b>	<b>12,547</b>	<b>7,277</b>	<b>2,325</b>	<b>295,131</b>
Net New/Incremental Firm (cumulative)		52,498	145,485	183,292	209,094	242,046	259,250	272,982	285,529	292,806	295,131	
New/Incremental Interruptible (by year)		-	-	441	-	-	500	-	-	-	500	1,441
New/Incremental Interruptible (cumulative)		-	-	441	441	441	941	941	941	941	1,441	
<b>Firm TJ/day (by year)</b>		<b>33</b>	<b>71</b>	<b>24</b>	<b>16</b>	<b>21</b>	<b>11</b>	<b>9</b>	<b>8</b>	<b>5</b>	<b>1</b>	<b>197</b>
Firm TJ/day (cumulative)		33	104	127	143	164	175	183	191	196	197	

Notes:

- 1) The volumes received through the 2023 Expression of Interest process were in cubic meters of gas per hour (m3/hr).
- 2) 71,262 m3/hr from the 2021 EOI has been contracted and is not included in the table above.
- 3) The 2023 Expression of Interest results, combined with the previously contracted volumes from the 2021 Expression of Interest process, were used to generate the revised demand forecast.

b) Please refer to note 3 in table 1 above

/U

ENBRIDGE GAS INC.

Answer to Interrogatory from  
OEB Staff (“STAFF”)

INTERROGATORY

Reference:

Exhibit B, Tab 2, Schedule 1, Page 11, Table 3: Panhandle System Capacity, Design Day Demand, and Shortfall

Preamble:

Enbridge Gas stated that the proposed Project is needed to meet the forecasted firm customer demands by November 1, 2023 and beyond.

As part of its filed evidence, Enbridge Gas provided the following table detailing the forecast of the Panhandle System capacity, Design Day Demand, and shortfall. The existing Panhandle System capacity is 713 TJ/d. Without the Project, Enbridge Gas forecast that the Design Day Demand in the winter 2023/2024 will be 744 TJ/d resulting in the first system shortfall of an estimated 31 TJ/d.

Table 3: Panhandle System Capacity, Design Day Demand, and Shortfall

	Historical Actuals		FORECAST									
	Winter 19/20	Winter 20/21	Winter 21/22	Winter 22/23	Winter 23/24	Winter 24/25	Winter 25/26	Winter 26/27	Winter 27/28	Winter 28/29	Winter 29/30	Winter 30/31
Panhandle System Capacity (TJ/d)	725	725	713	713	713	713	713	713	713	713	713	713
Design Day Demand Forecast (TJ/d)	640	656	672	694	744	828	854	880	906	932	958	983
Surplus (shortfall is negative) (TJ/d)	84	89	41	20	(31)	(114)	(140)	(166)	(192)	(218)	(244)	(270)

Question:

- a) Please restate the table above assuming the Project is approved as planned with an in- service date of November 2023 for the NPS 36 pipeline and November 2024 for the NPS 16 pipeline.
- b) Please restate the table above showing the forecast of the Panhandle System capacity, Design Day Demand and shortfall in TJ/d with:

- i. The additional proposed NPS 36 pipeline only with in-service date of November 2023
  - ii. The additional proposed NPS 16 pipeline only with in service date of November 2024
- c) Please discuss Enbridge Gas's approach to managing the risk of capacity shortfall of the Panhandle System if:
  - i. The in-service date for the proposed NPS 36 pipeline is delayed
  - ii. The in-service date for the proposed NPS 16 pipeline is delayed
- d) Please discuss Enbridge Gas's approach to accommodate the proposed November 2023 in-service date for the proposed Panhandle Loop in the event that construction start is delayed.
- e) Please discuss the impact on construction start and the proposed in-service date of the Leamington Interconnect in the event that the proposed in-service date for the Panhandle Loop is delayed.

**Response**

a) Please see Table 1. All values shown in Table 1 are in TJ per day.

Table 1

	Historical Actuals		FORECAST									
	W19/20	W 20/21	W 21/22	W 22/23	W 23/24 Stage 1	W 24/25 Stage 2	W 25/26	W 26/27	W 27/28	W 28/29	W 29/30	W 30/31
<b>Proposed System Capacity</b>	725	725	713	713	833	916	916	916	916	916	916	916
<b>Demand Base Forecast (TJ/d)</b>	640	656	672	694	744	828	854	880	906	932	958	983
Surplus (shortfall is negative)	84	69	41	20	89	89	63	37	11	(15)	(41)	(67)

b)

i. Please see Table 2. All values shown in Table 2 are in TJ per day.

The incremental 120 TJ/d resulting from the installation of the NPS 36 Panhandle Loop is shown in Winter 2023/2024. The 5 TJ/d of surplus in Winter 2024/2025 is on the margin of design which is too close to a shortfall given the projection of growth expected in the following year. One large new customer or a change in timing of customer attachments could drive the system into a shortfall.

Table 2

	Historical Actuals		FORECAST									
	W19/20	W 20/21	W 21/22	W 22/23	W 23/24 Stage 1	W 24/25	W 25/26	W 26/27	W 27/28	W 28/29	W 29/30	W 30/31
<b>Proposed System Capacity</b>	725	725	713	713	833	833	833	833	833	833	833	833
<b>Demand Base Forecast (TJ/d)</b>	640	656	672	694	744	828	854	880	906	932	958	983
Surplus (shortfall is negative)	84	69	41	19	89	5	(21)	(47)	(73)	(99)	(125)	(150)

ii. Please see Table 3. It is not possible to serve the forecast demand by only installing the NPS 16 Leamington Interconnect for Winter 2024/2025. The NPS 16 Leamington Interconnect capacity reduces to ~44 TJ/d without the benefit of the NPS 36 Panhandle loop being in service.

Table 3

	Historical Actuals		FORECAST									
	W19/20	W 20/21	W 21/22	W 22/23	W23/24	W 24/25 Stage 2	W 25/26	W 26/27	W 27/28	W 28/29	W 29/30	W 30/31
<b>Proposed System Capacity</b>	<b>725</b>	<b>725</b>	<b>713</b>	<b>713</b>	<b>713</b>	<b>757</b>	<b>757</b>	<b>757</b>	<b>757</b>	<b>757</b>	<b>757</b>	<b>757</b>
<b>Demand Base Forecast (TJ/d)</b>	<b>640</b>	<b>656</b>	<b>672</b>	<b>694</b>	<b>744</b>	<b>828</b>	<b>854</b>	<b>880</b>	<b>906</b>	<b>932</b>	<b>958</b>	<b>983</b>
Surplus (shortfall is negative)	84	69	41	19	(31)	(71)	(97)	(123)	(149)	(175)	(201)	(227)

c) and d)

In the event of a delayed in-service date of either the Panhandle Loop or the Leamington Interconnect, Enbridge Gas would evaluate short-term alternatives to increase Panhandle System capacity. The most likely action would be to contract firm deliveries at Ojibway through an exchange service for Winter 2023/24 to serve as many customer requests as possible.

Contracting Firm Exchange service was evaluated by the Company. Based on results from the RFP for a Firm Exchange between Dawn and Ojibway, the estimated capacity on PEPL system with delivery to Ojibway is only 21 TJ/d (whereas a minimum of 42 TJ/d of incremental deliveries at Ojibway is required to delay the in-service date of the proposed Project by one year).<sup>1</sup> Therefore, the required capacity to meet all Winter 2023/24 firm demands is not commercially available, resulting in design day demand exceeding system capacity for Winter 2023/24.

The executed Firm distribution contracts underpinning the need for the Project include a condition that the Board grants a leave to construct for the proposed Project. In the event Enbridge Gas does not have sufficient capacity through the proposed Project, the Company would provide formal notice of cancellation for firm service.

As of September 22, 2022, Enbridge Gas has executed 4 firm contracts and 2 Letters of Indemnity with customers that would need to be canceled. Once these contracts are canceled, Enbridge Gas would then need to begin the process of re-contracting with these customers for the delayed in-service date.

Additionally, there are 30 Commitment Letters which have been executed by customers that have expressed intent to execute a distribution contract or LOI for new or incremental natural gas capacity that would be created by the Project. These Commitment Letters would have to be cancelled and the customers would also need to be informed that their requested in-service date would be delayed, and that their requirements could not be met.

Greenhouse operations can be built and become operational in a short period of time – as little as six months. With a delay of in-service date and the corresponding lack of certainty of natural gas supply, there is a risk that greenhouse operators will change or cancel their expansion plans for the Leamington-Kingsville area, and potentially move their operations outside of the

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<sup>1</sup> Exhibit C, Tab 1, Schedule 1, Pages 14 to 19.



province. Other customer types may also be required to change their business plans, which are dependent on firm natural gas distribution service.

- e) In the event the Panhandle Loop in-service date is delayed, all else constant, the Leamington Interconnect construction schedule and in-service date of November 1, 2024 would not be impacted. However, the delay of the Panhandle Loop would result in a shortfall of capacity for customer demand for Winter 2023/2024.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
OEB Staff ("STAFF")

INTERROGATORY

Reference:

Exhibit B, Tab 1, Schedule 1, pages 18-19, paragraphs 55 and 56

Preamble:

Enbridge Gas stated that the capacity provided by the Project is intended to ensure the growing Panhandle Market has sufficient capacity until Winter 2028/2029.

In discussion of Project timing and growth plans, Enbridge Gas identified the potential need for a second phase of transmission expansion to meet the demands that are forecasted over the next 20 years. Enbridge Gas stated that it is forecasting the need for this second phase of transmission expansion to take place by Winter 2028/2029.

Question:

- a) Please explain the rationale for the assertion that the Panhandle System with the proposed incremental capacity provided by the Panhandle Regional Expansion Project, subject to this application, will not be sufficient to provide the needed capacity to the Panhandle Market beyond Winter 2028/2029?

**Response**

- a) Please refer to Table 1 showing the additional capacity added to Table 3 from Exhibit B, Tab 2, Schedule 1 on page 11. Assuming the Project is approved, the Panhandle System capacity of approximately 904 TJ/d compared to the forecast demands of approximately 906 TJ/d by Winter 2029/2030 would result in an estimated shortfall of 2 TJ/d (rounded). The forecasted demand is based on customer responses to the EOI process conducted in 2023 (Exhibit B, Tab 1, Schedule 1) and at Winter 2029/2030 total system demands would exceed system capacity. Enbridge Gas will continue to assess the Panhandle System's capacity position each year and at such time, evaluate if an IRP alternative could feasibly delay the need for further physical capacity.

/U

Table 1: Panhandle System Capacity (following reinforcement), Design Day Demand and Shortfall

	Historical Actuals (TJ/d)			Forecast (TJ/d)								
	Winter 19/20	Winter 20/21	Winter 21/22	Winter 22/23	Winter 23/24	Winter 24/25	Winter 25/26	Winter 26/27	Winter 27/28	Winter 28/29	Winter 29/30	Winter 30/31
<b>Panhandle System Capacity (TJ/d)</b>	725	725	713	737	737	904	904	904	904	904	904	904
<b>Design Day Demand Forecast (TJ/d)</b>	640	656	672	698	730	802	849	863	878	892	906	921
<i>Surplus (negative is shortfall)</i>	84	69	41	38	6	102	55	41	26	12	(2)	(17)

ENBRIDGE GAS INC.

Answer to Interrogatory from  
OEB Staff ("STAFF")

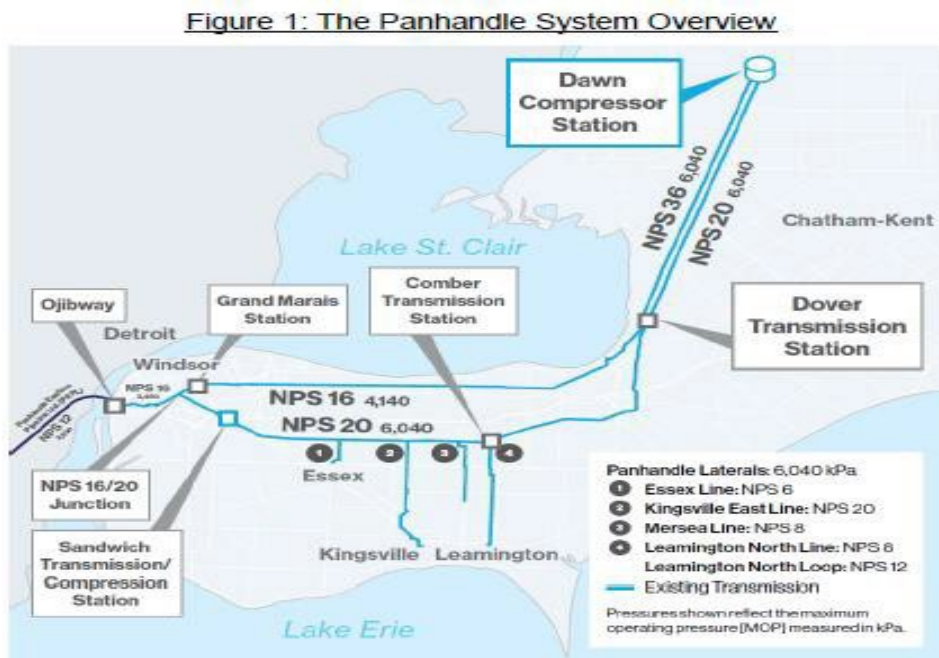
INTERROGATORY

Reference:

Exhibit B, Tab 2, Schedule 1, Page 2, Figure 1: Panhandle System Overview;  
Exhibit C, Tab 1, Schedule 1, pages 1-25, Project Alternatives; Exhibit C, Tab 1,  
Schedule 1, page 9, Table 1: Summary of Current Panhandle System Pressure  
Bottleneck and Proposed Facility Solution

Preamble:

Enbridge Gas provided a diagram of the Panhandle System overview:



Enbridge Gas identified two Panhandle System's pressure bottlenecks that need to be eliminated to provide the system capacity to meet the forecast demand growth:

1. The loss of pressure on NPS 20 Panhandle Line between Dover TS and Comber TS (Dover to Comber bottleneck)

2. The loss of pressure between NPS 20 Panhandle Line and Leamington-Kingsville market (Leamington-Kingsville market bottleneck)

The Project has been selected as a preferred alternative after assessment of:

1. Facility alternatives
  1. Panhandle Loop, to address the Dover to Comber bottleneck, construction of NPS 36 to loop (i.e. parallel to) the existing NPS 20 Panhandle Line west of Dover Transmission Station (TS).  
Leamington Interconnect, to address Leamington-Kingsville market bottleneck, construction of lateral NPS 16 connecting Kingsville East Line, Mersea Line, Leamington North Line and Leamington North Loop.  
The Panhandle Loop and Leamington Interconnect were selected as the best combined alternatives to meet the need determined by Enbridge Gas.
  2. Upsize of the existing NPS 16 Panhandle Line or NPS 20 Panhandle Line west of Dover TS
  3. Liquefied Natural Gas (LNG) Plant
2. Integrated Resource Planning Alternatives (IRPA)
  1. Firm 3<sup>rd</sup> party exchange between Dawn and Ojibway
  2. Demand side management alternative: Enhanced Targeted Energy Efficiency (ETEE)
  3. Trucked Compressed Natural Gas (CNG)
3. Hybrid or combination of facility with IRPA alternative
  1. Firm exchange between Dawn and Ojibway combined with the looping of the existing NPS 20 Panhandle Line west of Dover TS and installing a Leamington Interconnect lateral NPS 16

Enbridge Gas stated that it employed the following criteria to assess and select the preferred alternative:

1. Economic criteria as a quantitative measure of cost-effectiveness and used the following metrics:
  1. Total cost
  2. Cost per unit of capacity
  3. Net Present Value (NPV)
2. Timing to meet the Panhandle System forecast demand within five years
3. Safety and reliability to provide reliable and safe delivery of firm volumes on the coldest winter day on the Panhandle System
4. Risk management defined as price risk increase once the alternative

- has been deployed
5. Environmental and socio-economic impact which is defined by Enbridge Gas as qualitative impacts on Indigenous peoples, municipalities, landowners and the environment

Question:

- a) Using the Panhandle System overview diagram please delineate the pipeline facilities alternatives discussed in the evidence. Please use a separate overview diagram for each of pipeline facilities alternatives considered to address the two system bottlenecks.
- b) Please provide a table comparing all the alternatives assessed (facilities, IRPA and Hybrid) including the proposed Project. For each alternative provide values (quantitative or qualitative) of the five assessment criteria noted in the evidence. In a separate column explain the rationale for the outcome of the assessment for each of the alternatives.

**Response**

- a) Please see Figures 1-8 below for diagrams of each of the Facility, IRPA and Hybrid alternatives discussed. These diagrams have been updated to reflect the alternatives with the removal of the Leamington Interconnect where applicable.

**Facility Alternative Maps**

Figure 1

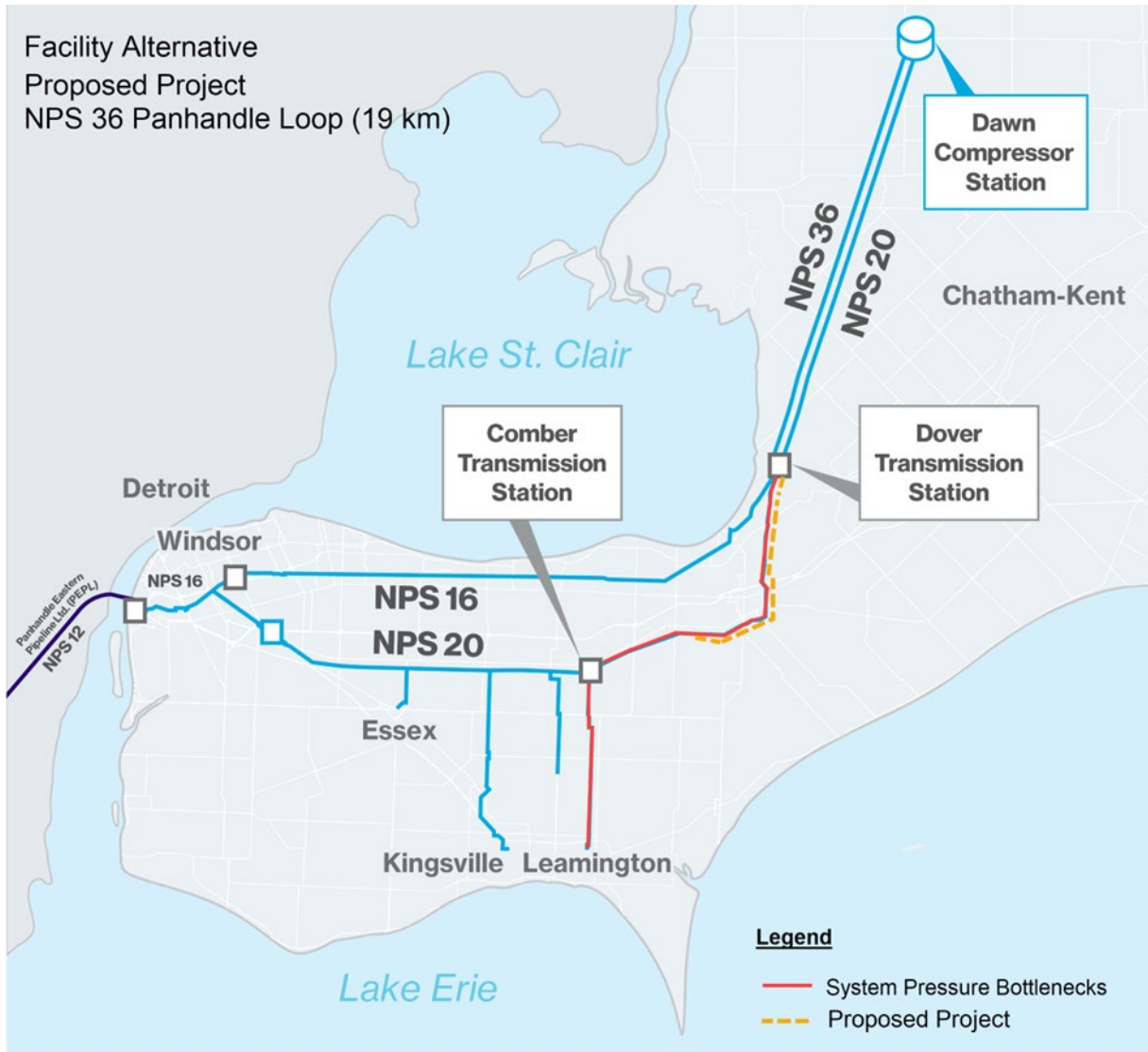


Figure 2

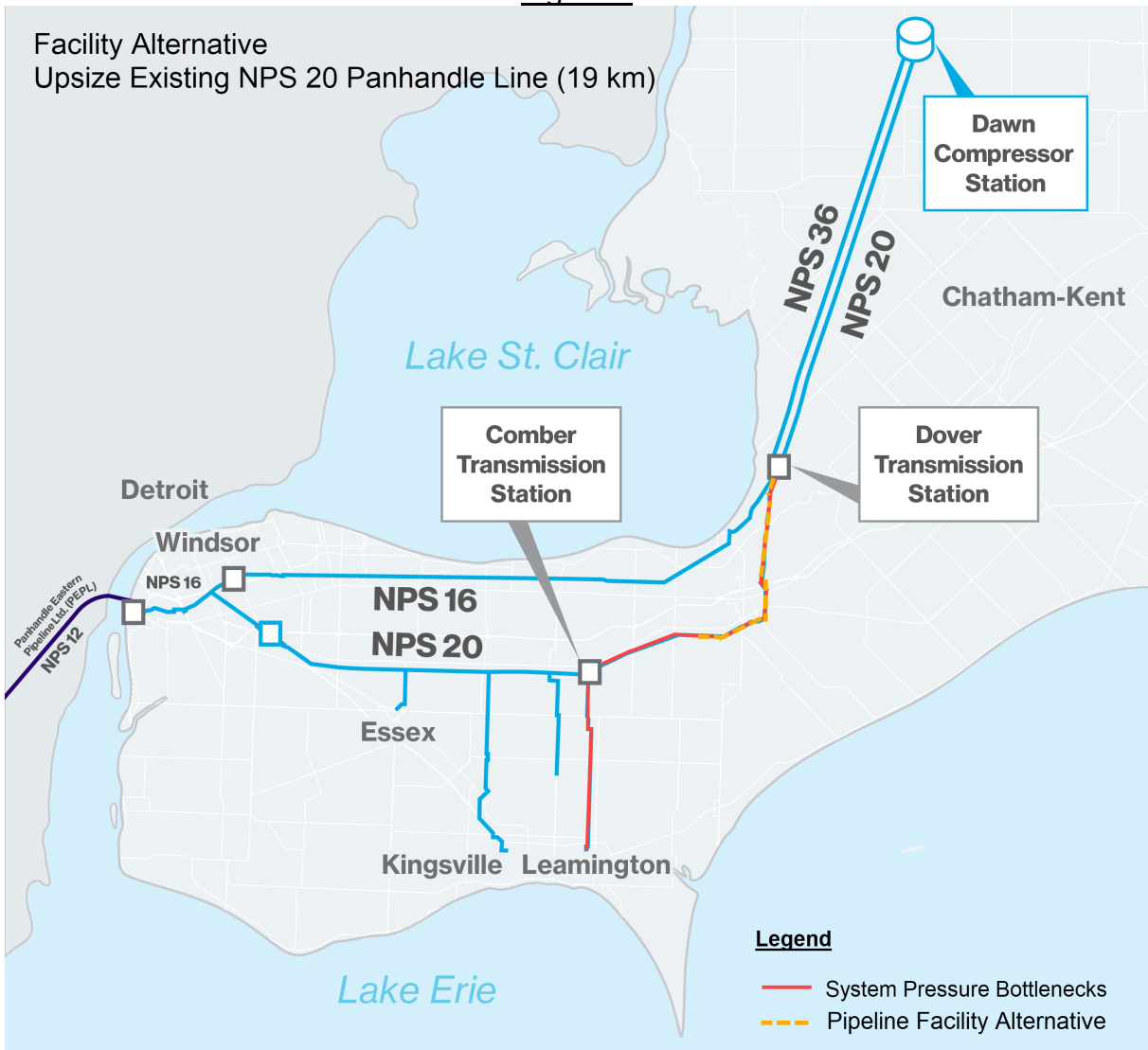


Figure 3



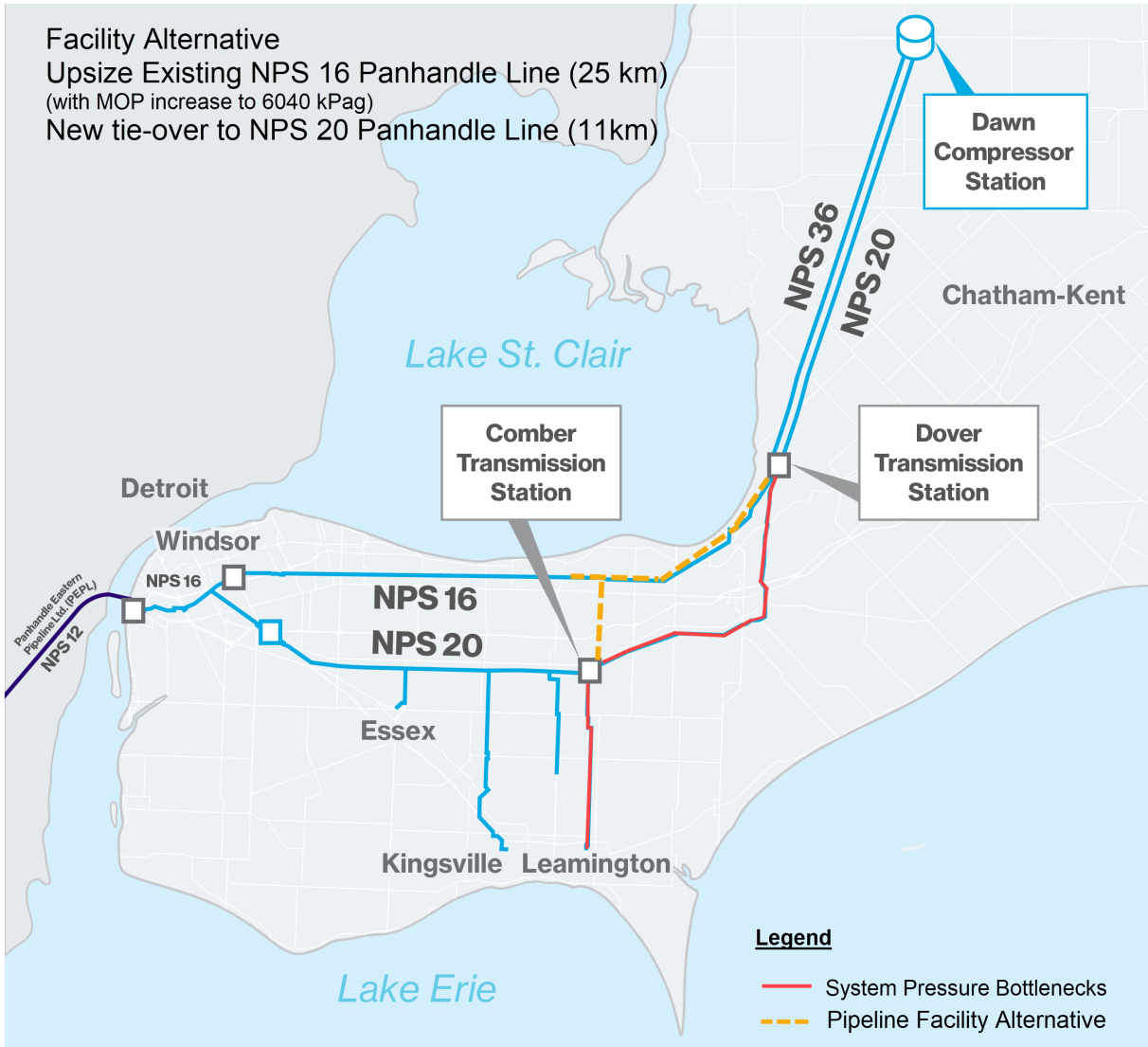
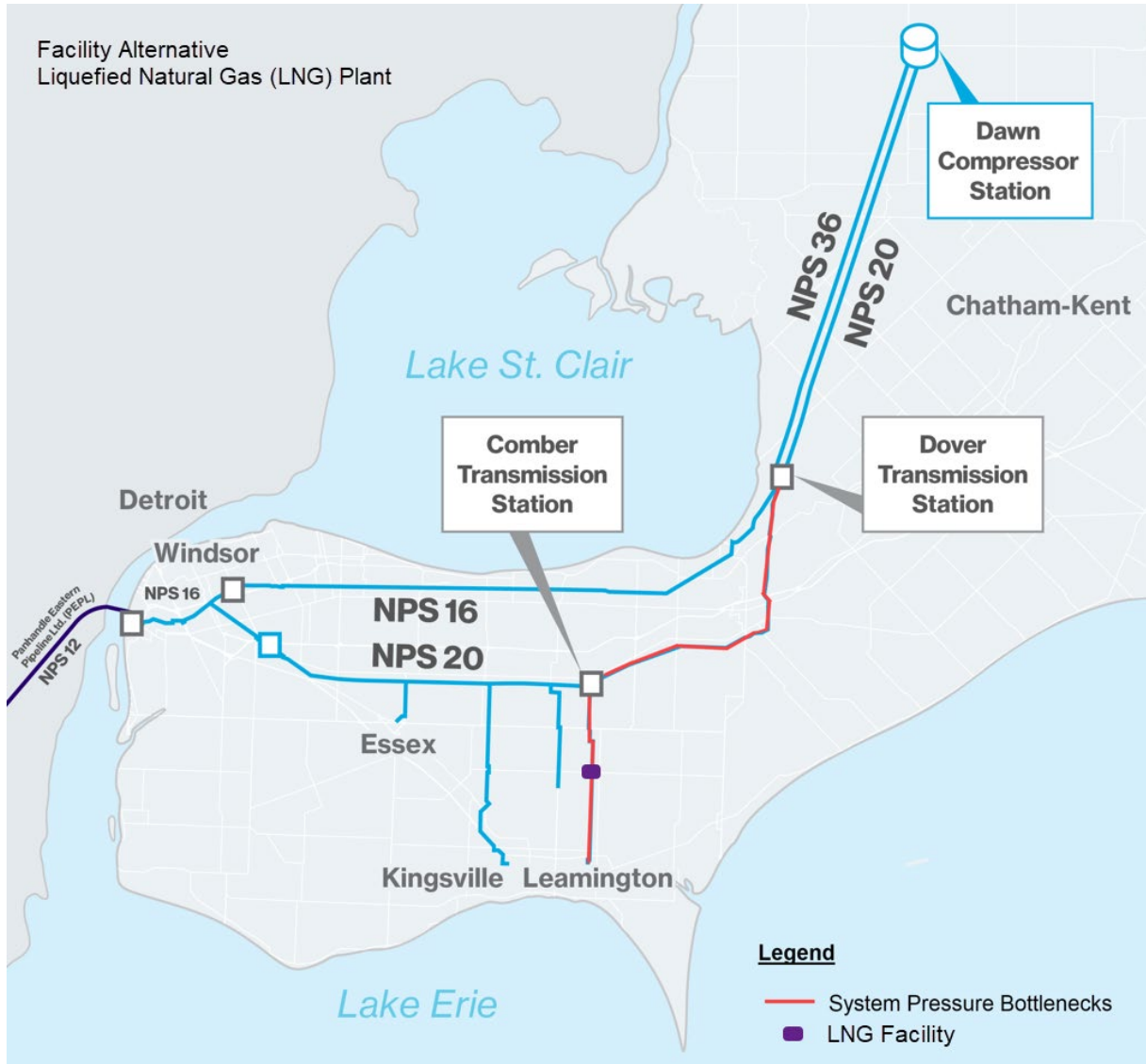


Figure 4



**Integrated Resource Planning Alternatives**

Figure 5

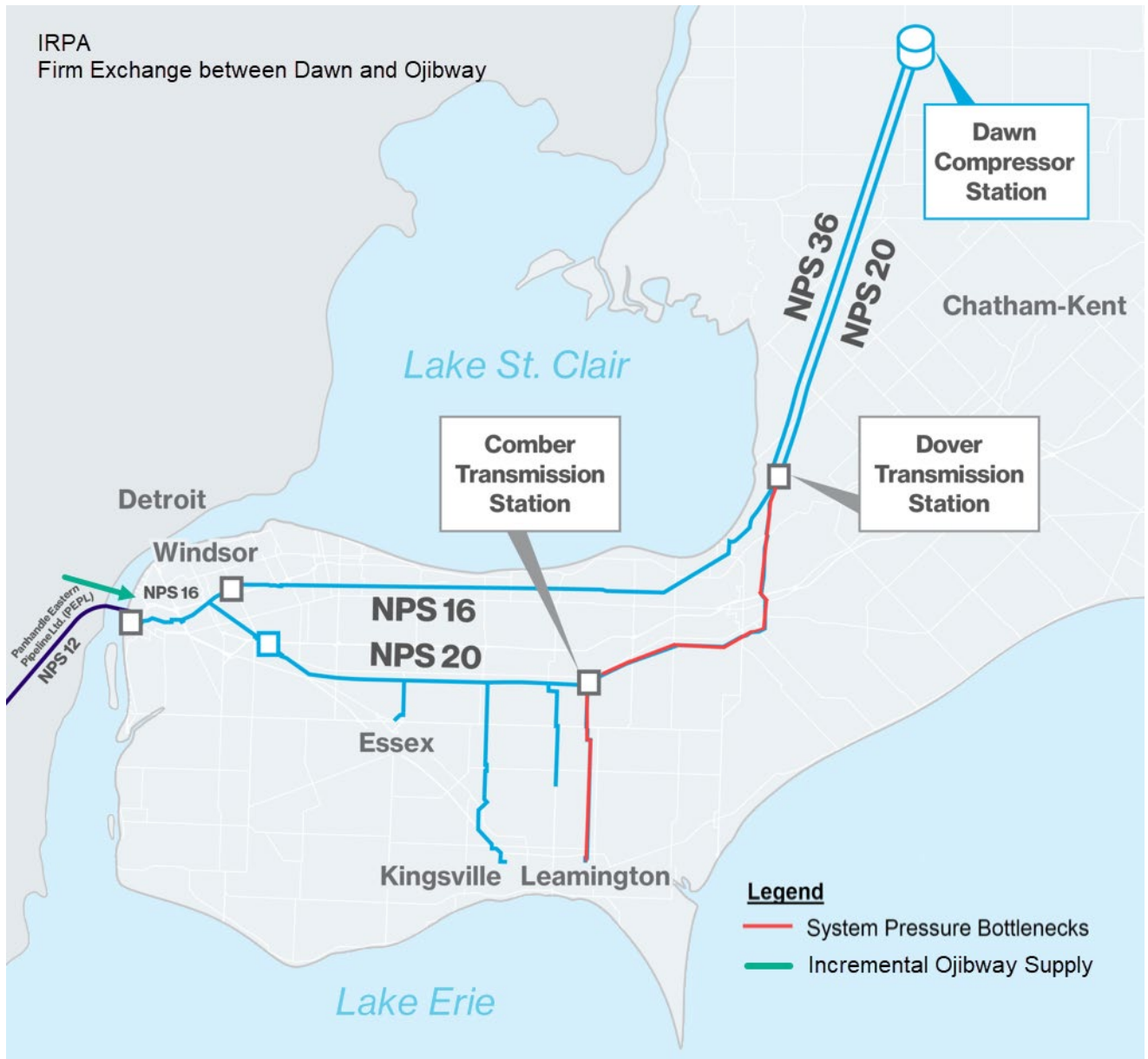


Figure 6

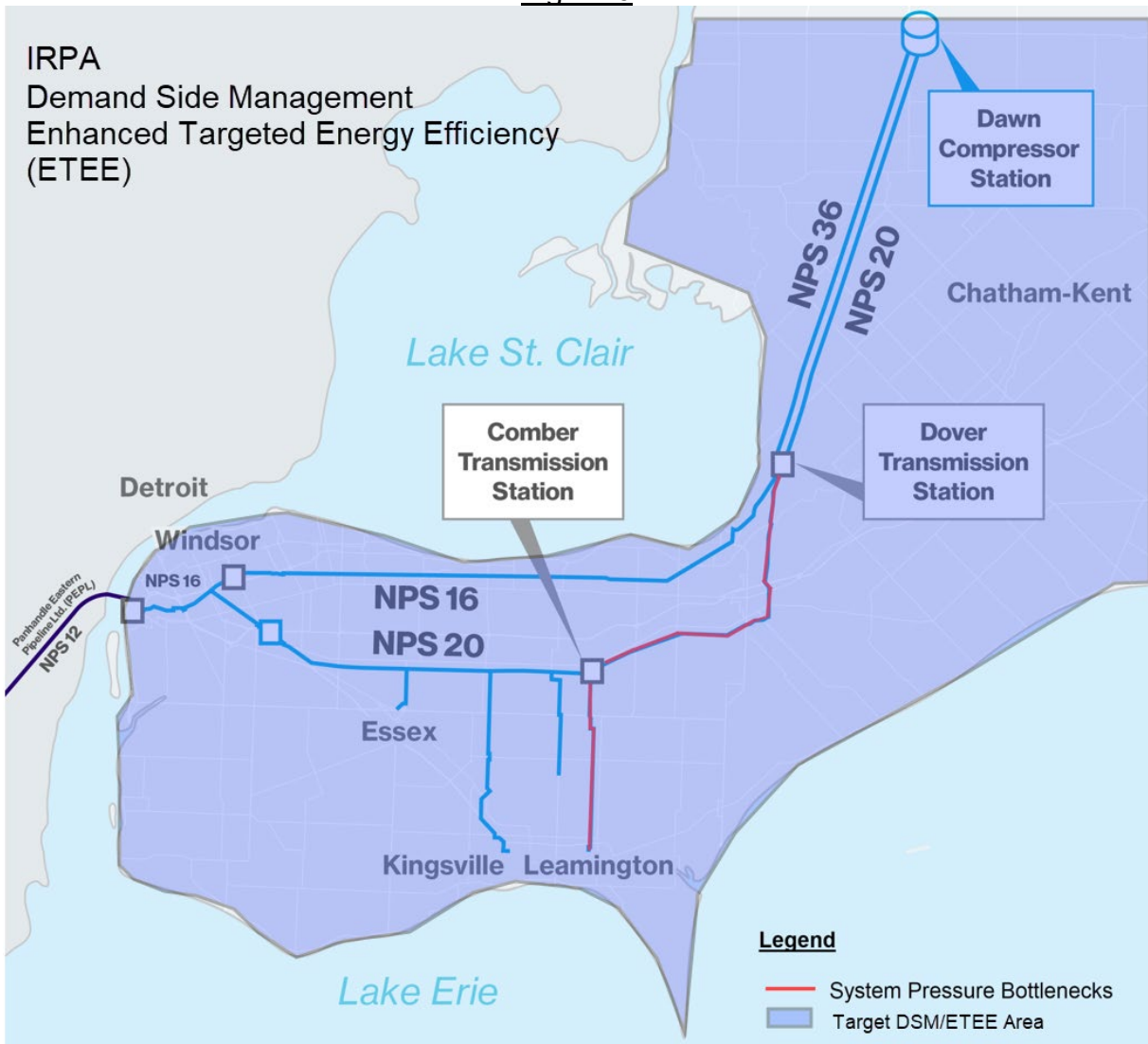
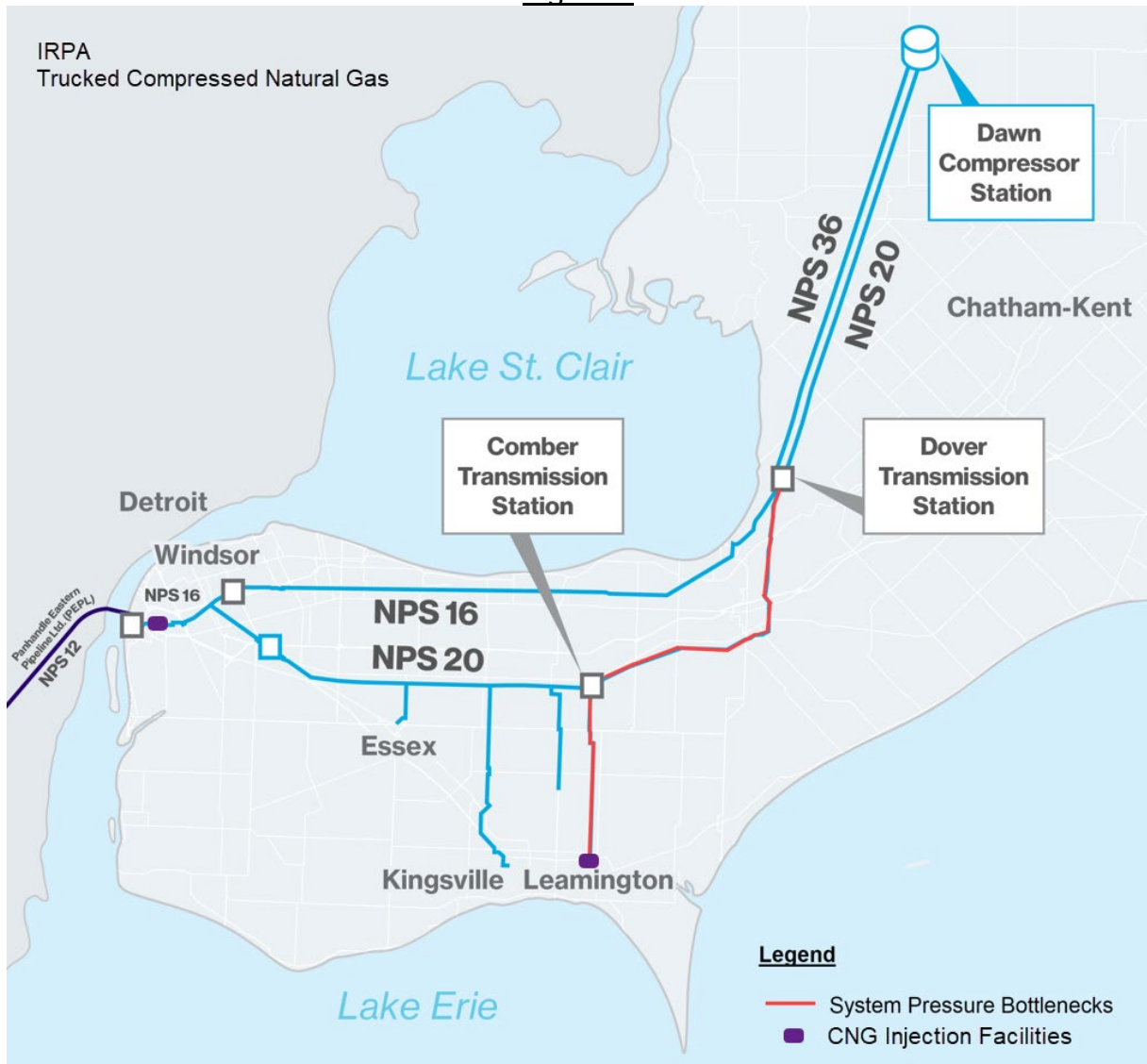
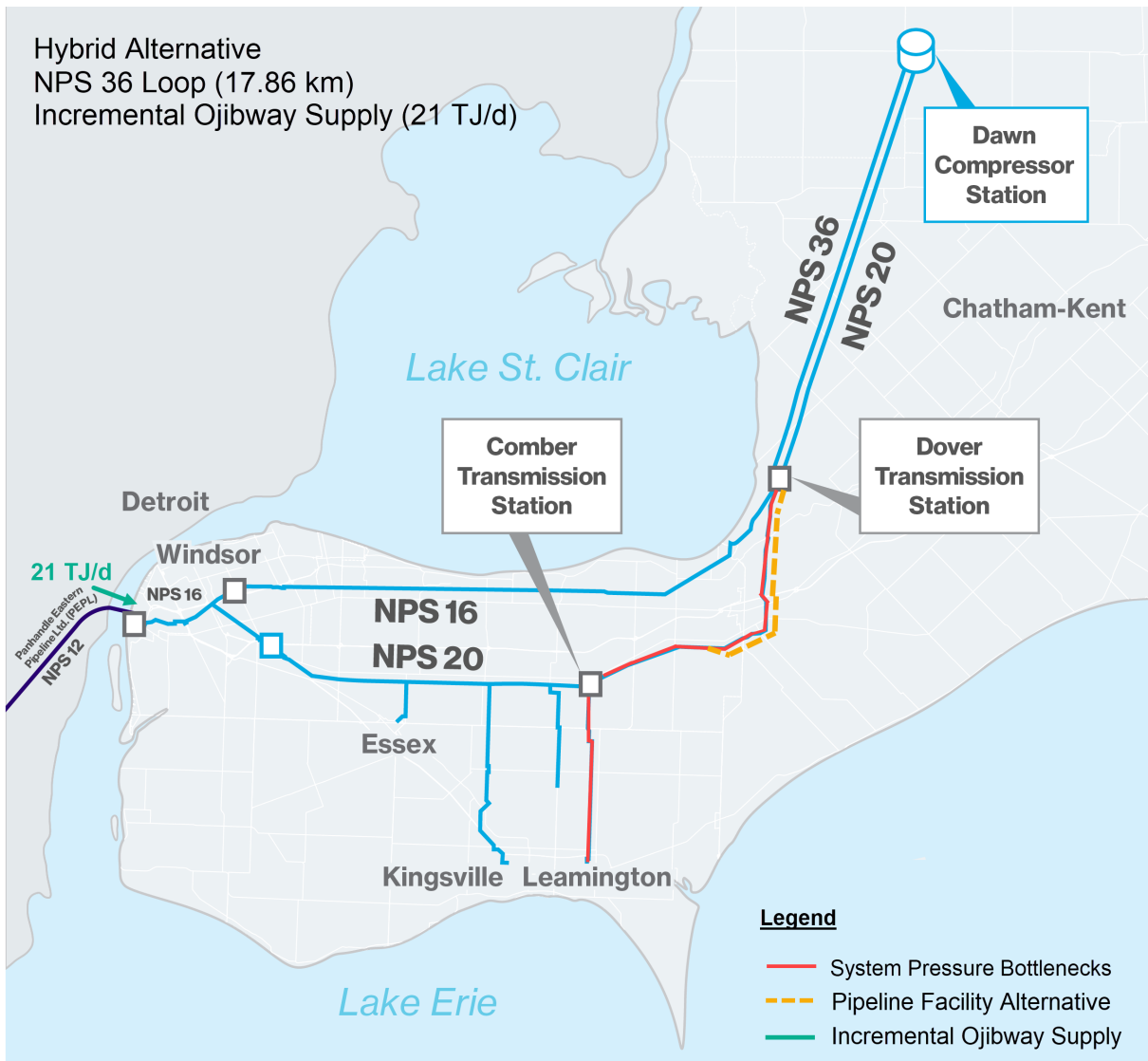


Figure 7



**Hybrid Alternative**

**Figure 8**



b) For a summary of viable alternatives (i.e., alternatives that meet all Assessment Criteria), please see Attachment 1 to this response. For a summary of non-viable alternatives (i.e., alternatives that do not meet all Assessment Criteria) please see Attachment 2 to this response. The Assessment Criteria applied to all alternatives is discussed at Exhibit C, Tab 1, Schedule 1, Pages 3-4.

Viable Alternatives (Meets all Alternatives Assessment Criteria)

Viable Alternative Description	Type	Capacity Created (TJ/d)	Cost Effectiveness			Timing	Safety & Reliability	Risk Management	Environmental & Socio-economic	Rationale
			Total Cost (\$ million)	\$/TJ	NPV <sup>1</sup>					
Proposed Project 19 km NPS 36 Panhandle Loop	Facility	168	\$358.0	\$2.13	\$(153.5)	✓	✓	✓	Minimizes project impact by paralleling existing right-of-way	Most cost-effective alternative with best cost per unit of capacity.  The proposed Project includes a larger capacity, with a lower cost per unit of capacity, to more effectively meet the growing customer demands. Please also see the response at Exhibit I.EP.8 for discussion of long-term benefits of this alternative.
19 km of NPS 30 Panhandle Loop	Facility	160	\$342.7 <sup>2</sup>	\$2.14	\$(144.6)	✓	✓	✓	Minimizes project impact by paralleling existing right-of-way	Creates less capacity (168 TJ vs. 160 TJ) and is therefore less cost effective based on cost per unit of capacity (\$2.14 vs. \$2.13 for the proposed project). Provides a slightly higher NPV than the proposed project but limited ability to serve anticipated future system demand.
17.86 km NPS 36 Panhandle Loop  21 TJ/d Firm Exchange between Dawn and Ojibway	Hybrid #1	168	Facility \$351.0  O&M \$4.2 Annually \$(66.2) over a 40-year term <sup>3</sup>	\$2.48	\$(212.1)	✓	✓	✓	Minimizes project impact by paralleling existing right-of-way	More costly than the preferred alternative based on cost per unit of capacity (\$2.48 vs. \$2.13 for the proposed Project) and NPV [\$(212.1) vs. \$(153.5) for the proposed Project] due to the need for both facilities and incremental annual O&M costs for a firm exchange service.  There is future price risk with respect to exchange services. The service contains price variability compared to facility alternatives which have a fixed cost once installed.
16.20 km NPS 36 (Wheatley Road end-point)  21 TJ/d Firm Exchange between Dawn and Ojibway	Hybrid #2	153	Facility \$330.5  O&M \$4.2 Annually \$(66.2) over a 40-year term <sup>3</sup>	\$2.59	\$(204.0)	✓	✓	✓	Minimizes project impact by paralleling existing right-of-way	More costly than the preferred alternative based on cost per unit of capacity (\$2.59 vs. \$2.13 for the proposed Project) and NPV [\$(204.0) vs. \$(153.5) for the proposed Project] due to the need for both facilities and incremental annual O&M costs for a firm exchange service.  There is future price risk with respect to exchange services. The service contains price variability compared to facility alternatives which have a fixed cost once installed.

<sup>1</sup> The calculation of the Net Present value does not include Overheads.

<sup>2</sup> The estimated cost of \$342.7 M for an NPS 30 alternative is based on a November 1, 2024 in-service date, for the purpose of displaying a direct comparative to the proposed Project. The actual installation of an NPS 30 alternative would result in a November 1, 2025 in-service date and as such the estimated cost would be higher due to inflationary impacts.

<sup>3</sup> The estimated O&M costs are based on the bid received in the RFP. The bid stated pricing is subject to refresh based on the market conditions at the timing of contracting.

Viabale Alternatives (Meets all Alternatives Assessment Criteria)

Viabale Alternative Description	Provides market assurance in meeting the growing firm demands along the Panhandle System for the next five years.	Increases Ontario customers' access to diverse supply, storage, and price transparency of the Dawn Hub.	Scalable with system growth.	Directly feeds area of growth.
Proposed Project 19 km NPS 36 Panhandle Loop	✓	✓	✓	✓
19 km NPS 30 Panhandle Loop	✓	✓	✓	✓
17.86 km NPS 36 Panhandle Loop  21 TJ/d Firm Exchange between Dawn and Ojibway	✓	✓	✓	✓
16.20 km NPS 36 (Wheatley Road end-point)  21 TJ/d Firm Exchange between Dawn and Ojibway	✓	✓	✓	✓



Non-Viable Alternatives (Does not meet all the Alternatives Criteria)

Non-Viable Alternative Description	Type	System Capacity Created (TJ/d)	Cost Effectiveness	Timing	Safety & Reliability	Risk Management	Environmental & Socio-economic	Rationale
Upsize of existing NPS 16 Panhandle Line west of Dover Transmission	Facility	N/A	N/A	X	X	✓	Easements on previously undisturbed land	<p>This Alternative is not viable as it cannot be constructed for November 1, 2024 and maintain reliable service to Panhandle System customers. This alternative would require moving as many as nine downstream system connections from the NPS 16 Panhandle Line to the NPS 20 Panhandle Line and constructing a new interconnecting pipeline between the NPS 16 Panhandle Line and the NPS 20 Panhandle Line.</p> <p>Additionally, this alternative would require acquisition and development of new greenfield pipeline easements on previously undisturbed land resulting in increased environmental and landowner impacts compared to the proposed Project.</p>
Upsize of existing NPS 20 Panhandle Line west of Dover Transmission	Facility	N/A	N/A	X	X	✓	Minimizes project impact by paralleling existing right-of-way	<p>The NPS 20 Panhandle Line is required to serve customers at all times of the year because the NPS 16 Panhandle Line cannot serve system demands on its own, even during periods of low demand in the summer. As result, reliable service to customers could not be maintained during the construction period while the NPS 20 Panhandle Line would be out of service. Therefore, a lift and lay of the NPS 20 Panhandle Line west of Dover Transmission is not a viable alternative.</p>
Liquefied Natural Gas (LNG) Plant	Facility	~156 TJ/d	<p>Costs: ~\$580 million in today's dollars</p> <p>O&amp;M: \$5 million annually</p>	X	✓	✓	N/A	<p>This alternative cannot be constructed for Winter 2024/25 and does not meet timing criteria. Additionally, this alternative is not financially feasible therefore Enbridge Gas did not assess it further.</p>
Firm 3rd party exchange between Dawn and Ojibway (+21 TJ/d, maximum available)	IRPa	Please Refer to Exhibit I.ED.6a(i)	<p>IRPA Costs: \$4.2 million Annually, 66.2 over a 40-year term<sup>1</sup></p> <p>\$/Capacity: \$3.15</p>	X	✓	✓	Utilizes existing pipeline facilities	<p>A firm exchange service between Dawn and Ojibway was rejected as there are no stand-alone commercial services that can be contracted with a pipeline company or secondary market that would deliver gas via the Panhandle System into the distribution networks that would eliminate the need for additional facilities. It is not possible to address the 5-year system shortfall of 156 TJ/d with Ojibway deliveries alone because the volume required would greatly exceed the physical import capability at Ojibway.</p> <p>Based on the Winter 2024/25 Panhandle System design forecast, a minimum of 69 TJ/d of incremental deliveries at Ojibway would be required to delay the in-service date of the proposed Project by one year (over triple the capacity which is operationally available to deliver to into Ojibway). This is not commercially available, as the estimated available capacity on the Panhandle Eastern Pipeline system with delivery to Ojibway is 21 TJ/d based on results from RFP.</p>

<sup>1</sup> The estimated O&M costs are based on the bid received in the RFP. The bid stated pricing is subject to refresh based on the market conditions at the timing of contracting.

Non-Viable Alternatives (Does not meet all the Alternatives Criteria)

Demand side management alternative: Enhanced Targeted Energy Efficiency (ETEE)	IRPA	57 TJ/d	Costs: ~\$468 million \$/Capacity: \$8.2	X	✓	✓	✓	<p>As noted in the Posterity report included at Attachment 3to Exhibit C-1-1, a maximum peak hour reduction potential of 72,000 m<sup>3</sup>/hour (57 TJ/d) from general service could be obtained by 2029/2030 compared to 168 TJ/d from the proposed project.</p> <p>There is insufficient peak demand reduction potential from the general service customer base downstream of the Leamington lateral interconnect to eliminate or reduce the scope of facility requirements to meet the identified system need.</p>
Trucked Compressed Natural Gas (CNG)	IRPA	N/A	N/A	X	X	X	X	<p>Approximately 420 truckloads of CNG per day would be required to meet the shortfall capacity of 156 TJ/d. This is not practical and poses issues both in terms of logistics and security of supply. For these reasons Enbridge Gas determined that this alternative is not a viable solution early in its assessment of alternatives and did not pursue further.</p>

Non-Viable Alternatives (Does not meet all the Alternatives Criteria)

Non-Viable Alternative Description	Provides market assurance in meeting the growing firm demands along the Panhandle System for the next five years.	Increases Ontario customers' access to diverse supply, storage, and price transparency of the Dawn Hub.	Scalable with system growth.	Directly feeds area of growth.
Upsize of existing NPS 16 Panhandle Line west of Dover Transmission	✓	✓	X	X
Upsize of existing NPS 20 Panhandle Line west of Dover Transmission	✓	✓	✓	✓
Liquefied Natural Gas (LNG) Plant	✓	✓	✓	✓
Firm 3rd party exchange between Dawn and Ojibway (+21 TJ/d, maximum available)	X	X	X	✓
Demand side management alternative: Enhanced Targeted Energy Efficiency (ETEE)	X	X	✓	✓
Trucked Compressed Natural Gas (CNG)	✓	✓	✓	✓

ENBRIDGE GAS INC.

Answer to Interrogatory from  
OEB Staff ("STAFF")

INTERROGATORY

Reference:

Exhibit A, Tab 2, Sched 2, page 2; Exhibit B, Tab 1, Sched 1, page 18

Preamble:

Enbridge Gas noted that the capacity provided by the Project is intended to ensure the growing Panhandle Market has sufficient capacity until Winter 2028/2029. Enbridge Gas indicated that it has also identified the potential need for a second phase of transmission expansion to meet the demands that are forecasted over the next 20 years, with a forecasted 2029 in-service date.

Question:

- a) Please clarify why Enbridge Gas proposed sizing the Project specifically to provide incremental capacity to address a five-year forecasted shortfall (i.e. as opposed to a smaller or larger project that would address the shortfall for a shorter or longer time horizon, respectively).
- b) Did Enbridge consider a project alternative (e.g. increasing the pipeline sizes of the Project) that would avoid the need for a second phase of expansion? If so, please describe why Enbridge Gas rejected this option, with reference to factors (e.g., cost per unit capacity/NPV, demand forecast uncertainty, etc.) that contributed to Enbridge Gas's decision.

**Response**

- a) As discussed at Exhibit C, Tab 1, Schedule 1, the proposed Project is the most cost-effective alternative on a cost per unit of capacity basis and is capable of serving forecasted demand until Winter 2028/2029. Other Project benefits are discussed in the response at Exhibit I.EP.8.

/U

Enbridge Gas designed the proposed Project to address the five-year forecast shortfall, while providing a balance between cost efficiencies in the planning, development, construction of the Project, and the forecast variability in the later years of the forecast. The proposed Project provides market assurance in meeting the growing firm demands along the Panhandle System for the next five years.

- b) Yes. Enbridge Gas considered alternatives including increased pipeline diameter. The NPS 42 Panhandle looping of the NPS 20 Panhandle Line option was not selected as the preferred alternative for several reasons: /U
- It only provides 4 TJ/d of additional capacity compared to the NPS 36, because the NPS 20 Panhandle Line bottleneck beyond the proposed Project end point to Comber Transmission station is not alleviated.
  - It is not a consistent pipe size with the upstream NPS 36 pipeline between Dawn and Dover Transmission station.
  - There are increased costs due to the additional launcher and receiver facilities required for the integrity program; and,
  - It requires two separate integrity programs, introducing additional risk, cost, and gas handling complexity into the operation and maintenance of the Panhandle System.

For a summary of all viable pipeline facility alternatives, please see Attachment 1 at Exhibit I.STAFF.7.

In order to mitigate the capacity shortfall beyond Winter 2028/2029, the various pipeline facilities considered would need to be extended towards Comber Transmission station to increase system capacity and reduce or eliminate the system bottlenecks downstream of the proposed Project.

It is not possible to avoid the need for future facilities beyond Winter 2028/2029 by increasing the diameter of any of the viable pipeline alternatives. Please see the response to Exhibit I.SEC.4 part a), which explains the 5-year timing criterion (the Project is expected to be fully utilized by 2029). Supporting 5 years of forecast growth strikes an ideal balance between meeting near term demands with a high level of certainty, cost efficiencies in the planning, development and construction of facilities required, and flexibility to adjust the growth forecast with the best available information in the future.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
OEB Staff ("STAFF")

INTERROGATORY

Reference:

Exhibit B, Tab 1, Schedule 1, pages 8-9; IRP Decision and Order (EB- 2020-0091), page 94

Preamble:

Enbridge Gas noted that it has not received any interest from customers in turning back firm or interruptible capacity or converting existing firm capacity to interruptible capacity.

Question:

- a) Please provide a status update on the scope and timing of Enbridge Gas's efforts in response to the OEB's direction in the IRP Decision and Order to study how interruptible rates might be modified to increase customer adoption in order to help reduce peak demand.
- b) Is Enbridge Gas giving consideration to demand response Integrated Resource Planning Alternatives (IRPAs) for customers (contract or general service) on firm distribution service, either as:
  - i. an alternative to the proposed Project. Please describe any such alternative assessed.
  - ii. to avoid or defer the potential second phase of transmission expansion beyond 2028/2029 in this region? If so, please describe. If not, why not?

**Response**

- a) Enbridge Gas filed the interruptible rates study in its 2024 Rate Rebasing proceeding (EB-2022-0200) at Exhibit 8, Tab 4, Schedule 7 and expects an OEB Decision on the proposal in Q4 2023 or Q1 2024.

/U

b)

- i) Yes, Enbridge Gas did consider demand response as an IRP alternative to the Project. Specifically, Enbridge Gas offered contract customers the opportunity to replace firm services with interruptible services, and inquired whether customers would be more inclined to consider interruptible services if the opportunity to negotiate lower than posted interruptible rates was available. As described in Exhibit B, Tab 1, Schedule 1, Paragraph 28, only 2 bids or 3% of the total EOI interest indicated that interruptible services was a viable alternative. Further, only 5 bids or 8% of the total EOI interest (inclusive of the two bids mentioned above) indicated they would consider interruptible service as an alternative to firm service, with a required reduction ranging between 20% and 35% below current interruptible rates. Of those five bids, three bids indicated that interruptible service was not a viable option and did not specify how they would comply during an interruption event. These five bids were not significant enough to reduce or defer the scope of the Project See Exhibit A Tab 4 Schedule 1 Page 4 Paragraph 17. /U

ii)

Most of the large customers in the Project area cannot shift their natural gas demands to off peak times or have their firm natural gas demands interrupted. Many of the customers in the Project area operate greenhouses and cannot shift their natural gas demands to off peak times, as this would result in no heat in the greenhouse during peak periods, which could damage their crops. Aside from natural gas, the main alternate fuels used for heating in the greenhouse sector are oil, diesel and propane. Not only are these fuels typically more expensive than natural gas, but they would also prevent a greenhouse from using the CO<sub>2</sub> emissions within the greenhouse because other elements in the exhaust of those alternate fuels would harm the crops. Without the availability of natural gas, a more expensive and higher carbon intensive energy source would need to be procured for heat, and an alternative source of CO<sub>2</sub> would also be required to maintain production levels. Backup alternate fuel systems are also not intended or designed to be used for extended periods of time. The availability of alternate fuels is another concern. In general, switching fuel sources is disruptive for greenhouse operations.

There are also commercial, industrial, and power generation customers within the Project area for which a demand response, or interruptible service, is not a viable option, as a reduction in natural demand consumption would cause a disruption to operations, creating economic and productivity loss, uncertainty, as well as potential safety concerns for

processes that cannot be easily/safely shut down and restarted at great frequency.

iii) Please see the response at Exhibit I.STAFF.10 b).



ENBRIDGE GAS INC.

Answer to Interrogatory from  
OEB Staff ("STAFF")

INTERROGATORY

Reference:

Exhibit C, Tab 1, Schedule 1, pages 23-24; Exhibit C, Tab 1, Schedule 1, Attachment 2; [Greenhouse Energy Profile Study](#) (IESO website).

Preamble:

Enbridge Gas indicated that an Enhanced Targeted Energy Efficiency IRPA (ETEE) for general service customers was assessed and rejected due to insufficient demand reduction potential.

Question:

- a) Why was the scope of the analysis for this energy efficiency IRPA limited to general service customers, as opposed to the contract customers who are driving incremental demand growth?
- b) Has Enbridge Gas considered energy efficiency IRPAs for contract customers to avoid or defer the potential second phase of transmission expansion in this region?
- c) Given that all but one of the responses to the Expression of Interest for additional natural gas capacity came from greenhouses, what is Enbridge Gas doing (through its DSM programs), to mitigate the growth in natural gas demand from the greenhouse sector? Has Enbridge adjusted its DSM program mix or outreach strategy to focus more on this sector?
- d) Please describe how Enbridge Gas has made use of the analysis in the 2019 "Greenhouse Energy Profile Study" that Enbridge Gas supported.

## **Response**

- a) The Enhanced Targeted Energy Efficiency IRP alternative focused on the general service customers in the Project area because the potential for incremental energy efficiency programming-related reductions for contract customers (who are already active participants in Enbridge Gas's DSM programming and sophisticated energy consumers) are limited and would not provide enough capacity to reduce, defer or avoid the Project. In addition, the energy efficiencies gained through such conservation activities typically reduce annual consumption but may have limited impact on peak hour needs.
- b) Enbridge Gas will consider all IRP alternatives to reduce, avoid or defer the potential second phase of transmission expansion in this region as part of its annual review and assessment of identified system needs/constraints and projects in the Asset Management Plan.
- c) Enbridge Gas continuously evolves and adjusts its DSM program design and implementation approaches in response to customer and market needs. Some of the adjustments Enbridge Gas has made in recent years in response to growth in the greenhouse sector includes:
- Increased the number of utility Energy Solutions Advisors focused on the greenhouse sector, from four to six; and
  - Introduced new limited-time incentive offers of 20-50% more incentive per greenhouse project.

Enbridge Gas Energy Solutions Advisors provide greenhouse customers with project assistance and are continuously exploring and identifying new ways that greenhouse customers/operators can implement energy efficient process improvements.

- d) As discussed in part a) above, the Enhanced Targeted Energy Efficiency IRP alternative assessed focused on general service customers only, served by the Panhandle system. Therefore, the 2019 "Greenhouse Energy Profile Study" was not relevant to the assessment.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
OEB Staff ("STAFF")

INTERROGATORY

Reference:

Exhibit C, Tab 1, Schedule 1, pages 14-22

Preamble:

Enbridge Gas provides details on two IRPAs:

- i. Exchanges (nominal) between Dawn and Ojibway
- ii. Hybrid Alternative consisting of firm exchange between Dawn and Ojibway in combination with looping of the NPS 20 Panhandle Line west of Dover Transmission and installing a Leamington Lateral interconnect

Enbridge Gas noted that it has considered and rejected these alternatives to the Project.

Question:

- a) Please discuss the parameters used in the assessment of each IRP alternative and a Hybrid Alternative noted in the preamble.
- b) Please explain the grounds for rejecting exchanges between Dawn and Ojibway alternative and for rejecting the Hybrid Alternative.

**Response**

a) and b)

Both alternatives were evaluated based on the parameters of the Assessment Criteria described at Exhibit C, Tab 1, Schedule 1, Pages 3-4. Through their evaluation, they were rejected because they did not meet all necessary criteria.

For a summary of the assessment of viable alternatives and the rationale for their selection or rejection, please see the response at Exhibit I.STAFF.7 Attachment 1.

For a summary of the assessment of non-viable alternatives and the rationale for their rejection, please see the response at Exhibit I.STAFF.7 Attachment 2.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
OEB Staff (“STAFF”)

INTERROGATORY

Reference:

Exhibit E, Tab 1, Schedule 1, pages 2-3, Table 1: Project Cost Comparison – Panhandle Loop, Table 2: Project Cost Comparison- Leamington Interconnect

Preamble:

Enbridge Gas provided the following tables outlining Project cost comparisons for the Panhandle Loop and Leamington Interconnect segments, separately. Each segment has been compared to a recent expansion project on the Panhandle System.

Table 1: Project Cost Comparison – Panhandle Loop

Item No.	Description	(a) Current Project Panhandle Loop	(b) Comparison Forecast 2017 PRP (EB-2016-0186)	(c) Comparison Actual 2017 PRP (EB-2016-0186)	(d) = (a) – (c) Variance to Actual
	<i>Pipeline Diameter</i>	<i>NPS 36</i>	<i>NPS 36</i>	<i>NPS 36</i>	
	<i>Length (km)</i>	<i>19 km</i>	<i>40 km</i>	<i>40 km</i>	
	<i>Pipeline Material</i>	<i>Steel</i>	<i>Steel</i>	<i>Steel</i>	
1	Materials	56,600,000	23,800,000	24,480,000	32,120,000 (1)
2	Labour, External Permitting and Land, Outside Services	124,100,000	203,754,000	202,374,000	(78,274,000) (2)
3	Contingency	19,200,000	34,133,000	-	19,200,000
4	IDC	3,500,000	2,781,000	1,837,000	1,663,000
5	Total Direct Capital Cost	203,400,000	264,468,000	228,691,000	(25,291,000)
6	Indirect Overheads	43,200,000	-	-	43,000,000 (3)
7	Total Project Cost	246,600,000	264,468,000	228,691,000	17,709,000
8	Total Cost per km	12,978,947/km	6,611,700/km	5,717,275/km	7,261,672/km

Table 2: Project Cost Comparison – Leamington Interconnect

Item No.	Cost Description	(a) Current Project PREP: Leamington Lateral	(b) Comparison Forecast KTRP (EB-2018-0013)	(c) Comparison Actual KTRP (EB-2018-0013)	(d) = (a) – (c) Variance to Actual
	<i>Pipeline Diameter</i>	<i>NPS 16</i>	<i>NPS 20</i>	<i>NPS 20</i>	
	<i>Length (km)</i>	<i>12 km</i>	<i>19 km</i>	<i>19 km</i>	
	<i>Pipeline Material</i>	<i>Steel</i>	<i>Steel</i>	<i>Steel</i>	
1	Materials	13,200,000	7,724,000	8,932,428	4,267,572 (1)
2	Labour, External Permitting and Land, Outside Services	37,300,000	82,931,000	67,912,817	(30,612,817) (2)
3	Contingency	5,200,000	13,599,000	-	5,200,000
4	IDC	1,100,000	1,462,000	691,496	408,504
5	Total Direct Capital Cost	56,800,000	105,716,000	77,536,741	(20,736,741)
6	Indirect Overheads	11,000,000	-	-	11,000,000
7	Total Project Cost	67,800,000	105,716,000	77,536,741	(9,736,741)
8	Total Cost per km	5,650,000/km	5,564,000/km	4,080,881/km	1,569,119/km

Enbridge Gas stated that it is not aware of any other recent and comparable project approved by the OEB. Enbridge Gas noted that costs for these projects are not directly comparable with the cost estimates for the Projects because of differences in the characteristics and timing.

Question:

- a) For Table 1 and Table 2 above, please add rows that show the “material cost per km” and “labour, external permitting and land, and outside services per km.” Please explain the reasons for any variances in both material and labour costs per km as between the Project and the actual costs of the comparison projects.
- b) Please advise whether indirect overheads for the Panhandle Reinforcement Project have ever been identified.
- c) Please explain why there are indirect overheads forecast for the Project and not for the comparison projects in Tables 1 and 2.
- d) Please provide tables, using the same itemized cost description as in Tables 1 and 2 (including the additional rows requested by OEB staff in part (a)), separately comparing the costs for the Panhandle Loop and the Leamington Interconnect to more recent OEB approved projects that are not on the

Panhandle System with a similar pipeline size and length and/or based on customer demand growth. For context, OEB staff would like to see more recent projects to allow for a comparison of material and labour costs in current market conditions.

- e) Please provide any other information to support the reasonableness of the cost estimates for each Panhandle Loop and Leamington Interconnect in the context of the significantly higher costs per km for the Project relative to the actual costs of the comparable projects.

**Response**

- a) For the Panhandle Loop, please see Table 1. For the Leamington Interconnect, please see Table 2.

Table 1: Project Cost Comparison – Panhandle Loop with Cost per KM

Item No.	Description	(a) Current Project Panhandle Loop	(b) Comparison Forecast (2017 PRP (EB-2016-0186))	(c) Comparison Actual 2017 PRP (EB-2016-0186)	(d) = (a) - (c) Variance to Actual
	<i>Pipeline Diameter</i>	<i>NPS 36</i>	<i>NPS 36</i>	<i>NPS 36</i>	
	<i>Length (km)</i>	<i>19 km</i>	<i>40 km</i>	<i>40 km</i>	
	<i>Pipeline Material</i>	<i>Steel</i>	<i>Steel</i>	<i>Steel</i>	
1	Materials	56,600,000	23,800,000	24,480,000	32,120,000
2	Labour	124,100,000	203,754,000	202,374,000	(78,274,000)
3	Contingency	19,200,000	34,133,000	-	19,200,000
4	Interest During Construction	3,500,000	2,781,000	1,837,000	1,663,000
5	Total Direct Capital Cost	203,400,000	264,468,000	228,691,000	(25,291,000)
6	Indirect Overheads	43,200,000	-	-	43,200,000
7	Total Project Cost	246,600,000	264,468,000	228,691,000	17,909,000
8	Total Cost per km	12,979,000	6,612,000	5,717,000	7,262,000
9	Material Cost per km	2,979,000	595,000	612,000	2,367,000
10	Labour, External permitting and land, and Outside Services per km	6,532,000	5,094,000	5,059,000	1,473,000

**Table 2: Project Cost Comparison – Leamington Interconnect with Cost per KM**

Item No.	Description	(a) Current Project PREP: Leamington Lateral	(b) Comparison Forecast KTRP (EB-2018-0013)	(c) Comparison Actual KTRP (EB-2018-0013)	(d) = (a) - (c) Variance to Actual
	<i>Pipeline Diameter</i>	<i>NPS 16</i>	<i>NPS 20</i>	<i>NPS 20</i>	
	<i>Length (km)</i>	<i>12 km</i>	<i>19 km</i>	<i>19 km</i>	
	<i>Pipeline Material</i>	<i>Steel</i>	<i>Steel</i>	<i>Steel</i>	
1	Materials	13,200,000	7,724,000	8,932,428	4,267,572
2	Labour	37,300,000	82,931,000	67,912,817	(30,612,817)
3	Contingency	5,200,000	13,599,000	-	5,200,000
4	Interest During Construction	1,100,000	1,462,000	691,496	408,504
5	Total Direct Capital Cost	56,800,000	105,716,000	77,536,741	(20,736,741)
6	Indirect Overheads	11,000,000	-	-	11,000,000
7	Total Project Cost	67,800,000	105,716,000	77,536,741	(9,736,741)
8	Total Cost per km	5,650,000	5,564,000	4,081,000	1,569,000
9	Material Cost per km	1,100,000	407,000	470,000	630,000
10	Labour, External permitting and land, and Outside Services per km	3,108,000	4,365,000	3,574,000	(466,000)

The variance in material cost per km between the proposed Project (Panhandle Loop and Leamington Interconnect) and the comparison project actuals (2017 PRP and KTRP) is driven mainly by supply chain challenges in recent years, including:

- Global supply chain issues: Recent global conflicts and the COVID-19 pandemic have negatively impacted supply chain dynamics, causing an increase in costs for a wide range of products.
- Limited capacity at production facilities: Production facilities are experiencing capacity and labour challenges, resulting in fewer quantities of products being available, and therefore increasing their costs. More specifically, one valve supplier has recently filed for insolvency, further limiting supply options, and therefore increasing costs.

The variance in labour cost per km between the proposed Panhandle Loop and the comparison project actual (2017 PRP) reflects approximately a 4% annual increase, which is within the expected range of annual labour cost increases from recent years.

The variance in labour cost per km between the proposed Leamington Interconnect and the comparison project actual (KTRP) is primarily due to the abnormally wet weather experienced during the construction of the KTRP project. These weather delays resulted in higher than typical contractor/construction costs, which are not expected to re-occur during the construction of the proposed Project.



- b) Indirect overheads for the Panhandle Reinforcement Project have not been specifically identified due to the process to allocate overheads at the time. Please see the response to c) below.
- c) Enbridge Gas adopted the practice of including indirect overheads for reference purposes with Leave to Construct (“LTC”) applications effective in 2019. This change in presentation was made to facilitate the comparison of costs presented in the Incremental Capital Module (“ICM”) applications as part of the annual rates filings and the LTCs for the projects. Tables 1 and 2 represent a comparison of costs as per the LTCs filed for the KTRP (EB-2018-0013) and the 2017 Panhandle Reinforcement Project (EB-2016-0186). The LTCs for these projects were filed prior to the decision to include indirect overheads as part of LTC applications.

The OEB’s own Natural Gas Facilities Handbook (updated March 31, 2022), also explicitly considers indirect overheads to be included as part of Total Project Costs at pages 34 and 35.<sup>1</sup>

- d) Upon review of recent projects, Enbridge Gas could not find directly comparable projects to the proposed Project, in terms of the variables listed by OEB Staff (pipeline size and length, in current market conditions).<sup>2</sup>
- e) Please see response to a) above. Enbridge Gas undertook the following efforts during development of cost estimates, to capture current market pricing for materials and labour costs:
- Requested and received external budgetary vendor quotes for major equipment and materials, including large-bore valves and line pipe.
  - Requested and received external non-binding construction contractor quotes from 8 independent construction contractors that execute comparable projects within Canada.

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<sup>1</sup> <https://www.oeb.ca/sites/default/files/uploads/documents/regulatorycodes/2022-03/OEB-Natural-Gas-Facilities-Handbook-20220331.pdf>

<sup>2</sup> Enbridge Gas is interpreting “current market conditions” as the most recent 12 months, as many of the supply chain challenges described in part a) have evolved during that timeframe.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
OEB Staff ("STAFF")

INTERROGATORY

Reference:

Exhibit E, Tab 1, Schedule 1, page 1, paragraphs 1 and 2

Preamble:

The total estimated cost of the Project is \$314.4 million. Excluding indirect overheads, the total estimated cost is \$260.2 million. The contingency rate of 11% is applied to all direct capital costs based on the risk profile of the Project. Enbridge Gas cost estimates are based on "...a class 3 estimate prepared in Q1 2022 as per American Association of Cost Engineers."

Question:

Please respond to the following questions referring to the entire Panhandle Regional Expansion Project cost estimate and to each of the Panhandle Loop and Leamington Interconnect cost estimates.

- a) Please provide an overview of the American Association of Cost Engineers standards and classes of cost estimates as applied to the Project.
- b) Please identify the factors of the Project's costs risk profile and Enbridge Gas's strategies to manage these risks in order to reduce use of the contingency budget.
- c) Does Enbridge Gas anticipate changes in the 11% contingency for the Project and if so please discuss.
- d) Given the maturity of the Project design, please discuss the criteria applied to assign the Project a class 3 cost estimate set by the American Association of Cost Engineers.

**Response**

- a) Please see Table 1 below for the 5 estimate classes as outlined in American Association of Cost Engineers (“AACE”) Recommended Practice (RP) No. 18R-97.

**Table 1 – Estimate Classification**

ESTIMATE CLASS	Primary Characteristic	Secondary Characteristic			
	LEVEL OF PROJECT DEFINITION Expressed as % of complete definition	END USAGE Typical purpose of estimate	METHODOLOGY Typical estimating method	EXPECTED ACCURACY RANGE Typical variation in low and high ranges [a]	PREPARATION EFFORT Typical degree of effort relative to least cost index of 1 [b]
Class 5	0% to 2%	Concept Screening	Capacity Factored, Parametric Models, Judgment, or Analogy	L: -20% to -50% H: +30% to +100%	1
Class 4	1% to 15%	Study or Feasibility	Equipment Factored or Parametric Models	L: -15% to -30% H: +20% to +50%	2 to 4
Class 3	10% to 40%	Budget, Authorization, or Control	Semi-Detailed Unit Costs with Assembly Level Line Items	L: -10% to -20% H: +10% to +30%	3 to 10
Class 2	30% to 70%	Control or Bid/Tender	Detailed Unit Cost with Forced Detailed Take-Off	L: -5% to -15% H: +5% to +20%	4 to 20
Class 1	50% to 100%	Check Estimate or Bid/Tender	Detailed Unit Cost with Detailed Take-Off	L: -3% to -10% H: +3% to +15%	5 to 100

Notes: [a] The state of process technology and availability of applicable reference cost data affect the range markedly. The +/- value represents typical percentage variation of actual costs from the cost estimate after application of contingency (typically at a 50% level of confidence) for given scope.  
 [b] If the range index value of “1” represents 0.005% of project costs, then an index value of 100 represents 0.5%. Estimate preparation effort is highly dependent upon the size of the project and the quality of estimating data and tools.

- b) The potential for cost escalation of material and labour costs represents the most significant cost risk(s) for the project. Enbridge Gas has used recent external market data to estimate these costs and has advanced procurement of long lead time items and general materials to mitigate the effect of changing market conditions.
- c) There is no plan to reassess or change the contingency for the project.

- d) Enbridge Gas adheres to AACE definitions for Class 3 based on RP 18R-97. The following activities were completed in support of achieving a Class 3 classification:
- 30% engineering design was completed by external consultants:
    - i. 30% engineering design deliverables including alignment sheets, PFD's, P&ID's, plot plans, and 3D models were completed and validated with Enbridge Gas internal subject matter experts.
    - ii. A detailed equipment list was produced and used to determine material costs.
  - Requested and received external budgetary vendor quotes for major equipment and materials including large-bore valves and line pipe.
  - Requested and received external non-binding construction contractor quotes from 8 independent construction contractors that execute comparable projects within Canada.
  - Contingency was estimated using a proprietary and time-tested contingency model that aligns with best practices espoused by the AACE and Construction Industry Institute.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
OEB Staff ("STAFF")

INTERROGATORY

Reference:

Exhibit A, Tab 3, Schedule 1, page 5, paragraph 13; Enbridge Gas's 2023 Rates (Phase 1) Application (EB-2022-0133), Exhibit A, Tab 2, Schedule 1, page 2, paragraph 4

Preamble:

Enbridge Gas stated that if the Project meets the criteria for rate recovery through the ICM mechanism, then an ICM request for the costs of the Project may form part of its 2023 Rates (Phase 2) application. Enbridge Gas also stated that upon rebasing, it expects the capital costs associated with the Project will be included in rate base.

In Enbridge Gas's 2023 Rates<sup>1</sup> (Phase 1) application currently before the OEB, Enbridge Gas stated that it will not be proposing an ICM request for 2023 rates "...and as such, there will not be a Phase 2 of the 2023 Rates application".

Question:

- a) Regarding Enbridge Gas's recovery of costs associated with the Project, please confirm that Enbridge Gas will not file an ICM request for the Project.
- b) Please advise whether Enbridge Gas intends to include the capital costs associated with the Project in rate base upon rebasing. If so, please confirm whether Enbridge Gas expects to include the costs of the Project in rate base as part of Enbridge Gas's upcoming 2024 rebasing application. Otherwise, please explain Enbridge Gas's plan for the recovery of costs associated with the Project.
- c) Considering that the Panhandle Expansion Project consists of two projects with in- service dates on November 1, 2023 and November 1, 2024 respectively, please advise whether it is Enbridge Gas's plan to include the capital cost of the

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<sup>1</sup> EB-2022-0133

entire Project in the rate base in the upcoming rebasing application for rates effective January 1, 2024

**Response**

- a) Confirmed.
- b) Confirmed.
- c) The capital cost of the Project will form part of 2024 rate base for the 2024 rebasing application based on the in-service date of each phase of the project.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
OEB Staff ("STAFF")

INTERROGATORY

Reference:

Exhibit E, Tab 1, Schedule 1, pages 4-10; Exhibit E, Tab 1, Schedules 3-7.

Preamble:

Enbridge Gas noted that E.B.O. 134 is the appropriate economic test to apply to the Project, as the Project consists entirely of transmission pipeline infrastructure to which distribution customers do not directly connect.

Enbridge Gas noted that the Stage 1 Discounted Cash Flow (DCF) analysis for the Project shows that the Project has a Net Present Value (NPV) of negative \$95 million and a Profitability Index (PI) of 0.63. Enbridge Gas further noted that after the Stages 2 and 3 DCF analyses are applied, the NPV for the Project is between \$342 million and \$463 million, and the Project is economically feasible.

Question:

- a) Please explain why indirect overhead is not included as part of the cash outflows in the DCF analysis. As part of the response, please provide a reference to the E.B.O. 134 Report of the Board.
- b) Please discuss the contract demand for contract rate customers and volumes for general service customers used in the calculation of the transmission margin at Exhibit E, Tab 1, Schedule 4. Please explain how these contract demand and volume figures were derived. Further, please explain how these figures align with the statement that 98% of the incremental capacity created by the Project will meet contract rate customer demand.
- c) Please provide a detailed calculation supporting the Stage 2 DCF analysis at Exhibit E, Tab 1, Schedule 6.
  - i. Please explain the annual energy demand figure used in the Stage 2 DCF

- analysis. Specifically, please discuss this energy demand figure in the context that it appears that only 2% of the incremental capacity created by the Project is for general service customers.
- ii. Please explain how the fuel mix used in the Stage 2 DCF analysis was estimated.
  - iii. Please explain the \$0.14/m<sup>3</sup> price for natural gas used in the Stage 2 DCF analysis.
  - iv. Please confirm that the natural gas price used in the Stage 2 DCF analysis includes the cost of carbon.
- d) Please confirm that only the direct economic benefits associated with the Project are included in the Stage 3 DCF analysis at Exhibit E, Tab 1, Schedule 7.
- e) Please explain the GDP Factor and the Jobs Factor used in the Stage 3 DCF analysis.
- f) Please confirm that the economic benefits (e.g. GDP impact, taxes, etc.) listed in the Stage 3 DCF analysis are the same as used in previous E.B.O. 134 tests for OEB approved Panhandle projects. If there are any changes relative to previous applications for Panhandle projects, please explain those changes and provide rationale supporting the changes.

## **Response**

- a) E.B.O. 134 Report of the Board states “The Board finds that incremental costs should be used in evaluating the feasibility of system expansion.”<sup>1</sup> Indirect overhead is not an incremental cost and has therefore not been included in the DCF analysis.
- b) The contract demand for contract rate customers was derived by dividing the Contract Firm (Total Incremental Demand) forecast, as seen at Exhibit B, Tab 1, Schedule 1, Page 13, Table 2, by a heat value content of 0.03932 GJ per m<sup>3</sup>.

/U

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<sup>1</sup> Ontario Energy Board, E.B.O. 134 Report of the Board, June 1, 1987, paragraph 6.70



The volumes for general service customers were derived using Enbridge Gas's customer attachment forecast. The customer attachments are converted into an annual volumetric forecast based on a forecast normalized average consumption.

Enbridge Gas's pipeline systems are designed to serve the peak design day demands of natural gas consumers. The schedule referred to by OEB Staff (Exhibit E, Tab 1, Schedule 4) is the Calculation of Revenue for the Project, which is calculated based on annual volumes/demand. There is no direct correlation between annual demand (m<sup>3</sup>) and peak day demand (TJ/d) as each are highly dependent on temperature and individual customer demand profiles. In other words, the revenue forecast for the Project provided at Exhibit E, Tab 1, Schedule 4 cannot be compared to the statement that 94% of Project capacity is designed for contract rate customer demand at Exhibit B, Tab 1, Schedule 1, Paragraph 33, as the annual demand that underpins the Calculation of Revenue for the Project is not related to the peak design day demand.

- c) Please refer to Exhibit I.ED.14 Attachment 1 for a live Excel version of the calculation. /U
- i. The statement that 2% of the incremental capacity created by the Project is for general service customers is based on the Design Day Demand forecast as shown at Exhibit B, Tab 1, Schedule 1, Page 13, Table 2 (TJ/d). The Stage 2 energy demand figure is based upon the forecast annual energy provided to general service customers by the Project. Please also see the response to part b) above.
  - ii. The fuel mix used in the Stage 2 analysis is based upon the Statistics Canada report Households and the Environment: Energy Use.<sup>2</sup> The fuel mix was calculated assuming the exclusion of natural gas and wood from the Stats Canada data.
  - iii. The natural gas price has been updated to \$0.30/m<sup>3</sup>. The updated price is the average effective price for the 12 months ending March 2023 determined using the posted effective price from the Ontario Energy Board website.<sup>3</sup> See Table 1 below.

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<sup>2</sup> Statistics Canada Catalogue no. 11-526-S, Households and the Environment: Energy Use - 2011, Page 19, Table 2

<sup>3</sup> <https://www.oeb.ca/consumer-information-and-protection/natural-gas-rates/historical-natural-gas-rates>

Table 1: Average Effective Price of Natural Gas

<b>Date</b>	<b>Effective Price (¢/m<sup>3</sup>)</b>
Apr 2022	20.1518
Jul 2022	31.3751
Oct 2022	36.0910
Jan 2023	32.3821
<b>Average</b>	<b>30.0000</b>

- iv. The natural gas price of \$0.30/m<sup>3</sup> is a before cost of carbon price, however the cost of carbon has been included separately in the results of the Stage 2 analysis.
- d) Confirmed. Only economic benefits associated with the Project are included in the Stage 3 analysis.
- e) The GDP Factor and Jobs Factor quantifies the impact that infrastructure spending has on gross domestic product (“GDP”) and on the generation of jobs. The GDP factor of 0.91 indicates that GDP rises by \$0.91 per dollar of spending. The Jobs factor of 4.7 indicates that 4.7 jobs are generated per million dollars spent.
- f) Confirmed. The approach to economic benefits in the Stage 3 analysis are the same as used in previous OEB-approved Panhandle projects. The assumption figures for GDP and Jobs Factors have been updated in this analysis to reflect more current information (see footnote at Exhibit E, Tab 1, Schedule 7 for source).

ENBRIDGE GAS INC.

Answer to Interrogatory from  
OEB Staff ("STAFF")

INTERROGATORY

Reference:

Exhibit D, Tab 1, Schedule 1: Environmental Matters, page 13, paragraph 21

Preamble:

Enbridge Gas filed an application with the Technical Standards and Safety Authority (TSSA). Enbridge Gas stated that it has not received any concerns from the TSSA to date and expects to receive a letter indicating that they have completed their review of the design for the Project in the coming months.

Question:

Please provide an update on the status of the TSSA's review of the Project.

**Response**

The TSSA completed their review of the design for the Project and provided its final review letter on July 26, 2022 (see Attachment 1). Within the letter, the TSSA confirmed that "all outstanding items have been addressed by EGI".



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July 26, 2022  
Final review letter

**Re: Panhandle Regional Expansion project- TSSA file WO# 8096252 - OEB file number: EB-2022-0157**

The applicable regulation that applies to Panhandle Regional Expansion project is [Ontario Regulation 210/01: Oil and Gas Pipeline Systems](#). The applicable standard for this project is CSA Z662-19 which TSSA adopted under [Oil and Gas Pipeline Code Adoption Document \(CAD\)](#). The mentioned Code Adoption Documents (CAD) specifies the standards that are adopted by TSSA and any changes or addition to the requirements of CSA Z662-19.

TSSA audits all Pipeline operating companies that are licensed to transmit or distribute “gas” in the province of Ontario. TSSA also reviews and audits all new pipeline projects that are submitted to OEB for leave to construct. The review of the new pipeline projects submitted to OEB consists of reviewing the technical aspect of the project and focusing on compliance with the adopted standards and O.Reg.210/01. TSSA has the authority to issue an order to the operator for any non-compliances to the regulation and/or adopted standards.

This project so far has been reviewed on the technical aspects of the project including design, material specification, wall thickness calculation and stress on the pipe wall thickness on the maximum operating pressure. All outstanding items have been addressed by EGI.

TSSA may audit and inspect the EGI to ensure compliance with applicable technical and safety standards for the construction and operation of this project.

Should you have any questions, please contact me at 416.734.3539 or by e-mail at [kmanouchehri@tssa.org](mailto:kmanouchehri@tssa.org). When contacting TSSA regarding this file, please refer to the Service Request number provided above.

Yours truly,

A handwritten signature in black ink, appearing to read "Kourosh Manouchehri".

Kourosh Manouchehri, P.Eng.,  
Fuels Safety Engineer  
Tel.: (416) 734-3539  
Fax: (416) 231-7525

ENBRIDGE GAS INC.

Answer to Interrogatory from  
OEB Staff ("STAFF")

INTERROGATORY

Reference:

Exhibit F, Tab 1, Schedule 1: Environmental Matters, page 2, paragraphs 7 and 8

Preamble:

As part of the public consultation, Enbridge Gas held two virtual public information sessions:

- November 17, 2021 to December 3, 2021
- February 14, 2022 to February 28, 2022

Enbridge Gas stated that notification of these virtual information sessions were completed by newspaper publications, letters, social media and radio.

Question:

- a) Please describe the content and timing of the newspaper publications, letters, social media and radio notifications for the sessions
- b) Please provide the attendance of these virtual sessions.
- c) Please discuss the comments or concerns received in the virtual information sessions and any follow ups Enbridge Gas has undertaken to respond.

**Response**

- a) A description of the content and timing of the newspaper publications, letters, social media and radio notifications for Virtual Information Session #1 can be found at Section 3.4.1, Page 17, of the Environmental Report (Exhibit F, Tab 1, Schedule 1, Attachment 1).

A description of the content and timing of the newspaper publications, letters, social media and radio notifications for Virtual Information Session #2 can be found at Section 3.4.2, Page 17, of the Environmental Report (Exhibit F, Tab 1, Schedule 1, Attachment 1).

- b) Virtual Information Session #1 had 419 participants. Virtual Information Session #2 had 459 participants.<sup>1</sup>
- c) As noted in Section 3.6.1 of the Environmental Report, during the two virtual information sessions seven comment forms were received from the public.

The main areas of concern included:

- The location of the Preliminary Preferred Wheatley Interconnect/Preliminary Preferred and Preferred Routes of the Wheatley Lateral Reinforcement and the environmental and agricultural effects it could cause; and
- Construction logistics (type of equipment used, accessing gas from the Panhandle Loop segment, and construction area width).

It should also be noted that four additional comments were received from the public via the interactive mapping tool noting concerns over a species sighting (Western Chorus Frog [*Pseudacris triseriata*]), an unmarked grave, swimming pool infrastructure, and a planned condo development near the Panhandle Loop, while one comment was received regarding a septic tank near the Leamington Interconnect.

In addition, Boralex Richardson Windfarm provided comments on the interactive mapping tool during the first virtual information session noting concerns about access to their wind infrastructure, excavations near the foundational base of some of their wind infrastructure, and damage to buried power cables in proximity to the Panhandle Loop. It should be noted that representatives from Enbridge Gas spoke to a representative from Boralex on December 16, 2021 and provided further project information.

Voltage Power reached out to AECOM requesting mapping for the Panhandle Loop and existing 16' and 20' pipelines in order to evaluate their proposed transmission line. At the time of writing this ER, it was agreed that the mapping would be sent to Voltage Power for their use.

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<sup>1</sup> Environmental Report, Section 3.5.2, Page 18 (Exhibit F, Tab 1, Schedule 1, Attachment 1)

Enbridge Gas responded to and considered, where relevant, all comments received during the virtual information sessions.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
OEB Staff ("STAFF")

INTERROGATORY

Reference:

Exhibit F, Tab 1, Schedule 1: Environmental Matters, page 4, paragraph 13 and Environmental Report, Appendix E: Stage 1 Archeological Assessment Report

Preamble:

An archeological assessment for the Project is required by the Ontario Heritage Act and Standards and Guidelines for Consultant Archaeologist (2011). Enbridge Gas stated that it would conduct the archeological assessments required by the for the Project during "...the Spring, Summer and Fall 2022". As part of the Environmental Report, Enbridge Gas included the Stage 1 Archeological Assessment Report for the Project. The Stage 1 Archaeological Assessment report recommends that a Stage 2 Archaeological Assessment be conducted for all potentially undisturbed sites within the Project's study area.

Question:

- a) What is the status and projected completion of the surveys and studies required to conduct the Stage 2 Archeological Assessment?
- b) What is the anticipated date for filing the Stage 2 Archaeological Assessment Report with the Ministry of Tourism, Culture and Sport (MTCS) for a review?

**Response**

- a) The surveys and studies required to conduct the Stage 2 Archaeological Assessment for the Panhandle Loop are approximately 94% complete. The remaining 6% of surveys and studies required are specific to the Richardson Sideroad Station and adjacent lands. All surveys and studies are anticipated to be complete in the spring of 2024. /U



- b) The Stage 2 Archaeological Assessment Report was filed with the Ministry of Citizenship and Multiculturalism (“MCM”), formerly the Ministry of Tourism, Culture and Sport (“MTCS”) on January 25<sup>th</sup>, 2023, and is currently under review.<sup>1</sup> The report for the Richardson Sideroad Station and adjacent lands is anticipated to be filed with the MCM in the spring of 2024.

/U

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a) <sup>1</sup> This Report excludes the surveys and studies specific to the Richardson Sideroad Station and adjacent lands. The Stage 2 Archeological Assessment Report for the Richardson Sideroad Station and adjacent lands is anticipated to be filed with the MCM in the spring of 2024.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
OEB Staff (“STAFF”)

INTERROGATORY

Reference:

Exhibit F, Tab 1, Schedule 1: Environmental Matters, page 4, paragraph 14 and Environmental Report, Appendix F: Cultural Heritage Assessment Report: Existing Conditions and Preliminary Impact Assessment

Preamble:

As part of the environmental assessment process for the Project, in accordance with the *Ontario Heritage Act*, Enbridge Gas is required to complete a *Cultural Heritage Assessment Report* (CHAR) prior to construction and submit it to the MTCS for review and comment. Enbridge Gas included in the Environmental Report, *A Cultural Heritage Report: Existing Conditions and Preliminary Impact Assessment* (Preliminary CHAR). The Preliminary CHAR concluded that there are no municipally, provincially and/or federally recognized Built Heritage Resources (BHR) and Cultural Heritage Landscapes (CHL) directly (physically) impacted by the Project. Enbridge Gas has committed to the recommendations in the Preliminary CHAR which is attached to the Environmental Report.

Question:

- a) Please comment if Enbridge Gas has submitted the Preliminary CHAR to the MTCS for review and if any comments were received. If applicable, please describe the comment received and Enbridge Gas’s response.
- b) Please discuss if there are other MTCS reporting requirements regarding the final CHAR for the Project. If so, what is the anticipated timeline for addressing these requirements?

Response

- a) A Cultural Heritage Assessment Report was completed, and a copy was provided in the ER when submitted to the MTCS as part of the OPCC review. As part of the

report, the MTCS confirmed on December 31, 2021, that no properties designated by the Minister or other provincial heritage properties were located within, or adjacent to, the project study area.

- b) No further reporting requirements are required.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
OEB Staff ("STAFF")

INTERROGATORY

Reference:

Exhibit G, Tab 1, Schedule 1, pages 1-2

Preamble:

The proposed pipelines for the Project total approximately 31 km in length. The Project will require approximately 59.5 hectares (147 acres) of permanent easement. Enbridge Gas will also require approximately 83 hectares (205 acres) of temporary easement for construction and topsoil storage purposes.

Enbridge Gas has initiated meetings with the landowners where temporary or permanent land rights are required and will continue to meet with them to obtain all required land rights.

Question:

- a) Please quantify the total required permanent and temporary easements for the Panhandle Loop and Leamington Interconnect separately.
- b) Please identify the permanent and temporary easement agreements that have been obtained since the filing of this application.
- c) Please provide an update on the status and prospect of remaining land negotiations where permanent and temporary easements are required. Please include any concerns raised by landowners and Enbridge Gas's responses.
- d) Please discuss any expected delays with respect to obtaining the required land rights for the Project and its impact to the construction start and in-service date for the Panhandle Loop and Leamington Interconnect.

**Response**

a) Please see Table 1 below:

Table 1

<b>Panhandle Loop</b>	Acres	Hectares
TOTAL Proposed Permanent Easement	104	42.0
TOTAL Proposed Temporary Land Use (TLU)	177	71.6

b) – c) All required Easement and Temporary Workspace Agreements have been secured except for 2 properties.

One landowner (owning both properties) expressed a concern regarding the proposed location of an above-ground station, pipeline easement and temporary easement within the Project area. Enbridge Gas continues to evaluate all options and is taking the landowners comments into consideration.

d) Enbridge Gas expects to have acquired all necessary land rights in advance of commencing Project construction, and does not anticipate any delay to planned Project in-service date at this time.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
OEB Staff ("STAFF")

INTERROGATORY

Reference:

Exhibit G, Tab 1, Schedule 1, pages 4-5, Table 1: Potential Permits/Authorizations for the Project

Preamble:

Enbridge Gas identified the potential permits and authorizations required for the Project and listed them in Table 1 at the reference above.

Enbridge Gas also stated that other authorizations, notifications, permits and/or approvals may be required in addition to those identified in Table 1.

Question:

- a) For each of the potential permits/authorizations listed in Table 1, please confirm if it has been identified as a potential permit/authorization for the Panhandle Loop, Leamington Interconnect, or both.
- b) For each of the potential permits/authorizations listed in Table 1, please confirm if it is required for the Project.
- c) For each permit/authorization listed in Table 1 that Enbridge Gas requires, please provide an update on the status of the permit/authorization including when Enbridge Gas expects to acquire each required permit/authorization. Please also discuss any anticipated potential delays in acquiring each required permit/authorization.
- d) Has Enbridge Gas identified to date any other required permits/authorizations, in addition to those listed Table 1? If so, please describe the required permit(s)/authorization(s), the status and expected date for acquisition of the permit(s)/authorization(s), and whether the permit(s)/authorization(s) are required for the Panhandle Loop, Leamington Interconnect, or both.

**Response**

a) to d)

/U

Please see Table 1 below.

Enbridge Gas continues to make applications for all necessary permits and authorizations for the Project into the Fall of 2023 and anticipates having all permits and authorizations in place prior to the start of construction by March 31, 2024, with the exception of the Archeological Assessment and clearance from the Ministry of Citizenship and Multiculturalism (“MCM”) for the Richardson Sideroad Station and adjacent lands, which is anticipated to be submitted in the spring of 2024 with clearance obtained by the summer of 2024. Please also see Exhibit I.STAFF.18.

Enbridge Gas continues to actively engage all required permitting agencies and has received positive feedback regarding the Project to date. Therefore, the Company does not anticipate any permitting delays.

**Table 1: Potential Permits/Authorizations for the Project**

<b>AUTHORITY</b>	<b>PURPOSE</b>	<b>PERMIT STATUS</b>
<b>Provincial</b>		
Ontario Energy Board	Pursuant to section 90(1) of the Act, an Order granting leave to construct the Project. Pursuant to section 97 of the Act, an Order approving the form of pipeline easement agreement found at Exhibit G, Tab 1, Schedule 1, Attachment 3, and the form of temporary land use agreement found at Exhibit G, Tab 1, Schedule 1, Attachment 4.	In Progress
Ministry of Transportation	Encroachment permit to cross Hwy 401.	In Progress
Ministry of Citizenship and Multiculturalism	Archaeological clearance under the <i>Ontario Heritage Act</i> (OHA).	In Progress
Plains Midstream Canada ULC	Encroachment Agreement to cross Plains Midstream pipelines.	Received
Ministry of Environment, Conservation and Parks	Permitting or registration under the <i>Endangered Species Act</i> (ESA) (2007).	Received for the Endangered Species Act (ESA) (2007)

	Permit to Take Water (PTTW) or Environmental Activity and Sector Registry (EASR) (surface and groundwater) under the <i>Ontario Water Resources Act</i> (1990).	In Progress for Permit to Take Water (PTTW)
Ministry of Energy	Provision of a letter confirming the procedural aspects of consultation with potentially impacted Indigenous communities undertaken by Enbridge Gas for the Project is satisfactory.	In Progress
<b>Municipal</b>		
County of Essex	Municipal Consent of proposed alignment, including road occupancy permits for crossings and access off municipal roads.	In Progress, received permits for early access
Municipality of Chatham-Kent		In Progress, received permits for early access
Municipality of Lakeshore		In Progress
Lambton County		In Progress
<b>Other</b>		
Canadian Pacific Railway	Crossing Agreement to cross under railway corridor.	In Progress
Via Rail Canada Inc.	Crossing Agreement to cross under railway corridor.	In Progress
Landowner agreements for easements, temporary working space and/or storage sites	Obtain required Easement agreements. Obtain required TLU Agreements.	In Progress
Lower Thames Valley Conservation Authority	Development Permits under Ontario Regulation 152/06 (Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses), as per the <i>Conservation Authorities Act</i> (1990)	Received



ENBRIDGE GAS INC.

Answer to Interrogatory from  
OEB Staff (“STAFF”)

INTERROGATORY

Reference:

Exhibit H, Tab 1, Schedule 1, Attachment 6 and Attachment 7

Preamble:

In accordance with the OEB’s Environmental Guidelines, Enbridge Gas contacted the Ministry of Energy (MOE) on June 29, 2021 with respect to the Crown’s duty to consult related to the Project. The MOE by way of a letter, delegated the procedural aspects of the Crown’s Duty to Consult for the Project to Enbridge Gas on August 6, 2021 (Delegation Letter).

In the Delegation Letter, the MOE identified six Indigenous communities that Enbridge Gas should consult in relation to the Project. In a follow-up email on August 6, 2021, the MOE asked that Delaware Nation be included in the engagement and consultation on the Project based on a “best practice based on proximity”. On June 10, 2022, Enbridge Gas provided to the MOE the Indigenous Consultation Report (ICR) for the Project. Enbridge Gas filed the ICR and supporting documents with the application’s evidence (Attachment 7). Upon its review of the ICR and monitoring the consultation related to the Project the MOE would issue to Enbridge Gas a letter indicating if in its opinion the procedural aspects of consultation undertaken by Enbridge Gas are satisfactory (Letter of Opinion). In accordance with the Indigenous consultation documentation protocol set in the OEB’s Environmental Guidelines, Enbridge Gas would file the Letter of Opinion with the OEB.

As part of the evidence, Enbridge Gas filed a summary of the Indigenous consultation activities (Attachment 6). The information Enbridge Gas filed at Attachments 6 and 7 describes the Indigenous consultation up to June 7, 2022.

Question:

- a) Please update the logs on Indigenous consultation activities and engagement since June 7, 2022. Please summarize any issues and

concerns that each of the engaged Indigenous communities raised to date.

- b) For each of the Indigenous communities consulted, please outline Enbridge Gas's plans, actions and commitments to continue to engage and, as appropriate:
- i) address any concerns
  - ii) resolve any outstanding issues or otherwise provide accommodation
  - iii) offer capacity funding
- c) Please update the evidence with a summary description and copies of any documentation on communication between the MOE and Enbridge Gas after June 7, 2022 regarding the MOE's review of Enbridge Gas's Indigenous consultation activities.
- d) Please obtain an update from the MOE on the status and anticipated timeline of receiving a Letter of Opinion for the Project.

## **Response**

- a) Please see Attachment 1 to this response for Enbridge Gas's updated Indigenous Engagement Log since the submission of Exhibit H, Tab 1, Schedule 1, Attachment 7, updated as of September 9, 2022.

During a meeting on July 19, 2022, CKSPFN/TFG asked a number of questions regarding the Project. These questions and Enbridge Gas's responses are set out in Attachment 2 to this response.

At various times since filing the current Application with the OEB, AFN, CKSPFN and WIFN expressed concerns during their respective reviews of the ER related to fugitive emissions, cumulative effects and mitigation measures. Please see Attachment 3 to this response for the First Nation's comments on the ER and how Enbridge Gas has addressed or plans to address their respective concerns.

- b) Aamjiwnaang First Nation
- Enbridge Gas has received comments from AFN regarding the ER and provided responses back for AFN's review. Enbridge Gas has offered to meet again to review the responses provided and address any issues or concerns AFN might have. As of September 9, 2022, Enbridge Gas is not aware of any outstanding concerns or issues.

- Enbridge Gas will continue to provide updates and engage with AFN on the Project.
- Capacity funding has been provided to AFN for their engagement in this Project.

#### Caldwell First Nation

- Enbridge Gas has requested a meeting to discuss the Project with CFN and engage on their Consultation Protocol. As of September 9, 2022, CFN has not advised Enbridge Gas that there are any outstanding concerns or issues. When CFN would like to meet, Enbridge Gas would be happy to discuss the Project with them. As CFN is engaged in the OEB proceeding for the Project, questions are also being addressed through the Interrogatory process.
- Enbridge Gas will continue to provide updates and engage with CFN on the Project.
- Enbridge Gas has offered capacity funding to CFN on multiple occasions.

#### Chippewa of Kettle and Stony Point First Nations

- Enbridge Gas has received comments from CKSPFN regarding the Environmental Report and provided responses back for CKSPFN's review. Enbridge Gas has offered to meet again to review the responses and address any issues or concerns CKSPFN might have. As CKSPFN is engaged in the OEB proceeding for the Project, questions are also being addressed through the Interrogatory process.
- Enbridge Gas will continue to provide updates and engage with CKSPFN on the Project.
- Capacity funding has been provided to CKSPFN for their engagement on this Project.

#### Chippewas of the Thames First Nation

- Enbridge Gas has received comments from COTTFN regarding the Environmental Report and is in the process of providing responses back for COTTFN's review. Enbridge Gas will offer to meet to review the responses and address any issues or concerns COTTFN might have.
- Enbridge Gas will continue to provide updates and engage with COTTFN on the Project.
- Capacity funding has been provided to COTTFN for their engagement in this Project.

Walpole Island First Nation

- Enbridge Gas has received comments from WIFN regarding the Environmental Report and provided responses back for WIFN's review. Enbridge Gas has offered to meet again to review the responses and address any issues or concerns WIFN might have. As of September 9, 2022, Enbridge Gas is not aware of any outstanding concerns or issues.

- c) On June 10, 2022, an Enbridge Gas representative emailed the MOE advisor to advise of the filing of the Application with the OEB. On June 13, 2022, the MOE acknowledged the email (please see Attachment 4 for this correspondence).

On September 6, 2022, an Enbridge Gas representative emailed the MOE advisor to request an update from the MOE on the status and anticipated timeline of receiving a Letter of Opinion for the Project, as per the request at part d) below. The MOE advisor responded on the same day to provide details on their interactions to date with Indigenous Nations (please see Attachment 5 for this correspondence).

- d) Please see Attachment 5 to this response for the update provided by the MOE as requested. As per the MOE email dated September 6, 2022:

ENERGY is in the process of discussing with communities their experiences with Enbridge's consultation to-date on the Panhandle project. ENERGY continues to monitor the OEB process and is reviewing Three Fires Group's interests and concerns. ENERGY's intent is to provide the Letter of Opinion by the end of the record closing.

**Enbridge Gas Inc. Indigenous Engagement Log**

Log updated as of September 9, 2022

<b>Aamjiwnaang First Nation (AFN)</b>					
<b>Line Item</b>	<b>Date</b>	<b>Method</b>	<b>Summary of Enbridge Gas Inc. ("Enbridge Gas") Engagement Activity</b>	<b>Summary of Community's Engagement Activity</b>	<b>Outstanding Issues or Concerns</b>
1.15	June 9, 2022	Email	The Enbridge Gas representative sent an email to the AFN representative to provide a monthly update of Enbridge Gas's proposed projects. The update provided information regarding the Project status, Outstanding Engagement Request and proposed OEB Project Application filing date. The Enbridge Gas representative advised that capacity funding was available to support engagement on Enbridge Gas projects.		
1.16	June 13, 2022	Email		The AFN representative emailed the Enbridge Gas representative inquiring about the due date for feedback on the Environmental Report.	
			The Enbridge Gas representative advised the Project application had been submitted to the OEB on June 10, 2022 but noted they could update the OEB and MOE on any additional comments received. The Enbridge Gas representative advised they could discuss AFN's comments during their June 28, 2022 meeting with the environmental committee.		
1.17	June 27, 2022	Email		The AFN representative emailed their comments on the environmental report to the Enbridge Gas representative. Capacity funding was provided to AFN and accepted on May 16, 2022.	
1.18	June 28, 2022	Virtual Meeting	Enbridge Gas and the AFN environmental committee met to discuss Enbridge Gas projects. Enbridge Gas reviewed the scope, route and species at risk for the Project. An Enbridge Gas representative advised that field surveys were being completed and Indigenous monitors representing AFN would be attending.		
				An AFN representative asked who was monitoring and who received the results of the fieldwork.	
			The Enbridge Gas representative responded that Tri-Tribal Monitoring service has been in the field on behalf		

			of AFN for the Project and that the results of the findings would be included in the Stage 2 report, which would be forwarded to AFN upon completion.		
				An AFN representative provided an update to the Environmental committee members that the Project environmental report underwent a technical review by Vertex, a third party environment firm representing AFN, and their comments were sent to Enbridge Gas on June 27. She advised the committee that Enbridge Gas would respond to the comments.	
1.19	August 12, 2022	Email	The Enbridge Gas representative sent an email to the AFN representative to provide a monthly update of Enbridge Gas's proposed projects. The update provided information regarding the Project status, Outstanding Engagement Request and proposed OEB Project Application filing date. The Enbridge Gas representative advised that capacity funding was available to support engagement on Enbridge Gas projects.		
1.20	September 8, 2022	Email	The Enbridge Gas representative emailed the AFN representative the responses to their comments on the environmental report (Exhibit I.STAFF.22, Attachment 3). The Enbridge Gas representative also provided a copy of the field study memo provided by the environmental consultant and generic sediment control plans for Dam & Pump, HDD, and Temporary Vehicle Crossings. The Enbridge Gas representative requested a meeting with AFN following their review of the comments.		
<b>Caldwell First Nation (CFN)</b>					
Line Item	Date	Method	Summary of Engagement Activity	Response from Community/Outstanding Issues	Outstanding Issues or Concerns
2.17	June 9, 2022	Email	The Enbridge Gas representative sent an email to the CFN representative to provide a monthly update of Enbridge Gas's proposed projects. The update provided information regarding the Project status, Outstanding Engagement Request and proposed OEB Project Application filing date. The Enbridge Gas representative advised that capacity funding was available to support engagement on Enbridge Gas projects.		
2.18	July 5, 2022	Telephone call	An Enbridge Gas representative called the CFN representative to follow up		

			on emails and left a voice mail message with a return phone number.		
2.19	July 11, 2022	In Person discussion	An Enbridge Gas representative met with a CFN representative who confirmed that Enbridge Gas was reaching out to the appropriate contact within the community.		
2.20	July 19, 2022	Email	The Enbridge Gas representative emailed the CFN representative, regarding the Fieldwork Participation Agreement (FPA). The Enbridge Gas representative advised that they would like to use the same FPA agreement for all Nations to ensure consistency and transparency. Enbridge Gas advised they would provide an FPA for the Project and noted capacity funding was available for CFN to obtain a legal review of the FPA.		
2.21	July 25, 2022	Email		The CFN representative emailed the Enbridge Gas representative advising CFN preferred to draft their own contracts, noting a pan-Indigenous approach to the contract was not satisfactory.	
2.22	August 5, 2022	Email	The Enbridge Gas representative emailed the CFN representative clarifying they did not use a pan-Indigenous approach to contracts, noting they preferred to standardize agreements for legal and contract management purposes. The Enbridge Gas representative advised they made accommodations to the best of their ability, and provided a draft agreement with suggested revisions. The Enbridge Gas representative provided an overview of rates, advising capacity funding was available for training or personal protection equipment.		
2.23	August 12, 2022	Email	The Enbridge Gas representative sent an email to the AFN representative to provide a monthly update of Enbridge Gas's proposed projects. The update provided information regarding the Project status, Outstanding Engagement Request and proposed OEB Project Application filing date. The Enbridge Gas representative advised that capacity funding was available to support engagement on Enbridge Gas projects.		
				The CFN representative emailed the Enbridge Gas representative advising they would provide comments once the CFN leadership had completed their	

				review of projects in their traditional territory.	
2.24	August 22, 2022	Email		The CFN representative emailed the Enbridge Gas representative advising the rates suggested by Enbridge Gas were acceptable, noting capacity funding would be negotiated from project to project. The CFN representative advised they accepted the recommended revisions to the CFN fieldwork participation agreement and the agreement for execution. The CFN representative requested the agreement be modified for future projects.	
			On August 24, 2022, the Enbridge Gas representative emailed the CFN representative providing the fieldwork participation agreement for execution. The Enbridge Gas representative requested a meeting to discuss the project and capacity funding.		
2.25	August 26, 2022	Email		The CFN representative emailed the Enbridge Gas representative the signed copy of the FPA for the Project. The CFN representative advised they would be interested in meeting to identify gaps in capacity in regard to the Project. The CFN representative advised it would be best to meet with CFN and the Three Fires Group (TFG) as the parties are working together.	
2.26	September 9, 2022	Email	The Enbridge Gas representative emailed the CFN representative to request some dates for a meeting with CFN and TFG and to also provide clarity on the partnership or arrangement between the two parties with respect to consultation on the Project.		
<b>Chippewas of Kettle and Stony Point First Nation (CKSPFN)</b>					
<b>Line Item</b>	<b>Date</b>	<b>Method</b>	<b>Summary of Engagement Activity</b>	<b>Response from Community/Outstanding Issues</b>	<b>Outstanding Issues or Concerns</b>
3.20	June 8, 2022	Email		A representative from the Three First Group, acting on behalf of CKSPFN, (TFG) sent an email to the Enbridge Gas representative to advise they required an extension of June 28, 2022 to review and comment on the environmental report for the Project. The TFG representative asked when the Project application was being filed with the OEB.	
			On June 9, 2022, the Enbridge Gas representative replied to the CKSPFN representative advising that the		



			Project application was anticipated to be filed on June 10, 2022. The Enbridge Gas representative requested a meeting after June 28, 2022 following CKSPFN's review of the environmental Report.		
3.21	June 28, 2022	Email		The CKSPFN representative emailed the Enbridge Gas representative advising they would provide their comments on the Environmental Report by July 5, 2022 and requested Enbridge Gas's availability for a meeting the week of July 18, 2022.	
				The Enbridge Gas representative emailed the CKSPFN representative providing their availability for a meeting on July 18 and 19, 2022.	
				The parties agreed to meet on July 19, 2022.	
3.22	July 5, 2022	Email		The CKSPFN representative emailed the Enbridge Gas representative providing their comments on the Project Environmental Report.	
				On the same day, the Enbridge Gas representative acknowledged receipt of the email.	
3.23	July 11, 2022	In person Meeting	The Enbridge Gas and CKSFPN/Three Fires Group (TFG) representatives met in person to discuss opportunities for business partnerships on Enbridge Gas work.		
				The TFG requested information regarding the general contractors for the Project.	
3.24	July 14, 2022	In Person Meeting	An Enbridge representative met in person with a representative from TFG to discuss opportunities for supply chain inclusion, bid timing of the RFP and construction timelines for the Project.		

3.25	July 19	Virtual meeting	<p>The Enbridge Gas representative had a conference call with CKSPFN regarding the Project. Topics of discussion included the purpose of the Project, water crossings, emissions, and the Environmental Report.</p>		
				<p>For the questions asked by TFG and the responses to these questions, please see Exhibit I.STAFF.22, Attachment 2</p>	
			<p>The Enbridge Gas representative advised they would provide responses to the questions not answered in the meeting in a follow up email.</p>		
3.26	July 19, 2022	Email	<p>The Enbridge Gas representative emailed the CKSPFN representative to confirm the contracting authority (Three Fires Group or CKSPFN) for the Fieldwork Participation Agreement.</p>		
				<p>On July 20, 2022, the CKSPFN representative replied and advised they would confirm the appropriate contracting authority for CKSPFN.</p> <p>The CKSPFN representative requested that Enbridge Gas email all consultants to ensure that the consultation email address was being used for all monitoring invitations.</p>	
			<p>The Enbridge Gas representative emailed the environmental consultant for the Project and included the CKSPFN representative to confirm that all emails should be sent to the consultation email address provided.</p>		
3.27	July 25, 2022	Email	<p>The Enbridge Gas representative emailed the CKSPFN representative providing the shape files for the Project.</p>		
3.28	July 27, 2022	Email	<p>The Enbridge Gas representative emailed the CKSPFN representative to provide updates on outstanding items. The Enbridge Gas representative advised that the response to CKSPFN's comments on the environmental report were delayed and an update would be provided the following week. The Enbridge Gas representative also advised that the shape files had been sent.</p>		
3.29	July 29, 2022	Email		<p>The TFG representative emailed the Enbridge Gas representative requesting Project details on the General Contractor bid list, timing</p>	

				of RFP and timelines for construction work.	
			On August 10, 2022, the Enbridge Gas representative replied to the TFG representative to provide the details requested.		
3.30	August 2, 2022	Email	<p>The Enbridge Gas representative emailed the CKSPFN representative providing a comment tracker and generic sediment control plans for Dam &amp; Pump, HDD, and Temporary Vehicle Crossings in response of the July 19, 2022 meeting. The Enbridge Gas representative noted some responses to the inquiries raised would be responded to within the environmental report responses and indicated they could be available later that week.</p> <p>Please see Exhibit I.STAFF.22, Attachment 2 for responses to the questions posed at the July 19, 2022 meeting.</p>		
3.31	August 11, 2022	Email	<p>The Enbridge Gas representative emailed the CKSPFN representative with an update email to advise on the status of responding to the comments received from CKSPFN regarding the environmental report . Enbridge Gas advised that their responses to the environmental would be ready for review the week of August 15, 2022, which would allow CKSPFN to review them prior to the OEB Intervenor comments due in early September. The Enbridge Gas also inquired as to any items CKSPFN has requested that remains outstanding.</p>		
3.32	August 12, 2022	Email	<p>The Enbridge Gas representative sent an email to the CKSPFN representative to provide a monthly update of Enbridge Gas’s proposed projects. The update provided information regarding the Project status, Outstanding Engagement Request and proposed OEB Project Application filing date. The Enbridge Gas representative advised that capacity funding was available to support engagement on Enbridge Gas projects.</p>		
3.33	August 18, 2022	Email	<p>The Enbridge Gas representative emailed the CKSPFN representative to provide its responses to CKSPFN’s comments on the environmental report (Exhibit I.STAFF.22, Attachment 3). The Enbridge Gas representative requested a meeting with CKSPFN to discuss the responses once CKSPFN</p>		

			<p>has had an opportunity to review them.</p> <p>Please see (Exhibit I.STAFF.22, Attachment 3) for responses to the CKSFPN environmental report.</p>		
3.34	August 24, 2022	Email	<p>The Enbridge Gas representative emailed the CKSFPN representative following up on an email sent on July 19 regarding the fieldwork participation agreement. The Enbridge Gas representative provided a copy of the standard fieldwork participation agreement for their review and requested clarity on which authority should be listed on these agreements (CKSFPN or TFG).</p>		
3.35	September 7, 2022	Email	<p>The Enbridge Gas representative emailed the CKSFPN representative a copy of the field study memo provided by the environmental consultant.</p>		

**Chippewas of the Thames First Nation (COTTFN)**

Line Item	Date	Method	Summary of Engagement Activity	Response from Community/Outstanding Issues	Outstanding Issues or Concerns
4.17	June 10, 2022	Email	<p>The Enbridge Gas representative emailed the COTTFN representative providing a June 2022 Project update. The Enbridge Gas representative advised comments received on the Environmental Report could be incorporated at any time. The Enbridge Gas representative requested a meeting in July 2022 to review COTTFN's comments on the environmental report.</p>		
4.18	July 25, 2022	Email		<p>The COTTFN representative emailed the Enbridge Gas representative advising they would provide their comments on the Environmental Report later that week. The COTTFN representative provided their availability for a community information session on current Enbridge Gas projects.</p>	
4.19	July 28, 2022			<p>The COTTFN representative emailed the Enbridge Gas representative providing their comments on the Project Environmental Report, and an invoice.</p> <p>COTTFN addressed concerns in the environmental report regarding mitigation measures, cumulative effects, and other issues.</p>	

				The letter requested a community engagement session in the fall 2022.	
4.20	Aug 2, 2022		The Enbridge Gas representative emailed the COTTFFN representative advising the Project team was working on responses to their comments on the Environmental Report. The Enbridge Gas representative noted they would schedule a community information session on current Enbridge projects for the fall 2022.		
4.21	Aug 12, 2022	Email	The Enbridge Gas representative sent an email to the COTTFFN representative to provide a monthly update of Enbridge Gas's proposed projects. The update provided information regarding the Project status, Outstanding Engagement Request and proposed OEB Project Application filing date. The Enbridge Gas representative advised that capacity funding was available to support engagement on Enbridge Gas projects.		
<b>Oneida Nation of the Thames (Oneida Nation)</b>					
Line Item	Date	Method	Summary of Engagement Activity	Response from Community/Outstanding Issues	Outstanding Issues or Concerns
5.11	June 10, 2022	Email	The Enbridge Gas representative was supposed to meet with the Oneida Nation representation on June 10, 2022 to discuss the Project, but the Oneida Nation representative was no longer available. The Enbridge Gas representative established a meeting for June 29, 2022. In addition to this, the Enbridge Gas representative advised comments received on the Environmental Report could be incorporated at any time. The Enbridge Gas representative requested a meeting in July 2022 to review the Oneida Nation's comments on the environmental report.		
5.12	June 29, 2022	In Person Meeting	The Enbridge Gas representative met with the Oneida Nation representative in Oneida First Nation. The Enbridge Gas representative provided a Project update. The Oneida Nation representative had no concerns with respect to the Project status.		
5.13	August 12, 2022	Email	The Enbridge Gas representative sent an email to the Oneida Nation representative to provide a monthly update of Enbridge Gas's proposed projects. The update provided information regarding the Project status, Outstanding Engagement Request and proposed OEB Project		

			Application filing date. The Enbridge Gas representative advised that capacity funding was available to support engagement on Enbridge Gas projects.		
<b>Walpole Island First Nation (WIFN)</b>					
<b>Line Item</b>	<b>Date</b>	<b>Method</b>	<b>Summary of Engagement Activity</b>	<b>Response from Community/Outstanding Issues</b>	<b>Outstanding Issues or Concerns</b>
6.19	June 9	Email	The Enbridge Gas representative emailed the WIFN representatives providing an update on the Project and requested a meeting to discuss the Project.		
6.20	June 20, 2022	Email		The WIFN representative emailed the Enbridge Gas representative providing their comments on the environmental report for the Project.  Capacity funding was provided to WIFN and accepted on May 16, 2022.	
6.21	July 13, 2022	In person meeting	The Enbridge Gas representative and the WIFN representative met to discuss the Project. Supply chain management was discussed, and information was provided on how WIFN businesses could participate in the supply chain management aspect of Enbridge Gas projects.		
6.22	August 12, 2022	Email	The Enbridge Gas representative sent an email to the WIFN representative to provide a monthly update of Enbridge Gas's proposed projects. The update provided information regarding the Project status, Outstanding Engagement Request and proposed OEB Project Application filing date. The Enbridge Gas representative advised that capacity funding was available to support engagement on Enbridge Gas projects.		
6.23	September 8, 2022	Email	The Enbridge Gas representative emailed the WIFN representative the responses to their comments on the environmental report. The Enbridge Gas representative also provided a copy of the field study memo provided by the environmental consultant and generic sediment control plans for Dam & Pump, HDD, and Temporary Vehicle Crossings. The Enbridge Gas representative requested a meeting with WIFN following their review of Enbridge Gas's responses to their comments.		

			Please see Exhibit I.STAFF.22, Attachment 3 for responses to the WIFN's environmental report.		
				On September 9, 2022, the WIFN representative acknowledged receipt of the email.	

Three Fires Group and Enbridge Gas meeting – July 19, 2022			
	TFG Question/Comment	Enbridge Gas Response/Comment	Follow up items from meeting
1.	Three Fires Group (TFG) asked to be informed if Enbridge Gas proceeds with originally proposed distribution lines for the Panhandle project, as they would like to be consulted on them as early as possible in the process.	Enbridge Gas agreed to meet early to discuss the proposed distribution lines for the Panhandle project if these proceed.	
2.	TFG asked when they would be receiving the ER comments for Panhandle that were sent to EGI on July 5, 2022	Enbridge Gas advised that they were working on the responses and should have drafts this week from the environmental consultants. Enbridge Gas committed to providing the Panhandle responses by July 29; however, due to vacations, this might not be feasible and Enbridge Gas would provide an update next week.	Enbridge Gas provided an update on Wednesday, July 27 that the responses would be provided the following week.
3.	TFG asked what the need was for the Project? Was it driven by large development such as the battery plant or Greenhouses?	Enbridge Gas advised that the need for the Panhandle Project stemmed from an increased need for gas supply in the general region. Greenhouses were a factor driving the need for gas supply. Enbridge	In the OEB application for the Project, Exhibit B Tab 1 Schedule 1, the need is described as follows:  11. Enbridge Gas launched an Expression of Interest (“EOI”) process in February 2021 to formally gauge interest for incremental growth on the Panhandle system.  15. Of the 44 bid forms received, 43 of the requests for additional capacity were from customers in the greenhouse



		Gas advised they would take the question away and confirm.	sector and one request was from a large power generator (Brighton Beach Power L.P. (doing business as Atura Power ("Atura"))).  18. After the close of the EOI process, Enbridge Gas was approached by a large industrial customer from the automotive industry (Stellantis N.V. ("Stellantis")) which requested incremental natural gas service to their planned large scale electric vehicle ("EV") battery manufacturing facility in Windsor, Ontario.
4.	TFG asked if the need for the Project was power generation specific	The Enbridge Gas representative advised they were not aware of any power generation that was needing additional gas supply from this Project but would confirm.	Please see the response above.
5.	TFG asked for the shape files for both the Dawn Corunna and Panhandle Project	The Enbridge Gas representative advised they would supply the shape files.	The shape files for the Panhandle Project were provided on Monday, July 25. The shape files for Dawn Corunna were provided on July 28.
6.	TFG advised that all Enbridge Gas correspondence with CKSPFN go through the consultation inbox	The Enbridge Gas representative confirmed they would send correspondence through the requested inbox.	
7.	The TFG representative asked about the cumulative effects assessment and why it is only limited to the construction phase of the project and not the operations phase.	The Enbridge Gas representative advised that he would follow up with a response.	This question will be addressed in the ER response table.
8.	The TFG representative asked about figure 1 (Panhandle Loop: Route Alternative Study	The Enbridge Gas representative advised	The Route Alternative Study Area is defined and explained in Section 2.2.1 of the ER.

	Area) and figure 2 (Panhandle preliminary). Why were the study boundaries used?	they would go back to Aecom to get a response.	
9.	The TFG representative advised that GHG and fugitive emissions within the CKSPFN traditional territory were a concern. The TFG asked about the anticipated fugitive emissions from the Project.	The Enbridge Gas representative advised they would seek out and provide a response.	Enbridge Gas has estimated that the incremental fugitive and vented (including integrity digs) emissions due to this project are approximately 238 tCO <sub>2</sub> e/yr. This considers emissions due to operations only.
10.	The TFG representative asked if we were transporting anything other than natural gas within the pipeline?	The Enbridge Gas representative advised that the line was for Natural Gas. The Enbridge Gas representative advised that they would also provide a response to this question within the response to the ER.	<p>It is important to clarify that the compatibility of steel transmission pipelines with blended or pure hydrogen remains under active investigation. While Enbridge Gas is evaluating the general compatibility of materials and systems up to 100% hydrogen, the upper limit has not yet been determined. These efforts underscore Enbridge Gas's proactive steps in working to ensure the gas grid of the future is able to deliver a lower carbon fuel to its customers.</p> <p>Partial or full conversion to hydrogen will necessitate enhanced integrity management programs and operational changes to ensure continued safety and reliability. Enbridge Gas is actively engaged with governments, research agencies and partners across the globe to accelerate the transition towards net-zero while keeping safety, affordability and reliability top of mind.</p>
11.	TFG asked about the mitigations for water crossings and requested review of water crossing specific mitigations based on the CKSPFN water assertion. When would these documents be available for review?	The Enbridge Gas representative advised that the draft EPP is not yet complete and will be updated as permits, like the water crossing permits, are obtained and permit conditions are known. The Enbridge Gas representative advised that we could send them	Enbridge Gas provided the Generic Sediment Control Plans for Dam & Pump crossings, HDD crossings, and temporary vehicle crossings (culverts and bridges), which were requested by CKSPFN when providing the minutes back on August 2, 2022.

		the Generic Sediment Control Plans that will be adhered to at this time.	
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Response to Aamjiwnaang First Nation (AFN) comments received June 27, 2022 re: Environmental Report on the Panhandle Regional Expansion Project (“Project”)				
No.	Section	Comment	Recommendation	Enbridge Gas Response
1.	4.33, 5.3.2.4 (Wildlife and Wildlife Habitat)	<p>In the context of wildlife and wildlife habitat, the AFN may want to consider the following:</p> <ul style="list-style-type: none"> <li>• Request details surrounding preliminary field investigations, involvement in any 2022 field studies, and a summary of specific sites that may have wildlife and/or wildlife habitat concerns where site-specific mitigation or monitoring may be required.</li> <li>• An apparent lack of any assessment of potential effects to wildlife corridors and habitat fragmentation.</li> </ul>		<p>To assess the potential effects of the project on the identified Species at Risk (SAR) species, ecological land classification, botanical inventories, and bat acoustic monitoring surveys were conducted in 2022.</p> <p>Field surveys were undertaken in 2022 in order to further understand the project challenges and opportunities towards wildlife and wildlife habitat and to further refine mitigation and preventative measures. Prior to the investigations, AFN was invited to participate in the 2022 field program. At this time, there are no additional wildlife and wildlife habitat investigations proposed. However, AFN will be provided with a report summarizing the field survey findings and recommendations.</p> <p>As stated in Section 4.3.3.1 of the Environmental Report (ER), the majority of the study area is composed of agricultural fields with natural areas largely limited to hedgerows or narrow strips of woodlots and riparian areas of agricultural drains. Additionally, both pipelines parallel or follow existing infrastructure (roads, existing pipeline easements), limiting new effects to undisturbed lands. Mitigation measures, including a tree planting program, as summarized in ER Appendix G, will be employed to limit effects to SAR and Significant Wildlife Habitat (SWH). Through these measures no significant project impacts, including habitat fragmentation, are anticipated.</p>
2.	4.3.3.2, 5.3.2.5, Appendix D (Species and Risk)	<p>In the context of SAR, the AFN may want to consider the following:</p> <ul style="list-style-type: none"> <li>• Request details surrounding preliminary field investigations, involvement in any 2022 field studies, and a summary of specific sites that may have SAR</li> </ul>		<p>To assess the potential effects of the project on the identified SAR species, ecological land classification, botanical inventories, and bat acoustic monitoring surveys were conducted in 2022.</p>

		concerns where site-specific mitigation or monitoring may be required		Enbridge Gas has offered AFN the opportunity to participate in the field program and has committed to providing AFN a report summarizing the SAR field survey findings.
3.	5.3.3.1 (Indigenous Interests)	The ER does not explain how indigenous concerns were considered during the effect assessment.		<p>Consultation, including Indigenous Engagement, is detailed in Section 3 and Appendix B of the ER.</p> <p>Potential project effects from construction and operation on Indigenous interests were considered and addressed, through proposed mitigation measures, by Enbridge Gas in Section 5.3.3.1</p> <p>Additionally, through this ER review process Enbridge Gas will address any specific Indigenous concerns.</p>
4.	6 (Cumulative Effects Assessment)	<ul style="list-style-type: none"> <li>• Aquatics (groundwater, surface water, fish and fish habitat) do not appear to have been considered in the cumulative effects assessment.</li> <li>• Socio-economic effects do not appear to have been considered in the cumulative effects assessment.</li> <li>• Cumulative effects are predicted to be not significant or not expected for soil, vegetation, wildlife and wildlife habitat, and air quality and noise. The primary rationale provided to support this conclusion is that mitigation measures will avoid or minimize any potential effects to these receptors. However, it is not clear how the successful implementation of the proposed mitigation measures will be monitored or assessed during and after Project construction as no specific monitoring or contingency plans are provided in the ER</li> </ul>		<p>The cumulative effects assessment was completed in accordance with the Ontario Energy Board (OEB) Environmental Guidelines. Enbridge Gas reviewed publicly available information on current and planned projects in the area, then considered the effects that are additive or interact with the effects that have already been identified as resulting from the pipeline construction. The cumulative effects assessment identified potential additive effects on soil, vegetation, wildlife and wildlife habitat, air quality and the acoustic environment. Enbridge Gas determined that, provided the mitigation and protective measures outlined in the ER 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, they are not anticipated to be significant.</p> <p>A full-time Environmental Inspector will be on-site for the duration of the project to assess the effectiveness of mitigation measures and implement adaptive management should mitigation measures be limited in effectiveness. The</p>

				pipeline corridor will be monitored following construction to ensure the effectiveness of mitigation measures.
5.	7 (Environmental Monitoring and Contingency Plans)	<p>The AFN may want to consider the following:</p> <ul style="list-style-type: none"> <li>• Request to be informed or involved in any 2022 field studies in determining sensitive environmental locations or features that may require monitoring.</li> <li>• Request to be involved in the development of the Project EPP.</li> <li>• Request regular updates of any environmental inspections during and after construction.</li> <li>• Request to be immediately informed of any undocumented archaeological or heritage resource discoveries.</li> </ul>		<p>Enbridge Gas has committed to 2022 field studies and AFN has been participating in these studies. Enbridge Gas has also committed to providing AFN with a report summarizing field study findings.</p> <p>Enbridge Gas is open to continue working with AFN moving forward.</p>
6.		<p>While the Projects Indigenous Engagement Log Demonstrates active engagement between the proponent and the Nation during the Project information phase, the ER does not demonstrate how Indigenous concerns were considered, or how treaty rights were considered during the effects assessment. Mitigations for effects to traditional Indigenous territories, communities and practices are not proposed in the effects assessment.</p>		<p>Section 5.3.3.1 of the ER considers potential impacts and mitigation measures for Indigenous interests. Additionally, through this ER review process Enbridge Gas will address any specific Indigenous concerns.</p> <p>A summary of feedback from the First Nations is provided with the Project application for OEB approval. These can be found in H1-1 Attachment 6 and 7 of the OEB filing.</p>
7.		<p>Vegetation clearing and disruption of traditionally significant species is of concern to the Nation. As such, limiting vegetation removal to the extent possible and implementing invasive species management is important. We recommend that the Nation be involved in the planning and procurement of native species where opportunities exist for seeding and restoration of cleared vegetations. Also, consideration should</p>	<p>Enbridge must be providing specific details about what actions they plan to undertake to offset forest/woodland habitat loss and forest/woodland fragmentation associated with this project.</p>	<p>Section 2 of the ER notes the route selection process that was followed for the Project. The route selection process examined route alternatives and chose the most preferred route based on avoidance of socio-economic and environmental features. Based on this process, the majority of the preferred route resides in agricultural land with minimal disturbance to vegetation and woodland.</p>

		<p>be given to promote the Nation’s greenhouse for vegetation restoration initiatives.</p>	<p>Enbridge must commit to consulting with AFN on the offsetting measurers. AFN expects that these measurers will include:</p> <ul style="list-style-type: none"> <li>• Offsetting the fragmentation and loss of forests/woodlots by creating more forest habitat within the local landscape at a minimum of a 3:1 ratio;</li> <li>• Prioritizing forest habitat offsetting measurers to expand existing forests/woodlands and to maintain or build habitat connectivity within the local landscape;</li> <li>• Prioritize planting native plant species and consulting with AFN to ensure that plant species of importance are included in the plantings;</li> <li>• Undertake follow-up monitoring for a minimum of 5 years</li> </ul>	<p>In addition, Enbridge Gas is committed to implementing a tree replacement program that replants woodland removed with seedlings of native species that are guaranteed until they reach free to grow status. This program was planned at a ratio of 2:1 for the woodland areas removed and will now be increased to 3:1 (trees to be replaced on a 3:1 area basis at 1000 tree seedlings per acre) in response to the Indigenous consultation process.</p> <p>Directly impacted landowners are given first right of refusal for the tree planting under this program. If landowners are not interested in planting trees on their property, Enbridge Gas will work with Indigenous communities and local conservation authorities to find suitable locations to plant trees.</p>
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8.		<p>Measures and standards to avoid and mitigate impacts to fish and fish habitat including impacts to aquatic species at risk must include always having a qualified environmental professional on site during any works or activities below the high-water mark to verify that measures and standards to avoid and mitigate impacts to fish and fish habitat are effective. The authorized project footprint must be monitored for pools of standing water and stranded or trapped fish within those pools. This monitoring must be conducted anytime that there is a potential for pools of standing water, including times when work activities are not taking place. Using appropriate gear, timing, and salvage techniques, a qualified environmental professional shall capture and relocate fish and invertebrates salvaged</p>		<p>The referenced Best Management Practices (BMPs) will be implemented.</p>
9.		<p>A spill prevention and emergency response plan must be developed to minimize potential for environmental incidents and to provide guidance for responding to situations that pose imminent</p>		<p>Mitigation measures identified in Tables 5-3, 5-5, 5-7 and Section 7.2.2 of the ER will be implemented during the duration of the project. These mitigation measures,</p>



		<p>threat to the environment. The measures contained in the plan will minimize adverse effects to terrestrial and aquatic environments and improve the safety of the workers and public. Contamination of land and/or water from spills can result in pollution of soil and groundwater, which could be lethal to aquatic and terrestrial wildlife. Given the importance of surface water to the Nation, we recommend that the Nation be involved in the development of the plan and their endorsement be sought before finalizing the plan. If these measures are implemented in addition to Enbridge's recommended mitigation measures, impact to surface water will be reduced to non-significant.</p>		<p>including the Spill Prevention plan, will be part of the Environmental Protection Plan for construction.</p> <p>Construction will complete an Emergency Response plan for all areas of execution in coordination with the Contractors completing works across the Project prior to start of any activities.</p>
10.		<p>Surface and groundwater are important to the Nation. As such, we recommend that the Nation be given the opportunity to review and comment on all in-water work plans, erosion and sediment control plan, and emergency spill prevention and response plan before construction.</p>		<p>Generic Sediment Control Plans for Dam &amp; Pump, HDD, and Temporary Vehicle Crossings will be provided for review.</p> <p>Regarding emergency spill prevention and response plan, please see comment #9.</p>
11.		<p>The Nation should be consulted on timing and completion of the Stage 2 archaeological assessment for artifacts. There is concern that anything found of archaeological significance has not been provided to the Nation as it was collected by Six Nations and not provided specifically to the Aamjiwnaang First Nation.</p>		<p>Enbridge Gas offered AFN the opportunity to participate in the 2022 field program and will consult with AFN on the details of the stage 2 archeological assessment. Enbridge Gas provides capacity funding for participation in archaeological assessments as well as having monitors participate in the Stage 2 Archaeology Assessment work.</p> <p>No items have been provided to any First Nations.</p>
12.		<p>The Nation should seek or request opportunities for local business and community members to participate in the Project where practicable.</p>		<p>The Enbridge Gas representative for Supply Chain Management- Indigenous Engagement has met with AFN to discuss opportunities on the Project and for local business</p>

		Trainings and workshops could be made available to the Nation so they can qualify for higher paying technical positions.		participation in Enbridge Gas projects in general. Enbridge Gas is in the process of working through training workshops that could be offered and will be able to provide AFN with more information in the future.
13.		Territorial lands have not been as well studied as Reserve lands with respect to Traditional Land Use or Traditional Knowledge. The capacity of the Nation to extend beyond the boundaries of the reserve to assess potential Project impacts to their territorial lands is required.		Enbridge Gas would be happy to discuss the completion of an Indigenous Knowledge, Land Use study, extending beyond the boundaries of the reserve, with AFN.
14.		The Nation should be involved in future field study investigations that may have wildlife and/or wildlife habitat concerns where site-specific migration or monitoring may be required. Also, if there are existing preliminary field investigation studies of wildlife and wildlife habitat within the proposed project area, they should be available to the Nation.		Ecological field surveys were undertaken in 2022 to enhance the understanding of Project impacts on significant wildlife habitat. AFN has been involved in the field programs to date. Additionally, please see response to comment #1.
15.		The Nation should be involved in future preliminary field investigations and any existing recent field survey studies that may have SAR concerns where site-specific mitigation or monitoring may be required be made available to them. Certain species at risk (e.g., Butler’s Garter Snake) have been downgraded from endangered to threatened, which has removed engagement opportunities for the Nation.		While Butler’s Garter Snake is a SAR (as defined as an ESA species listed as Threatened, Endangered or Extirpated), it was not identified during the ER SAR records review for SAR within the vicinity of the study area or during the 2022 field program.  Ecological field surveys were undertaken in 2022. AFN has been involved in the field programs to date.  Additionally, please see response to comment #1 and #2
16.		Details on the assessment of potential effects to wildlife corridors and habitat fragmentation should be included in the ER.		As stated in ER Section 4.3.3.1, the majority of the Project Site Areas are composed of agricultural fields with natural areas largely limited to hedgerows or narrow strips of woodlots and riparian areas of agricultural drains.

				<p>Additionally, both pipelines parallel or follow existing infrastructure (roads, existing pipeline easements), limiting new effects to undisturbed lands.</p> <p>Potential effects of the project on wildlife and their habitat have been identified in Section 5.3.2.4.</p>
17.	5.3.7 Designated Natural Areas and Vegetation	<p>Vertex recommends that Enbridge develop a Vegetation Management Plan to identify potential impacts to vegetation that may result from the Project, and outline mitigation measures to prevent adverse environmental effects to terrestrial ecosystems over both the short and long term. The Vegetation Management Plan should aim to ensure that no adverse impacts to at-risk plant species (e.g., American Chestnut, Ogden’s Pondweed, Gillman’s Goldenrod, Colicroot and Black Ash) and to other ecosystems outside the Project footprint.</p>		<p>Section 5.3.2.3 (Table 5-8) of the ER lists potential impacts to vegetation as well as recommended mitigation &amp; preventative measures to be followed during construction in order to limit impacts to vegetation. Some of these mitigation &amp; preventative measures include, limiting vegetation removal, obtaining permitting requirements/approval from government regulatory agencies, revegetating cleared areas with native seeds and vegetation species, and the replanting of trees as part of Enbridge’s tree replacement program. Contract provisions will also require the Contractor to minimize impacts to vegetation communities during construction and implement mitigation and preventative measures.</p> <p>In addition to the mitigation measures outlined in the ER and contract package, Enbridge Gas will also provide a Plant Species of Concern Contingency Plan to the winning construction contractor that outlines protocols and measures to follow if an at-risk plant species is found during construction.</p>
18.	5.3.8 Wildlife and Wildlife Habitat	<p>Vertex recommends that the Nation be involved in future field study investigations that may have wildlife and/or wildlife habitat concerns where site-specific migration or monitoring may be required. Also, if there are existing preliminary field investigation studies of wildlife and wildlife habitat within the proposed project area, they should be available to the Nation.</p>		<p>Please see response to comment #1.</p>

19.	5.3.9 Species at Risk	We recommend that the Nation be involved in future preliminary field investigations and any existing recent field survey studies that may have SAR concerns where site-specific mitigation or monitoring may be required be made available to them.		Please see response to comment #2.
20.	5.3.12 Landfills and Contaminated Sites	A Waste Management Plan for the collection, storage, labeling, and disposal of waste material should be developed prior to the execution of the Project. The waste management plan should also cover disposal of excess soil and management of contaminated soil.		Enbridge Gas will develop a Waste Management Plan prior to construction
21.	5.5 Environmental Monitoring and Contingency Plans	We recommend that the Nation be involved in the development of the Construction Environmental Management Plan and that their comments and input are considered. The Nation should also be involved in future field studies in determining sensitive environmental locations or features that may require ongoing monitoring.		<p>Enbridge Gas has committed to 2022 field studies and AFN has been participating in these studies. Enbridge Gas has also committed to providing AFN with a report summarizing field study findings.</p> <p>Enbridge Gas is open to continue working with AFN moving forward.</p>
22.	Other Recommendations	While the Projects Indigenous Engagement Log demonstrates active engagement between the proponent and the Nation during the Project information phase, the ER does not demonstrate how Indigenous concerns were considered, or how treaty rights were considered during the effects assessment. Mitigations for effects to traditional Indigenous territories, communities and practices are not proposed in the effects assessment.		Please see response to comment #6.

Enbridge Gas Inc.'s ("Enbridge Gas") Response to Chippewas of Kettle & Stoney Point First Nation's Comments received July 5, 2022 re: Environmental Report on the Panhandle Regional Expansion Project ("Project")			
Table 1. Comments on the Panhandle Regional Expansion Project – Environmental Report ("ER")			
Reference	Text from ER	Comments	Enbridge Gas Response
Section 1.2	19 km of new pipeline which loops – or parallels – the existing 20-inch Panhandle Pipeline. The new pipeline will be 36 inches in diameter and located adjacent [...] Chatham-Kent.	<ul style="list-style-type: none"> <li>- There is an opportunity to design this pipeline such that it can transport alternative fuels like hydrogen and/or blends of natural gas in the near-term, rather than needing to retrofit the line to make this feasible. Given the profoundly serious impacts of climate change on all aspects of the environment, this is a consideration that should be outlined in the present report.</li> <li>- Enbridge should comment on measures that will be taken to ensure pipeline integrity during alternative fuel transport and blending.</li> </ul>	<p>The compatibility of steel transmission pipelines with blended or pure hydrogen remains under active investigation. While Enbridge Gas is evaluating the general compatibility of materials and systems up to 100% hydrogen, the upper limit has not yet been determined. These efforts underscore Enbridge Gas's proactive steps in working to ensure the gas grid of the future is able to deliver a lower carbon fuel to its customers.</p> <p>Partial or full conversion to hydrogen will necessitate enhanced integrity management programs and operational changes to ensure continued safety and reliability. Enbridge Inc., including Enbridge Gas, is actively engaged with governments, research agencies and partners across the globe to accelerate the transition towards net-zero while keeping safety, affordability, and reliability top of mind.</p>
Section 3.6.1	It should also be noted that four additional comments were received from the public via the interactive mapping tool noting concerns over a species sighting (Western Chorus Frog [ <i>Pseudacris triseriata</i> ], [...]) near the Leamington Interconnect.	<ul style="list-style-type: none"> <li>- Enbridge should comment on (1) western chorus frog wildlife and habitat surveys, and (2) measures that will be taken to ensure the protection of the western chorus frog's habitat.</li> <li>- The Great Lakes/St. Lawrence population of western chorus frog is threatened in Canada, and as such has a Recovery Strategy under the Species at Risk Act. Main threats to the species are listed as habitat loss and degradation through urban development, climate change, and the expansion and maintenance of linear infrastructure, all of which are features of the proposed</li> </ul>	<p>The ecology team has made note of the sighting of Western Chorus Frog, reported through the interactive mapping tool.</p> <p>Ecological field surveys have been completed in 2022 to investigate species presence and significant wildlife habitat (SWH) in the vicinity of the Project Study Areas (PSAs).</p> <p>As stated in Section 4.3.3.1 of the Environmental Report (ER) the Western Chorus Frog is not a provincial Species at Risk (SAR) in the geography where it was noted to occur. However, the species is considered a SAR federally when projects occur on federal lands. Although these [non-SAR] species are not afforded protection under the provincial Endangered Species Act, effects to these species need to be considered as their habitat may be designated as significant, such as amphibian breeding habitat.</p>

		<p>project (Environment Canada, 2015). The habitat of this species is also protected in Ontario by the Provincial Policy Statement (PPS) under the Planning Act.</p>	<p>The anticipated effects on these [non-SAR] species are likely limited as the majority of the Project area is composed of agricultural fields with natural areas largely limited to hedgerows or narrow strips of woodlots and riparian areas of agricultural drains. Additionally, both pipelines parallel or follow existing infrastructure (roads, existing pipeline easements), limiting new effects to undisturbed lands. Ecological land classification surveys, and targeted surveys for SAR such as habitat assessments have further refined areas of suitable significant wildlife habitat (SWH). Mitigation measures noted in Table 5-9 of the ER will be employed to limit effects to these candidate features. Some of these mitigation measures include Installing and maintaining sediment and erosion controls such as silt fence barriers, rock flow check dams, compost filter socks or approved alternative along the edge of the construction footprint area if within 30 m of a wetland or waterbody where appropriate, obeying site speed limits identified in plans for traffic management and adhering to applicable timing windows (e.g., bat roosting window of April 1 to October 1).</p>
<p>Section 4.2.3</p>	<p>A segment north of Jeannettes Creek, approximately 5km in length, and the north end of the Panhandle Route lies within a Significant Groundwater Recharge Area and a Highly Vulnerable Aquifer (MECP, 2022).</p>	<ul style="list-style-type: none"> <li>- Enbridge should include comment(s) as well as mitigation measure(s) in Section '5.3.1.2 Groundwater Resources' that will be taken to ensure and maintain the integrity of groundwater recharge zones and significant groundwater resources.</li> <li>- Enbridge should seek approval from local residents, Indigenous communities, municipal and provincial governments, and conservation authorities prior to building a pipeline nearby and/or above a highly vulnerable aquifer/source of drinking water.</li> </ul>	<p>Potential effects and mitigation measures to groundwater resources are summarized in ER Table 5-1. Through the implementation of mitigation measures, no significant adverse residual effects on groundwater are anticipated. This includes the Significant Groundwater Recharge Area and Highly Vulnerable Aquifer identified in ER Section 4.2.3.</p> <p>Impacts are not anticipated beyond the Project footprint based on the mitigation measures recommended in section 5.3.1.2 and potential impacts on aquatic resources will be addressed through the permitting process. Enbridge Gas is seeking leave to construct from the Ontario Energy Board in accordance with applicable legislation and will obtain any legally required permits to undertake the Project. Enbridge Gas offers capacity funding to Indigenous communities we are engaged with to support in meaningful consultation on projects.</p>

<p>Section 4.3.1.1</p>	<p>There are twenty-nine watercourses that are crossed by the Panhandle Loop based on a desktop review of relevant aerial imagery and watercourse mapping. They include 11 named drains, 15 unnamed drains, Jeannettes Creek, Baptiste Creek, and the Thames River. Ultimately, these watercourses drain to the Thames River or Lake St. Clair.</p>	<ul style="list-style-type: none"> <li>- As stated in the ER, the watercourses crossed by the pipeline will ultimately drain into the Thames River or Lake St. Clair, both of which are of great importance to CKSPFN. Many of the watercourses that drain into Lake St. Clair are already significantly impacted by industrial and agricultural operations in the area, and are in need of protection.</li> <li>- Enbridge should clearly outline how these 29 watercourses will be crossed by the PPR, as well as how any direct impacts to the watercourses will be mitigated.</li> <li>- We have appended CKSPFN’s water rights assertion (Band Council Resolution #2851), which declares ownership and jurisdiction of the lakebeds and waterways within the study area. Further information regarding plans for crossing these watercourses should be provided to CKSPFN so that we can more accurately assess any risks to our lands and waters.</li> </ul>	<p>At this point it is determined that the majority of watercourse crossings will be completed using Isolated Open-Cut (i.e., dam &amp; pump) methods. The remaining watercourses (e.g., Jeannettes and Baptiste Creek, the Thames River, and some smaller watercourses close to roadways, etc.) will be installed using trenchless methods (i.e., HDD or direct pipe).</p> <p>Table 5-5 summarizes mitigation measures for surface waters, including watercourse crossings. With the implementation of mitigation measures, no significant adverse residual effects on surface water are anticipated during construction or operation of the project.</p> <p>Watercourse crossings will adhere to the sediment control plans for Dam &amp; Pump and Horizontal Direction Drill. Culverts and bridges will be installed in adherence to the sediment control plan for temporary vehicle crossings.</p> <p>The sediment control plans for Dam &amp; Pump and Horizontal Direction Drill were sent to TFG on August 2, 2022.</p> <p>Enbridge Gas would be pleased to hold additional meetings with CKSPFN representatives to further explain and discuss planned Project watercourse crossings and work in the area of watercourses as well as to answer any questions regarding the above-referenced sediment control plans and mitigation measures.</p>
<p>Section 4.3.1.3</p>	<p>Jack’s Creek Drain is categorized as a municipal Class D drain meaning it is permanent, has a fall or fall and spring restriction window, and contains sensitive fish. The drain was categorized in 2019 as containing Lake Chubsucker (<i>Erimyzon sucetta</i> – Endangered (END) under SARA, Threatened (THR) under Endangered</p>	<ul style="list-style-type: none"> <li>- CKSPFN asks to be provided with all records and protection plans for sensitive or SAR fish and mussel species within Jack’s Creek Drain, as well as all other watercourses crossed by the PPR. Suitable habitat for coolwater fish species is somewhat limited in the area</li> </ul>	<p>Ecological field surveys have been completed in 2022 to enhance the understanding of watercourse crossings and their potential for fish and mussel SAR and SAR habitat. Enbridge Gas will provide CKSPFN with a report summarizing the SAR field survey findings. Enbridge Gas will consult with CKSPFN as part of relevant Department of Fisheries and Oceans Canada (DFO) and the Ministry of the Environment, Conservation and Parks (MECP)</p>

	<p>Species Act (ESA)) and the recently downlisted Special Concern Mapleleaf mussel (<i>Quadrula quadrula</i> – Special Concern (SC) under SARA and ESA). The drain flows North-West for 2.5 km from the crossing before it meets another drain, merges, and then flows into Lake St. Clair. The following fish community is known as Jacks Creek from the LIO dataset (MNDMNR, 2022). Jacks Creek provides habitat to an assemblage of 28 warmwater and coolwater fish species (Table 4-2) several species of mussels and is characterized overall as having a warmwater thermal regime.</p>	<p>and impacts should be avoided as much as possible.</p>	<p>applications should these permits be required e.g., Species at Risk Act (SARA), and Endangered Species Act (ESA).</p> <p>As stated in ER Section 4.3.1.3, all the Threatened and Endangered species within the study area receive protection under both the provincial ESA and federal SARA.</p> <p>Additional correspondence with regulators/permitting agencies will be required for any additional aquatic SAR identified or if a watercourse containing provincially or federally listed SAR will be affected by the Project.</p>
<p>Section 4.3.2.1</p>	<p>The PPS, implemented under the Planning Act (1990), protects Provincially Significant Wetlands (PSWs) from development and site alteration while regulations under the Conservation Authorities Act (1990) prohibit certain activities within wetlands (MNR, 2010). The PPS further specifies that a wetland is considered provincially significant if evaluated as such through the OWES (MNR, 2014). Until categorized by NDMNR, wetlands are classified as “unevaluated”.</p>	<ul style="list-style-type: none"> <li>- It should be noted that unevaluated wetlands are often the result of research gaps, and do not always indicate a lack of importance or ecological value.</li> <li>- Enbridge should look to survey and mitigate effects on both Provincially Significant Wetlands, classified through the OWES, as well as unevaluated wetlands.</li> </ul>	<p>Agree. Section 4.3.2, Designated Natural Areas and Vegetation of the Environmental Report provides an overview of the various types of wetlands, and whether they are traversed by the Project. The Environmental Report assesses the impacts of the Project on all wetland types, and the mitigation for wetlands as provided in Tables 5.1, 5.3, 5.8, and 5.9 applies to all wetland types.</p>
<p>4.3.2.2.2</p>	<p>One woodlot on County Road 8 will be crossed by the pipeline, which may result in some tree clearing.</p>	<ul style="list-style-type: none"> <li>- Enbridge should elaborate on its Tree Replacement Program in the ER to ensure appropriate measures are in place to replace the loss of trees, particularly within the woodlot along the Leamington Interconnect.</li> <li>- As per OEB Environmental Guidelines (2016), Enbridge should disclose additive</li> </ul>	<p>Where feasible, in consultation with directly impacted landowners, Enbridge Gas will restore the lands to pre-existing conditions with the exception of woodlands and trees within the permanent easement. Enbridge Gas committed to implementing a tree replacement program that replants woodland removed with seedlings of native species that are guaranteed until they reach free to grow status. This program was planned at a ratio of 2:1 for the woodland areas removed and will now be increased to</p>



		<p>effects, specifically forest/woodlot cover losses due to tree clearing for pipeline construction as well as operation and maintenance.</p>	<p>3:1 (trees to be replaced on a 3:1 area basis at 1000 tree seedlings per acre).</p> <p>Directly impacted landowners are given first right of refusal for the tree planting under this program. If landowners are not interested in planting trees on their property, Enbridge Gas will work with Indigenous communities and local conservation authorities to find suitable locations to plant trees.</p>
<p>Table 5-4 Potential spread of Soybean Cyst Nematode (SCN)</p>	<p>If the pipeline route or an adjacent farm field is identified as having SCN all equipment and boots should be properly cleaned before moving to an area that has not shown to be impacted by SCN. This may involve thorough washing before moving equipment from an impacted field to nonimpacted field.</p>	<ul style="list-style-type: none"> <li>- Enbridge should disclose an approximate location for where said “thorough washing” would occur in the ER to mitigate the downstream effects of washing potentially contaminated equipment (including boots) with SCN. If a location cannot be provided, Enbridge should ensure this information is included in its best practice protocol and approved by landowners of agricultural fields.</li> </ul>	<p>Enbridge Gas will commit to establishing best practice protocol for controlling Soybean Cyst Nematode (SCN) spread and sharing this protocol with landowners of agricultural fields.</p>
<p>Table 5-5 Changes in surface water quality and quantity</p>	<p>N/A</p>	<ul style="list-style-type: none"> <li>- Enbridge should disclose proposed dewatering mitigation measures, as it relates to changes in surface water quantity since none were present in Table 5-5.</li> <li>- What mitigation measures will be taken – before, during, and after construction – to ensure the biophysical features remain intact whilst dewatering occurs? If damaged, how will fish and invertebrate habitat be restored post-dewatering?</li> </ul>	<p>The potential impacts from dewatering and surface water takings will be evaluated once the detailed design of the Project is complete.</p> <p>Enbridge Gas will obtain a permit from the MECP for the water taking (Environmental Activity and Sector Registry [EASR] or Permit to Take Water [PTTW]) and complete detailed modelling and mitigation plans in support of that permit and in accordance with MECP requirements when construction details become available.</p> <p>For these reasons, the proposed pipeline construction at the Panhandle Regional Expansion Site is considered to have a low potential for impacts to hydrogeological features.</p>

			CKSPFN will be consulted as part of relevant DFO and MECF applications should these permits be required e.g., SARA, ESA or PTTW.
Table 5-5 Changes in surface water quality and quantity (cont.)	Restrict construction equipment to designated controlled vehicle access routes to minimize the potential contamination.	<ul style="list-style-type: none"> <li>- CKSPFN requests access to all documents for vehicle routes for construction sites along bodies of water (rivers, streams, wetlands, etc.). A clear, visual map – with coordinates – should be provided to the CKSPFN Consultation Team.</li> </ul>	Enbridge Gas will commit to establishing vehicle routes for construction sites to minimize the potential for watercourse contamination and will share this information with CKSPFN.
Table 5-5 Changes in surface water quality and quantity (cont.)	Control quantity and quality of stormwater discharge using best management practices.	<ul style="list-style-type: none"> <li>- Enbridge should disclose said best management practices in its ER. For instance, an Appendix can outline the best management practices that will be used to mitigate potential impacts of stormwater discharges.</li> </ul>	Best management practices include the use of filtration tubs, sediment bags, discharge being setback a minimum of 30 metres from a waterbody, and oversight from a full-time environmental inspector. This information will be included in the Environmental Protection Plan.
Section 5.3.2.2	A field investigation of each watercourse crossing will be conducted to determine if fish and/or fish habitat is present.	<ul style="list-style-type: none"> <li>- Enbridge should disclose the upstream and downstream distances that will be considered to evaluate and determine the presence of fish and/or fish habitat.</li> </ul>	<p>The established right-of-way, plus 25 m upstream and downstream of the right-of-way limits, was assessed for the presence of fish and/or fish habitat.</p> <p>Qualified Environmental Practitioners (QEP) have completed ecological field investigations to determine if fish and/or fish habitat are present, to ensure that the field assessments are scientifically defensible and adhere to established procedures and regulatory requirements.</p>
Table 5-11 Effects to traditional Indigenous territories, communities, and practices	Indigenous communities should be consulted with for any permits where a duty to consult applies.	<ul style="list-style-type: none"> <li>- Limiting opportunities to consult Indigenous communities only when the “duty to consult applies” does not recognize the immediate need to respect and promote the rights of Indigenous Peoples affirmed in treaties and the United Nations Declaration on</li> </ul>	<p>Enbridge Gas is committed to engaging meaningfully with Indigenous Nations on an ongoing basis throughout the lifecycle of the Project including the operational phase.</p> <p>As articulated in Enbridge Inc.’s Indigenous Peoples Policy, Enbridge Gas respects the unique rights of Indigenous Peoples, Treaties and UNDRIP. Enbridge Gas is committed to meaningful</p>

		<p>the Rights of Indigenous Peoples (UNDRIP). As such, the Chippewas of Kettle and Stony Point First Nation (CKSPFN) call upon Enbridge to commit to taking effective measures – including administrative, consultation, and cooperation with Indigenous Peoples, and promoting mutual respect and understanding as well as good relations – with CKSPFN and all other treaty Nations throughout the proposed Panhandle project and during future projects.</p>	<p>engagement on proposed and future projects with Indigenous communities.</p> <p>We look forward to continuing to engage with TFG, CKSPFN and other Nations on the proposed Project, including its operations phase, and during future Enbridge Gas projects. If there are specific measures that CKSFPN would like to see initiated, we would be happy to discuss further.</p> <p>Enbridge Gas commenced consultation with CKSPFN on the Project October 15, 2021 and is engaged in ongoing discussions and information exchange. Enbridge Gas welcomes specific feedback that CKSPFN and other Nations may have, on the Project to avoid or mitigate any impacts the Project may have on aboriginal rights and interests.</p>
<p>Section 5.3.3.4</p>	<p>Potential effects on community services and infrastructure during construction and operation.</p>	<ul style="list-style-type: none"> <li>- Beyond the potential effects listed in Section 5.3.3.4 – Community Services and Infrastructure, the ER does not address the possible increase in violence, sexual assault, and harassment towards status and non-status Indigenous women and girls as well as 2SLGBTQIA+ individuals.</li> <li>- Does Enbridge have a Code of Conduct for temporary workers (including third party contractors) working in non-local project areas?</li> <li>- MMIWG Calls to Justice for Extractive and Development Industries: <i>13.1 We call upon all resource-extraction and development industries to consider the safety and security of Indigenous women, girls, and 2SLGBTQIA people, as well as their equitable benefit from development, at all stages of project planning, assessment,</i></li> </ul>	<p>There would be no anticipated residual effects due to the Project's scope, anticipated existing local tradesperson workforce, and short duration of active construction timeline of approximately six months coupled with the requirements of Enbridge Gas' Supplier Code of Conduct.</p> <p>Enbridge Gas' general contractors are required to follow Enbridge policies including the Supplier Code of Conduct, which states "Enbridge believes that each individual with whom we come in contact deserves to be treated fairly, honestly, and with dignity. We do not condone any form of harassment, discrimination, or inappropriate actions or language of any kind." Drug and Alcohol Programs, Respectful Workplace Training and Indigenous Peoples Awareness Training are specific to the Construction Contractor(s) that will construct the projects, which haven't been selected yet.</p>

		<p><i>implementation, management, and monitoring.</i></p>	<p>Enbridge Gas would welcome an elder or a cultural representative from CKSPFN to share their knowledge specific to the region with the Project team.</p> <p>Should CKSPFN have further suggestions based on local and regional experiences and best practices, Enbridge encourages information sharing in this regard.</p>
<p>Table 5-12</p>	<p>Given the available capacity of the local community services and infrastructure, along with the implementation of the mitigation measures, no significant adverse residual effects on community services and infrastructure are anticipated.</p>	<ul style="list-style-type: none"> <li>- Although no significant adverse residual effects on community services and infrastructure have been documented in the ER, we call upon Enbridge to provide social capacity for Indigenous communities, if demand limits a community's ability to seek the services they require.</li> <li>- MMIWG Calls to Justice for Extractive and Development Industries: <i>13.2 We call upon resource-extraction and development industries and all governments and service providers to anticipate and recognize increased demand on social infrastructure because of development projects and resource extraction, and for mitigation measures to be identified as part of the planning and approval process. Social infrastructure must be expanded and service capacity built to meet the anticipated needs of the host communities in advance of the start of projects. This includes but is not limited to ensuring that policing, social services, and health services are adequately staffed and resourced</i></li> </ul>	<p>While no significant adverse residual effects on community services and infrastructure are anticipated, in the event that such effects materialized, Enbridge Gas would work in consultation with the Indigenous community to mitigate those impacts.</p> <p>Indigenous communities are able to apply for funding through Enbridge Inc.'s corporate citizenship program. Enbridge Gas would be happy to discuss this program with CKSPFN and has provided the link to the application for funding. <a href="https://www.enbridge.com/About-Us/Our-Values/Corporate-citizenship/Apply-For-Funding.aspx">https://www.enbridge.com/About-Us/Our-Values/Corporate-citizenship/Apply-For-Funding.aspx</a></p> <p>In addition, through its lifecycle engagement program, Enbridge Gas enters into long term relationship agreements designed to support operational engagement, provide capacity funding as needed, and offers Project-related agreements when appropriate.</p> <p>Should CKSPFN have further suggestions based on local and regional experiences and best practices, Enbridge Gas encourages information sharing in this regard.</p>

<p>Table 5-13 Restricted land access</p>	<p>Any municipal approvals required for land restrictions and haul routes</p>	<ul style="list-style-type: none"> <li>- Enbridge should notify CKSPFN – well in advance – about any land restrictions throughout the development, construction, operation, and maintenance of the proposed Panhandle project.</li> </ul>	<p>Enbridge Gas is currently seeking all municipalities approvals for road crossings and drain crossings. Meetings have been held with municipalities to review alignments and proposed haul routes, and the municipalities have no concerns at this time. Enbridge Gas continues to meet with municipalities regarding open cut vs. trenchless methods and depths.</p>
<p>Section 6.2</p>	<p>Since the project is not predicted to have net effects during operations, only the construction, operation and/or decommissioning of future developments occurring before the completion of construction were considered in the assessment of cumulative effects.</p>	<ul style="list-style-type: none"> <li>- Given that fugitive emissions (i.e., the unintentional and undesirable emissions, leakage, or discharge of gases or vapors from storage tanks, pipelines, wells, or other pieces of infrastructure) as well as “integrity digs” will likely occur during operations, it is not reasonable to conclude that the project will have no net effects during operations.</li> <li>- Enbridge should clarify this statement and indicate that the project will have net additive effects during its operational lifecycle. As such, Enbridge should (1) reconsider the study boundaries of the Panhandle project and (2) include an analysis of cumulative effects during the operation of this project within the ER.</li> <li>- CKSPFN is aware that the following projects will be adjacent to the Panhandle Regional Expansion Project with potential construction schedule overlaps, and as such Enbridge should include these projects in the cumulative effects assessment, including attention to effects on Agricultural Resources, Cultural Heritage Resources, Land Use and Communities, Natural Environment</li> </ul>	<p>We recognize that the language in Section 6.2 of the Environmental Report (ER) is unclear. Operations and maintenance activities were considered and are discussed in Section 6.4.2 Operations and Maintenance. While maintenance activities will be required during operations (i.e., inspections, monitoring, integrity work), leading to dust, noise, and exhaust from construction equipment (as noted in the ER), the activities are not anticipated to have significant adverse residual effects. Enbridge Gas has robust pipeline safety and monitoring programs to ensure our assets operate safely and in accordance with the current regulations of the day.</p> <p>It is possible that further integrity maintenance activities may be required as a result of unanticipated external impacts to the pipeline (e.g., third-party damage, environmental forces). In those instances, Enbridge Gas may need to undertake further ground disturbance. Such maintenance activities will go through a separate environmental review and permitting process outside of the scope of the ER. In addition, any assessment of impacts beyond the project components as described in Section 1.2 Project Description, such as fugitive emissions, are outside of the scope of the ER.</p> <p>The cumulative effects assessment was completed in accordance with the OEB Environmental Guidelines. The temporal boundary for the cumulative effects assessment of the Project construction phase is considered appropriate for the limited residual Project effects that are anticipated to remain after mitigation measures</p>

		<p>Resources (physical, atmospheric, surface water, groundwater, source water protection, designated or special natural areas, vegetation, fish and fish habitat, woodlands, species at risk, wildlife habitat, invasive species), Indigenous Community VECs and Interests, Recreational Resources, Visual and Aesthetic Resources, and Built Environment Infrastructure such as infrastructure crossings, and interactions with wind turbines, roads/highways/bridges, other pipelines, etc.</p> <ul style="list-style-type: none"> <li>○ Hydro One Networks Inc. - Chatham Switching Station</li> <li>○ Hydro One Networks Inc. - Lake shore Transmission Stations Project Leamington Transformer Junction</li> <li>○ Hydro One Networks Inc. - Chatham to Lakeshore Transmission Line</li> <li>○ Hydro One Networks Inc. - St. Clair Transmission Line</li> <li>○ Highway 401 Improvements - Tilbury to London</li> <li>○ Enbridge - Dawn to Corunna</li> </ul>	<p>are implemented and interactive with other concurrent, unrelated projects. Sections 6.1, 6.3 and Table 6-1 in the ER reference the cumulative effects methodology and project inclusion list considered for the Project. The projects included in the project inclusion list were identified by reviewing publicly available information on current and planned projects in the area as well as through consultation with Hydro One, municipalities, etc. Any projects not listed within the project inclusion list fall outside of the temporal boundary and were not considered (i.e., Enbridge Gas Dawn to Corunna Project). Further, the cumulative effects assessment identified potential additive effects on soil, vegetation, wildlife and wildlife habitat, air quality and the acoustic environment. Enbridge Gas determined that, provided the mitigation and protective measures outlined in the ER 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, they are not anticipated to be significant.</p>
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Enbridge Gas Inc. ("Enbridge Gas") Response to Walpole Island First Nation (WIFN) Comments received June 20, 2022 re: Environmental Report on the Panhandle Regional Expansion Project ("Project")		
Item	Comment	Enbridge Gas Response
1.0 Contaminated Sites		
Comment 1	The report reviewed federal and provincial sources for formal records of landfills contaminated sites in the proposed pipeline area; however, these archives are not necessarily indicative of the presence of potential contaminated sites. The mitigation plan is reactive based on finding issues of concern not proactive by evaluating the potential for an impact prior to construction. A proactive approach to identify issues of concern prior to construction is much more effective.	No contaminated sites were uncovered within the vicinity of the Project Study Areas (PSAs) through review of major landfill locations, Provincial Registry ([Ministry of the Environment, Conservation and Parks] MECP Record of Site Condition (RSC) filings) and Federal Contaminated Sites Inventory. It is acknowledged in Section 4.4.8 of the Environmental Report (ER) that there is uncertainty as to the location of the 12 small landfills identified in the review. However, through mitigation measures summarized in Table 5-15, no significant adverse residual effects from Landfills and Contaminated Sites are anticipated.
Comment 2	The process should include (prior to construction) the completion of a Phase One Environmental Site Assessment (ESA) in accordance with Ontario Regulation 153/04 and CSA Standard CSA Z768-01 (Reaffirmed 2016) along the selected route. This will provide an indication of the potential to intersect contaminated sites in a well-structured fashion. The need for additional assessment such as a Phase Two ESA would be contingent on the findings of the Phase One ESA. This information would allow for a pre-construction understanding of the potential to disturb contamination and the creation of an impact mitigation plan. The comments on Hydrogeology would also be very relevant when installing linear infrastructure through contaminated areas. The preparation of the Phase One ESA will also assist in the preparation of the Assessment of Past Uses (APU) required by Ontario Regulation 406/19) for the importation of soil for backfill along the pipeline route.	Enbridge Gas performed a historical background check on lands within the PSA along with a search of contaminated sites as mentioned in Enbridge Gas' response to Comment 1. No contaminated sites were identified during this background review. Further investigative work will be completed during the excess soils work for the Project.
2.0 Hydrogeology		
Comment 3	The report addresses the short-term construction related impacts and mitigation but does not address long term impacts of the pipeline once it is in place. The pipeline has the potential to be a preferential pathway for groundwater migration and possibly a preferential pathway for contaminant migration. A mitigation plan is required to address how the creation of	With the implementation of the recommended mitigation measures to avoid changes in groundwater quantity and flow pattern, as summarized in ER Table 5-1, potential adverse environmental effects of the Project will largely be avoided and, where avoidance is not possible, effects have been minimized to the point where they are not likely significant.

	preferential groundwater pathways will be addressed to prevent impacts. This could include the use of clay plugs or other methods at sensitive places along the pipeline based on the hydrogeology of the surrounding area through which the pipeline passes. The philosophy of the installation should be to maintain the hydrogeological regime and not introduce any significant new flow pathways.	
3.0 Geotechnical		
Comment 4	The report recognizes the potential impacts and the proposed mitigation methods are reasonable. The comments regarding Hydrogeology should be taken into consideration as unnatural groundwater flow pathways created by the pipeline, if not appropriately mitigated, has the potential for a geotechnical impact. Comments on Contaminated Sites includes comments on the assessment and management of excess soil and selection of the appropriate soil quality Standards for importation along the pipeline route and must be considered in the geotechnical planning.	Enbridge Gas will implement all the required mitigative actions defined in the ER regarding the assessment and management of hydrogeology/excess soils conditions during construction and operation phases.
4.0 Infrastructure		
Comment 5	The report identifies the potential to intersect existing infrastructure of various types along the pipeline route and focuses on the impacts to social and economic impacts of construction activity but does not note the need for mitigation of impacts to physical infrastructure especially co-buried infrastructure. A mitigation plan is required to address the potential to impact physical buried infrastructure such as pipelines, cables, and other services. The mitigation plan should recognize that co-buried infrastructure must be identified, and impacts mitigated including reference to Contaminated Sites, Hydrogeological and Geotechnical comments.	Enbridge Gas will perform locates to identify any existing infrastructure and will work closely with utility companies to ensure avoidance and/or mitigation of any possible impacts, where required. Co-buried infrastructure is not anticipated for this project.
5.0 Terrestrial Ecology Impacts		
Future Commitments		
Comment 6	Please provide the proposed work plan when available including the survey locations, protocols, and survey timing	Ecological field surveys have been completed in 2022 and will be used to enhance the understanding of environmental features in the PSAs. WIFN was offered the opportunity to participate in the 2022 field program and continue to be invited for fieldwork days.



Comment 7	Please provide the results of field studies once they are available	Enbridge Gas has committed to providing WIFN with a report summarizing the 2022 field survey findings.
Environmental Monitoring and Contingency Plans		
Comment 8	Please specify who will be responsible for the development of a frac out plan if a horizontal directional drilling (HDD) approach will be used at watercourse crossings. If applicable, please provide the plan when available.	MECP has also requested the development of a frac out plan. Enbridge Gas is committed to producing such a plan and will provide it to WIFN .
Impacts		
Comment 9	As per the Ministry of the Environment, Conservation and Parks (MECP) comments, provide a rationale that if HDD will be used, will it be completed at a sufficient depth to ensure that overwintering reptiles and/or turtle eggs will not be impacted.	Enbridge Gas will use the horizontal directional drilling (HDD) at sufficient depths as the proposed pipeline installation method to allow the pipeline to cross under the Thames River and Baptiste and Jeanettes Creeks. Therefore, no impacts are proposed to the beds of those areas and no impacts to turtle eggs or overwintering reptiles are anticipated.
Mitigation Measures		
Comment 10	Will restoration measures beyond seeding (i.e., Plantings, habitat enhancement) be considered?	Yes, where required and where any necessary landowner permission is granted.
Comment 11	It is understood that trees directly above or adjacent to the pipeline infrastructure will be removed and will not be replaced to facilitate future maintenance. Will compensation plantings be completed for the lost trees? If compensation plantings will be employed, where will these plantings occur? Please refer to section 8.0 Cumulative Effects for further comments in regard to tree compensation.	Yes, compensation plantings will be completed for tree loss in consultation with landowners and other interested parties.
Comment 12	If significant wildlife habitat (SWH) features are identified within the project area and are likely to be impacted by the proposed project, feature-specific mitigation measures should be provided (i.e.,/ setbacks, timing windows, etc.).	Yes, where these features are identified, mitigation is proposed, where required.
Comment 13	All individuals responsible for the handling herpetofauna should be trained on how to handle reptiles correctly and safely.	Qualified individuals who have been trained on how to handle reptiles will be responsible for any relocations that might be required during construction.
Comment 14	Species at Risk (SAR) identification training should be provided to construction staff and contractors on-site regardless of the trenched installation method employed given the identified potential for the direct loss and/or damage of SAR habitat during site preparation, excavation, etc.	Trained personnel will be on-site to monitor construction and be responsible for checking that the ER's mitigation measures and monitoring requirements are executed. Enbridge Gas will implement an orientation program for inspectors and contractor personnel to provide information regarding Enbridge Gas's environmental program and commitments and safety measures.

<p>Comment 15</p>	<p>Please provide additional details regarding wildlife rescues including if permits and/or discussion with the Ministry of Northern Development, Mines, Natural Resources and Forestry (MNDMNR) will be required.</p>	<p>Information on rescue plans can be found in Tables 5-7 and 5-9 of the ER. If during the course of wildlife rescue Species at Risk (SAR) are found to be present within the site, all local work will be stopped until a management plan has been determined with consultation, from MECP &amp; the Department of Fisheries and Oceans Canada (DFO) if available and as appropriate. The most likely form of action will be an immediate relocation outside of the impact zone paired with additional monitoring to ensure no immediate negative effects. Regardless of SAR status, all wildlife rescues will employ methods that ensure safe capture, handling, and release to prevent harm or mortalities.</p>
<p>Comment 16</p>	<p>In areas where there is potential for reptiles to occur, erosion and sediment control (ESC)/ wildlife fencing should be designed in accordance with the recommendations provided in <i>Reptile and amphibian exclusion fencing</i> (MNRF, 2020). Fencing design should consider species-specific height and burial recommendations provided in Table 1 of the MNRF document where appropriate.</p>	<p>Stockpile areas placed prior to June 30 (turtle egg laying period; Ontario Nature, 2016) in proximity to suitable turtle habitat will be assessed by the environmental inspector to determine if they are suitable turtle nesting habitat, and exclusionary fencing will be installed where necessary. Stockpile areas that are placed after June 30 do not require assessment or installation of exclusionary fencing as this is after the typical period for turtle/snake egg laying. Exclusionary fencing may be installed along watercourses and the work areas to avoid fencing individual stockpiles.</p> <p>Stockpiles at watercourse crossings will not be in place long term. Short-term stockpiles at watercourse crossings will be monitored by a full-time environmental inspector and will be stabilized in such a manner to prevent erosion and sediment transportation.</p>
<p>Comment 17</p>	<p>Surveys of the work area should be completed prior to and following the installation of ESC measures to ensure wildlife has not become trapped in the work area.</p>	<p>All erosion and sediment control measures will be implemented under direction of an experienced environmental inspector who will ensure implementation of Erosion and Sediment Control (ESC) measures based on the site conditions.</p>
<p>Comment 18</p>	<p>Debris from vegetation removals should be kept and used as brush piles for snakes where feasible and appropriate.</p>	<p>Agreed, mitigation measures related to snakes will be developed and confirmed with MECP. However, it should be noted that debris will not be kept on the pipeline right-of-way and piling of debris outside of the pipeline right-of-way is subject to landowner approval.</p>
<p>Comment 19</p>	<p>Where there is potential for SAR snakes or turtles to occur within the project area, daily sweeps of the work limits and construction equipment should occur during the snake and turtle active windows.</p>	<p>Agreed, mitigation measures related to SARS snake or turtles will be developed and confirmed with MECP.</p>
<p>Comment 20</p>	<p>If site preparation will occur during the turtle nesting period and is within proximity to identified turtle habitat, the construction limits should be surveyed by an ecologist/ biologist to identify turtle nests. If any nests are presumed to be from an</p>	<p>Agreed.</p> <p>Stockpile areas placed prior to June 30 (turtle egg laying period; Ontario Nature, 2016) in proximity to suitable turtle habitat will be assessed by the environmental inspector to determine if they are suitable turtle nesting habitat, and exclusionary fencing will be</p>

	endangered or threatened species, the MECP should also be contacted for further direction.	installed where necessary. Stockpile areas that are placed after June 30 do not require assessment or installation of exclusionary fencing as this is after the typical period for turtle/snake egg laying. Exclusionary fencing may be installed along watercourses and the work areas to avoid fencing individual stockpiles.
6.0 Aquatic Ecology Impacts		
Comment 21	Overall, potential impacts to fish habitat and SAR and their habitat cannot be accurately assessed at this time until field studies confirm the fish habitat conditions, features, or Fisheries Act and species-specific SARA mitigation plans. Impacts to fish habitat will depend on the selected installation method. Per section 5.2.1 Construction, the installation method for watercourse crossings have not been confirmed at this point.	At this point it is determined that watercourse crossings will be completed using trenchless installations methods or Isolated Open-Cut (i.e., dam & pump). However, crossing techniques will be confirmed through detailed design and discussions with appropriate regulatory authorities (e.g., Lower Thames Valley Conservation Authority, Essex Region Conservation Authority) to avoid effects to fish and fish habitat.
Comment 22	The methodology for the aquatic habitat and fisheries community sampling are not provided. Please note, it is expected that targeted surveys for SAR fish and mussels will be conducted within the project area. Please provide the results of the fish community sampling and fish/mussel habitat assessments, when available.	The methodologies used for aquatic habitat and fisheries community sampling will be outlined in a memo that will be shared with WIFN. The memo will also include a summary of the results of the sampling.
Comment 24	Please provide WIFN the opportunity to assign field technicians to participate in the 2022 fish community sampling and fish/mussel habitat assessments.	Fish community sampling and fish/mussel habitat assessment was completed at the proposed watercourse crossings in 2022. WIFN was offered the opportunity to participate in the 2022 field program.
Comment 25	Previous and future correspondence with the MECP, Fisheries and Oceans Canada (DFO), NDMNRF, and St. Clair Region Conservation Authority (SCRCA) should be provided when available.	An up-to-date Ontario Pipeline Coordinating Committee (OPCC)/agency review summary table is being kept and can be provided to WIFN upon request.
Comment 26	It is mentioned that DFO will review the project for Fisheries Act approval, if required based on construction methodology, as well as for approval under SARA. Please note, it may be required to either register the project with MECP or obtain an overall benefit permit from MECP for aquatic SAR, depending on the footprint of the works in SAR habitat.	Agreed. As noted in the ER, if a watercourse containing provincially or federally listed SAR will be affected by the project, additional engagement with regulators such as DFO and MECP will be required. The DFO could require a Fisheries Act Authorization, which requires offsetting activities, and the MECP would also need to be contacted regarding the requirements under the Endangered Species Act (ESA). Potential requirements could come in the form of mitigation advice that would support avoidance of contravention of the ESA, a notification of activity or a permit.
Comment 24	On page 63 in <i>Table 5-7: Potential effects, Proposed Mitigation and Net Effects on Fish and Fish Habitat and Aquatic SAR</i> under the heading <i>Erosion and Sediment Control</i> the text refers to Appendix I:	Generic Sediment Control Plans for Dam & Pump, HDD, and Temporary Vehicle Crossings will be provided to WIFN for review.

	<p>“For detailed information on mitigation measures, contingency plans, and construction sequences of different types of watercourse crossings, refer to the Generic Sediment Control Plans provided in Appendix I.”</p> <p>Appendix I in the report contains only a generic sediment control fence diagram and no reference to detailed information on mitigation measures, contingency plans, and construction sequences for different types of water crossings. Please provide details from the referenced appendix for review.</p>	
<p>7.0 Socio-economic and Cultural Impacts</p>		
<p>Comment 25</p>	<p>As identified in Table 4-6, a significant portion of the population within the Project Study Areas (PSAs) identify as Indigenous. Walpole Island is located within 50 km of the PSAs. Please include details specific to local Indigenous communities, including WIFN, when available.</p>	<p>Enbridge Gas would like to work with WIFN to learn more on how we can gather this information (if publicly available) and include details specific to the local Indigenous communities in this section.</p>
<p>Comment 26</p>	<p>Section 4.4.5 Culture, Tourism and Recreation Facilities does not include recognition of the cultural landscape values held by WIFN in the PSAs. WIFN has occupied and used the lands of its territory since time immemorial, which would include cultural and spiritual use values and activities throughout its territorial and Treaty lands. Please be aware that the current conditions of the PSAs do not preclude WIFN from re-establishing conditions to support future desired cultural and spiritual uses.</p>	<p>Enbridge Gas would like to obtain further details from WIFN regarding its cultural and spiritual uses on lands in the area so that we can ensure that we can mitigate any potential impacts the Project or Enbridge Gas’s operations may have on WIFN’s ability to use this land in the future.</p>
<p>8.0 Cumulative Effects</p>		
<p>Comment 27</p>	<p>We recognize the justification for not replacing trees removed within the corridor, however we would like to ask if there is an opportunity for compensation plantings outside of the corridor. Through the continual development in the area and tree removal within the Enbridge corridors, there is an ongoing negative impact to the area. Cumulative effects are defined by the Cumulative Effects Assessment Practitioners Guide (1999) as changes to the environment that are caused by an action in combination with other past, present, and future human actions. Tree removal along the corridor associated with Enbridge</p>	<p>Where feasible, in consultation with directly impacted landowners, Enbridge Gas will restore the lands to pre-existing conditions with the exception of woodlands and trees within the permanent easement. Enbridge Gas committed to implementing a tree replacement program that replants woodland removed with seedlings of native species that are guaranteed until they reach free to grow status. This program was planned at a ratio of 2:1 for the woodland areas removed and will now be increased to 3:1 (trees to be replaced on a 3:1 area basis at 1000 tree seedlings per acre).</p> <p>Directly impacted landowners are given first right of refusal for the tree planting under this program. If landowners are not interested in planting trees on their property,</p>

	<p>projects may be contributing to a “nibbling loss” through the gradual disturbance and loss of habitat in the area.</p> <p>Forest cover is already very low in this region. The Chatham-Kent Official Plan (2018) specifies the total land area has approximately 4% forest cover. The Lake Erie-Lake Ontario Ecoregion (7E) is also called the Carolinian Forest Ecoregion and contains the greatest species diversity in Canada. The on-going vegetation removals through Enbridge’s projects may result in less representation of these rare species on a regional scale. WIFN would like to see that the land is restored to a better condition than before the proposed development. WIFN requests that trees that are removed directly above and adjacent to the pipeline and trees removed on temporary construction areas are compensated with native tree seedlings at a ratio of 3:1.</p>	<p>Enbridge Gas will work with Indigenous communities and local conservation authorities to find suitable locations to plant trees.</p>
<p>Comment 28</p>	<p>The Environmental Guidelines (2016) set out by the Ontario Energy Board are temporally and spatially inadequate to assess cumulative effects and do not necessarily take Indigenous values into account. We do not anticipate that the existing gaps in evaluating cumulative effects as set out in the Environmental Guidelines (2016) will be addressed through this project.</p>	<p>Thank you for providing this comment. Enbridge Gas follows the Ontario Energy Board’s Environmental Guidelines for Hydrocarbon Pipelines and Facilities in Ontario (2016) when planning a pipeline project in Ontario. Section 4.3.14 of the Environmental Guidelines (2016) contains information on cumulative effects and how cumulative effects should be considered and assessed in the Environmental Report of a pipeline project. Enbridge Gas adheres to and applies the principles contained within Section 4.3.14 of the Environmental Guidelines (2016) for all our pipeline projects in Ontario.</p> <p>It should be noted that Enbridge Gas is open to continuing discussions on evaluating cumulative effects as it relates to Indigenous values and the environment to better improve the cumulative effects assessment process.</p>
<p>Comment 29</p>	<p>Due to the proponent’s on-going development and operation within the WIFN territory, we continue to encourage a collaborative approach to developing a cumulative effects assessment framework with WIFN. As identified in previous projects, we encourage Enbridge to consider how it may achieve net environmental gains through its on-going projects, there is an opportunity for Enbridge to collaborate with WIFN to determine what actions and policies could achieve new environmental gain to prevent and mitigate cumulative effects</p>	<p>The cumulative effects assessment was completed in accordance with the OEB Environmental Guidelines. Enbridge Gas reviewed publicly available information on current and planned projects in the area, then considered the effects that are additive or interact with the effects that have already been identified as resulting from the pipeline construction. The cumulative effects assessment identified potential additive effects on soil, vegetation, wildlife and wildlife habitat, air quality and the acoustic environment. Enbridge Gas determined that, provided the mitigation and protective measures outlined in the ER are implemented and that concurrent projects implement similar mitigation and</p>

	and begin to restore conditions to support WIFN future desired uses.	<p>protective measures, potential cumulative effects are not anticipated to occur, or if they do occur, they are not anticipated to be significant.</p> <p>Enbridge Gas offers capacity funding to all Indigenous communities to engage in meaningful consultation on projects. Enbridge Gas would be happy to discuss the completion of an Indigenous Knowledge, Land Use study with WIFN.</p>
Comment 30	WIFN requests the opportunity to assign field technicians to participate in environmental monitoring activities including tree/vegetation survival inspections and the one-year walking inspection to determine whether areas require further rehabilitation.	Enbridge Gas will work with WIFN to have field technicians participate in environmental monitoring activities including tree/vegetation survival inspections and the one-year walking inspection to determine whether areas require further rehabilitation.
9.0 Consultation	The consultation components of the ER were reviewed including Chapter 3 and Appendix B. This review is limited to consultation efforts made by Enbridge with First Nations, focusing on the specific comments raised by WIFN. The following comments are provided.	
Comment 31	Section 3.6 of the ER provides a summary of the feedback received from the public, agencies, Lower Thames Valley Conservation Authority, upper and lower tier municipalities, and interest groups. This section of the ER is missing information for the feedback received from the seven First Nations identified for consultation. A new section should be added to the ER to document the missing information.	A summary of feedback from the First Nations is provided with the Project application for OEB approval. These can be found in H1-1 Attachment 6 and 7 of the OEB filing.
Comment 32	Appendix B6 provides a log of engagement activities (emails, phone calls and meetings) with the seven First Nations identified for consultation. The ER does not include the records of correspondence (emails, minutes of meeting, etc.) that correspond to most of the log entries, except those relating to Notices.	The records of correspondence (emails, etc) are captured within the OEB filing due to their size. These can be found in H1-1 Attachment 7 of the OEB filing.
Comment 33	The Indigenous Engagement Log references comments raised by WIFN at a meeting with Enbridge on November 15, 2021. WIFN indicated the area between the Thames River and Jeanettes Creek is very significant to WIFN and the Three Fires Confederacy. The ER does not reference this discussion with WIFN. The cultural importance of this area to WIFN and the Three Fires Confederacy should be added to the ER including a	<p>Enbridge Gas, through discussions with WIFN, are aware of this sensitive area and it will be communicated with construction staff through training and identification in the Environmental Protection Plan.</p> <p>Enbridge Gas would welcome an elder or a cultural representative from WIFN to share their knowledge specific to the region with the Project team.</p>

	<p>commitment to continue to consult with WIFN about this culturally important area moving forward.</p> <p>Enbridge should seek discussions with WIFN for accommodation to work through the culturally significant area identified by WIFN between Jeanettes Creek and the Thames River.</p>	
<p>Comment 34</p>	<p>The Project Update letter to WIFN dated April 8, 2022 notes that the Wheatley Lateral Reinforcement, Talbot Road Reinforcement and Oak Street and Essex Road 33 reinforcement will no longer be considered part of the Panhandle regional Expansion Project. It is unclear if Enbridge will pursue these distribution pipelines in the future and through what process these pipelines would be undertaken. Clarification should be provided in Section 1.2 or the ER relating to the timing and process that would be used for these distribution pipelines and an acknowledgement that affected First Nations, including WIFN would be consulted early in the planning process.</p>	<p>At this time, Enbridge Gas has not determined whether the Wheatley Lateral Reinforcement, Talbot Road Reinforcement and Oak Street and Essex Road 33 reinforcement will proceed and if they do proceed, the expected timing. Should these pipelines be required, affected First Nations, including WIFN will be consulted early in the planning process.</p>

**From:** Lauren Whitwham <Lauren.Whitwham@enbridge.com>  
**Sent:** June 10, 2022 11:30 AM  
**To:** Brown, Gillian (ENERGY) <Gillian.Brown2@ontario.ca>  
**Cc:** Gibson, Amy (ENERGY) <Amy.Gibson@ontario.ca>; Catherine Pennington <Catherine.Pennington@enbridge.com>; Kevin Berube <kevin.berube@enbridge.com>  
**Subject:** Panhandle Regional Expansion Project: Filed with OEB

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

Good morning Gillian,

Today Enbridge Gas filed the leave to construct application and evidence for the **Panhandle Regional Expansion Project** with the OEB. Please find attached our Indigenous Engagement summary and log for your review.

I will send the Virtual Open House slides under a separate email due to size restrictions.

Kevin and I are happy to connect on any questions, clarification or comments you might have. Kevin engages with Chippewas of the Thames and Oneida while I engage with the other Nations.

If you could please acknowledge receiving this email, that would be much appreciated.

Have a good weekend,



**From:** [Brown, Gillian \(ENERGY\)](#)  
**To:** [Lauren Whitwham](#)  
**Cc:** [Gibson, Amy \(ENERGY\)](#); [Catherine Pennington](#); [Kevin Berube](#)  
**Subject:** [External] RE: Panhandle Regional Expansion Project: Filed with OEB  
**Date:** Monday, June 13, 2022 10:45:31 AM

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Hi Lauren,

Thank you very much for alerting us to the Leave to Construct application and sharing the Indigenous Engagement summary and log for the Panhandle Regional Expansion Project.

We will be in touch if we have any questions. We will hopefully have some more team members soon, so you may hear from myself or a colleague if we have any follow-up questions.

Have a lovely day,  
Gillian

---

**From:** Lauren Whitwham <Lauren.Whitwham@enbridge.com>  
**Sent:** September 6, 2022 10:59 AM  
**To:** Brown, Gillian (ENERGY) <Gillian.Brown2@ontario.ca>  
**Cc:** Gibson, Amy (ENERGY) <Amy.Gibson@ontario.ca>; Catherine Pennington <Catherine.Pennington@enbridge.com>; Haris Ginis <Haris.Ginis@enbridge.com>; Kevin Berube <kevin.berube@enbridge.com>  
**Subject:** Panhandle Regional Expansion Project update for OEB process

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Hi Gillian,

Hope this finds you well and you enjoyed your summer.

As you might know, Enbridge Gas is currently in the Interrogatory Responses (IRs) part of the OEB application for Panhandle Regional Expansion Project. One of the OEB Staff IRs is to "obtain an update from the MOE on the status and anticipated timeline of receiving a Letter of Opinion for the Project". Would you be able to provide us with an update and anticipated timeline?

We will be providing an updated log within the IRs and I will send that over to you once filed. Kevin and I are also available for any questions or concerns that might come up during your conversations with the First Nations during your engagement on the Project. Kevin engages with COTTFN and Oneida Nation while I engage with the others.

Feel free to reach out at any time.

Thanks so much,  
Lauren

From: [Brown, Gillian \(ENERGY\)](#)  
To: [Lauren Whitbam](#)  
Cc: [Gibson, Amy \(ENERGY\)](#); [Catherine Pennington](#); [Haris Ginis](#); [Kevin Berube](#); [Ali-Khan, Farrah \(ENERGY\)](#)  
Subject: [External] RE: Panhandle Regional Expansion Project update for OEB process  
Date: Tuesday, September 6, 2022 3:12:55 PM

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Hi Lauren,

I'm well thanks, hope you had a great long weekend. Thanks very much for sharing the updated log when it is available.

My colleague Farrah and I have been following the OEB process as part of our sufficiency assessment work. We met with OEB staff on July 14<sup>th</sup> and they indicated they would need our Letter of Opinion by November (this was prior to Procedural Order No. 1). We will be working backwards from the timelines set, and will have our Letter to the OEB in time. Given that Three Fires Group is an intervenor, this impacts how early we can provide the Letter.

Status update for OEB

- ENERGY is in the process of discussing with communities their experiences with Enbridge's consultation to-date on the Panhandle project. ENERGY continues to monitor the OEB process, and is reviewing Three Fires Group's interests and concerns. ENERGY's intent is to provide the Letter of Opinion by the end of the record closing.

Additional information for Enbridge

- ENERGY began its reach outs to communities in early July 2022.
- ENERGY has met with Chippewas of the Thames First Nation and Aamjiwnaang First Nation. Follow up conversations will likely take place in mid-late September. COTTFFN shared they were waiting for Enbridge's response to their questions and comments sent on July 28<sup>th</sup>, and that a second meeting with ENERGY would be more useful after that had happened. Similarly, AFN indicated not meeting again until September would allow for AFN representatives to meet with Enbridge staff on the recommendations from the ER to better understand how Enbridge is addressing the community's concerns.
- ENERGY has not yet received a response from Walpole Island.
- Caldwell First Nation responded on theirs and Chippewas of Kettle and Stony Point's First Nation's behalf, and indicated they (as the Three First Nation Group) would like to discuss both Panhandle and Dawn Corunna (for which Caldwell was not identified). ENERGY replied indicating we would be happy to meet, but that we would be engaging with Caldwell on an interest basis for Dawn Corunna

project. ENERGY is still waiting for a response and a meeting.

- Due to timing availability for the Oneida Nation of the Thames rep, ENERGY proposed a discussion on both Panhandle and Dawn Corunna, but is still waiting to hear back.
- ENERGY will continue to follow up with all communities on a regular basis to ensure we can hear first-hand from communities. Reach-outs will be ramping up.

This is opportune timing, as I had reached out to Enbridge twice to share what we had heard from our COTTFFN meeting, but unfortunately did not receive a response. Perhaps we can schedule a touch-base in a few weeks with you and Kevin once we have had further meetings with communities to share what we have heard?

Best,  
Gillian

ENBRIDGE GAS INC.

Answer to Interrogatory from  
OEB Staff (“STAFF”)

INTERROGATORY

Reference:

Exhibit A, Tab 2, Schedule 1

Preamble:

Enbridge Gas has applied for leave to construct facilities pursuant to section 90(1) of the Ontario Energy Board Act, 1998 (OEB Act).

The OEB’s standard conditions of approval for applications filed under section 90 of the OEB Act are provided below.

Question:

Please comment on the standard conditions of approval. If Enbridge Gas does not agree with any of the standard conditions of approval, please identify the specific conditions that Enbridge Gas disagrees with. Please specify any changes, amendments or additional conditions to the standard conditions. Explain the rationale for any proposed changes or amendments.

**Application under Section 90(1) of the OEB Act  
Enbridge Gas Inc.  
EB-2022-0157  
DRAFT  
Standard Conditions of Approval**

1. Enbridge Gas Inc. shall construct the facilities and restore the land in accordance with the OEB’s Decision and Order in EB-2022-0157 and these Conditions of Approval.
2. (a) Authorization for leave to construct shall terminate 12 months after the decision is issued unless construction has commenced prior to that date.  
(b) Enbridge Gas Inc. shall give the OEB notice in writing:

- i. of the commencement of construction, at least 10 days prior to the date construction commences
  - ii. of the planned in-service date, at least 10 days prior to the date the facilities go into service
  - iii. of the date on which construction was completed, no later than 10 days following the completion of construction
  - iv. of the in-service date, no later than 10 days after the facilities go into service
3. Enbridge Gas Inc. shall obtain all necessary approvals, permits, licences, certificates, agreements and rights required to construct, operate and maintain the Project.
4. Enbridge Gas Inc. shall implement all the recommendations of the Environmental Report filed in the proceeding, and all the recommendations and directives identified by the Ontario Pipeline Coordinating Committee review.
5. Enbridge Gas Inc. shall advise the OEB of any proposed change to OEB-approved construction or restoration procedures. Except in an emergency, Enbridge Gas Inc. shall not make any such change without prior notice to and written approval of the OEB. In the event of an emergency, the OEB shall be informed immediately after the fact.
6. Concurrent with the final monitoring report referred to in Condition 7(b), Enbridge Gas Inc. shall file a Post Construction Financial Report, which shall provide a variance analysis of project cost, schedule and scope compared to the estimates filed in this proceeding, including the extent to which the project contingency was utilized. Enbridge Gas Inc. shall also file a copy of the Post Construction Financial Report in the proceeding where the actual capital costs of the project are proposed to be included in rate base or any proceeding where Enbridge Gas Inc. proposes to start collecting revenues associated with the Project, whichever is earlier.
7. Both during and after construction, Enbridge Gas Inc. shall monitor the impacts of construction, and shall file with the OEB one electronic (searchable PDF) version of each of the following reports:
  - (a) A post construction report, within three months of the in-service date, which shall:
    - i. provide a certification, by a senior executive of the company, of Enbridge Gas Inc.'s adherence to Condition 1
    - ii. describe any impacts and outstanding concerns

- identified during construction
  - iii. describe the actions taken or planned to be taken to prevent or mitigate any identified impacts of construction
  - iv. include a log of all complaints received by Enbridge Gas Inc., including the date/time the complaint was received, a description of the complaint, any actions taken to address the complaint, the rationale for taking such actions
  - v. provide a certification, by a senior executive of the company, that the company has obtained all other approvals, permits, licenses, and certificates required to construct, operate, and maintain the proposed project
- (b) A final monitoring report, no later than fifteen months after the in-service date, or, where the deadline falls between December 1 and May 31, the following June 1, which shall:
- i. provide a certification, by a senior executive of the company, of Enbridge Gas Inc.'s adherence to Condition 4
  - ii. describe the condition of any rehabilitated land
  - iii. describe the effectiveness of any actions taken to prevent or mitigate any identified impacts of construction
  - iv. include the results of analyses and monitoring programs and any recommendations arising therefrom
  - v. include a log of all complaints received by Enbridge Gas Inc., including the date/time the complaint was received; a description of the complaint; any actions taken to address the complaint; and the rationale for taking such actions
8. Enbridge Gas Inc. shall designate one of their employees as project manager who will be the point of contact for these conditions, and shall provide the employee's name and contact information to the OEB and to all affected landowners, and shall clearly post the project manager's contact information in a prominent place at the construction site.

### **Response**

Enbridge Gas accepts these Standard Conditions of Approval.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Ontario Energy Board Staff (STAFF)

INTERROGATORY

Reference:

Updated Application, Exhibit B, Tab 1, Schedule 1, page 7, paragraph 26, page 10, paragraph 33; Attachment 8: 2023 Expression of Interest Non-Binding Bid Form, Attachment 9: 2023 Distribution Service Binding Reverse Open Season Form

Preamble:

After the proceeding was placed in abeyance on December 5, 2022, Enbridge Gas updated its forecast of the demand for incremental capacity to support the need for the Project. To re-confirm the customer interest in demand for incremental capacity on the Panhandle System Enbridge Gas launched, on February 23, 2023, the second non-binding Expression of Interest (EOI 2023) and a Binding Reverse Open Season (ROS). A total of 42 EOI 2023 bids were received from 39 entities as of closing the EOI process on April 6, 2023. The prospective customers expressed interest for capacity of 197 TJ/d from 2024 to 2033. Of the 42 bids, 38 were from the greenhouse sector, 2 from the electricity generation (power) sector and 2 from commercial sector.

According to the outcomes of the EOI 2023, 94% of the total incremental potential project demand is by contract rate customers. Enbridge Gas stated that, as of May 2023, 34% of the contract rate customer demand is “underpinned by firm distribution contract”.

Enbridge Gas plans to execute distribution service contracts with customers for the service in 2024 and 2025 and secure the remaining contracts from contract rate customers in the years to follow.

Question(s):

a) Please explain the statement that 34% of the contract customer demand is underpinned by firm distribution contracts. How many firm distribution contracts have been executed to date for incremental firm service in 2024 and 2025? Please provide a total contracted capacity demand for 2024 to 2025 by volume, by customer or by sector.

b) What is Enbridge Gas’s plan to secure the remaining firm distribution contracts for the incremental capacity demand forecast for the years 2026 to 2033?

Response

a) 57 TJ/d of incremental customer demand is currently underpinned by a firm distribution contract, accounting for 34% of the total incremental capacity created by the Project (i.e., 168 TJ/d).

In addition, Enbridge Gas is actively engaged in contract negotiations with customers who require an additional 10 TJ/d of incremental capacity starting in 2024 and 64 TJ/d of incremental capacity starting in 2025.

The total amount of incremental customer demand that is currently underpinned by a firm distribution contract or is being negotiated for a firm distribution contract by the end of 2025 (i.e., the first 2 years of the Project) is 131 TJ/d, accounting for 78% of the total incremental capacity created by the Project (i.e., 168 TJ/d).

Please see Table 1 below for a breakdown of incremental customer demand requirements (underpinned by a firm distribution contract and in negotiation) for 2024 and 2025 by customer and sector.

Table 1: 2024 and 2025 Incremental Customer Demand Requirements (Underpinned by Firm Distribution Contract and In Negotiation) by Customer and Sector

Status	Customer	Sector	TJ/Day		
			2024	2025	Total
<b><u>Underpinned by Firm Distribution Contract</u></b>					
	1	Power <sup>1</sup>	57.4	0	57.4
<b>Total Underpinned by Firm Distribution Contract</b>			<b>57.4</b>	<b>0</b>	<b>57.4</b>
<b><u>In Negotiation</u></b>					
	2	Power	0	6.3	6.3
	3	Power	0	25.1	25.1
	4	Greenhouse	0.5	3.1	3.6
	5	Greenhouse	2.4	0	2.4
	6	Greenhouse	0	2.4	2.4
	7	Greenhouse	2.2	0	2.2
	8	Greenhouse	0	2.1	2.1
	9	Greenhouse	1.6	0	1.6
	10	Greenhouse	0	1.4	1.4
	11	Greenhouse	1.3	1.6	2.9

<sup>1</sup> The contract term for the executed contract is July 16, 2024 to July 15, 2029.



	12	Greenhouse	1.3	1.3	2.7
	13	Greenhouse	0	1	1
	14	Greenhouse	0	0.9	0.9
	15	Greenhouse	0.4	0	0.4
	16	Greenhouse	0.2	0	0.2
	17	Greenhouse	0	4.5	4.5
	18	Greenhouse	0	3.1	3.1
	19	Greenhouse	0	2.2	2.2
	20	Greenhouse	0	1.6	1.6
	21	Greenhouse	0	1.3	1.3
	22	Food and Beverage	0	0.1	0.1
	23	Greenhouse	0	0.9	0.9
	24	Greenhouse	0	1.1	1.1
	25	Greenhouse	0	1.7	1.7
	26	Greenhouse	0	0.8	0.8
	27	Greenhouse	0	1.3	1.3
<b>Total In Negotiation</b>			<b>9.9</b>	<b>63.8</b>	<b>73.8</b>
<b>Total Underpinned by Firm Distribution Contract and In Negotiation</b>			<b>67.3</b>	<b>63.8</b>	<b>131.2</b>

b) Enbridge Gas is primarily engaged in discussions and negotiations with contract customers requiring capacity in the near term (i.e., 2024 - 2025) to execute firm distribution contracts. For bids received requesting service beyond 2025, Enbridge Gas will be engaging with those customers over the next 12-24 months, or otherwise as appropriate, to initiate activities which include the assessment of customer specific distribution assets, establishment of credit, and ultimately contract execution.

It should be noted that Enbridge Gas is also engaged in active discussions and negotiations with customers who did not submit EOI bids but required additional capacity, including companies seeking to locate in Windsor, Essex County, and Chatham-Kent to support new technologies such as electric vehicle battery manufacturing related industries.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Ontario Energy Board Staff (STAFF)

INTERROGATORY

Reference:

Procedural Order No. 4, December 14, 2022, page 3; Updated Application Exhibit E, Tab 1, Schedule 1, B. Project Economics, paragraph 4, page 3

Preamble:

In Procedural Order No. 4, which placed the proceeding in abeyance as of December 5, 2022, the OEB confirmed that the issue of the applicability of E.B.O. 134 and E.B.O. 188 is within the scope of the proceeding. The OEB stated:

“...the OEB is of the view that the economics of the project, the applicability of EBO 134 and EBO 188, and the extent to which contributions in aid of construction should be required are issues that are in scope for this proceeding. Enbridge may wish to consider whether to provide additional evidence on those issues as part of its proposed update to its application. Enbridge may also wish to consider whether it should be communicating with potentially affected customers regarding the position of some parties that contributions in aid of construction should be required.”

In the updated application filed on June 16, 2023, Enbridge Gas addressed the issue of applicability of the E.B.O. 134 and E.B.O. 188 by stating that E.B.O. 134 is the appropriate economic test as the Project is entirely a transmission project.

As part of the EOI 2023, Enbridge Gas conducted outreach to customers who indicated their intention to submit an EOI bid to obtain customer's position on paying CIAC. Enbridge Gas asked these customers how a requirement for a CIAC may impact their demands for new/incremental service.

Enbridge Gas stated that the customers feedback was as follows:

- Customers submitting EOI bids for new/incremental service were generally doing so under the assumption that the OEB would apply the established regulatory framework for transmission system expansion projects, which does not require CIAC, consistent with similar projects constructed in the past. Customers generally indicated opposition to being required to provide CIAC to support transmission system expansion in this instance.

•No customer indicated that they would be willing to provide CIAC for a transmission system expansion project without understanding the magnitude of the CIAC and the unique justification for its selective application in this instance.

Question(s):

- a) Please provide details on Enbridge Gas's customer outreach activities regarding the requirement for a CIAC including dates, method of communication, and information provided to customers.
- b) Please advise whether any customers will be directly connected to the Project.
- c) Please advise whether Enbridge Gas agrees that the Project almost entirely benefits identifiable contract customers.

Response:

- a) As part of the 2023 EOI, Enbridge Gas conducted outreach to customers who indicated their intention to submit an EOI bid to obtain their position on paying a CIAC. Enbridge Gas asked these customers how a requirement for a CIAC may impact their demands for new/incremental service. This outreach was a result of the OEB's Procedural Order No. 4 dated December 14, 2022, which stated:<sup>1</sup>

“Enbridge may also wish to consider whether it should be communicating with potentially affected customers regarding the position of some parties that contributions in aid of construction should be required.”

Outreach occurred between February 15, 2023 and April 6, 2023.

There was no information sent to customers regarding the matter, and Enbridge Gas account managers were not provided with a script to deliver to customers. Rather, Enbridge Gas account managers sought customer feedback via verbal communication and recorded any feedback from customers. The customer feedback collected by Enbridge Gas account managers can be found at Attachment 1 to this response. Please note that Enbridge Gas is requesting confidential treatment of the names of customers in Attachment 1. A summary of the feedback back can be found at Exhibit A, Tab 4, Schedule 1, Paragraph 21.

Please also see the response at Exhibit I.SEC.5, part b) for instructions/guidance provided to Enbridge Gas account managers regarding the matter.

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<sup>1</sup> OEB Procedural Order No. 4 (December 14, 2022), p. 3.

- b) No customers will be directly connected to the Project.<sup>2</sup>
- c) No, Enbridge Gas does not agree that the transmission Project almost entirely benefits identifiable contract customers. The very nature of a transmission pipeline is that it provides natural gas to a broad geographic region comprised of multiple distribution systems of which a large number of both contract and general service customers are served. Whereas distribution pipelines benefit a very specific customer or set of customers, a transmission pipeline provides benefits to a broad region. The proposed Project will enable the transportation of natural gas for the benefit of all natural gas customers within the Panhandle Market (including the Municipalities of Chatham-Kent, Lakeshore, Tecumseh, Windsor, LaSalle, Amherstburg, Essex, Kingsville and Leamington, St. Clair, and Dawn-Euphemia).

The proposed Project partially alleviates the largest Panhandle System bottleneck (see Exhibit B, Tab 2, Schedule 1, pp. 13 - 14). Partial alleviation of the bottleneck improves the reliability of natural gas service for existing customers and will allow for growth among both existing and new customers on the Panhandle System. All customers benefit from alleviation of Panhandle System bottlenecks.

Although the demand forecast is based on contract customers who responded to the EOI, these are not the only customers that will benefit from the capacity created. Customers that did not respond to the EOI will have the ability to connect to the system using any capacity that is available at the time of their request. The timing of when commercial, industrial, and power generation customers are in a position to express their needs for natural gas service do not always align with the timing of Enbridge Gas's EOI process. As a result, the EOI results are only a point-in-time snapshot of customer demand. As has been demonstrated over the last decade, both expected and unexpected growth in the Panhandle Market area has continued to materialize as new customers attach to the natural gas system. As these new customers request natural gas service, it is important that Enbridge Gas has the ability to accommodate them in a timely and economic manner.

Transmission system capacity is available on a "first come, first served" basis. Once in service, the proposed Project will serve all existing and future customers whether or not they participated in the EOI.

The capacity created by the proposed Project will also benefit new general service customers. The timing for the attachment of general service customers is dependent upon the planning and development of new residential and commercial buildings as undertaken by cities, municipalities, and developers. Since the Project will provide

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<sup>2</sup> For clarity, the Project consists of the Panhandle Loop (i.e., 19 km of NPS 36 natural gas pipeline) and ancillary measurement, pressure regulation, and station facilities within the Township of Dawn Euphemia and in the Municipality of Chatham-Kent.

incremental capacity across a broad geographic region, it will benefit all new general service customers in that area by allowing Enbridge Gas to attach these new customers as they emerge.

Existing contract and general service customers will also benefit from the capacity created by the Project. These customers, which are already attached to the system, will have the ability to grow their natural gas use (and in some cases their businesses) by leveraging the capacity that is available after the Project is placed into service.

From an operational standpoint, the proposed Project also provides enhanced system reliability and redundancy to existing customers during non-peak times of the year. Once the proposed pipeline facilities are placed into service, they become a functional loop of the overall Panhandle System. Enbridge Gas cannot differentiate natural gas molecules as they flow through the transmission system, and as a result both new and existing customers will be served by both the new and existing transmission facilities. The proposed Project increases operational flexibility in the event of maintenance, in-line inspections or unplanned outage on the Panhandle System, including interruption of Ojibway supply.

From a broader economic perspective, as outlined at Exhibit E, Tab 1, Schedule 1, Paragraph 19, the transmission Project will also provide direct and indirect economic benefits to Ontario estimated at approximately \$257 million. This figure does not include the similar direct and indirect economic benefits to Ontario when both existing and new natural gas customers invest and grow their operations. Within EOI bid responses, customers indicated that total direct capital investments into their business operations in Southern Ontario related to their incremental natural gas needs would exceed \$4.5 billion.

Enbridge Gas is aware of an increased demand for natural gas in the Panhandle Market via local economic development organizations and recent publications:

- March 2023: “Drawings, details of new hospital revealed during virtual town hall” – <https://windsorstar.com/news/local-news/drawings-details-of-new-hospital-revealed-during-virtual-town-hall>
- April 2023: “Windsor-Essex being eyed for billions in new industrial investment” – <https://windsorstar.com/news/Windsor-essex-being-eyed-for-billions-in-new-industrial-investment>
- June 2023: “New Interchange Connecting Lauzon Parkway To 401 'Highest Priority' Says Ford” – <https://www.iheartradio.ca/am800/news/new-interchange-connecting-lauzon-parkway-to-401-highest-priority-says-ford-1.19736147>

- July 2023: “Windsor lands another big EV auto supply chain company” – <https://windsorstar.com/news/Windsor-lands-another-big-ev-auto-supply-chain-company>
- August 2023: “Windsor inching closer to landing another major foreign investment” – <https://windsorstar.com/news/Windsor-inching-closer-to-landing-another-major-foreign-investment>

Please also see a recent Globe and Mail article which includes commentary from the greenhouse industry:

- August 2023: “Southern Ontario’s greenhouse operators warn lack of infrastructure is slowing growth in booming sector” – <https://www.theglobeandmail.com/business/article-windsor-greenhouse-growers-infrastructure/>

The IESO has similarly recognized the significant and exceptional demand the Panhandle Market area will experience as part of their Southwest Ontario Bulk Planning initiatives<sup>3</sup>.

*“Electricity demand in Southwest Ontario is growing at a rapid pace. This growth is primarily driven by economic development in the agriculture and manufacturing sectors. The Windsor-Essex and Chatham-Kent areas are the primary drivers of the agriculture growth, which is projected to reach a demand of 2,300 MW by 2035 - the equivalent of adding a city the size of Ottawa to the electricity grid.”*

The IESO has forecasted that Ontario will see a capacity need emerging in 2025 and growing through the latter part of the decade. Peak electricity demand in the Windsor-Essex and Chatham areas is forecast to grow from roughly 500 megawatts in 2022 to about 2,100 megawatts in 2035, equivalent to adding cities the size of Ottawa and London to the grid. The IESO was directed by the Minister of Energy to procure certain natural gas generation to respond to this demand.

Enbridge Gas understands that replacing the generation capacity that the IESO has been directed by the Minister of Energy to procure will be significantly more expensive to meet the demand and reliability needs of the Panhandle region. Furthermore, it is not clear at this time what other generation technology has the ability to be deployed in the timeframe and scale required to respond to system needs. More specifically:<sup>4</sup>

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<sup>3</sup> <https://www.ieso.ca/en/Get-Involved/Regional-Planning/Southwest-Ontario/Southwest-Ontario-Bulk-Planning-Initiatives>

<sup>4</sup> <https://www.ontario.ca/files/2023-07/energy-powering-ontarios-growth-report-en-2023-07-07.pdf>, p. 49.

*“Ontario’s natural gas generators can be turned on and ramped up quickly to ensure the province does not need to be reliant on emergency actions such as conservation appeals and rotating blackouts to stabilize the grid, according to the IESO.*

*While during most hours throughout the year Ontario can meet its electricity generation needs with nuclear, hydroelectric, bioenergy, wind and solar power, natural gas generation also acts as the province’s insurance policy that can be turned on if the wind is not blowing or sun is not shining, or another generator is offline for repairs. There is currently no like-for-like replacement for natural gas and the IESO has concluded it is needed to maintain system reliability until nuclear refurbishments are complete and new non-emitting technologies such as storage mature.”*

Customer	Comments Heard Regarding Customer Specific CIAC for Transmission Assets
[REDACTED]	Not in favor of making contribution
[REDACTED]	Not in favor of making contribution
[REDACTED]	Not in favor of making contribution
[REDACTED]	No, everything costs too much. Fertilizer up 32% in Jan/Feb, labour up, HR costs up.
[REDACTED]	Not in favor of making contribution
[REDACTED]	Not in favor of making contribution
[REDACTED]	Not in favor of making contribution
[REDACTED]	Not in favor of making contribution
[REDACTED]	Not in favor of making contribution
[REDACTED]	Not in favor of making contribution
[REDACTED]	Need to minimize all business costs
[REDACTED]	No, don't want to pay as much as they do already
[REDACTED]	No comment provided
[REDACTED]	Not in favor of making contribution
[REDACTED]	No comment provided
[REDACTED]	Not in favor of making contribution
[REDACTED]	Not in favor of making contribution
[REDACTED]	Customer does not want to see any change to current process for CIAC for Distribution
[REDACTED]	No comment provided
[REDACTED]	Customer uninterested in paying direct costs
[REDACTED]	Customer uninterested in paying direct costs
[REDACTED]	Not in favor of making contribution
[REDACTED]	No comment provided
[REDACTED]	No comment provided
[REDACTED]	No comment provided
[REDACTED]	Customer uninterested in paying direct costs
[REDACTED]	Customer uninterested in paying direct costs
[REDACTED]	Not in favor of making contribution
[REDACTED]	Not in favor of making contribution
[REDACTED]	Not in favor of making contribution
[REDACTED]	Customer uninterested in paying direct costs
[REDACTED]	Not in favor of making contribution
[REDACTED]	Not in favor of making contribution
[REDACTED]	Not in favor of making contribution
[REDACTED]	Customer does not want to see any change to current process for CIAC for Distribution
[REDACTED]	No comment provided
[REDACTED]	No comment provided
[REDACTED]	Not interested in paying any direct costs
[REDACTED]	Not interested in paying any direct costs



ENBRIDGE GAS INC.

Answer to Interrogatory from  
Ontario Energy Board Staff (STAFF)

INTERROGATORY

Reference:

Updated Application, Exhibit B, Tab 1, Schedule 1, Attachment 1, Panhandle Regional Expansion Projects-Expression of Interest and Capacity Request Form, February 17, 2021, pages 1-2; Exhibit B, Tab 1, Schedule 1, Attachment 8, Panhandle Regional Expansion Project -Expression of Interest and Reverse Open Season, February 23, 2023, pages 1-7; OEB Decision and Order, December 5, 2020, EB-2020-0094, pages 13-15

Preamble:

The OEB approved, on December 5, 2020, Enbridge Gas's Application for approval of a System Expansion Surcharge, a Temporary Connection Surcharge and an Hourly Allocation Factor. In that proceeding Enbridge Gas stated that it intended to use the Hourly Allocation Factor (HAF) process on development projects that may involve a mix of distribution and transmission facilities.

The OEB in its Decision found that the "...use of the HAF results in allocation of the capital costs of a project in a fair and equitable manner as the costs would be allocated over time to eligible customers seeking access to the incremental capacity generated by the project".<sup>1</sup>

Enbridge Gas's Expression of Interest and Capacity Request Form, February 17, 2021 informed the prospective contract customers that the HAF process would be used to charge the prospective contract customers for additional distribution facilities that may be required to serve demands provided by the transmission facilities and that the application of the HAF methodology would be subject to approval of the OEB. There is no mention of the HAF in the EOI 2023 form filed in the updated evidence.

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<sup>1</sup> EB-2020-0095 Decision and Order, December 5, 2020, page 16

Question(s):

a) In addition to the Enbridge Gas's HAF process statement in the EOI 2021 form, please discuss Enbridge Gas's view on asking the contract customers that benefit from the Project to contribute to the capital cost of the transmission facilities applying the HAF process.

b) Please advise whether there was any further communication in regard to the HAF with prospective customers following the closing of the EOI process in 2023? If not, please explain why not. If yes, please provide a summary of customers' comments with respect to the application of the HAF.

Response:

a) The statement regarding the Hourly Allocation Factor ("HAF") was included in the 2021 EOI form because Enbridge Gas had not yet determined what facilities were required (i.e., distribution facilities or transmission facilities), and customer demands and their locations were unknown when the EOI was issued. Depending on the results of the 2021 EOI process, transmission and/or distribution facilities may have been required to meet customer demands. The statement within the 2021 EOI regarding the HAF was in relation to potential distribution facilities, not potential transmission facilities.<sup>2</sup>

The 2023 EOI form did not include a statement regarding the HAF because the 2021 EOI process provided clarity that only transmission facilities were required for the Project.

Enbridge Gas does not believe it is appropriate to apply the HAF to large volume customers as the Project consists exclusively of transmission facilities and does not include any distribution facilities. The OEB's Decision, which approved the conditions for the use for the HAF, was issued within the context of E.B.O. 188, which relates solely to the economic evaluation of distribution system expansions. The OEB reiterated the applicability of the HAF within its November 5, 2020 Decision regarding EB-2020-0094 (p. 20, emphasis added):

*The OEB approves the use of HAF for projects that are primarily distribution and if there is a minor component of transmission then the OEB would still accept the use of HAF. For exclusively transmission projects, the OEB has not agreed to the application of HAF.*

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<sup>2</sup> For clarity, the statement within the 2021 EOI form regarding the HAF was as follows: "The Hourly Allocation Factor process recently approved by the OEB will be used for any **additional distribution facilities that may be required** related to the demands served by the transmission facilities [emphasis added]." (Exhibit B, Tab 1, Schedule 1, Attachment 1, p. 1).

The HAF works properly for a distribution project since the capacity created by the distribution facilities can be localized to a very specific area where the hydraulic benefits of the project are spread evenly. Due to this localized nature of distribution project, Enbridge Gas can calculate a HAF that applies equally anywhere within that distribution project area of benefit. When a customer reserves capacity within that project's area of benefit, the specific location of that customer does not impact how much of the project capacity is used. In other words, two customers attaching in two different areas of that distribution project area of benefit will have the same impact on the project facilities. This allows Enbridge Gas to calculate a HAF that can be appropriately administered and results in a HAF that is applied equitably amongst customers over time.

Conversely, the use of the HAF is not appropriate for transmission projects due to the broad geographic area impacted by the facilities. The benefits of the transmission project are not spread evenly across that region, which prevents Enbridge Gas from calculating a HAF that is applicable across the entire area of benefit. A customer's location within that geographic area will have a major impact on how much of project capacity is needed to serve that customer, and therefore customers will not benefit equally from the transmission facilities. In other words, two customers attaching in two different areas of a transmission project area of benefit will not have the same impact on the project facilities. If these customers were to pay a HAF, they would not be contributing equally to the project costs. A transmission project serving multiple classes of customers that have varying impacts to project capacity over a multi-year attachment horizon makes the calculation and administration of the HAF complex and inequitable. This leads to significant risks related to the determination of an appropriate allocation between large and small volume customers in Southwestern Ontario.

- b) No communication occurred during or after the close of the 2023 EOI regarding the HAF. The Project consists exclusively of a transmission facility (and no distribution facilities) and as such the HAF and/or CIAC are not appropriate. Please see the response to part a) above and Exhibit I.STAFF.25, part c).

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Ontario Energy Board Staff (STAFF)

INTERROGATORY

Reference:

Updated Application, Exhibit D, Tab 1, Schedule 1, page 11, paragraph 19  
Exhibit I.STAFF.16, Attachment 1

Preamble:

Enbridge Gas has received a letter from the Technical Standards and Safety Authority (TSSA), dated July 26, 2022, indicating that they have completed their review of the design for the proposed facilities and have no concerns.

Enbridge Gas filed the TSSA's letter at Exhibit I.STAFF.16, Attachment 1.

Question(s):

- a) Please advise whether Enbridge Gas informed the TSSA of the updated Project.
- b) Please advise whether the TSSA confirmed that its review letter dated July 26, 2022 does not need to be updated. If not, please provide an update on the TSSA review letter.

Response:

a) and b)

Enbridge Gas did not engage the TSSA regarding the amended application filed June 16, 2023, as the scope and design of the Panhandle Loop did not change following the TSSA's initial review. As such, the TSSA's review letter dated July 26, 2022 at Exhibit I.STAFF.16, Attachment 1 remains appropriate.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Ontario Energy Board Staff (STAFF)

INTERROGATORY

Reference:

Updated Application Exhibit F, Tab 1, Schedule 1, page 2, paragraph 5 and Attachment 2, Updated

Preamble:

In May 2023, Enbridge Gas sent a letter to Ontario Pipeline Coordinating Committee (OPCC) members, affected municipalities, conservation authorities, landowners, Indigenous communities, and other local agencies advising of the updated Project scope.

Enbridge Gas filed a summary of the comments received as of June 5, 2023 at Attachment 2.

Question(s):

a) Please provide any updates to Attachment 2 since June 5, 2023.

Response:

a) Enbridge Gas has no updates to provide for Exhibit F, Tab 1, Schedule 1, Attachment 2. The summary of comments filed as of June 5, 2023 remains accurate.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Ontario Energy Board Staff (STAFF)

INTERROGATORY

Reference:

Updated Application Exhibit F, Tab 1, Schedule 1, page 2, paragraph 6; I.STAFF.17

Preamble:

As part of the public consultation, Enbridge Gas held two virtual public information sessions:

- November 17, 2021 to December 3, 2021
- February 14, 2022 to February 28, 2022

Enbridge Gas stated that notification of these virtual information sessions were completed by newspaper publications, letters, social media and radio.

Question(s):

- a) Has Enbridge Gas conducted any additional public consultation since updating its application? Please describe.
- b) Please update Exhibit I.STAFF.17 for any additional public consultation Enbridge Gas has undertaken since updating its application.<sup>2</sup>

Response:

- a) No, Enbridge Gas has not conducted additional public consultation since filing its amended application dated June 16, 2023.
- b) There are no updates related to the interrogatory response at Exhibit I.STAFF.17.

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<sup>2</sup> OEB staff notes that I.Staff.17 is not on the list of planned interrogatory response updates in Enbridge Gas's August 25, 2023 letter.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Ontario Energy Board Staff (STAFF)

INTERROGATORY

Reference:

Updated Application, Exhibit G, Tab 1, Schedule 1, page 1, paragraph 4  
Exhibit I.STAFF.20

Preamble:

Enbridge Gas stated that the proposed pipelines require approximately 42.0 hectares (104 acres) of permanent easement and approximately 71.6 hectares (177 acres) of temporary easement for the Project.

In response to Staff-20 (a), Enbridge Gas stated that the total required permanent easement for the Panhandle Loop is 40.62 hectares (100.35 acres) and the total required temporary easement for the Panhandle Loop is 62.03 hectares (153.26 acres).

Question(s):

- a) Please explain why Enbridge Gas requires an increase in permanent and temporary land rights since updating its application given that the scope of the Panhandle Loop has not changed since the update to the application.
- b) Please describe any additional changes to the land rights required for the Project since updating the application other than the land rights associated with the Leamington Interconnect that are no longer required.
- c) Please provide the status of land rights for the proposed tie-in station at Richardson Road.

Response:

- a) Enbridge Gas confirms that the scope of the Panhandle Loop has not changed. However, since filing the initial application in June 2022, Enbridge Gas engaged affected landowners in discussions regarding the Project route. As an outcome of those discussions and the feedback received, Enbridge Gas adjusted the easement and temporary workspaces required for the Project.

- b) Enbridge Gas is currently negotiating a surface lease<sup>1</sup> for a potential above-ground valve site that would serve as a temporary tie-in to the existing NPS 20 pipeline.
- c) Land rights have not been granted to Enbridge Gas for the land parcel subject to the proposed station adjacent to Richardson Side Road. Enbridge Gas continues to work with the landowner to secure the land rights for the proposed tie-in station

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<sup>1</sup> A lease to cover Enbridge Gas's intended occupation of an area of land with aboveground, securely fenced apparatus for the purposes of connecting the proposed Project to the existing NPS pipeline.



ENBRIDGE GAS INC.

Answer to Interrogatory from  
Ontario Energy Board Staff (STAFF)

INTERROGATORY

Reference:

Updated Application, Exhibit H, Tab 1, Schedule 1, pages 2, 4, paragraphs 6-7, 15;  
Attachment 6: Indigenous Consultation Report: Summary Table, June 4, 2023;  
Attachment 7, Indigenous Consultation Log, June 4, 2023

Preamble:

On June 6, 2023 Enbridge Gas provided an updated description of the Project reflecting changes made to the Project scope and on June 10, 2023 an updated Indigenous Consultation Report (ICR) to the Ministry of Energy.

Enbridge Gas also filed an updated summary of its Indigenous consultation activities for the Project up to June 4, 2023.

Question(s):

a) Has the Ministry of Energy indicated any changes with respect to Enbridge Gas's duty to consult for the Project following its review of the updated Project description? Please confirm that Enbridge Gas is still required to consult all of the Indigenous communities listed in the Ministry of Energy's August 6, 2021 delegation letter provided at Attachment 2.

b) Please update the Indigenous Consultation Report: Summary Table, dated June 4, 2023.

c) Please update the Log of Indigenous Consultation dated June 4, 2023.

d) Please summarize any new issues and/or concerns raised from Indigenous communities. Please outline Enbridge Gas's plans, actions and commitments to continue to engage and, as appropriate:

- i. address any concerns
- ii. resolve any outstanding issues or otherwise provide accommodation
- iii. offer capacity funding

e) Please provide an update on the status and anticipated timeline of receiving the Ministry of Energy's letter of opinion for the Project.

Response:

- a) The Ministry of Energy did not indicate any changes with respect to Enbridge Gas's duty to consult for the Project following its review of the updated Project description. Enbridge Gas is still required to consult all of the Indigenous communities listed in the Ministry of Energy's August 6, 2021 delegation letter.
- b) Please see Exhibit I.STAFF.31 Attachment 1.
- c) Please see Exhibit I.STAFF.31 Attachment 2.
- d) As of September 13, 2023, Enbridge Gas has not been made aware of any new issues and/or concerns raised from Indigenous communities. Enbridge Gas has offered capacity funding and will continue to engage with the Indigenous Nations potentially affected by the Project.
- e) On September 12, 2023, the Ministry of Energy advised Enbridge Gas that:  
  
"ENERGY continues its sufficiency assessment and is monitoring relevant materials submitted to the OEB. Since there is an Indigenous intervenor, our Letter of Opinion will likely be submitted close to the end of record when Enbridge submits its written reply submission (November 29, 2023)."

**INDIGENOUS CONSULTATION REPORT: SUMMARY TABLE**

As of September 12, 2023

<b>Aamjiwnaang First Nation (AFN)</b>		
<b>Was project information provided to the community?</b>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<p>Enbridge Gas has provided AFN with the following information:</p> <ul style="list-style-type: none"> <li>• a detailed description of the nature and initial scope of the Project. This included a list of other provincial or federal approvals that may be required for the Project to proceed;</li> <li>• Maps of the Project location and any other affected area(s)</li> <li>• Slides for the two Virtual Open Houses</li> <li>• Description and map advising of a change in scope of the Project.</li> <li>• Environmental Report, providing information about the potential effects of the Project on the Environment.</li> <li>• Generic Sediment Control Plans</li> <li>• Natural Heritage Background Review and Field Investigations Technical Memorandum</li> <li>• Description and map advising of a change in scope of the Project and information on the Project being in abeyance with the OEB.</li> </ul> <p>Enbridge Gas requested community feedback, including any suggestions or proposals on mitigating, avoiding or accommodating any potential impacts the Project may have on Aboriginal or treaty rights.</p> <p>Capacity funding has been offered to support activities such as timely technical reviews of documents and participation in field work associated with the proposed Project, and to engage in meaningful consultation.</p>

<p><b>Was the community responsive/did you have direct contact with the community?</b></p>	<p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p>	<p>Enbridge Gas and an AFN representative have exchanged emails regarding the Project. Enbridge Gas and AFN representatives have met on multiple occasions to further discuss the Project.</p>
<p><b>Did the community members or representatives have any questions or concerns?</b></p>	<p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p>	<p>Enbridge Gas received comments from AFN regarding the Environmental Report. AFN's comments addressed matters such as cumulative effects, environmental monitoring and contingency plans, and mitigation measures. Enbridge Gas provided responses to AFN for review and met with AFN on October 31, 2022 to discuss those responses. These comments and Enbridge Gas' responses can be found in Exhibit H, Tab 1, Schedule 1, Attachment 7, line-item attachment 1.26.</p>
<p><b>Does the community have any outstanding concerns?</b></p>	<p><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p>	<p>To date, AFN has not identified any outstanding concerns related to the Project. Enbridge Gas will continue to engage with the community in relation to the Project.</p>
<p><b>Caldwell First Nation (CFN)</b></p>		
<p><b>Was project information provided to the community?</b></p>	<p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p>	<p>Enbridge Gas has provided CFN with the following information:</p> <ul style="list-style-type: none"> <li>• a detailed description of the nature and initial scope of the Project. This included a list of other provincial or federal approvals that may be required for the Project to proceed;</li> <li>• Maps of the Project location and any other affected area(s)</li> <li>• Slides for the two Virtual Open Houses</li> <li>• Description and map advising of a change in scope of the Project.</li> <li>• Environmental Report, providing information about the potential effects of the Project on the Environment.</li> </ul>

		<ul style="list-style-type: none"> <li>• Description and map advising of a change in scope of the Project and information on the Project being in abeyance with the OEB.</li> <li>• Stage 1-2 Archaeology Assessment report</li> </ul> <p>Enbridge Gas requested community feedback, including any suggestions or proposals on mitigating, avoiding or accommodating any potential impacts the Project may have on Aboriginal or treaty rights.</p> <p>Capacity funding has been offered to support activities such as timely technical reviews of documents and participation in field work associated with the proposed Project, and to engage in meaningful consultation.</p>
<p><b>Was the community responsive/did you have direct contact with the community?</b></p>	<p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p>	<p>Enbridge Gas and CFN representatives have exchanged multiple emails about the Project. The parties are attempting to schedule a meeting to further discuss the Project and next steps.</p>
<p><b>Did the community members or representatives have any questions or concerns?</b></p>	<p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p>	<p>Initially, CFN representatives requested information regarding the Enbridge Gas contractor, the timing of the Environmental Report and the stage one archaeology work. The Enbridge Gas representative provided the requested information regarding timing of these reports and the Enbridge Gas contractor.</p> <p>CFN has expressed the need to have a community meeting to discuss the Project and Enbridge Gas agreed to participate in the meeting.</p> <p>CFN, as a member of Three Fires Group, was an intervenor in the original filing of this Project application and had many questions to which Enbridge Gas responded on the proceeding record.</p>
<p><b>Does the community have any outstanding concerns?</b></p>	<p><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p>	<p>To date, CFN has identified the need to have a community meeting to discuss the Project. Enbridge Gas has attempted to schedule the meeting and will continue to engage with the community in relation to the Project.</p>

<p><b>Chippewas of Kettle and Stony Point First Nation (“CKSPFN”)</b></p>		
<p><b>Was project information provided to the community?</b></p>	<p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p>	<p>Enbridge Gas has provided CKSPFN with the following information:</p> <ul style="list-style-type: none"> <li>• a detailed description of the nature and initial scope of the Project. This included a list of other provincial or federal approvals that may be required for the Project to proceed;</li> <li>• Maps of the Project location and any other affected area(s)</li> <li>• Slides for the two Virtual Open Houses</li> <li>• Description and map advising of a change in scope of the Project.</li> <li>• Environmental Report, providing information about the potential effects of the Project on the Environment.</li> <li>• Generic Sediment Control Plans</li> <li>• Natural Heritage Background Review and Field Investigations Technical Memorandum</li> <li>• Description and map advising of a change in scope of the Project and information on the Project being in abeyance with the OEB.</li> <li>• Stage 1-2 Archaeology Assessment report</li> </ul> <p>Enbridge Gas requested community feedback, including any suggestions or proposals on mitigating, avoiding or accommodating any potential impacts the Project may have on Aboriginal or treaty rights.</p> <p>Capacity funding has been offered to support activities such as timely technical reviews of documents and participation in field work associated with the proposed Projects, and to engage in meaningful consultation.</p>
<p><b>Was the community responsive/did you have direct</b></p>	<p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p>	<p>Enbridge Gas and CKSPFN representatives have exchanged emails and had a telephone call regarding the Project. In addition, meetings were held on multiple occasions during which the Project was discussed.</p>

<p><b>contact with the community?</b></p>		
<p><b>Did the community members or representatives have any questions or concerns?</b></p>	<p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p>	<p>CKSPFN representatives have discussed the following with Enbridge Gas representatives in the course of engagement on the Project: availability of and funding for monitors on Enbridge Gas projects; supply chain management participation; and the scope, schedule, and cost of the Project.</p> <p>Enbridge Gas received comments from CKSPFN regarding the Environmental Report. CKSPFN’s comments addressed matters such as fugitive emissions, cumulative effects and mitigation measures. Enbridge Gas provided responses to CKSPFN for review. These comments and Enbridge Gas’ responses can be found in Exhibit H, Tab 1, Schedule 1, Attachment 7, line-item attachment 3.42.</p> <p>CKSPFN, as a member of Three Fires Group, was an intervenor in the original filing of this Project application and had many questions to which Enbridge Gas responded on the proceeding record.</p>
<p><b>Does the community have any outstanding concerns?</b></p>	<p><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p>	<p>To date, CKSPFN has not identified any outstanding concerns regarding the Project. Enbridge Gas will continue to engage with the community in relation to the Project.</p>
<p><b>Chippewas of the Thames First Nation (“COTTFN”)</b></p>		
<p><b>Was project information provided to the community?</b></p>	<p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p>	<p>Enbridge Gas has provided COTTFN with the following information:</p> <ul style="list-style-type: none"> <li>• a detailed description of the nature and initial scope of the Project. This included a list of other provincial or federal approvals that may be required for the Project to proceed;</li> <li>• Maps of the Project location and any other affected area(s)</li> <li>• Slides for the two Virtual Open Houses</li> <li>• Description and map advising of a change in scope of the Project.</li> <li>• Environmental Report, providing information about the potential effects of the Project on the Environment.</li> <li>• Description and map advising of a change in scope of the Project and information on the Project being in abeyance with the OEB.</li> </ul>

		<p>Enbridge Gas requested community feedback, including any suggestions or proposals on mitigating, avoiding or accommodating any potential impacts the Project may have on Aboriginal or treaty rights.</p> <p>Capacity funding has been offered to support activities such as timely technical reviews of documents and participation in field work associated with the proposed Projects, and to engage in meaningful consultation.</p>
<p><b>Was the community responsive/did you have direct contact with the community?</b></p>	<p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p>	<p>Enbridge Gas and COTTFN representatives exchanged emails regarding the Project and met multiple times to further discuss the Project. A meeting was held on November 16, 2022 to provide information to the Community.</p>
<p><b>Did the community members or representatives have any questions or concerns?</b></p>	<p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p>	<p>COTTFN representatives requested additional maps and information regarding capacity funding.</p> <p>Enbridge Gas received comments from COTTFN regarding the Environmental Report. COTTFN's comments addressed matters such as fugitive emissions and climate change, water crossing methods and mitigation measures. Enbridge Gas provided COTTFN with responses to the COTTFN's comments. . These comments and Enbridge Gas' responses can be found in Exhibit H, Tab 1, Schedule 1, Attachment 7, line-item attachment 4.29.</p>
<p><b>Does the community have any outstanding concerns?</b></p>	<p><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p>	<p>To date, COTTFN has not identified any outstanding concerns regarding the Project. Enbridge Gas will continue to engage with the community in relation to the Project.</p>
<p><b>Oneida Nation of the Thames (“Oneida Nation”)</b></p>		
<p><b>Was project information provided to the community?</b></p>	<p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p>	<p>Enbridge Gas has provided Oneida Nation with the following information:</p> <ul style="list-style-type: none"> <li>• a detailed description of the nature and initial scope of the Project. This included a list of other provincial or federal approvals that may be required for the Project to proceed;</li> </ul>



		<ul style="list-style-type: none"> <li>• Maps of the Project location and any other affected area(s)</li> <li>• Slides for the two Virtual Open Houses</li> <li>• Description and map advising of a change in scope of the Project.</li> <li>• Environmental Report, providing information about the potential effects of the Project on the Environment.</li> <li>• Description and map advising of a change in scope of the Project and information on the Project being in abeyance with the OEB.</li> </ul> <p>Enbridge Gas requested community feedback, including any suggestions or proposals on mitigating, avoiding or accommodating any potential impacts the Project may have on Aboriginal or treaty rights.</p> <p>Capacity funding has been offered to support activities such as timely technical reviews of documents and participation in field work associated with the proposed Projects, and to engage in meaningful consultation.</p>
<p><b>Was the community responsive/did you have direct contact with the community?</b></p>	<p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p>	<p>Enbridge Gas and Oneida Nation representatives have exchanged emails regarding the Project and met on multiple occasions to discuss the Project.</p>
<p><b>Did the community members or representatives have any questions or concerns?</b></p>	<p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p>	<p>Oneida Nation and Enbridge Gas representatives have discussed the process for adding Oneida Nation businesses or affiliated businesses to Enbridge Gas' database. Oneida Nation has not raised any other questions or concerns regarding the Project.</p>
<p><b>Does the community have any outstanding concerns?</b></p>	<p><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p>	<p>To date, the Oneida Nation has not identified any outstanding concerns regarding the Project. Enbridge Gas will continue to engage with the community in relation to the Project.</p>
<p><b>Walpole Island First Nation ("WIFN")</b></p>		

<p><b>Was project information provided to the community?</b></p>	<p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p>	<p>Enbridge Gas has provided WIFN with the following information:</p> <ul style="list-style-type: none"> <li>• a detailed description of the nature and initial scope of the Project. This included a list of other provincial or federal approvals that may be required for the Project to proceed;</li> <li>• Maps of the Project location and any other affected area(s)</li> <li>• Slides for the two Virtual Open Houses</li> <li>• Description and map advising of a change in scope of the Project.</li> <li>• Environmental Report, providing information about the potential effects of the Project on the Environment.</li> <li>• Generic Sediment Control Plans</li> <li>• Natural Heritage Background Review and Field Investigations Technical Memorandum</li> <li>• Description and map advising of a change in scope of the Project and information on the Project being in abeyance with the OEB.</li> </ul> <p>Enbridge Gas requested community feedback, including any suggestions or proposals on mitigating, avoiding or accommodating any potential impacts the Project may have on Aboriginal or treaty rights.</p> <p>Capacity funding has been offered to support activities such as timely technical reviews of documents, participation in field work associated with the proposed Projects, and to engage in meaningful consultation.</p>
<p><b>Was the community responsive/did you have direct contact with the community?</b></p>	<p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p>	<p>Enbridge Gas and WIFN representatives have exchanged emails regarding the Project and met on multiple occasions to discuss the Project.</p>
<p><b>Did the community members or representatives have any</b></p>	<p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p>	<p>Enbridge Gas received comments from WIFN regarding the Environmental Report. WIFN's comments addressed matters such as cumulative effects, aquatic ecology impacts and mitigation measures. Enbridge Gas provided WIFN with responses to the WIFN's comments. These comments and Enbridge Gas' responses can be found in Exhibit H, Tab 1, Schedule 1, Attachment 7, line-item attachment 6.22.</p>

<p><b>questions or concerns?</b></p>		
<p><b>Does the community have any outstanding concerns?</b></p>	<p><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p>	<p>To date, WIFN has not identified any outstanding concerns related to the Project. Enbridge Gas will continue to engage with the community.</p>
<p><b>Eelūnaapèewii Lahkèewiit (“Delaware Nation”)</b></p>		
<p><b>Was project information provided to the community?</b></p>	<p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p>	<p>Enbridge Gas has provided Delaware Nation with the following information:</p> <ul style="list-style-type: none"> <li>• a detailed description of the nature and initial scope of the Project. This included a list of other provincial or federal approvals that may be required for the Project to proceed;</li> <li>• Maps of the Project location and any other affected area(s)</li> <li>• Slides for the two Virtual Open Houses</li> <li>• Description and map advising of a change in scope of the Project.</li> <li>• Environmental Report, providing information about the potential effects of the Project on the Environment.</li> <li>• Description and map advising of a change in scope of the Project and information on the Project being in abeyance with the OEB.</li> </ul> <p>Enbridge Gas requested community feedback, including any suggestions or proposals on mitigating, avoiding or accommodating any potential impacts the Project may have on Aboriginal or treaty rights.</p> <p>Capacity funding has been offered to support activities such as timely technical reviews of documents and participation in field work associated with the proposed Projects, and to engage in meaningful consultation.</p>
<p><b>Was the community responsive/did you have direct contact with the community?</b></p>	<p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p>	<p>Enbridge Gas and Delaware Nation had a telephone conversation about the Project. The Delaware Nation representative advised they would provide the information to Chief and Council and if there were further questions, they would reach out.</p>
<p><b>Did the community members or representatives have any</b></p>	<p><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p>	<p>To date, Delaware Nation has not raised any questions or concerns regarding the Project.</p>

<b>questions or concerns?</b>		
<b>Does the community have any outstanding concerns?</b>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	To date, Delaware Nation has not identified any outstanding concerns related to the Project. Enbridge Gas will continue to engage with the community.

**Enbridge Gas Inc. Indigenous Consultation Log**

Log for the period of June 4, 2023 to September 13, 2023

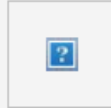
<b>Aamjiwnaang First Nation (AFN)</b>					
<b>Line Item</b>	<b>Date</b>	<b>Method</b>	<b>Summary of Enbridge Gas Inc. ("Enbridge Gas") Communication Activity</b>	<b>Summary of Community's Communication Activity</b>	<b>Issues or Concerns Raised and Enbridge Gas Responses</b>
<b>No update</b>					
<b>Caldwell First Nation (CFN)</b>					
<b>Line Item</b>	<b>Date</b>	<b>Method</b>	<b>Summary of Enbridge Gas Inc. ("Enbridge Gas") Communication Activity</b>	<b>Summary of Community's Communication Activity</b>	<b>Issues or Concerns Raised and Enbridge Gas Responses</b>
2.53	August 30, 2023	Email	An Aecom representative, acting on behalf of Enbridge Gas, sent an email to the CFN representatives to provide the Stage 1 -2 Archaeological Assessment (AA) report for download.		Stage 1-2 AA report was provided to TFG as per request during OEB proceedings (JT1.11 4a).
2.54	September 12, 2023	Email	An Enbridge Gas representative emailed the CFN to follow up on the Stage 1-2 AA report as it had not been downloaded yet. The Enbridge Gas representative advised the CFN representative to advise if they had any difficulties downloading the report.		
<b>Chippewas of Kettle and Stony Point First Nation (CKSPFN)</b>					
<b>Line Item</b>	<b>Date</b>	<b>Method</b>	<b>Summary of Enbridge Gas Inc. ("Enbridge Gas") Communication Activity</b>	<b>Summary of Community's Communication Activity</b>	<b>Issues or Concerns Raised and Enbridge Gas Responses</b>
3.47	August 8, 2023	Phone	An Enbridge Gas representative had a discussion with a CKSPFN representative. The CKSPFN representative advised that the CKSPFN Chief and administration were examining the CKSPFN protocol for engaging proponents, and aligning work plans and scheduling with their consultants at Three Fires Group (TFG). During the call the CKSPFN representative requested that the Enbridge Gas representative provide CKSPFN with information on		CKSPFN requested information on previous Project engagement with TFG.

			previous project engagement with TFG.		
3.48	August 14, 2023	Email	An Enbridge Gas representative emailed a CKSPFN representative requesting a meeting to discuss Enbridge Gas Project consultation, past involvement with TFG and First Nations consultation in the region. The Enbridge Gas representative provided some dates for in person meetings.		
3.49	August 16	Email		A CKSPFN representative emailed the Enbridge Gas representative to confirm a date for the meeting.	
3.50	August 16, 2023	Email	An Enbridge Gas representative emailed the CKSPFN representative to provide information on previous Project engagement with TFG. The Enbridge Gas representative provided links to the OEB regulatory proceedings.		Enbridge Gas provided CKSPFN with links to the OEB Panhandle proceedings and key references regarding Indigenous consultation that may be of interest.
3.51	August 30, 2023	Email	An Aecom representative, acting on behalf of Enbridge Gas, sent an email to the CKSPFN representatives to provide the Stage 1 and 2 AA report for the community to download.		Stage 1-2 AA report was provided to TFG as per request during OEB proceedings (JT1.11 4a).
3.52	September 13, 2023	Email	An Enbridge Gas representative sent an email to the CKSPFN representative to follow up on the Stage 1-2 AA report as it had not been downloaded yet. The Enbridge Gas representative advised the CKSPFN representative to advise if they had any difficulties downloading the report.		
<b>Chippewas of the Thames First Nation (COTTFN)</b>					
<b>Line Item</b>	<b>Date</b>	<b>Method</b>	<b>Summary of Enbridge Gas Inc. ("Enbridge Gas") Communication Activity</b>	<b>Summary of Community's Communication Activity</b>	<b>Issues or Concerns Raised and Enbridge Gas Responses</b>
<b>No update</b>					
<b>Oneida Nation of the Thames (Oneida Nation)</b>					

Line Item	Date	Method	Summary of Enbridge Gas Inc. ("Enbridge Gas") Communication Activity	Summary of Community's Communication Activity	Issues or Concerns Raised and Enbridge Gas Responses
<b>No update</b>					
<b>Walpole Island First Nation</b>					
Line Item	Date	Method	Summary of Enbridge Gas Inc. ("Enbridge Gas") Communication Activity	Summary of Community's Communication Activity	Issues or Concerns Raised and Enbridge Gas Responses
<b>No update</b>					
<b>Eelūnaapèewii Lahkèewiit ("Delaware Nation")</b>					
Line Item	Date	Method	Summary of Enbridge Gas Inc. ("Enbridge Gas") Communication Activity	Summary of Community's Communication Activity	Issues or Concerns Raised and Enbridge Gas Responses
<b>No update</b>					

Line-item attachment 2.53

**From:** [WeTransfer](#)  
**To:** [Hartwig, Emily](#)  
**Subject:** Panhandle Project: Stage 1-2 AA sent successfully to ecd.manager@caldwellfirstnation.ca  
**Date:** Wednesday, August 30, 2023 3:56:24 PM



Panhandle Project: Stage 1-2 AA  
sent to  
[ecd.manager@caldwellfirstnation.ca](mailto:ecd.manager@caldwellfirstnation.ca)

2 items, 69.8 MB in total • Expires on 6 September, 2023

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Recipients

[ecd.manager@caldwellfirstnation.ca](mailto:ecd.manager@caldwellfirstnation.ca)

Download link

<https://we.tl/t-fo5Vsy2NmP>



Line-item attachment 2.54

**From:** [Lauren Whitwham](#)  
**To:** [Zack Hamm](#)  
**Cc:** [Chasity Dodge](#)  
**Subject:** Panhandle: Stage 1-2 AA  
**Date:** Tuesday, September 12, 2023 4:07:01 PM  
**Attachments:** [image001.emz](#)  
[image002.png](#)

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Hi Zack,

Just wanted to follow up on an email that was sent to you at the end of August. Aecom sent the Stage 1-2 AA report for the Panhandle Regional Expansion report over for your review.

I don't believe that you have downloaded the report yet so I just wanted to follow up to call it to your attention.

Let me or Emily Hartwig from Aecom know if you have any troubles.

Thanks,  
Lauren

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**From:** Lauren Whitwham <[Lauren.Whitwham@enbridge.com](mailto:Lauren.Whitwham@enbridge.com)>  
**Sent:** Monday, August 14, 2023 12:22 PM  
**To:** Jordan George <[Jordan.George@kettlepoint.org](mailto:Jordan.George@kettlepoint.org)>; Verna George <[Verna.George@kettlepoint.org](mailto:Verna.George@kettlepoint.org)>; Kimberly Bressette <[Kimberly.Bressette@kettlepoint.org](mailto:Kimberly.Bressette@kettlepoint.org)>  
**Cc:** Chasity Dodge <[chasity.dodge@enbridge.com](mailto:chasity.dodge@enbridge.com)>  
**Subject:** Enbridge Gas: Project Consultation meeting

Good afternoon,

Hope you have been enjoying your summer. Can't believe that September is fast approaching.

We were hoping to set up a meeting with Kettle and Stony Point First Nation in September to discuss Enbridge Gas Project consultation, past involvement with TFG and First Nations consultation in the region. We can also provide information on the current Enbridge Gas projects including Watford RNG, Boblo Island and Panhandle Regional Expansion Project.

We would be happy to come to you and meet at the band office in September. Right now, September 13, 14 and 19 look good for us. Alternatively, we could have a virtual meeting if you'd like to meet sooner than mid-September.

Thanks and looking forward to hearing from you,

Lauren

---

**From:** Kimberly Bressette <[Kimberly.Bressette@kettlepoint.org](mailto:Kimberly.Bressette@kettlepoint.org)>  
**Sent:** Wednesday, August 16, 2023 11:24 AM  
**To:** Lauren Whitwham <[Lauren.Whitwham@enbridge.com](mailto:Lauren.Whitwham@enbridge.com)>  
**Cc:** Chasity Dodge <[chasity.dodge@enbridge.com](mailto:chasity.dodge@enbridge.com)>; Jordan George <[Jordan.George@kettlepoint.org](mailto:Jordan.George@kettlepoint.org)>; Verna George <[Verna.George@kettlepoint.org](mailto:Verna.George@kettlepoint.org)>  
**Subject:** [External] RE: Enbridge Gas: Project Consultation meeting

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Good Morning Lauren,

We are available on September 19<sup>th</sup> to meet and we look forward to the update on the projects.

I am available until 3:30 that day.  
Preferably 9:30 or 1:30 would be ideal.

Look forward to hearing from you.

Miigwetch!



**Kimberly Bressette**  
**CHIEF**  
**Chippewas of Kettle and Stony Point First Nation**

Line-item attachment 3.50

**From:** [Lauren Whitwham](#)  
**To:** [Jordan George](#)  
**Subject:** Consultation with TFG on behalf of CKSPFN  
**Date:** Wednesday, August 16, 2023 3:21:50 PM  
**Attachments:** [Capacity Funding Boblo Island CKSPFN SIGNED.pdf](#)  
[2023-07-28 - CKSPFN RidgeRNG Comments FINAL.pdf](#)  
[2023-07-28 - CKSPFN WatfordRNG Comments FINAL.pdf](#)  
[TFG CKSPFN Lifecycle Engagement Program July final.pdf](#)

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Hi Jordan,

Thanks for the call last week regarding CKSPFN and proponent consultation. We look forward to meeting with you, Chief and Verna on September 19 to discuss Enbridge's project consultation.

You had mentioned seeking information on the engagement TFG has been doing with Enbridge. I've included the most recent comments to our Watford Pipeline Project environmental review and some of the links to the regulatory proceedings that TFG has participated in on behalf of CKSPFN and Caldwell First Nation.

The Dawn Corunna Project was approved by the OEB. Information can be found here: <https://www.rds.oeb.ca/CMWebDrawer/Record?q=CaseNumber%3DEB-2022-0086&sortBy=recRegisteredOn-&pageSize=400> and this includes the TFG submissions and transcript from their questioning.  
<https://www.rds.oeb.ca/CMWebDrawer/Record/750259/File/document> – CKSPFN Interrogatory questions and Enbridge Gas responses pg 140-171  
<https://www.rds.oeb.ca/CMWebDrawer/Record/752111/File/document> – Day 1 transcript – end of Day 1 TFG  
<https://www.rds.oeb.ca/CMWebDrawer/Record/752454/File/document> – Day 2 transcript – beginning of Day 2 TFG

The Panhandle Regional Expansion Project is with the OEB for the regulatory process now. Information can be found here: <https://www.oeb.ca/applications/applications-oeb/current-major-applications/eb-2022-0157>  
<https://www.rds.oeb.ca/CMWebDrawer/Record/756695/File/document> TFG interrogatory questions and Enbridge Gas responses from pg 470-646  
<https://www.rds.oeb.ca/CMWebDrawer/Record/757857/File/document> - Day 1 transcript pg 94

Enbridge is currently engaging on the Watford Pipeline Project and the Boblo Island Community Expansion Project for which TFG has signed capacity funding agreements for their engagement with Enbridge Gas. Capacity Funding is to ensure that Indigenous Nations have funding to engage with Enbridge to review projects and meet. Enbridge just finished a two year capacity funding agreement with TFG for engagement on Projects within the Treaty area. We also have a Lifecycle Engagement Program agreement signed with TFG on behalf of CKSPFN. The Lifecycle agreement is attached. This agreement spells out how Enbridge will engage with TFG/CKSPFN.

I'm happy to provide any further information that you might be interesting in reviewing.

Thanks again and looking forward to meeting on September 19.

Lauren

Line-item attachment 3.51

**From:** [WeTransfer](#)  
**To:** [Hartwig, Emily](#)  
**Subject:** Panhandle Project: Stage 1-2 AA sent successfully to [consultation@kettlepoint.org](mailto:consultation@kettlepoint.org) and 2 others  
**Date:** Wednesday, August 30, 2023 3:52:32 PM

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Panhandle Project: Stage 1-2 AA  
sent to  
[consultation@kettlepoint.org](mailto:consultation@kettlepoint.org)  
and 2 others

2 items, 69.8 MB in total • Expires on 6 September, 2023

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**Recipients**

[consultation@kettlepoint.org](mailto:consultation@kettlepoint.org) [verna.george@kettlepoint.org](mailto:verna.george@kettlepoint.org)  
[jordan.george@kettlepoint.org](mailto:jordan.george@kettlepoint.org)

**From:** [Lauren Whitwham](#)  
**To:** [Consultation](#)  
**Cc:** [Jordan George](#); [verna.george@kettlepoint.org](mailto:verna.george@kettlepoint.org); [Chasity Dodge](#)  
**Subject:** Enbridge Gas Panhandle: Stage 1-2 AA report  
**Date:** Wednesday, September 13, 2023 12:44:31 PM

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Good afternoon,

Just wanted to touch base regarding the Stage 1-2 AA report for the Panhandle Regional Expansion Project.

As part of the OEB proceeding we advised TFG that we would share the Stage 1-2 archaeology report when it was complete. We currently have three parcels of properties that still need to be completed however, this is the most recent document.

On August 30, 2023, Emily Hartwig from Aecom sent [consultation@kettlepoint.org](mailto:consultation@kettlepoint.org) an email with the link for download. It does not seem that [consultation@kettlepoint.org](mailto:consultation@kettlepoint.org) has downloaded the document.

Please advise if you have any difficulties with accessing the document.

Thanks,  
Lauren

ENBRIDGE GAS INC.

Answer to Interrogatory from  
The Association of Power Producers of Ontario ("APPrO")

INTERROGATORY

References:

N/A

Preamble:

The IESO is planning to procure at least 3,500 MW through multiple procurements (Long-Term RFP, Expedited Long-Term RFP and Medium-Term RFPs, among other procurements). It is expected that some of this additional procurement will come from existing or expanded gas facilities.

Question:

- a) Has Enbridge included new or expanded gas generation facilities in its forecasts based on the current RFPs being launched by the IESO? If so, what amount and, if not, why?

Response

No, the demand forecast underpinning the need for the Project did not specifically include new or expanded gas generation facilities based on the current RFP's being launched by the IESO. The demand forecast underpinning the Project is based on the requests and commitments for new or incremental firm service and the conversion of existing interruptible service to firm service, as communicated by customers through the EOI process in early 2021 or after the EOI process. Through the EOI process Enbridge Gas did receive one bid from a large gas generation facility to convert their existing interruptible service to firm service, which has been included in the demand forecast for the Project.

The IESO is still in the process of securing the generation capacity through multiple procurements. While gas fired generators in the Panhandle Area of Benefit may be awarded contracts through the procurement process, supply solutions and options including locations are currently unknown. If Enbridge Gas were to include new or

expanded generation facilities in its forecasts, it would be on a speculative basis, and would not meet Enbridge Gas' standards for inclusion in the demand forecast.



ENBRIDGE GAS INC.

Answer to Interrogatory from  
The Association of Power Producers of Ontario ("APPrO")

INTERROGATORY

References:

N/A

Preamble:

The 2021 APO from the IESO expects gas-fired generation to increase from 12 TWh annually in 2021 to 31 TWh by 2026 and nearly 34 TWh in 2030.

Question:

- a) Given the substantial increase in gas requirements to provide that amount of gas-fired generation, how much of that forecasted future gas-fired generation is included in the needs assessment for the Panhandle Regional Expansion Project ("Project")? If it is not included, please explain why.

**Response**

Please see the response to Exhibit I.APPrO.1.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
The Association of Power Producers of Ontario ("APPRO")

INTERROGATORY

References:

Exhibit C, Tab 1, Schedule 1

Preamble:

N/A

Question:

- a) Is it possible to increase the existing capacity of the Panhandle system through more moderate modifications to manage future demand growth? Please provide any additional analysis or studies that Enbridge has undertaken that are not included in the current application.
- b) Did Enbridge consider increasing the maximum operating pressure on the existing pipe lines to increase capacity? If so, why was this option rejected?

**Response**

- a) No, there were no additional alternatives identified by Enbridge Gas to accommodate the 5-year system shortfall. Please refer to Exhibit C, Tab 1, Schedule 1 for the Company's assessment of project alternatives, and the response at Exhibit I.STAFF.7.
- b) The Panhandle System maximum operating pressure is determined based on the design parameters of the existing pipeline materials and the inlet pressure at Dawn and Ojibway. The system is currently operating at its maximum operating pressure and this maximum operating pressure cannot be further increased.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
The Association of Power Producers of Ontario (“APPrO”)

INTERROGATORY

References:

Exhibit B, Tab 1, Schedule 1, Attachment 1 – “Panhandle Regional Expansion Project Expression 3 of Interest and Capacity Request Form”

Preamble:

N/A

Question:

- a) Given the need for new electricity generation capacity in the Southwestern region of the province, did Enbridge’s EOI include any potential new gas-fired generation companies or other electricity generation companies?
- b) Did Enbridge canvass the IESO to determine what amount of new (or expanded) gas-fired generation may materialize in the region? If so, please provide any documents provided to or received from the IESO.

**Response**

a) and b)

Please see the responses at Exhibit I.APPrO.1 and Exhibit I.PP.13.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
The Association of Power Producers of Ontario (“APPo”)

INTERROGATORY

References:

IESO Annual Planning Outlook

Preamble:

N/A

Question:

- a) If energy output from gas-fired generation is expected to increase by more than 20 TWh annually between now and 2030 – as it currently laid out in the IESO’s APO – can the current configuration of the Panhandle pipeline accommodate that level of demand growth? And, if not, has Enbridge worked with the IESO to study the reliability implications?
- b) Given that many gas-fired generators are located across the province, does the inability of the Panhandle system to manage future growth have any impact on large gas-fired generation facilities in other parts of the province?
- c) Please provide any system-wide impacts on the province’s electricity sector that have been undertaken by Enbridge or the IESO in response to the capacity shortfall in the Panhandle system.
- d) Has Enbridge undertaken any analysis on the impact to the variable operating costs of gas-fired generators – both within the southwestern region of the province and elsewhere – due to supply constraints in the Panhandle system? If so, please provide the analysis.

Response

a) - c)

No, Enbridge Gas has not worked with the IESO to study reliability implications.

No, the inability of Enbridge Gas’s Panhandle System to manage future growth without a capacity solution does not have any direct impact on gas-fired generation facilities in

other parts of the province, as there is no physical relationship between the existing Panhandle System capacity and other areas of the province.

Please also see the responses to Exhibit I.APPrO.1 and Exhibit I.PP.13.

- d) No, Enbridge Gas has not completed the analysis sought by APPrO regarding the impacts to variable operating costs of gas-fired electricity generators.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
The Association of Power Producers of Ontario ("APPPrO")

INTERROGATORY

References:

Exhibit B, Tab 1, Schedule 1, Page 7 of 19  
Exhibit B, Tab 2, Schedule 1, Page 9 of 16

Preamble:

"There are additional industrial customers requesting Panhandle System capacity, but which were not part of the EOI process. These additional customers are not currently included in the demand forecast for the Project due to the preliminary nature of their requests, but their requests provide further support for the growing need for capacity on the Panhandle System."

"The general service (Rate M1 and Rate M2) demand consists of residential, commercial, and small industrial customers. Approximately 45% of the firm demand served by the Panhandle System is for the general service customers.

The contract rate (M/BT4, M/BT5, M/BT7, T-1 and T-2) demand accounts for about 55% of the firm demand served by the Panhandle System. The contract rate demand consists of power generation, greenhouse and large commercial/industrial. The current mix is 29% power generation, 52% greenhouse and 19% large commercial/industrial customers."

Question:

- a) Please provide a high-level estimate of the potential demand that is not included in this application, but may materialize over the next decade.
- b) Please provide the additional capacity that may be required based on preliminary requests that were not included in Enbridge's current forecast for the Panhandle system.
- c) What will the future split be between the "System General Service Market" and "System Firm Contract Market" with: (i) current forecasts; and (ii) the potential demand that is not included in the application over the next decade?

d)

i) By Winter 2030/2031, the breakdown of firm contract demands excluding general service is estimated to be:

- Power Generation: 32%
- Greenhouse: 56%
- Large Commercial/Industrial: 12%

ii) By Winter 2033/2034, the breakdown of firm contract demands excluding general service is estimated to be:

- Power Generation: 31%
- Greenhouse: 58%
- Large Commercial/Industrial: 11%

/U

ENBRIDGE GAS INC.

Answer to Interrogatory from  
The Association of Power Producers of Ontario ("APPrO")

INTERROGATORY

References:

Exhibit B, Tab 1, Schedule 1, Page 7 of 19

Preamble:

"This conclusion is further reinforced by the Company's expectation that any capacity created on the Panhandle System could also be relied upon in the future to support transmission and distribution of renewable natural gas and/or hydrogen gas volumes."

Question:

- a) Has Enbridge undertaken any studies on forecasted growth of hydrogen or RNG in Ontario? If so, please provide these reports.

**Response**

No, Enbridge Gas has not undertaken any studies on forecasted growth of hydrogen or RNG in Ontario.



ENBRIDGE GAS INC.

Answer to Interrogatory from  
The Association of Power Producers of Ontario ("APPrO")

INTERROGATORY

References:

Exhibit B, Tab 1, Schedule 1

Preamble:

"As noted in the IESO's December 2021 Annual Planning Outlook, the Brighton Beach Generating Station ("BBGS") will play a particularly critical role in meeting localized power generation needs between 2024 and 2028. With demand for electricity continuing to grow, it is expected that the BBGS will continue to play a significant role in meeting the region's electricity supply needs beyond 2028. It is Enbridge Gas's understanding that these near-term and longer-term needs have driven the request for incremental firm service from this customer."

Question:

- a) Does Enbridge expect the BBGS generating station to operate beyond 2030?
- b) Has Enbridge discussed the long-term operation of the BBGS with the IESO?
- c) Has Enbridge discussed the reliability implications to Ontario's electricity grid of the retirement of the BBGS by 2030 or earlier? Please provide any analysis Enbridge provided or received from the IESO.

Response

- a) Yes. The IESO's planning outlooks suggest that the availability of existing resources including gas-fired generators (including BBGS) will be required beyond 2030.

Figures 21 & 22 of the IESO's 2021 Annual Planning Outlook imply that without the continued availability of existing resources, including electricity produced by natural gas generators, an energy shortfall is expected to start in 2026 and continue to grow sharply through 2042.<sup>1</sup>

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<sup>1</sup> <https://www.ieso.ca/-/media/Files/IESO/Document-Library/planning-forecasts/apo/Dec2021/2021-Annual-Planning-Outlook.ashx>, Page 48.

Figure 13 of the IESO's 2022 Annual Acquisition Report implies that potential contribution of existing resources will play a significant role in meeting adequacy needs from 2027 to 2034.<sup>2</sup>

b) No.

c) No.

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<sup>2</sup> <https://www.ieso.ca/-/media/Files/IESO/Document-Library/planning-forecasts/aar/Annual-Acquisition-Report-2022.ashx>, Pages 39-40.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Association of Power Producers of Ontario (APPrO)

INTERROGATORY

Reference:

Exhibit A, Tab 4, Schedule 1, Page 5

Preamble:

Enbridge's current position regarding the Contributions in Aid of Construction (CIAC) is that it is not appropriate to require a CIAC from specific customers for the proposed project.

Question(s):

Is Enbridge aware of any customers that would be impacted by the change in OEB policy to include a CIAC for future transmission projects, but are not part of this proceeding?

Response:

Enbridge Gas does not have information regarding the impact a requirement of CIAC for future transmission projects would have on specific customers. However, the Company submits that all existing and prospective customers and provincial and municipal economic development groups seeking to attract business to the province could be impacted.

A change to policy would very likely have a direct impact on capital investment and job creation throughout the province. Enbridge Gas has heard from customers that they plan their business decisions on the basis that the OEB will apply its rules, regulations and guidelines in a manner consistent with previous practices. All existing customers who contracted capacity related to previous transmission projects were not required to pay a CIAC for those projects. For existing customers who participated in the EOI seeking to expand their operations, a change to the OEB's rules in this regard will likely lead to those customers reconsidering their expansion plans. Additional consideration needs to be given to customers who would be held to a new CIAC requirement for transmission projects, which would create inequity relative to existing competitors who connected to the natural gas system under existing rules.

Enbridge Gas submits that adding a requirement of CIAC for transmission projects, in the best case, will lessen Ontario's competitive advantage as new industries (such as the electric vehicle battery/manufacturing industry) could consider locating their businesses in other jurisdictions which do not have CIAC requirements for transmission projects, and in the worst case, could impact the viability of natural gas-generation projects resulting in regional energy challenges.

Access to energy is essential for commercial and industrial customers seeking to invest in Ontario, as natural gas remains a critical source of energy for customers requiring increasing amounts of affordable energy. Enbridge Gas continues to receive requests for new/incremental firm natural gas service from customers not previously identified through the EOI.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Association of Power Producers of Ontario (APPrO)

INTERROGATORY

Reference:

Exhibit A Tab 4 Schedule 1 Page 6 of 7; Exhibit E, Tab 1, Schedule 1, Pages 5, 17-19;  
Directive - Order in Council 586/2023

Preamble:

“Customers submitting EOI bids for new/incremental service were generally doing so under the assumption that the OEB would apply the established regulatory framework for transmission system expansion projects, which does not require CIAC [...] No customer indicated that they would be willing to provide CIAC for a transmission system expansion project without understanding the magnitude of the CIAC and the unique justification for its selective application in this instance.”

According to Ministerial Directive 586 / 2023, “Southwestern Ontario, especially the Windsor-Essex region is experiencing rapid growth in electricity demand from greenhouses as well as investments in the lithium-ion battery and automotive sectors. According to IESO, peak electricity demand in the Windsor-Essex and Chatham areas is forecast to grow from roughly 500 megawatts in 2022 to about 2,100 megawatts in 2035, equivalent to adding cities the size of Ottawa and London to the grid.”

Question(s):

1. Enbridge Gas is forecasting continued demand growth from commercial, industrial, and residential customers located in the areas west of Dawn, with concentrations in the Municipalities of Windsor, Leamington, and Kingsville related to greenhouse, automotive and power generation.

a) Please describe what impacts may occur if the project is not approved or if the OEB does not apply the established regulatory framework for CIAC for transmission system projects noted in the preamble. Please discuss the economic, employment and tax revenue impacts on the local and provincial economies.

b) Did any Enbridge receive any feedback from potentially affected customer s regarding the same? If so, please describe what may happen to projects proposed by third parties (e.g., Stellantis) if the project is not approved or if the OEB does not

apply the established regulatory framework for CIAC for transmission system projects.

2. Please provide copies of Orders in Council 1348/2022 and 586/2023 from the Ontario Minister of Energy approved and ordered, respectively, on October 6, 2022 and April 27, 2023.

3. Given the potential that a number of gas-fired capacity additions may not be feasible if the project is not approved or a significant CIAC is requested, has Enbridge considered the following:

a) The reliability and cost impacts to the Ontario electricity system and electricity customers if the generation capacity the IESO has been directed by the Minister of Energy to procure, or is already contracted through its authorized planning and procurement processes, must be replaced?

b) How will this financial impact flow to electricity ratepayers and potentially impact the calculations underpinning the Stage 2 and 3 figures?

Response:

1. a) and b)

Please see the response at Exhibit I.APPRO.9 for potential impacts regarding a change in policy to require CIAC for transmission projects.

Please see the response at Exhibit I.STAFF.25, part c) for information regarding Project benefits that extend beyond EOI-identified customers.

The Project will directly support job growth, increase property tax revenue for the affected municipalities and increase tax revenue for the province. Furthermore, as indicated by various letters of support received by Enbridge Gas, the Project has broad support from regional municipalities as well as major customer groups. Several of the letters of support (Exhibit B, Tab 1, Schedule 1, Attachments 3 – 7) outline the importance of the Project for current and future growth within the area.

2. The Order in Council 1348/2022 can be found at the following link:  
<https://www.ontario.ca/page/directive-order-council-13482022>

The Order in Council 586/2023 can be found at the following link:  
<https://www.ontario.ca/page/directive-order-council-5862023>

3. a) Enbridge Gas understands that replacing the generation capacity that the IESO has been directed by the Minister of Energy to procure will be significantly more expensive to meet the demand and reliability needs of the Panhandle region. Furthermore, it is not clear at this time what other generation technology has the ability to be deployed in the timeframe and scale required to respond to system needs. More specifically:<sup>1</sup>

Ontario's natural gas generators can be turned on and ramped up quickly to ensure the province does not need to be reliant on emergency actions such as conservation appeals and rotating blackouts to stabilize the grid, according to the IESO.

While during most hours throughout the year Ontario can meet its electricity generation needs with nuclear, hydroelectric, bioenergy, wind and solar power, natural gas generation also acts as the province's insurance policy that can be turned on if the wind is not blowing or sun is not shining, or another generator is offline for repairs. There is currently no like-for-like replacement for natural gas and the IESO has concluded it is needed to maintain system reliability until nuclear refurbishments are complete and new non-emitting technologies such as storage mature.

- b) Enbridge Gas expects that the financial impacts include impacts to electricity ratepayers through increased electricity rates. The reliability and cost impacts to the Ontario electricity system are not included in the natural gas Project's Stage 2 and Stage 3 calculations.

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<sup>1</sup> <https://www.ontario.ca/files/2023-07/energy-powering-ontarios-growth-report-en-2023-07-07.pdf>, p. 49.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Association of Power Producers of Ontario (APPrO)

INTERROGATORY

Reference:

Exhibit A, Tab 4. Schedule 1, Page 5

Preamble:

“Following the Application being placed into abeyance in December 2022 (at the Company’s request), Enbridge Gas re-evaluated existing system capacity based on the impact of actual 2022 customer demands, updated forecast demands, updated SWAHV, and supply volumes on the Panhandle System. As a result of this assessment the Company found that:”

Question(s):

1. Please provide a detailed description of the SWAHV and other supply/demand changes that occurred between the original application for the project and the update that resulted in an additional 24 TJ/day of capacity on the Panhandle system.
2. Please describe future changes to supply/demand conditions that may result in additional capacity to be made available on the existing Panhandle system.
  - a) If Enbridge does not expect further changes to the capacity of the Panhandle system, please explain why.

Response:

1. The System-Wide Average Heating Value (“SWAHV”) is the energy content of natural gas and is updated on an annual basis. From the time the initial application was filed in June 2022 to the time the amended application was filed in June 2023, the SWAHV changed from 0.00003932 TJ/m<sup>3</sup> to 0.00003912 TJ/m<sup>3</sup>. This update resulted in a decrease in existing system capacity of 3.8 TJ/d.

The existing system capacity increased by 27.1 TJ/d as a result of the updated hydraulic analysis which found that demand locations were in more hydraulically favourable locations than previously estimated.



The difference between the SWAHV decrease of 3.8 TJ/d and the demand location increase of 27.1 TJ/d is a net increase of 24 TJ/d. Please also see the response to Exhibit I.ED.26, part a).

2. As stated at Exhibit A, Tab 4, Schedule 1, p. 5, system capacity is based on the existing pipeline facilities, customer demand volumes and location, SWAHV, and supply volumes and location. System capacity will fluctuate as customer demand volumes and location and SWAHV are updated. However, the current capacity of the existing system is based on the best available information at this time and therefore no additional capacity is expected to be available to address the increasing demand forecasted for Winter 2024/2025.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Association of Power Producers of Ontario (APPrO)

INTERROGATORY

Reference:

Exhibit D Tab 1 Schedule 1 Page 3 of 11; Exhibit A Tab 4 Schedule 1 Page 6 of 7

Preamble:

“The Project will commence at the existing Enbridge Gas Dover Transmission Station located 40 km southwest of the Dawn Hub at Balmoral Line and Town Line Road in Chatham-Kent, Ontario. The pipeline will loop the existing NPS 20 Panhandle Line, following existing easements where possible, for approximately 19 km to Richardson Sideroad in Lakeshore, Ontario where it will tie into the existing NPS 20 Panhandle Line at a new valve site station.”

Question(s):

- 1.As a line loop, APPrO understands that all customers who receive service from the proposed project will use both the existing NPS 20 and new NPS 36 legs of the pipeline. Please confirm that all customers downstream of the project will utilize the project for the provision of gas delivery service, not just the customers submitting EOI bids for new/incremental service.
- 2.Please describe benefits existing customers will receive from the project (e.g., enhanced reliability, spreading OM&A costs over more customers / volumes, etc.).

Response:

1. Confirmed.
2. Please see the response at Exhibit.I.STAFF.25, part c).

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Association of Power Producers of Ontario (APPrO)

INTERROGATORY

Reference:

Exhibit B Tab 2 Schedule 1 Page 15 of 16

Preamble:

Paragraph 33 refers to “Attachment 1”, which is a Winter 2024/2025 Panhandle System schematic showing the network analysis for the Panhandle System assuming no reinforcements are completed.

Question(s):

Please provide Attachment 1.

Response:

The attachment referenced within the interrogatory is included within the pre-filed evidence at Exhibit B, Tab 2, Schedule 1, Attachment 1 (updated June 16, 2023).

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Environmental Defence (“ED”)

INTERROGATORY

Reference:

Ex. B, Tab 1, Schedule 1.

Question:

- (a) Please provide a copy of table 1 on page 11 with the figures converted to m<sup>3</sup>/d.
- (b) Please provide conversion factors for TJ to m<sup>3</sup>.
- (c) On page 14, Enbridge states: “The greenhouse sector does not currently have a viable economic alternative to replace natural gas for heat and CO<sub>2</sub> production.” Please provide an analysis comparing the cost of heating a greenhouse with gas versus a high-efficiency heat pump. Please provide this analysis over a 15 year time horizon, including the federal government’s planned increases to the carbon price.

**Response**

a) Please see Table 1.

Table 1

	Historical Actuals (m3/d)			FORECAST (m3/d)								
	Winter 19/20	Winter 20/21	Winter 21/22	Winter 22/23	Winter 23/24	Winter 24/25	Winter 25/26	Winter 26/27	Winter 27/28	Winter 28/29	Winter 29/30	Winter 30/31
General Service Firm (Total )	8,137,763	7,853,310	7,884,028	7,832,260	7,880,854	7,928,707	7,974,872	8,019,785	8,062,781	8,104,141	8,143,482	8,180,905
Contract Firm (Total excluding Power Generators)	5,591,970	6,144,934	6,500,153	7,309,867	8,082,515	8,408,921	8,735,302	9,061,708	9,388,113	9,714,519	10,040,900	10,367,306
Power Generators - Firm Contract only	2,697,871	2,706,441	2,700,102	2,701,022	2,701,022	4,168,021	4,987,398	4,987,398	4,987,398	4,987,398	4,987,398	4,987,398
<b>Total System Demand Forecast</b>	16,427,604	16,704,684	17,084,283	17,843,149	18,664,392	20,505,649	21,697,572	22,068,891	22,438,292	22,806,058	23,171,779	23,535,608
General Service Firm (Total Incremental Demand)	486,326	(222,301)	38,708	(92,076)	48,594	47,853	46,166	44,913	42,996	41,360	39,340	37,423
Contract Firm (Incremental excluding Power Generators)	627,860	595,672	361,470	776,483	772,648	326,406	326,380	326,406	326,406	326,406	326,380	326,406
Power Generators - Firm Contract only (incremental)	(565,777)	29,175	(3,586)	(12,883)	-	1,466,999	819,376	-	-	-	-	-
<b>Total Incremental Demand Forecast</b>	548,409	402,546	396,592	671,524	821,242	1,841,258	1,191,922	371,319	369,402	367,766	365,721	363,829
<b>Total Incremental Demand Forecast (Cumulative)</b>	-			671,524	1,492,766	3,334,024	4,525,946	4,897,265	5,266,667	5,634,433	6,000,153	6,363,983

/U

- b) The conversion factor from TJ per day to m<sup>3</sup> per day is based on the System Wide Average Heating Value ("SWAHV") which is updated annually. The conversions are as follows: /U
- For Winter 2019/2020: 0.00003898 TJ/m<sup>3</sup>
  - For Winter 2020/2021: 0.00003928 TJ/m<sup>3</sup>
  - For Winter 2021/2022: 0.00003932 TJ/m<sup>3</sup>
  - For Winter 2022/2023 to W2030/2031: 0.00003912 TJ/m<sup>3</sup>
- c) Enbridge Gas has not developed an analysis comparing the cost of heating a greenhouse with natural gas versus an electric heat pump. The reference to the viability of alternative solutions for heating and CO<sub>2</sub> production for greenhouses is based on the utility's understanding of greenhouse operations, as well as greenhouse customer requirements for natural gas via the EOI process. Enbridge Gas is not aware of any large greenhouse customers that use electric heat pumps for heating and CO<sub>2</sub> production.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Environmental Defence (“ED”)

INTERROGATORY

Reference:

Ex. B, Tab 1, Schedule 1.

Preamble:

Enbridge states as follows on page 9: “Approximately 45% of the firm demand served by the Panhandle System is for general service customers. Enbridge Gas forecasts that general service customer demand in the Panhandle Market will increase by approximately 3.7% between winter 2021/2022 and 2030/2031. Incremental demands from general service customers make up approximately 2.5% of the incremental capacity of the proposed Project.”

Question:

- (a) Please provide a table listing the forecast number of general service customers, broken down by customer type, and showing the per-customer average demand for each customer type, for 2021/2022 and 2030/2031, for the relevant area.
- (b) Please provide the customer attachment forecast for the 2021/2022 and 2030/2031, including a breakdown by customer type and a breakdown by new construction versus conversion of existing building

**Response**

a) and b)  
Please see Table 1 below.

Table 1: Forecast General Service Attachments, Panhandle Market (2022-2031)

<b>Year</b>	2022	2023	2024	2025	2026	2027	2028	2029	2030
Residential Attachments	1,487	1,473	1,454	1,424	1,394	1,333	1,277	1,221	1,158
Commercial Attachments	106	117	115	112	109	105	101	98	94
Industrial Attachments	3	3	3	2	2	2	2	1	1

The number of general services customers in the relevant area is estimated to be approximately:

- Residential: 180,500
- Commercial/Industrial: 15,500

The per-customer average demand for each customer attachment type is assumed to be 0.89 m<sup>3</sup>/hr and 9.72 m<sup>3</sup>/hr for commercial/industrial.

The general service attachments on the Panhandle System is assumed to be approximately 1-5% fuel conversions.



ENBRIDGE GAS INC.

Answer to Interrogatory from  
Environmental Defence (“ED”)

INTERROGATORY

Reference:

Ex. B, Tab 1, Schedule 1.

Preamble:

On page 15, Enbridge states: “As noted in the IESO’s December 2021 Annual Planning Outlook, the Brighton Beach Generating Station (“BBGS”) will play a particularly critical role in meeting localized power generation needs between 2024 and 2028.<sup>11</sup> With demand for electricity continuing to grow, it is expected that the BBGS will continue to play a significant role in meeting the region’s electricity supply needs beyond 2028. It is Enbridge Gas’s understanding that these near-term and longer-term needs have driven the request for incremental firm service from this customer.”

Question:

- (a) Please reproduce the table 1 on page 11 with an additional row to indicate the historical and forecast design day demand attributable to power generation.
- (b) Seeing as Ontario is a summer peaking jurisdiction, please explain how Enbridge determines the design day demand associated with power generation.
- (c) Please provide the actual demand from power generation on the three highest demand days in each of the last ten years for the project area.
- (d) Please provide the design day demand from power generation for the last ten years as assumed in Enbridge’s gas supply planning processes.

**Response**

- a) Please see Exhibit B, Tab 1, Schedule 1, Table 2. /U
- b) Design day demand for power generators is equivalent to their firm contract demand. Power generators can exercise their contract at any time and this capacity is held to be dispatchable when it is called upon. Enbridge Gas must plan to meet all contractual obligations and must plan to meet these requirements on the design day. /U
- c) Please see Table 2 below.

**Table 2: Natural Gas-fired Power Generation on the Three Highest Demand Days**

Year	Date	Power Generation Demand (10 <sup>3</sup> m <sup>3</sup> /day)
2022	20-Jan-2022	2311
2022	21-Jan-2022	1549
2022	14-Feb-2022	1774
2021	5-Feb-2021	11
2021	15-Feb-2021	7
2021	16-Feb-2021	14
2020	13-Feb-2020	64
2020	26-Feb-2020	44
2020	27-Feb-2020	48
2019	29-Jan-2019	654
2019	30-Jan-2019	684
2019	31-Jan-2019	1492
2018	04-Jan-2018	1258
2018	05-Jan-2018	1563
2018	16-Jan-2018	1545
2017	6-Jan-2017	1639
2017	7-Jan-2017	302
2017	13-Mar-2017	69
2016	4-Jan-2016	2198
2016	17-Jan-2016	1112
2016	18-Jan-2016	1128
2015	19-Feb-2015	3215
2015	20-Feb-2015	3578
2015	23-Feb-2015	3172
2014	21-Jan-2014	4261
2014	22-Jan-2014	4241
2014	11-Feb-2014	4114
2013	21-Jan-2013	1854
2013	22-Jan-2013	3229
2013	23-Jan-2013	2822

d) As outlined in Exhibit I.ED.4 part b), the design day demand forecast in the Gas Supply Plan is shown by rate zone and not by individual transmission pipeline system. Table 3 below shows the design day demand for the power generation customers served by the Panhandle System from Winter 2012/2013 to Winter 2021/2022.

Table 3: Power Generation Design Day Demand

	Design Day Demands (TJ/d)									
	Winter 12/13	Winter 13/14	Winter 14/15	Winter 15/16	Winter 16/17	Winter 17/18	Winter 18/19	Winter 19/20	Winter 20/21	Winter 21/22
Power Generators - Firm Only (TJ/d)	108	108	129	130	131	131	127	105	106	106

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Environmental Defence (“ED”)

INTERROGATORY

Reference:

Exhibit B, Tab 2

Question:

- (a) Please provide excerpts from Enbridge most recent gas supply plan that are relevant to this proceeding.
- (b) Please explain how the demand described in this application is reflected in the gas supply plan.

Response

- a) Please see the response to part b) below. At Exhibit B, Tab 3, Schedule 1, page 8, Enbridge Gas references contracts on the Panhandle Eastern Pipeline to Ojibway that are held by the Company for sales service customers (all of which influence Panhandle System design). Enbridge Gas’s Panhandle capacity is referenced throughout the 2022 Annual Gas Supply Plan Update (EB-2022-0072), including details on the parameters of the contracts which appear on Page 2 of Appendix C. Enbridge Gas’s Panhandle Eastern capacity required to meet Design Day demand on the Panhandle System is discussed in the 5 year Annual Gas Supply Plan (EB-2019-0137) at page 80.
- b) The Panhandle System design day demand forecast is included in Table 1 of Exhibit B, Tab 1, Schedule 1. The design day demand described in Enbridge Gas’s gas supply plan is detailed by the larger rate zone. The Panhandle System’s design day demand is included within the Union South rate zone design day demand and is included in the Enbridge Gas 2022 Annual Gas Supply Plan Update (EB-2022-0072) at page 26, Table 4, Row 4. The design day demand forecast in the 2022 Annual Gas Supply Plan Update reflects information known during the completion of the 2021/2022 gas supply plan in the summer of 2021. The Winter 2021/2022 Panhandle System design day demand is about 20% of the total 2021/2022 Union

South rate zone design day demand forecast shown in the 2022 Annual Gas Supply Plan Update.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Environmental Defence (“ED”)

INTERROGATORY

Reference:

Exhibit C, Tab 1, Schedule 1

Question:

- (a) Please provide list of all references to this project in previous AMPs and other capital planning documents.
- (b) Please indicate when Enbridge first anticipated the need for this project.
- (c) Please indicate when Enbridge first considered potential IRPAs.
- (d) Please describe the steps taken by Enbridge prior to the IRP proceeding decision to comply with previous directives of the OEB regarding IRP.

Response

- a) Please see Table 1 below.

Table 1: List of References to Project in Previous AMPs and Other Capital Planning Documents

<b>Document</b>	<b>Case Number(s)</b>	<b>Reference(s)</b>
Union Gas Asset Management Plan 2018-2027	EB-2017-0306/EB-2017-0307	Exhibit C.STAFF.54, Attachment 2, Pages 7, 39-40, 41, 79
Union Gas Asset Management Plan 2019-2028	EB-2018-0305	Exhibit C1, Tab 3, Schedule 1, Pages (14, 74, 77, 176)
EGI Asset Management Plan Addendum (2020)	EB-2019-0194	Exhibit C, Tab 1, Schedule 1, Pages (9, 69, 72, 171-172)
EGI Asset Management Plan 2021-2025	EB-2020-0181	Exhibit C, Tab 2, Schedule 1, Page (88)
EGI Asset Management Plan Addendum (2022)	EB-2021-0148	Exhibit B, Tab 2, Schedule 3, Pages (8, 14, 18)

- b) Enbridge Gas anticipated a potential need for incremental future facilities of this nature while developing the Kingsville Transmission Reinforcement Project (EB-2018-0013), in 2018. At the time, the need for incremental future facilities was anticipated to arise in 2026. This need was reaffirmed in 2021 when the forecasted demand growth accelerated the need for the current Project to Winter 2023/2024, as discussed in Exhibit B, Tab 1, Schedule 1, pages 2-11.
- c) Enbridge Gas began reviewing IRP alternatives in Q1 2021 when the EOI for the Project was issued. Enbridge Gas conducted similar IRP alternative assessments for the 2016 Panhandle Reinforcement Project and 2018 Kingsville Transmission Reinforcement Project<sup>1</sup> which yielded similar results to those assessed in relation to the current Project.
- d) Please refer to Exhibit C, Tab 1, Schedule 1, and Exhibit I.STAFF.7 for details on Enbridge Gas's assessment of alternatives related to the Project. Enbridge Gas submits that activities prior to the OEB establishing the IRP Framework, unrelated to the Project, are not relevant to this proceeding. Please also see the response to part c) for discussion of previous assessments for the 2016 Panhandle Reinforcement Project and the 2018 Kingsville Transmission Reinforcement Project.

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<sup>1</sup> EB-2016-0186, Exhibit A, Tab 6 and EB-2018-0013, respectively.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Environmental Defence ("ED")

INTERROGATORY

Reference:

Exhibit C, Tab 1, Schedule 1

Question:

- (a) Please reproduce table 1 on page 11 of Ex. B, Tab 1, Schedule 1, adding rows with the following additional information:
- i. The potential capacity that could be feasibly sourced from Ojibway, in terms of the TJ/d at Ojibway and the TJ/d at the Leamington-Kingsville area;
  - ii. The potential capacity that could be cost-effectively sourced from Ojibway, in terms of the TJ/d at Ojibway and the TJ/d at the Leamington-Kingsville area;
  - iii. The potential capacity that could be obtained through targeted cost-effective energy efficiency programming;
  - iv. The potential capacity that could be obtained via demand response contracts (i.e. incenting customers to switch to interruptible service); and
  - v. The forecast demand from power generation.
- (b) Please provide a table showing the annual cost for items (i) to (iv) above.





- ii. There is no Panhandle System capacity that could be cost-effectively sourced from Ojibway compared to the proposed Project. This alternative was evaluated and deemed a non-viable alternative. Please see the response to Exhibit I.STAFF.7, Attachment 2.
- iii. Enbridge Gas reviewed potential capacity that could be obtained through targeted cost-effective energy efficiency programming and determined that a maximum peak hour reduction potential of 72,000 m<sup>3</sup>/hour (57 TJ/d) could be obtained. For additional details please refer to Exhibit C, Tab 1, Schedule 1, Pages 20-21, Paragraph 67, and the response at Exhibit I.STAFF.7, Attachment 2. /U
- iv. There is no potential capacity that could be obtained via demand response. Please see the response at Exhibit I.STAFF.9, part b).
- v. Please see the response to Exhibit I.ED.3, part a).

b) Please see Table 2 below. /U

Table 2: Costs of Additional Capacity and ETEE

<b>Item #</b>	<b>Potential Panhandle System Capacity Source</b>	<b>Estimated Costs</b>
i, ii	21 TJ/d Firm Exchange between Dawn and Ojibway	\$4.2 million Annually
iii	57 TJ/d Enhanced Targeted Energy Efficiency (ETEE)	~\$468 million Total

Please also see the response to Exhibit I.STAFF.7, Attachment 2.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Environmental Defence (“ED”)

INTERROGATORY

Reference:

Exhibit C, Tab 1, Schedule 1, Attachment 2

Question:

- (a) Please provide all data sheets, assumptions, and calculations underlying the Posterity Group analysis, including live spreadsheets where possible.
- (b) How did the Posterity Group generate peak hour savings figures based on the 2019 Achievable Potential Study, which focused on annual savings?
- (c) Posterity Group found that the “[p]eak hour reduction from demand side management is approximately 6,900 m<sup>3</sup>/hr by winter 2029/2030.” Please provide an annual breakdown up to 2029/2030.
- (d) Posterity Group found that the “[p]eak hour reduction from demand side management is approximately 6,900 m<sup>3</sup>/hr by winter 2029/2030.” Please ask the Posterity Group to provide the corresponding annual savings (m<sup>3</sup>) and peak day (m<sup>3</sup>/d) savings.
- (e) For the energy efficiency programming described by the Posterity Group, please provide (i) the lifetime gas savings (m<sup>3</sup>), (ii) the lifetime avoided tonnes of GHGs (t CO<sub>2</sub>e), (iii) the approximate value of the avoided gas, and (iv) the approximate value of the avoided carbon emissions (accounting for carbon price escalation).
- (f) Please compare the Posterity “mirror model” with the 2019 Achievable Potential Study. Does one find that there are greater potential savings than the other? If yes, by how much (%) and why?
- (g) Please ask the Posterity Group to estimate the potential based on double the incentives, including an appropriate adjustment to the free ridership rate.
- (h) Why does the Posterity Group provide figures in based on the peak hour whereas the rest of the application uses design day figures?
- (i) Please provide all communications between Enbridge and Posterity Group regarding this matter.

**Response**

- a) Please see Attachment 1 to this response for the “IRP Analysis project Leamington Interconnect Modelling Approach” memo, which details the assumptions and methodology used in Posterity Group’s analysis. The calculations are completed via Posterity’s proprietary model/software and the results are outputted.

Please see Attachment 2 to this response for Enbridge Gas’s growth assumptions. Customer data for individual general service customers was also provided to Posterity, however has not been included in Attachment 2. Enbridge Gas submits that individual customer names, locations, and consumption volumes are not relevant to the request.

Please see Attachment 3 to this response for the Posterity output file.

- b) Please see Attachment 4 to this response for Posterity’s Peak Modelling Method Memo for information on the methodology.
- c) Please see Table 1 below.

Table 1: Annual Peak Hour Reduction by Sector

Hourly Peak Reduction (m <sup>3</sup> /hr)				
Year	Residential	Commercial	Industrial	Total
2023	471	63	279	813
2024	1,155	139	556	1,849
2025	2,105	186	821	3,112
2026	2,987	215	1,070	4,272
2027	3,799	230	1,291	5,319
2028	4,527	238	1,475	6,240
2029	5,027	241	1,606	6,874

- d) The corresponding annual savings is 17,009,470 m<sup>3</sup>.

The comparable peak day savings is 5.43TJ/d. For clarity, the scope of Posterity’s analysis was for general service customers on the distribution network within the Leamington, Kingsville and Wheatley area. The focus of the analysis was on peak hour, and therefore the model was calibrated only for peak hour. The peak hour value was then converted to peak day to allow for comparison to the project need.

e) Please see Table 2 below.

Table 2: Lifetime Savings from Energy Efficiency Programming from Posterity Group Report

Year	Lifetime Natural Gas Savings (m <sup>3</sup> ) <sup>1</sup>	Lifetime Emissions Savings (tonnes CO <sub>2</sub> e) <sup>2</sup>	Lifetime Natural Gas Cost Savings (\$) <sup>3</sup>	Lifetime Carbon Cost (\$/tonne) <sup>4</sup>	Lifetime Carbon Cost Savings (\$)
2023	26,859,755	52,672	3,760,366	65	3,423,679
2024	34,676,992	68,002	4,854,779	80	5,440,126
2025	44,815,044	87,882	6,274,106	95	8,348,819
2026	47,200,739	92,561	6,608,103	110	10,181,671
2027	46,978,047	92,124	6,576,927	125	11,515,494
2028	40,411,740	79,247	5,657,644	140	11,094,639
2029	28,631,131	56,146	4,008,358	155	8,702,575
2030	22,147,829	43,432	3,100,696	170	7,383,422

NOTES:

1 - The lifetime savings were calculated by multiplying the annual savings of each new measure implemented in a given year by the lifetime of that measure.

2 - Assumed Emission Factor: 0.001961 tCO<sub>2</sub>e/m<sup>3</sup>.

3 - Assumed Natural Gas Cost: \$0.14/m<sup>3</sup>.

4 - Assumed Carbon Cost based on Minimum National Carbon Pollution Price Schedule for 2023-2030.

f) Please see Attachment 5 to this response for the outputs (in annual m3 savings) of the 2019 Achievable Potential Study and Posterity's "mirror model". The comparison is provided for Scenario B, as this is the scenario relevant to Posterity's mirror model. There are several components to the outputs, therefore the Company cannot provide a specific percentage difference as requested.

To understand the challenges of comparing the two outputs, and to provide an understanding of the factors driving differences between the two outputs, see below for a summary of the work completed by Enbridge Gas and Posterity to arrive at the "mirror model":

- Through Posterity's effort, an original model was created to mimic the 2019 Achievable Potential Study as closely as possible.
- A large number of issues were identified and documented through the joint analysis of Posterity and Enbridge Gas, which included the following four categories:
  - Misalignment of reference case sector structure and assumptions;
  - Measure assumptions that were not substantiated or not applicable;

- Measure adoption and diffusion assumptions on achievable potential that did not align with historic market experience; and,
- Program delivery cost assumptions that don't reflect historic experience.
- A "mirror model" was created which reflects the impacts of the recommended modifications that were made to the original model in attempt to address some of the deficiencies identified.

For clarity, for the purpose of completing an assessment on peak hour demand reduction for IRP, Posterity developed an IRPA model based off the "mirror model". The updates that were incorporated to support the IRPA modelling are outlined in Attachment 1 of this response, and include:

- Calibrated the base year to weather adjusted 2021 consumption and updated the reference case to align with Enbridge's forecast of customer growth;
- Corrected customer regional mapping for the base year and reference case according to customer data supplied by Enbridge;
- Added rate class and customer account data;
- Developed hours-use peak factors for each region, sector, segment, and end use; and,
- Added a residential demand response measure.

Given this subsequent evolution of the model, and the change in model objective from annual savings to a peak hour focus, the outputs between the IRPA Model and the 2019 APS would be meaningfully different.

- g) The Posterity analysis was completed using Scenario B from the APS, which assumes unconstrained potential where incentives are set at 100% of incremental cost of each measure. Therefore, the results provided would illustrate the maximum achievable potential assuming no program cost or incentive constraints. Increasing incentives beyond 100% of the incremental cost is beyond the scope of the 2019 APS, and more research would be required to complete the analysis.
- h) The scope of Posterity analysis was for general service customers on the distribution network within the Leamington, Kingsville and Wheatley area, where peak hour analysis was most applicable, as distribution networks are designed based on peak hour basis.

The Panhandle Transmission System is designed using daily demand on Design Day, or peak day basis.

- i) Please see Attachment 6 to this response for all email correspondences.



## IRP Analysis project

### *Leamington Interconnect Modelling Approach*

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**Project:** Integrated Resource Planning Alternative Analysis (IRPA Analysis)

**Re:** Leamington Interconnect LTC

**Submitted by:** Posterity Group (PG)

**Date:** May 27, 2022

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This memo presents information on the approach that was taken to develop the model used for the Leamington Interconnect IRPA Analysis project.

## 1 Notes on the Modeling Approach

The following sections summarize the modelling method used to conduct the analysis:

### 1.1 Model Updates

We started with the Posterity 'mirror model' of the 2019 Achievable Potential Study (APS), and incorporated the following updates to support IRPA modelling (creating the Posterity IRPA model):

- Calibrated the base year to weather adjusted 2021 consumption and updated the reference case to align with Enbridge's forecast of customer growth for the Leamington region.
- Corrected customer regional mapping for the base year and reference case according to customer data supplied by Enbridge.
- Added rate class and customer account data
- Developed hours-use peak factors for each region, sector, segment, and end use
- Added a residential demand response measure

### 1.2 Adjustments to Produce a Regional Model

We made the following adjustments to the Posterity IRPA model to produce a regional model:

- The Union South gas region in the West IESO zone was selected. All other regions were ignored.
- Scenario B was used (the scenario with the greatest potential from the achievable potential study)
- Only the following rates were selected:
  - Residential: M1
  - Commercial: M1, M2
  - Industrial: M1, M2







- Using customer data for the Leamington region, scaling factors were developed for each segment within the three sectors that were studied: residential, commercial, and industrial. These scaling factors were calculated by comparing the 2021 consumptions from the Leamington dataset provided by EGI and the 2021 consumptions for the Union South region from Posterity’s IRPA model. This step was done to determine the proportion of accounts in Union South that can be attributed to the Leamington region. The scaling factors were applied to the accounts in Posterity’s IRPA model to scale down the Union South region to represent Leamington.
- Accounts were added to each segment in the proportion that they were present in 2021 in the Union South region from Posterity’s IRPA model such that the total account growth in each sector matched the growth forecast provided by Enbridge for each year in the reference case. More information on the segments analyzed is provided in the following section.
- The hours-use peak factors for new accounts in the residential and commercial sectors were calibrated to match the expected per customer 2022 peak hourly demand provided in the EGI dataset. These peak hourly demands are lower than the average peak hourly demand per customer of existing customers. Since the model incorporates a 2 percent demolition rate of existing residential and commercial buildings that are replaced by new buildings and treated as new accounts, the overall peak hourly demand in these sectors decreases over time.
- Although there is no account growth forecasted in the industrial sector, the Unit Energy Consumption (UEC) assumptions built into the 2019 APS model, which this model is based on, increase over time, leading to an increase in peak hourly demand in the industrial sector. There is also no demolition rate applied to the industrial sector so the decrease in peak hourly demand due to lower peak hourly demand assumptions of new versus existing customers seen in other sectors does not affect the industrial sector.

### 1.3 Segment Scaling Factors

Exhibit 1 below shows the segments that are accounted for in the IRPA model, the Union South and Leamington consumptions for 2021, and the consumption scaling factor derived from them. There are additional segments in the model that were not present in the Leamington dataset and were thus assigned a consumption scaling factor of zero.

**Exhibit 1– Segment Consumption Scaling Factors**

Sector	Segment	2021 Union South Consumption (m <sup>3</sup> )	2021 Leamington Consumption (m <sup>3</sup> )	Consumption Scaling Factor
Residential	Attached/Row House	81,782,679	3,253,137	0.0398
	Detached House	644,444,094	33,746,171	0.0524
	Multi-Residential Low Rise	10,174,171	1,577,494	0.1550





<b>Commercial</b>	Food Retail	13,187,733	460,361	0.0349
	Hospital	2,675,515	187,030	0.0699
	Large Office	20,952,283	386,362	0.0184
	Long Term Care	14,002,358	1,025,345	0.0732
	Other Commercial	139,667,949	14,411,820	0.1032
	Other Motel/Hotel	2,796,486	270,920	0.0969
	Other Non-Food Retail	44,674,594	1,559,513	0.0349
	Other Office	45,594,773	968,056	0.0212
	Restaurant	28,997,970	983,865	0.0339
	School	27,747,189	817,859	0.0295
	Warehouse	25,968,045	1,434,872	0.0553
<b>Industrial</b>	Agriculture	110,007,131	60,668,167	0.5515
	Chemicals Manufacturing	8,017,914	215,210	0.0268
	Food and Beverage Manufacturing	12,486,198	1,400,532	0.1122
	Other Industrial	88,495,953	4,947,998	0.0559
	Pulp, Paper, and Wood Products Manufacturing	7,238,873	41,182	0.0057
	Utility	3,943,216	34,670	0.0088

Exhibit 2 shows the segments that are accounted for in the IRPA model, the number of accounts for both the M1 and M2 rate class in 2021 in Union South, and the corresponding account scaling factors used to implement the growth forecast provided by Enbridge. The account scaling factors are calculated as a percentage of the total number of accounts within the sector, in both the M1 and M2 rate class, with the sum of all of the account scaling factors for each sector adding up to one. These account scaling factors are then multiplied by the number of new accounts for each sector in a given year to reflect the growth rate with accurate proportions. Due to the fact that there was no growth rate forecasted in the general service industrial sector during the years analyzed, account scaling factors are not required for that sector. As with the consumption scaling, there are additional segments in the model that were not present in the Leamington dataset and were thus assigned an account scaling factor of zero.





**Exhibit 2 – Segment Accounts Scaling Factors**

Sector	Segment	M1 2021 Union South Accounts	M2 2021 Union South Accounts	M1 Accounts Scaling Factor	M2 Accounts Scaling Factor
Residential	Attached/Row House	492,401	n/a	0.1513	n/a
	Detached House	272,355	n/a	0.8367	n/a
	Multi-Residential Low Rise	3,907	n/a	0.0120	n/a
Commercial	Food Retail	1,434	40	0.0557	0.0015
	Hospital	9	9	0.0004	0.0004
	Large Office	1,670	64	0.0648	0.0025
	Long Term Care	86	83	0.0033	0.0032
	Other Commercial	9,095	460	0.3531	0.0179
	Other Motel/Hotel	79	15	0.0031	0.0006
	Other Non-Food Retail	4,858	134	0.1886	0.0052
	Other Office	3,633	140	0.1410	0.0054
	Restaurant	1,808	98	0.0702	0.0038
	School	324	195	0.0126	0.0076
	Warehouse	1,425	101	0.0553	0.0039



**General Service Growth**

\*Based on 2018 FBP for Leamington, Kingsville and Wheatley

GENERAL SERVICE GROWTH COUNTS*																				
Year	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
RESIDENTIAL	181	112	112	112	112	112	112	112	112	112	112	112	112	112	112	112	112	112	112	112
COMMERCIAL	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
INDUSTRIAL	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Peak Load Assumptions Per Customer	
Customer Type	Peak Load (m3/hr)
Residential	0.97
Commercial	4.4

**Contract Growth**

Incremental Firm Demand Growth Over time per Design Day Demand Forecast													
TJ/d	W 21/22	W 22/23	W 23/24	W 24/25	W 25/26	W 26/27	W 27/28	W 28/29	W 29/30	W 30/31	W 31/32	W 32/33	W 33/34
Incremental Contract Firm Growth *		21	30	25	25	25	25	25	25	25	25	25	21

\*A 20hr factor and Heating Value of 39.32 (MJ/m3) can be assumed to convert from TJ/day to m3/hr

\*Majority of this contract growth is agricultural (greenhouses)

**Assumptions**

- For any customers with no rate numbers in SAP, the last active rate number was used. If no last active rate number was available, then M1 was assumed for consumption less than 50,000 m3/hr and M2 was assumed for consumption greater than 50,000 m3/hr
- All own-use customers will be excluded from the assesment
- Contract customers will contribute to the refernece case growth but should be excluded from the ETEE analysis

Measure Name	Peak Hour Reduction (m3/hr) in 2029
Com   Adaptive Thermostats	0.0
Com   Air Curtains	-
Com   Boilers - Advanced Controls (Steam Systems)	2.4
Com   CEE Tier 2/Energy Star Clothes Washers	0.0
Com   Condensing Boiler   Std	23.7
Com   Condensing Make Up Air Unit	4.8
Com   Condensing Storage Water Heater	-
Com   Demand Control Kitchen Ventilation	4.8
Com   Demand Control Ventilation	4.6
Com   Demand controlled Circulating Systems	0.1
Com   Destratification	51.1
Com   Dock Door Seals	-
Com   Drain Water Heat Recovery (DWHR)   Retro	0.0
Com   Drain Water Heat Recovery (DWHR)  New	0.0
Com   Energy Efficient Laboratory Fume Hood	92.8
Com   Energy Recovery Ventilation and Ventilation (Enhanced)	6.8
Com   ENERGY STAR Dishwasher	0.8
Com   ENERGY STAR Fryer (84% eff)	3.4
Com   ENERGY STAR Griddle (74% eff)	1.5
Com   ENERGY STAR Steam Cooker	2.3
Com   Furnace Tune-Up	0.0
Com   Gas Convection Oven	-
Com   Gas Fired Heat Pump	1.0
Com   Gas Fired Rooftop Units	8.8
Com   Heat Recovery Ventilator	3.4
Com   High Efficiency Condensing Furnace AFUE 95% from 80% code	-
Com   High Efficiency Underfired Broilers	2.0
Com   HOTEL OCCUPANCY CONTROLS (HVAC + LIGHTING)	-
Com   Ice Rink Heat Recovery	-
Com   Infrared Heaters	0.7
Com   Low Flow Pre-Rinse Spray Nozzle	2.5
Com   Ozone Laundry Treatment	2.4
Com   Roof Insulation/Ceiling Insulation (R25 Code to R35)	-
Com   Solar Water Preheat (Pools/DHW)	0.4
Com   Steam System Optimization	-
Com   Super High Perf Glazing  New	-
Com   Super High Perf Glazing  RET	-
Com   Super-High Efficiency Furnaces (Emerging Tech)	-
Com   Wall Insulation	20.4
Ind   Air Compressor Heat Recovery	1.7
Ind   Boiler Tune Up	-
Ind   Boiler Upgrade	250.7
Ind   Direct Contact Water Heaters	69.0
Ind   Gas Turbine Optimization	0.2
Ind   Greenhouse Envelope Improvements	75.7
Ind   HE HVAC Controls	91.3
Ind   HE HVAC Units	0.8
Ind   HE Stock Tank	0.5
Ind   High Efficiency Burners	17.7
Ind   High Efficiency Furnaces	-
Ind   High Efficiency HVAC Fans (Gas)	592.2
Ind   Improved Controls -Process Heating Gas	3.2

Measure Name	Peak Hour Reduction (m3/hr) in 2029
Ind   Insulation - Steam	3.8
Ind   Loading Dock Seals	91.3
Ind   Process Heat Improvements	63.8
Ind   Process Heat Recovery (Gas)	5.7
Ind   Process Optimization (Gas)	0.1
Ind   Recommissioning	0.0
Ind   Solar Walls	4.6
Ind   Steam Leak Repairs	-
Ind   Steam Trap Repair	1.0
Ind   Steam Turbine Optimization	0.2
Ind   VAV Conversion Project (Gas)	325.2
Ind   Ventilation Optimization (Gas)	7.5
Res   Adaptive Thermostat	5.5
Res   Air Sealing	964.6
Res   Attic Insulation	131.7
Res   Basement Wall Insulation	167.9
Res   Condensing Boiler	175.4
Res   Condensing Storage Water Heater	-
Res   DHW Recirculation Systems	-
Res   Drain Water Heat Recovery	-
Res   Early Hot Water Heater Replacement	-
Res   Energy Star Clothes Dryer	-
Res   Energy Star Windows	-
Res   Floor Insulation	-
Res   Furnace Tune Up	-
Res   Heat Recovery Ventilator	44.7
Res   Heat Recovery Ventilator 0% Baseline	558.3
Res   Heat Recovery Ventilator 55% Baseline	278.0
Res   High Efficiency Condensing Furnace	-
Res   High Efficiency Gas Pool Heater	-
Res   Solar Water Preheat (Pools/DHW)	-
Res   Tankless Water Heater	-
Res   Wall Insulation	344.1
Res   Whole Home Building Envelope	1,479.9
Shift Heating Off Peak	877.4

Sector(s)	End Use	Peak Hour Reduction (m3/hr) in 2029
Residential	Washing/Drying Appliances	-
Residential	Misc Residential	-
Residential/Commercial	Space Heating	5,252.7
Residential/Commercial	Cooking	9.2
Residential/Commercial	Water Heating	6.2
Commercial	Misc Commercial	0.0
Industrial	HVAC	1,188.5
Industrial	Process Heating (Water and Steam)	325.1
Industrial	Process Heating (Direct)	92.0
Industrial	Process Cooling	-
Industrial	Other Process	0.5
Industrial	Power and Utility	-

<b>Sector</b>	<b>Customer Type</b>	<b>Peak Hour Reduction (m3/hr) in 2029</b>
Residential	Attached or Row House	257
Residential	Detached House	4,742
Residential	Multi-Res: Low Rise	28
Residential	Total	5,027
Commercial	Food Retail	2
Commercial	Hospital	20
Commercial	Large Office	17
Commercial	Long Term Care	7
Commercial	Other Commercial	32
Commercial	Other Hotel_Motel	10
Commercial	Other Non-Food Retail	5
Commercial	Other Office	60
Commercial	Restaurant	15
Commercial	School	11
Commercial	Warehouse	60
Commercial	Total	241
Industrial	Agriculture	1,212
Industrial	Chemicals Mfg	2
Industrial	Food and Beverage Mfg	26
Industrial	Other Industrial	366
Industrial	Power and Other Utility	-
Industrial	Pulp, Paper, and Wood Products Mfg	1
Industrial	Total	1,606



Year	Incentive Costs	Non Incentive Costs
2023	2,484,039.80	993,632.49
2024	3,451,900.61	1,380,782.62
2025	5,081,612.83	2,032,672.63
2026	5,344,992.65	2,138,030.28
2027	5,388,896.92	2,155,596.99
2028	4,599,532.79	1,839,856.71
2029	3,406,098.13	1,362,468.71
2030	2,355,478.01	942,202.66
2031	1,619,098.26	647,643.84
2032	1,101,252.12	440,505.43
2033	448,176.00	179,274.94
2034	319,164.74	127,670.43
2035	1,046,223.79	418,494.18
2036	911,566.99	364,631.41
2037	808,353.39	323,345.95

Measure Name	Total Incentive Costs (2023-2037)	Total Non-Incentive Costs (2023-2037)
Com   Adaptive Thermostats	10,535.66	4,214.26
Com   Air Curtains	5,065.84	2,026.33
Com   Boilers - Advanced Controls (Steam Systems)	1,620.93	648.37
Com   CEE Tier 2/Energy Star Clothes Washers	367.42	146.97
Com   Condensing Boiler   Std	50,103.28	20,041.31
Com   Condensing Make Up Air Unit	18,560.53	7,424.21
Com   Condensing Storage Water Heater	-	-
Com   Demand Control Kitchen Ventilation	8,923.64	3,569.45
Com   Demand Control Ventilation	15,802.87	6,321.15
Com   Demand controlled Circulating Systems	132.06	52.82
Com   Destratification	177,685.43	71,074.20
Com   Dock Door Seals	-	-
Com   Drain Water Heat Recovery (DWHR)   Retro	48.86	19.55
Com   Drain Water Heat Recovery (DWHR)   New	19.42	7.77
Com   Energy Efficient Laboratory Fume Hood	21,794.16	8,717.67
Com   Energy Recovery Ventilation and Ventilation (Enhanced)	58,089.51	23,235.80
Com   ENERGY STAR Dishwasher	6,359.83	2,543.93
Com   ENERGY STAR Fryer (84% eff)	64,127.52	25,651.01
Com   ENERGY STAR Griddle (74% eff)	36,906.75	14,762.70
Com   ENERGY STAR Steam Cooker	10,202.19	4,080.88
Com   Furnace Tune-Up	17.35	6.94
Com   Gas Convection Oven	-	-
Com   Gas Fired Heat Pump	78,750.20	31,500.08
Com   Gas Fired Rooftop Units	16,763.28	6,705.31
Com   Heat Recovery Ventilator	29,803.85	11,921.54
Com   High Efficiency Condensing Furnace AFUE 95% from 80% code	-	-
Com   High Efficiency Underfired Broilers	9,013.09	3,605.24
Com   HOTEL OCCUPANCY CONTROLS (HVAC + LIGHTING)	-	-
Com   Ice Rink Heat Recovery	-	-
Com   Infrared Heaters	2,932.89	1,173.15
Com   Low Flow Pre-Rinse Spray Nozzle	8,142.99	3,257.20
Com   Ozone Laundry Treatment	21,612.39	8,644.95
Com   Roof Insulation/Ceiling Insulation (R25 Code to R35)	-	-
Com   Solar Preheat Make up Air	-	-
Com   Solar Water Preheat (Pools/DHW)	1,423.31	569.33
Com   Steam System Optimization	-	-
Com   Super High Perf Glazing   New	894,248.32	357,699.45
Com   Super High Perf Glazing   RET	1,016,374.70	406,550.03
Com   Super-High Efficiency Furnaces (Emerging Tech)	-	-
Com   Wall Insulation	12,322.88	4,929.15
Ind   Air Compressor Heat Recovery	20,478.64	8,191.46
Ind   Boiler Tune Up	-	-
Ind   Boiler Upgrade	8,661,582.01	3,464,633.26
Ind   Direct Contact Water Heaters	-	-
Ind   Gas Turbine Optimization	826.33	330.53
Ind   Greenhouse Envelope Improvements	83,944.16	33,577.68
Ind   HE HVAC Controls	207,081.02	82,832.42
Ind   HE HVAC Units	2,947.16	1,178.86
Ind   HE Stock Tank	2,150.38	860.15
Ind   High Efficiency Burners	229,375.10	91,750.02
Ind   High Efficiency Furnaces	-	-
Ind   High Efficiency HVAC Fans (Gas)	681,851.05	272,740.45
Ind   Improved Controls -Process Heating Gas	20,991.89	8,396.76
Ind   Insulation - Steam	11,723.56	4,689.43
Ind   Loading Dock Seals	175,173.71	70,069.49
Ind   Process Heat Improvements	523,615.49	209,446.17
Ind   Process Heat Recovery (Gas)	101,070.72	40,428.28
Ind   Process Optimization (Gas)	897.95	359.18
Ind   Recommissioning	2,533,308.20	1,013,323.01
Ind   Solar Walls	87,531.20	35,012.49
Ind   Steam Leak Repairs	-	-
Ind   Steam Trap Repair	11,622.77	4,649.11
Ind   Steam Turbine Optimization	968.17	387.27
Ind   VAV Conversion Project (Gas)	724,204.35	289,681.53
Ind   Ventilation Optimization (Gas)	-	-
Res   Adaptive Thermostat	1,125,829.02	450,331.62
Res   Air Sealing	2,140,510.55	856,204.24

Measure Name	Total Incentive Costs (2023-2037)	Total Non-Incentive Costs (2023-2037)
Res   Attic Insulation	792,364.16	316,945.74
Res   Basement Wall Insulation	332,541.74	133,016.66
Res   Condensing Boiler	1,625,931.84	650,372.88
Res   Condensing Storage Water Heater	-	-
Res   DHW Recirculation Systems	-	-
Res   Drain Water Heat Recovery	-	-
Res   Early Hot Water Heater Replacement	-	-
Res   Energy Star Clothes Dryer	-	-
Res   Energy Star Windows	-	-
Res   Floor Insulation	-	-
Res   Furnace Tune Up	-	-
Res   Heat Recovery Ventilator	788,066.29	315,226.61
Res   Heat Recovery Ventilator 0% Baseline	2,836,325.31	1,134,530.07
Res   Heat Recovery Ventilator 55% Baseline	633,976.99	253,590.84
Res   High Efficiency Condensing Furnace	-	-
Res   High Efficiency Gas Pool Heater	-	-
Res   Solar Water Preheat (Pools/DHW)	-	-
Res   Tankless Water Heater	-	-
Res   Wall Insulation	2,371,865.50	948,745.92
Res   Whole Home Building Envelope	8,988,136.35	3,595,252.94
Shift Heating Off Peak	71,744.31	28,953.46

Measure Name	Peak Hour Reduction (m3/hr) in 2029	
	Incentive Spending	Non-Incentive Spending
Com   Adaptive Thermostats	-	-
Com   Air Curtains	-	-
Com   Boilers - Advanced Controls (Steam Systems)	-	-
Com   CEE Tier 2/Energy Star Clothes Washers	27.78	11.11
Com   Condensing Boiler   Std	0.00	0.00
Com   Condensing Make Up Air Unit	1,452.80	581.12
Com   Condensing Storage Water Heater	-	-
Com   Demand Control Kitchen Ventilation	152.43	60.97
Com   Demand Control Ventilation	716.77	286.71
Com   Demand controlled Circulating Systems	-	-
Com   Destratification	1,427.08	570.83
Com   Dock Door Seals	-	-
Com   Drain Water Heat Recovery (DWHR)   Retro	-	-
Com   Drain Water Heat Recovery (DWHR)  New	1.40	0.56
Com   Energy Efficient Laboratory Fume Hood	-	-
Com   Energy Recovery Ventilation and Ventilation (Enhanced)	3,645.53	1,458.21
Com   ENERGY STAR Dishwasher	274.17	109.67
Com   ENERGY STAR Fryer (84% eff)	4,894.73	1,957.89
Com   ENERGY STAR Griddle (74% eff)	2,862.21	1,144.88
Com   ENERGY STAR Steam Cooker	756.46	302.58
Com   Furnace Tune-Up	-	-
Com   Gas Convection Oven	-	-
Com   Gas Fired Heat Pump	5,869.09	2,347.64
Com   Gas Fired Rooftop Units	1,289.32	515.73
Com   Heat Recovery Ventilator	1,354.42	541.77
Com   High Efficiency Condensing Furnace AFUE 95% from 80% code	-	-
Com   High Efficiency Underfired Broilers	664.37	265.75
Com   HOTEL OCCUPANCY CONTROLS (HVAC + LIGHTING)	-	-
Com   Ice Rink Heat Recovery	-	-
Com   Infrared Heaters	236.07	94.43
Com   Low Flow Pre-Rinse Spray Nozzle	1,000.69	400.28
Com   Ozone Laundry Treatment	411.02	164.41
Com   Roof Insulation/Ceiling Insulation (R25 Code to R35)	-	-
Com   Solar Water Preheat (Pools/DHW)	111.06	44.43
Com   Steam System Optimization	-	-
Com   Super High Perf Glazing  New	-	-
Com   Super High Perf Glazing  RET	-	-
Com   Super-High Efficiency Furnaces (Emerging Tech)	-	-
Com   Wall Insulation	-	-
Ind   Air Compressor Heat Recovery	3,612.38	1,444.95
Ind   Boiler Tune Up	-	-
Ind   Boiler Upgrade	1,315,164.56	526,065.90
Ind   Direct Contact Water Heaters	-	-
Ind   Gas Turbine Optimization	1.17	0.47
Ind   Greenhouse Envelope Improvements	6,003.85	2,401.54
Ind   HE HVAC Controls	40,413.23	16,165.29
Ind   HE HVAC Units	511.06	204.43
Ind   HE Stock Tank	324.87	129.95
Ind   High Efficiency Burners	3,811.52	1,524.61
Ind   High Efficiency Furnaces	-	-

Measure Name	Peak Hour Reduction (m3/hr) in 2029	
	Incentive Spending	Non-Incentive Spending
Ind   High Efficiency HVAC Fans (Gas)	16,430.39	6,572.16
Ind   Improved Controls -Process Heating Gas	827.21	330.88
Ind   Insulation - Steam	2,328.03	931.21
Ind   Loading Dock Seals	34,186.31	13,674.53
Ind   Process Heat Improvements	8,797.65	3,519.06
Ind   Process Heat Recovery (Gas)	16,967.75	6,787.10
Ind   Process Optimization (Gas)	126.64	50.65
Ind   Recommissioning	354,825.41	141,930.12
Ind   Solar Walls	4,450.08	1,780.03
Ind   Steam Leak Repairs	-	-
Ind   Steam Trap Repair	483.61	193.44
Ind   Steam Turbine Optimization	1.37	0.55
Ind   VAV Conversion Project (Gas)	11,604.81	4,641.92
Ind   Ventilation Optimization (Gas)	-	-
Res   Adaptive Thermostat	90,726.82	36,290.73
Res   Air Sealing	49,236.96	19,694.78
Res   Attic Insulation	-	-
Res   Basement Wall Insulation	2,401.51	960.60
Res   Condensing Boiler	122,584.43	49,033.79
Res   Condensing Storage Water Heater	-	-
Res   DHW Recirculation Systems	-	-
Res   Drain Water Heat Recovery	-	-
Res   Early Hot Water Heater Replacement	-	-
Res   Energy Star Clothes Dryer	-	-
Res   Energy Star Windows	-	-
Res   Floor Insulation	-	-
Res   Furnace Tune Up	-	-
Res   Heat Recovery Ventilator	62,038.48	24,815.40
Res   Heat Recovery Ventilator 0% Baseline	505,626.24	202,250.47
Res   Heat Recovery Ventilator 55% Baseline	123,943.87	49,577.57
Res   High Efficiency Condensing Furnace	-	-
Res   High Efficiency Gas Pool Heater	-	-
Res   Solar Water Preheat (Pools/DHW)	-	-
Res   Tankless Water Heater	-	-
Res   Wall Insulation	123,874.86	49,549.92
Res   Whole Home Building Envelope	469,374.24	187,749.63
Shift Heating Off Peak	8,271.42	3,338.05

<b>Peak Reduction and Cost by Measure Type in 2029</b>			
	<b>Peak Hour Reduction (m3/hr)</b>	<b>Incentive Spending</b>	<b>Non-Incentive Spending</b>
ETEE Measures	5,997	3,397,827	1,359,131
DR Measures	877	8,271	3,338
<b>Total</b>	<b>6,874</b>	<b>3,406,098</b>	<b>1,362,469</b>



## *Peak Modelling Method*

Peak hour outputs in the “Mirror Model” are modelled using this two-step approach (details on each step are provided in the text that follows):

1. End-use based ‘hours-use’ peak factors were developed for each region, sector, segment, and end use.
2. ‘Hours-use’ peak factors are applied to annual volume outputs for each scenario to calculate Peak-hour estimates.

### **1. Method for developing hours-use peak factors**

PG worked with EGI to develop ‘hours-use’ peak factors by following this approach:

- Peak hour values were provided by EGI for each rate-zone region, by sector.
- End-use load shapes were imported from other regions.
- Load shapes for space heating-related end uses were calibrated to align with peak hour target values at the regional level and used to develop hours-use peak factors for use in Step 2. (Load shapes for end uses not related to space heating vary much less from one region to another.)

#### **Peak hour targets**

Peak hour values were provided by EGI’s network planning department for each of the legacy EGI and Union Gas rate-zone regions.

Our understanding is these values come from EGI’s hydraulic model, which starts at a very detailed level geographically and rolls up to larger zones and regions.

The peak analysis method being used in this project is a bottom-up approach, but rather than rolling up different regional gate-stations, Navigator is rolling up peak information starting at the end-use level, rolling up into whole buildings, segments, sectors, and regions. If both methods are working correctly, they should match at the top level.

#### **Imported load shapes from other regions**

PG worked with a subcontractor who employed an extensive library of load shapes from studies all over North America to identify the shapes that were most suitable for Ontario’s climate and building mix.

#### **Load shape calibration and developing hours-use factors**

To calibrate the load shapes, the following steps were undertaken:

- The load shapes for most end-uses were left unchanged from those the subcontractor provided because most do not vary greatly from one jurisdiction to another and are not very sensitive to climate.
- For weather-related end-use load shapes:
  - First, weather-related end-use load shapes were adjusted to include the heating degree baseline that was most suitable for each building type in that region. This approach was used because the heating load varies from one jurisdiction to another.





- Second, we applied factors to the weather-related end-uses to calibrate the peak hour, by region, as closely as we could to the target numbers supplied by EGI.<sup>1</sup>

**Hours-use factors**

The exhibits below present hours-use factors by sector for the base-year:

**Exhibit 1 – Residential End-Use Peak Factors**

End Uses	Hours-Use	Weightings
Cooking	2,956	1.10%
Misc. Residential	3,578	6.93%
Space Heating	1,895	74.05%
Washing/Drying	24,380	1.70%
Water Heating	3,578	16.21%
<b>Grand Total</b>	<b>2,174</b>	

**Exhibit 2 – Commercial End-Use Peak Factors**

End Uses	Hours-Use	Weightings
Cooking	6,178	3.68%
Misc. Commercial	4,464	4.59%
Space Heating	1,234	80.15%
Water Heating	5,223	11.58%
<b>Grand Total</b>	<b>1,454</b>	

<sup>1</sup> The calibration factors were limited within reasonable ranges and applied across all sectors at once. Therefore, if the total all-sector peak hour value was too low, the weather-related end-use factors were adjusted for all sectors.







**Exhibit 3 – Industrial End-Use Peak Factors**

<b>End Uses</b>	<b>Hours-Use</b>	<b>Weightings</b>
HVAC	803	14.42%
Other Process	8,329	6.05%
Power and Utility	3,400	10.14%
Process Cooling	10,397	0.47%
Process Heating (Direct)	7,889	49.31%
Process Heating (Water and Steam)	7,877	19.61%
Transportation	8,760	0.00%
<b>Grand Total</b>	<b>3,284</b>	

## ***2. Applying peak factors***

Here is an example of what ‘Hours-Use’ factors represent, referring to the residential end-use peak factors exhibit above.

- Hours-Use factor for Res Space Heating = residential space heating component of peak hour (m3/hour) = annual res space heating volume / 1,895 hours

The weighted average factors in the Grand Total rows in the tables above may seem counterintuitive. It is important to remember that hours-use factors are used as dividing factors; their inverses are used in the calculation of peak loads.



**Net Annual m3 savings**

	SC B - APS			SC B - Mirror		
	Commercial	Industrial	Residential	Commercial	Industrial	Residential
2022	86,553,572	127,132,889	77,431,303	83,127,292	189,317,536	176,579,624
2023	96,742,273	130,319,904	84,471,575	77,133,602	355,834,405	241,259,042
2024	105,268,386	141,560,289	89,703,318	57,659,996	535,506,982	333,247,483
2025	111,240,289	144,556,417	92,906,928	29,401,812	631,347,963	284,645,694
2026	114,454,049	150,775,613	94,278,263	17,995,893	490,298,446	244,204,443
2027	114,047,422	144,555,879	93,988,964	13,664,256	224,664,139	191,664,643
2028	112,250,324	139,878,486	93,007,533	10,182,987	123,952,791	145,419,496
2029	108,885,777	131,082,389	90,988,593	8,410,176	72,403,605	97,349,181
2030	102,555,434	119,958,393	89,077,626	9,488,715	73,954,184	61,681,308

## Paula Claudino

---

**From:** Alex Tiessen  
**Sent:** March 30, 2022 8:39 AM  
**To:** Amrit Kuner  
**Cc:** Paula Claudino  
**Subject:** Re: [External] Scoping Document - Leamington Interconnect IRPA

Thanks, that worked!

**Alex Tiessen**, P.Eng., CMVP, PMP | Principal | 613.219.5312 | [tiessen@posteritygroup.ca](mailto:tiessen@posteritygroup.ca)  
**POSTERITY GROUP** | [posteritygroup.ca](http://posteritygroup.ca)

On Wed, Mar 30, 2022 at 8:19 AM Amrit Kuner <[Amrit.Kuner@enbridge.com](mailto:Amrit.Kuner@enbridge.com)> wrote:

Hey Alex,

Sorry about that, I just checked it in – let me know if that worked?

Thanks,

Amrit

---

**From:** Alex Tiessen <[tiessen@posteritygroup.ca](mailto:tiessen@posteritygroup.ca)>  
**Sent:** Tuesday, March 29, 2022 7:40 PM  
**To:** Amrit Kuner <[Amrit.Kuner@enbridge.com](mailto:Amrit.Kuner@enbridge.com)>  
**Cc:** Paula Claudino <[paula@posteritygroup.ca](mailto:paula@posteritygroup.ca)>  
**Subject:** Re: [External] Scoping Document - Leamington Interconnect IRPA

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Hi - getting closer I think :) I see the 'PREP Leamington' folder now, but when I go into it, there aren't any files.

Is it possible that you still might need to check it in?

-Alex

**Alex Tiessen**, P.Eng., CMVP, PMP | Principal | 613.219.5312 | [tiessen@posteritygroup.ca](mailto:tiessen@posteritygroup.ca)  
**POSTERITY GROUP** | [posteritygroup.ca](http://posteritygroup.ca)

On Tue, Mar 29, 2022 at 5:00 PM Amrit Kuner <[Amrit.Kuner@enbridge.com](mailto:Amrit.Kuner@enbridge.com)> wrote:

Thanks Alex, I think external access for our sharepoint sites can take a bit of time so I have saved it at the link you provided below, you can access it [here](#).

Hope that works, let me know.

Thanks,

Amrit

---

**From:** Alex Tiessen <[tiessen@posteritygroup.ca](mailto:tiessen@posteritygroup.ca)>  
**Sent:** Tuesday, March 29, 2022 3:42 PM  
**To:** Amrit Kuner <[Amrit.Kuner@enbridge.com](mailto:Amrit.Kuner@enbridge.com)>  
**Cc:** Paula Claudino <[paula@posteritygroup.ca](mailto:paula@posteritygroup.ca)>  
**Subject:** Re: [External] Scoping Document - Leamington Interconnect IRPA

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Thanks, Amrit.

Sharepoint has asked why i need access to this data!

I provided the following reason "Project data sent from Project manager".

It is telling me I need to wait for approval now.

Just wanted to give you a heads up.

Another option might be to save it here:

<https://esites.enbridge.com/sites/csd/EGDcarbonstrategy/Shared%20Documents/Forms/AllItems.aspx?RootFolder=%2Fsites%2Fcsd%2FEGDcarbonstrategy%2FShared%20Documents%2FEnergy%20Transition%2FScenario%20Planning%2FPosterity%20Related%20Documents%2FIRPA%20Files&FolderCTID=0x01200000C75F39DB208D429152E471DD291A79&View=%7B3AEF3AE7%2DE532%2D422E%2DBB47%2D81BC19FC8792%7D>

Presumably, we could access it right away if it was located here.

-Alex

**Alex Tiessen**, P.Eng., CMVP, PMP | Principal | 613.219.5312 | [tiessen@posteritygroup.ca](mailto:tiessen@posteritygroup.ca)  
**POSTERITY GROUP** | [posteritygroup.ca](http://posteritygroup.ca)

On Tue, Mar 29, 2022 at 1:41 PM Amrit Kuner <[Amrit.Kuner@enbridge.com](mailto:Amrit.Kuner@enbridge.com)> wrote:

Hi Alex,

Please proceed with this work, we are just sorting out the PO on our end so you should see that shortly. Here is a link to the existing customer data set for Leamington: [Customer Extract - Leamington](#)

2020 and 2021 annual consumption has been added in as well but please note that these values are not weather normalized.

I am still waiting on a couple details for the growth forecast so I will send that over once I get it.

Thanks,

Amrit

---

**From:** Alex Tiessen <[tiessen@posteritygroup.ca](mailto:tiessen@posteritygroup.ca)>  
**Sent:** Tuesday, March 22, 2022 6:02 PM  
**To:** Amrit Kuner <[Amrit.Kuner@enbridge.com](mailto:Amrit.Kuner@enbridge.com)>  
**Cc:** Chris Ripley <[CRipley@uniongas.com](mailto:CRipley@uniongas.com)>; Paula Claudino <[paula@posteritygroup.ca](mailto:paula@posteritygroup.ca)>  
**Subject:** Re: [External] Scoping Document - Leamington Interconnect IRPA

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Hi Amrit,

Per our discussion this morning, if you can provide written authorization to proceed, we are happy to begin the work while we await the PO.

I'll keep an eye out for a link to the customer dataset - once you have it posted to sharepoint.

-Alex

**Alex Tiessen**, P.Eng., CMVP, PMP | Principal | 613.219.5312 | [tiessen@posteritygroup.ca](mailto:tiessen@posteritygroup.ca)  
**POSTERITY GROUP** | [posteritygroup.ca](http://posteritygroup.ca)

On Tue, Mar 15, 2022 at 9:23 AM Amrit Kuner <[Amrit.Kuner@enbridge.com](mailto:Amrit.Kuner@enbridge.com)> wrote:

Thanks Alex, I have submitted this in for a PO so hopefully you will see that come through shortly.

For the Wheatley costs, once you send me an invoice for the work completed I can get that processed.

Thanks,

Amrit

---

**From:** Alex Tiessen <[tiessen@posteritygroup.ca](mailto:tiessen@posteritygroup.ca)>  
**Sent:** Tuesday, March 8, 2022 12:48 PM  
**To:** Amrit Kuner <[Amrit.Kuner@enbridge.com](mailto:Amrit.Kuner@enbridge.com)>  
**Cc:** Erika Aruja <[aruja@posteritygroup.ca](mailto:aruja@posteritygroup.ca)>; Chris Ripley <[CRipley@uniongas.com](mailto:CRipley@uniongas.com)>  
**Subject:** Re: [External] Scoping Document - Leamington Interconnect IRPA

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Hi Amrit,

I have attached an updated scoping document where I have made edits to address your comments.

- Can we be more clear that the IRPA being assessed is ETEE?

Language updated in scoping document to be more specific. I have mentioned ETEE and DR

- Can the peak hour reduction be provided by customer type as well?

Yes, I have updated to reflect this.

- Can the peak reduction and associated cost be shown for both ETEE and Demand Response combined and separately?

Yes, I have updated to reflect this.

- For the normalized annual volume by customer, is there a preferred year that would make the most sense to use?

We don't have a preferred year because we end up calibrating the baseyear to align with the normalized actuals provided by EGI. Then Yr 1 of peak reduction potential = Year provided + 1. It likely makes sense for EGI to select the most recent calendar year for which it has a complete set of normalized annual volume data.

-Alex

**Alex Tiessen**, P.Eng., CMVP, PMP | Principal | 613.219.5312 | [tiessen@posteritygroup.ca](mailto:tiessen@posteritygroup.ca)  
**POSTERITY GROUP** | [posteritygroup.ca](http://posteritygroup.ca)

On Tue, Mar 8, 2022 at 10:17 AM Amrit Kuner <[Amrit.Kuner@enbridge.com](mailto:Amrit.Kuner@enbridge.com)> wrote:

Hi Alex,

Just a couple comments on this scoping document:

- Can we be more clear that the IRPA being assessed is ETEE?
- Can the peak hour reduction be provided by customer type as well?
- Can the peak reduction and associated cost be shown for both ETEE and Demand Response combined and separately?
- For the normalized annual volume by customer, is there a preferred year that would make the most sense to use?

I am meeting with our System Planning team this week to discuss approach on data pulls so I will send you that info as soon as I can and I am currently working on getting that PO set-up.

Thanks,

Amrit

---

**From:** Alex Tiessen <[tiessen@posteritygroup.ca](mailto:tiessen@posteritygroup.ca)>

**Sent:** Thursday, March 3, 2022 2:10 PM

**To:** Amrit Kuner <[Amrit.Kuner@enbridge.com](mailto:Amrit.Kuner@enbridge.com)>

**Cc:** Erika Aruja <[aruja@posteritygroup.ca](mailto:aruja@posteritygroup.ca)>

**Subject:** [External] Scoping Document - Leamington Interconnect IRPA



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Hi Amrit,

During our call on Tuesday we discussed the need for IRPA analysis on the Leamington Interconnect project.

I have attached a scoping document that presents details on approach, timing, level-of-effort and budget for the Leamington IRPA. The last section of the scoping document includes a checklist of information we will need for these types of assignments moving forward.

Please let me know if you have any questions, or would like to discuss revisions.

-Alex

**Alex Tiessen**, P.Eng., CMVP, PMP | Principal | 613.219.5312 | [tiessen@posteritygroup.ca](mailto:tiessen@posteritygroup.ca)  
**POSTERITY GROUP** | [posteritygroup.ca](http://posteritygroup.ca)

## Paula Claudino

---

**From:** Amrit Kuner <Amrit.Kuner@enbridge.com>  
**Sent:** April 18, 2022 10:42 AM  
**To:** Julian Nappert  
**Cc:** Paula Claudino; Alex Tiessen; Whitney Wong  
**Subject:** RE: [External] Leamington Interconnect IRPA dataset

Hi Julian,

I think we can stick with just showing the customers that the ETEE program is being applied to, i.e. general service so Option 1. However, in the memo we should be clear that the driver for this project is growth, mainly on the contract side so the reference case will show growth.

I hope that makes sense, we can have a quick chat about it this week in more detail if you would like.

Thanks,  
Amrit

---

**From:** Julian Nappert <nappert@posteritygroup.ca>  
**Sent:** Wednesday, April 13, 2022 4:01 PM  
**To:** Amrit Kuner <Amrit.Kuner@enbridge.com>  
**Cc:** Paula Claudino <paula@posteritygroup.ca>; Alex Tiessen <tiessen@posteritygroup.ca>  
**Subject:** Re: [External] Leamington Interconnect IRPA dataset

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Hi Amrit,

We had previously said that we did not need the contract customer data for our analysis but now that we are going through the data, we realize that it may actually be required. This depends how Enbridge wants to position the outputs:

1. Is Enbridge looking to show just the customers where the ETEE program is being applied, in which case we would not need the contract customer data and would ignore the contract customer growth rate?
2. Or does Enbridge want to show the entire picture including the contract customers (we can exclude DSM on these customers and just show their growth over the years)?

If it is the second option, we would need the weather normalized data for the contract customers (with their rate classes) in the same format as the overall dataset. Let me know what you think. I'm also happy to jump on a call to clarify anything if need be.

Cheers,

Julian

On Mon, Apr 4, 2022 at 2:37 PM Amrit Kuner <[Amrit.Kuner@enbridge.com](mailto:Amrit.Kuner@enbridge.com)> wrote:

Hi Paula,

Please see my responses below. I will try to get as much of this information as possible by the end of this week.

Thanks,

Amrit

---

**From:** Paula Claudino <[paula@posteritygroup.ca](mailto:paula@posteritygroup.ca)>  
**Sent:** Friday, April 1, 2022 12:57 PM  
**To:** Amrit Kuner <[Amrit.Kuner@enbridge.com](mailto:Amrit.Kuner@enbridge.com)>  
**Cc:** Alex Tiessen <[tiessen@posteritygroup.ca](mailto:tiessen@posteritygroup.ca)>; Julian Nappert <[nappert@posteritygroup.ca](mailto:nappert@posteritygroup.ca)>  
**Subject:** [External] Leamington Interconnect IRPA dataset

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Hello Amrit,

Thank you for providing the dataset for the Leamington Interconnect IRPA. Now that we have had a chance to take a look, we have a few questions/requests:

1. You noted that the 2020 and 2021 annual consumption figures are not weather normalized. Would it be possible to receive the weather normalized version?

**Working on this request with another team at EGI, will share this information shortly**

2. This dataset is missing the "rate number" column, which we need in order to map customers to rate classes in the model. Can you please provide an updated dataset that includes this column?

**Thanks for flagging this, I will get the spreadsheet updated.**

3. Are there any hourly peak reduction target(s) and timelines associated with peak reduction targets (e.g., Are there milestone years that are important?) that we should be aware of?

**I will confirm this with our System Planning teams.**

4. Are there any customers included in this dataset that should be excluded from IRPAs?

**For now, do not exclude any customers.**

5. When can we expect to receive the updated growth rates?

We are just finalizing the contract growth piece, I will share hopefully this week.

We are also awaiting direction for the following two items in order to prepare appropriate proposals:

For the 2 items below, I have another internal meeting on Thursday which will help determine the direction on them so I will be in touch on this items later this week/early next week.

1. Support for asset management plan screening
2. Support for non-specific IRPA projects. I believe you mentioned you would have a discussion with internal folks this week to develop a list of priorities.

Thanks,

Paula

--

Paula Claudino, P.Eng., M.ASc | Senior Consultant | 613.608.8000 | [paula@posteritygroup.ca](mailto:paula@posteritygroup.ca)

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*Please note: Posterity Group staff are following social distancing guidelines and will be working remotely until further notice. Our office space will be closed during this time.*

*Many Posterity Group staff are taking on additional family responsibilities during this period. To the extent that these responsibilities affect deadlines and deliverables, this will be communicated directly.*

*We remain committed to providing our clients the same flexibility and responsiveness that they have come to expect.*

--

**Julian Nappert** | Consultant

613-850-5915 | [http://secure-web.cisco.com/1rYAV9dI9FIhhRZCETQpww4zW-FoKDC0GWrZwEqQVT\\_Nx1sNPUhW4eDtG9bISk0RcWRkBgYB4g8l1J7mzY4lZ9r63fvFEFDXTwN\\_CsbPVqafQYyeYc7iS4mM81SbJaKliEgYgl5TXRqd2JJAZRc0V3RitRtrXd8le-MYNdBXOoJkfVzzLZm7mDbf5zhc-cic5pARCu9YPv7eCFWQ0eg6vSZzvKCL4XDJ-nikMfyCzkDN7j5NC3BFSsz5s4-5HMcZn0\\_0gMGjfAHnIdY\\_guQG2Z6FtkP7BQViGutPOJqxOHJlbdrahU-DkZ7KiQM6QTDzu/http%3A%2F%2Fwww.posteritygroup.ca](http://secure-web.cisco.com/1rYAV9dI9FIhhRZCETQpww4zW-FoKDC0GWrZwEqQVT_Nx1sNPUhW4eDtG9bISk0RcWRkBgYB4g8l1J7mzY4lZ9r63fvFEFDXTwN_CsbPVqafQYyeYc7iS4mM81SbJaKliEgYgl5TXRqd2JJAZRc0V3RitRtrXd8le-MYNdBXOoJkfVzzLZm7mDbf5zhc-cic5pARCu9YPv7eCFWQ0eg6vSZzvKCL4XDJ-nikMfyCzkDN7j5NC3BFSsz5s4-5HMcZn0_0gMGjfAHnIdY_guQG2Z6FtkP7BQViGutPOJqxOHJlbdrahU-DkZ7KiQM6QTDzu/http%3A%2F%2Fwww.posteritygroup.ca)



*Please note: Posterity Group staff are following social distancing guidelines and will be working remotely until further notice. Our office space will be closed during this time.*

## Paula Claudino

---

**From:** Amrit Kuner <Amrit.Kuner@enbridge.com>  
**Sent:** May 11, 2022 2:21 PM  
**To:** Paula Claudino  
**Subject:** RE: [External] Leamington IRP analysis memos

Sounds good, thanks Paula!

---

**From:** Paula Claudino <paula@posteritygroup.ca>  
**Sent:** Wednesday, May 11, 2022 2:17 PM  
**To:** Amrit Kuner <Amrit.Kuner@enbridge.com>  
**Cc:** Julian Nappert <nappert@posteritygroup.ca>; Alex Tiessen <tiessen@posteritygroup.ca>; Chris Ripley <CRipley@uniongas.com>; Geoff Chung <Geoff.Chung@enbridge.com>  
**Subject:** Re: [External] Leamington IRP analysis memos

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Hi Amrit,

We will send you our responses, updated memos, and updated results later today. We will be meeting shortly to go over a couple of final items and will send everything over shortly thereafter.

Thanks,  
Paula

On Wed, May 11, 2022 at 12:22 PM Amrit Kuner <[Amrit.Kuner@enbridge.com](mailto:Amrit.Kuner@enbridge.com)> wrote:

Hi Paula,

Just wanted to follow-up on this, when can we expect to get this back?

Thanks!

Amrit

---

**From:** Paula Claudino <[paula@posteritygroup.ca](mailto:paula@posteritygroup.ca)>  
**Sent:** Friday, May 6, 2022 3:14 PM  
**To:** Amrit Kuner <[Amrit.Kuner@enbridge.com](mailto:Amrit.Kuner@enbridge.com)>  
**Cc:** Julian Nappert <[nappert@posteritygroup.ca](mailto:nappert@posteritygroup.ca)>; Alex Tiessen <[tiessen@posteritygroup.ca](mailto:tiessen@posteritygroup.ca)>; Chris Ripley <[CRipley@uniongas.com](mailto:CRipley@uniongas.com)>; Geoff Chung <[Geoff.Chung@enbridge.com](mailto:Geoff.Chung@enbridge.com)>  
**Subject:** Re: [External] Leamington IRP analysis memos

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Hi Amrit,

Thank you for providing these additional questions. We are still working through responses to a couple of the questions, so we will get back to you with our full response by early next week.

Have a nice weekend,

Paula

On Wed, May 4, 2022 at 4:43 PM Amrit Kuner <[Amrit.Kuner@enbridge.com](mailto:Amrit.Kuner@enbridge.com)> wrote:

Thanks Paula, a couple additional questions from our DSM team on these memos:

- Approach Memo
  - What is the residential demand response measure? I don't see it in the excel file
  - What are the hours-use peak factors by region and segment? I have only seen the Sept 2020 memo with the 14 factors by sector and end use
  - When reviewing the approach, how as the data we provided used? Isolating for residential:
    - the 2021 residential Leamington Consumption is ~38.6M m3 in the table of the Approach memo,
    - the weather normalized 2021 consumption for residential based on USERDATA2 in the data file EGI provided (~37.5M m3),
    - The Posterity Excel data file has residential consumption for 2019 of 38.9M m3; 2021 of 35.4M m3; 2023 of 37.7M m3
    - All the values are close but not close enough to understand the flow
- Results Memo
  - Confirmation that the reduction costs are shown as net cost amounts? (I think it should be gross costs, but not sure what NTG conversion should be used)
  - There is no mention of the starting year of when the ETEE would start? The data file shows that it starts in 2023

If you think it might be easier to have a quick meeting about this, let me know.

Thanks,

Amrit

---

**From:** Paula Claudino <[paula@posteritygroup.ca](mailto:paula@posteritygroup.ca)>  
**Sent:** Wednesday, May 4, 2022 3:50 PM  
**To:** Amrit Kuner <[Amrit.Kuner@enbridge.com](mailto:Amrit.Kuner@enbridge.com)>  
**Cc:** Julian Nappert <[nappert@posteritygroup.ca](mailto:nappert@posteritygroup.ca)>; Alex Tiessen <[tiessen@posteritygroup.ca](mailto:tiessen@posteritygroup.ca)>; Chris Ripley <[CRipley@uniongas.com](mailto:CRipley@uniongas.com)>; Geoff Chung <[Geoff.Chung@enbridge.com](mailto:Geoff.Chung@enbridge.com)>  
**Subject:** Re: [External] Leamington IRP analysis memos

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Hi Amrit,

Thanks for providing your comments. We should be able to respond by the end of the week.

We confirm it would be fine for these documents to be filed as part of the regulatory proceeding for this project with the caveat that the method document is not comprehensive, as it was written for an internal audience and might raise questions. We would not have any issue with the scoping document also being filed, if necessary.

Best regards,

Paula

On Tue, May 3, 2022 at 1:23 PM Amrit Kuner <[Amrit.Kuner@enbridge.com](mailto:Amrit.Kuner@enbridge.com)> wrote:

Hi Paula,

Attached are my comments, I didn't have too many comments but I did want to understand the reference case numbers a bit more. For any customers that have no consumption in 2021, we can remove them from the analysis. And thanks for flagging the conservation target vs. the total forecasted demand – since this area has a significant amount of contract demand and growth, that is not surprising.



Also I wanted to confirm – were both of these documents developed assuming that they could be filed as part of the regulatory proceeding for this project? We likely would file the results memo in evidence but may be asked for the methodology during IRs. Similarly, we may be asked for the scoping document during IRs as well.

Please let me know if you would like to chat about this more, thanks.

Amrit

---

**From:** Paula Claudino <[paula@posteritygroup.ca](mailto:paula@posteritygroup.ca)>  
**Sent:** Tuesday, April 26, 2022 1:28 PM  
**To:** Amrit Kuner <[Amrit.Kuner@enbridge.com](mailto:Amrit.Kuner@enbridge.com)>  
**Cc:** Julian Nappert <[nappert@posteritygroup.ca](mailto:nappert@posteritygroup.ca)>; Alex Tiessen <[tiessen@posteritygroup.ca](mailto:tiessen@posteritygroup.ca)>  
**Subject:** [External] Leamington IRP analysis memos

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Hello Amrit,

Attached is our first draft of the results and approach memos for the Leamington IRP analysis. Alex will provide a link to the supporting MS Excel file shortly.

We would like to flag a couple of issues:

- In the dataset provided, there are customers with no consumption that have peak demand
- The conservation target you mentioned (105,544 m3/hr by W29/30) is greater than the total forecasted demand of the customers included in our analysis (approximately 88,000 m3/hr by W29/30).

Best regards,

Paula

--

Paula Claudino, P.Eng., M.ASc | Senior Consultant | [613.608.8000](tel:613.608.8000) | [paula@posteritygroup.ca](mailto:paula@posteritygroup.ca)

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*We remain committed to providing our clients the same flexibility and responsiveness that they have come to expect.*

--

**Paula Claudino, P.Eng., M.ASc | Senior Consultant | 613.608.8000 | [paula@posteritygroup.ca](mailto:paula@posteritygroup.ca)**

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--

**Paula Claudino, P.Eng., M.ASc | Senior Consultant | 613.608.8000 | [paula@posteritygroup.ca](mailto:paula@posteritygroup.ca)**

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--  
**Paula Claudino, P.Eng., M.ASc | Senior Consultant | 613.608.8000 | [paula@posteritygroup.ca](mailto:paula@posteritygroup.ca)**  
**POSTERITY GROUP | [posteritygroup.ca](https://posteritygroup.ca)**



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**Paula Claudino**

**From:** Geoff Chung <Geoff.Chung@enbridge.com>  
**Sent:** May 26, 2022 9:28 AM  
**To:** Whitney Wong; Alex Tiessen; Julian Nappert  
**Cc:** Paula Claudino; Amrit Kuner; Chris Ripley; Kurtis Lubbers  
**Subject:** RE: [External] Leamington IRP analysis memos - responses to questions and updated memos

Just another comment to potentially add a footnote indicating that the costs presented in the results memo also do not include fixed portfolio overhead costs (based on my understanding).

Thanks,  
 Geoff

**From:** Whitney Wong <Whitney.Wong@enbridge.com>  
**Sent:** Wednesday, May 25, 2022 5:16 PM  
**To:** Alex Tiessen <tiessen@posteritygroup.ca>; Julian Nappert <nappert@posteritygroup.ca>  
**Cc:** Paula Claudino <paula@posteritygroup.ca>; Amrit Kuner <Amrit.Kuner@enbridge.com>; Chris Ripley <CRipley@uniongas.com>; Geoff Chung <Geoff.Chung@enbridge.com>; Kurtis Lubbers <Kurtis.Lubbers@enbridge.com>  
**Subject:** RE: [External] Leamington IRP analysis memos - responses to questions and updated memos

Thanks Alex & Julian for the quick turnaround in making the updates!

Just a few more (hopefully minor) requests:

- To confirm, are the peak hour reduction and costs presented as net values? Can the modeled results be updated to gross values by applying a blanket 75% NTG conversion factor, and if that could that stated somewhere as a high level assumption. For the purposes of assessing the technical potential, providing the gross values would be more illustrative. But since there was no NTG conversion factor specified in the original APS, we're suggesting a general blanket conversion for now.
- With regards to the growth demand in 2029, the 71,600m3/hr still seems higher than what was forecasted. Looking at the General Service Growth, we should only be taking into account the growth between 2021 to 2029 – which would be ~1572m3/hr. Since the customer extract was pulled fairly recently, any growth before 2021 that would have already been captured in the existing customer extract.

General Service Growth														
*Based on 2018 FBP for Leamington, Kingsville and Wheatley														
GENERAL SERVICE GROWTH COUNTS*														
Year	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	
RESIDENTIAL	181	112	112	112	112	112	112	112	112	112	112	112	112	
COMMERCIAL	15	15	15	15	15	15	15	15	15	15	15	15	15	
INDUSTRIAL	2	0	0	0	0	0	0	0	0	0	0	0	0	
			Residential	109	109	109	109	109	109	109	109	109	978	
			Commercial	66	66	66	66	66	66	66	66	66	594	
Peak Load Assumptions Per Customer												Total Growth (2021-2029)		1571.76 m3/
Customer Type	Peak Load (m3/hr)													
Residential	0.97													
Commercial	4.4													

Let me know if you require any additional details!

Thanks,

**Whitney Wong**

C: 437.234.1293

---

**From:** Alex Tiessen <[tiessen@posteritygroup.ca](mailto:tiessen@posteritygroup.ca)>  
**Sent:** Wednesday, May 25, 2022 1:48 PM  
**To:** Julian Nappert <[nappert@posteritygroup.ca](mailto:nappert@posteritygroup.ca)>  
**Cc:** Whitney Wong <[Whitney.Wong@enbridge.com](mailto:Whitney.Wong@enbridge.com)>; Paula Claudino <[paula@posteritygroup.ca](mailto:paula@posteritygroup.ca)>; Amrit Kuner <[Amrit.Kuner@enbridge.com](mailto:Amrit.Kuner@enbridge.com)>; Chris Ripley <[CRipley@uniongas.com](mailto:CRipley@uniongas.com)>; Geoff Chung <[Geoff.Chung@enbridge.com](mailto:Geoff.Chung@enbridge.com)>; Kurtis Lubbers <[Kurtis.Lubbers@enbridge.com](mailto:Kurtis.Lubbers@enbridge.com)>  
**Subject:** Re: [External] Leamington IRP analysis memos - responses to questions and updated memos

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The accompanying excel output file is located here:

<https://esites.enbridge.com/sites/csd/EGDcarbonstrategy/Shared%20Documents/Forms/AllItems.aspx?RootFolder=%2Fsites%2Fcsd%2FEGDcarbonstrategy%2FShared%20Documents%2FEnergy%20Transition%2FScenario%20Planning%2FPosterity%20Related%20Documents%2FIRPA%20Files%2FPREP%20Leamington&FolderCTID=0x01200000C75F39DB208D429152E471DD291A79&View=%7B3AEF3AE7%2DE532%2D422E%2DBB47%2D81BC19FC8792%7D&InitialTabId=Ribbon%2ERead&VisibilityContext=WSSTabPersistence#InplviewHash3aef3ae7-e532-422e-bb47-81bc19fc8792=RootFolder%3D%252Fsites%252Fcsd%252FEGDcarbonstrategy%252FShared%2520Documents%252FEnergy%2520Transition%252FScenario%2520Planning%252FPosterity%2520Related%2520Documents%252FIRPA%2520Files%252FPREP%2520Leamington>

**Alex Tiessen**, P.Eng., CMVP, PMP | Principal | 613.219.5312 | [tiessen@posteritygroup.ca](mailto:tiessen@posteritygroup.ca)  
**POSTERITY GROUP** | [posteritygroup.ca](http://posteritygroup.ca)

On Wed, May 25, 2022 at 12:56 PM Julian Nappert <[nappert@posteritygroup.ca](mailto:nappert@posteritygroup.ca)> wrote:

Hi Whitney,

I have attached the two updated memos to reflect the comments brought forward last week. Alex will provide the link to the supporting MS Excel file shortly.

We were able to calibrate the peak hourly load in the model to match the existing 2021 peak hourly load and have updated the new customers' peak hourly volumes to match those provided in the growth rate data. This has been added to the Approach Memo and the updated findings are reflected in the Results Memo (where the findings for 2037 have also been removed).

Please let us know if you have any further questions or comments!

Cheers,

Julian

On Tue, May 24, 2022 at 9:20 AM Whitney Wong <[Whitney.Wong@enbridge.com](mailto:Whitney.Wong@enbridge.com)> wrote:

Hi Paula,

That's understandable and appreciate you working within the tight timelines. Please do track the additional time spent on this request, we can sort out the payment for that afterwards.

With regards to question 2, it would be the intent that all new customers/growth have the same hourly volumes applied (0.97m<sup>3</sup>/hr for RES and 4.4m<sup>3</sup>/hr for COM) over the entire reference period. That would help align with our internal modelling assumptions for growth.

Let me know if you have any additional questions/clarifications!

Thanks,

Whitney

-----Original Message-----

From: Paula Claudino <[paula@posteritygroup.ca](mailto:paula@posteritygroup.ca)>

Sent: Thursday, May 19, 2022 5:25 PM

To: Whitney Wong <[Whitney.Wong@enbridge.com](mailto:Whitney.Wong@enbridge.com)>

Cc: Julian Nappert <[nappert@posteritygroup.ca](mailto:nappert@posteritygroup.ca)>; Alex Tiessen <[tiessen@posteritygroup.ca](mailto:tiessen@posteritygroup.ca)>; Amrit Kuner <[Amrit.Kuner@enbridge.com](mailto:Amrit.Kuner@enbridge.com)>; Chris Ripley <[CRipley@uniongas.com](mailto:CRipley@uniongas.com)>; Geoff Chung <[Geoff.Chung@enbridge.com](mailto:Geoff.Chung@enbridge.com)>; Kurtis Lubbers <[Kurtis.Lubbers@enbridge.com](mailto:Kurtis.Lubbers@enbridge.com)>

Subject: Re: [External] Leamington IRP analysis memos - responses to questions and updated memos

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Hi Whitney,

We should be able to make these changes but they represent a scope change as this approach differs from the approach we agreed to and it will take us extra time compared to our budget to make these changes to the model.

We will track our time spent modifying the model separately and we request that we be approved to bill hourly for this additional time spent. We will do our best to meet your deadline but it will be difficult due to vacation schedules around the long weekend.

We will be able to calibrate the model to peak hourly load rather than to annual consumption but we are not yet sure if we can use Enbridge's assumed hourly volumes for RES and COM for new accounts. Would the intent be that all new customers have the same hourly volumes (0.97 m3/hr for RES and 4.4 m3/hr for COM) over the entire reference period?

We can certainly edit the memo to only include data up to 2029/2030.

If you can provide further guidance on what you mean in your second question (i.e. do you want all new customers to have hourly volumes of

0.97 m3/hr for RES and 4.4 m3/hr for COM over the entire reference period?), we can work to update the model accordingly tomorrow and try to have the updated memo ready for you by next week.

Thanks,

Paula

On Thu, May 19, 2022 at 12:24 PM Whitney Wong <[Whitney.Wong@enbridge.com](mailto:Whitney.Wong@enbridge.com)> wrote:

>

> Hi Paula,

>

>

>

> Thanks for providing the updated files. We did have a few additional comments with regards to the memos. We're hoping to address some of the differences in the modelling inputs to better align Posterity's reference demand forecast with our model outputs.

>

- >
- >
- > For the peak hourly load in the 2021 reference case, would it be
- > possible to use the existing peak hourly loads to calibrate the
- > Posterity model instead of calibrating to annual consumption? (i.e.
- > align to the ~67,000m<sup>3</sup>/hr from the spreadsheet)
- >
- >
- >
- > For the expected peak hourly load, instead of using the average peak demand from existing accounts, can Enbridge's assumed hourly volumes of 0.97 m<sup>3</sup>/hr for RES and 4.4 m<sup>3</sup>/hr for COM be applied instead?
- >
- >
- >
- > The forecast for our Leamington filing only goes up to 2029/2030, can we remove the forecasted 2037 peak hour reduction (in Section 1) and provide the 2029 growth forecast in Section 3 instead of the 2037 (i.e. the 94,000m<sup>3</sup>/hr in 2037)?
- >
- >
- >
- > Unfortunately we are on somewhat tight timelines with this, and hoping to have a finalized memo by mid next week (May 25th). Can you let us know if it any/all of the above updates could be accommodated within this timeframe?
- >
- >
- >
- > Let me know if you require any additional clarifications or would like to set up a quick call to discuss!
- >
- >



>

> Thanks,

>

>

>

> Whitney Wong | P.ENG

> ADVISOR, INTEGRATED RESOURCE PLANNING

>

> ENERGY TRANSITION PLANNING

>

> C: 437.234.1293

>

>

>

> From: Paula Claudino <[paula@posteritygroup.ca](mailto:paula@posteritygroup.ca)>

> Sent: Wednesday, May 11, 2022 3:28 PM

> To: Amrit Kuner <[Amrit.Kuner@enbridge.com](mailto:Amrit.Kuner@enbridge.com)>

> Cc: Julian Nappert <[nappert@posteritygroup.ca](mailto:nappert@posteritygroup.ca)>; Alex Tiessen

> <[tiessen@posteritygroup.ca](mailto:tiessen@posteritygroup.ca)>

> Subject: [External] Leamington IRP analysis memos - responses to

> questions and updated memos

>

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> Hello Amrit,

>

>

>

> Attached are our updated drafts of the results and approach memos as well as a question tracker, which includes answers to each of your questions. Alex will provide a link to the supporting MS Excel file shortly.

>

>

>

> Please note both the reference case and estimated savings figures have changed since the first draft as we made several changes to the model to address a couple of your questions. These changes include:

>

> - We removed the years 2019 and 2020 to prevent any further confusion

>

> - We added in the missing residential demand response measure, which

> had been accidentally omitted from the first version

>

> - We adjusted the measure implementation timing so that all measures

> begin to be applied in 2023

>

> - We accounted for a missing set of accounts in the industrial sub

> sector, which had been missed earlier

>

>

>

> We would be happy to answer any further questions you may have or discuss any of the answers we have already provided.

>

>

>

> Thanks,

>

> Paula

> --

>

> Paula Claudino, P.Eng., M.ASc | Senior Consultant | 613.608.8000 |

> [paula@posteritygroup.ca](mailto:paula@posteritygroup.ca)

>

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>

> Please note: Posterity Group staff are following social distancing guidelines and will be working remotely until further notice. Our office space will be closed during this time.

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--

Paula Claudino, P.Eng., M.ASc | Senior Consultant | 613.608.8000 | [paula@posteritygroup.ca](mailto:paula@posteritygroup.ca) POSTERITY GROUP | [posteritygroup.ca](http://posteritygroup.ca)

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--

**Julian Nappert** | Consultant

613-850-5915 | [http://secure-web.cisco.com/1daNGMesNUsNwxqKMSwBQLdcNMnPXVDS13KdIRuT2dsGJgtHDGGZSKEwlkOdDv6RwDlnNFHzKikCE7F4WAroentbiRbiElhVwuqyF1eXupTgA5gwGj28mlrJhIPt-Bx0-7930Yoh\\_ygDA9IAkXJDQnT4Ef8x6GqL5yaaUTLFVAODawf6hNY5vA5IJ2FZ4jCpgPc8hlm73aQjce3OF\\_zpMsTTPV\\_jyV77s0xvhGXp66YQg9yThMXcAl8fjeEHJ3laymVjx5ubhtC8ikN0Krm8GmYwoVHxJCfziuh7-Zbv\\_wFwMqTgShStPL-zgvNjFQPk9/http%3A%2F%2Fwww.posteritygroup.ca](http://secure-web.cisco.com/1daNGMesNUsNwxqKMSwBQLdcNMnPXVDS13KdIRuT2dsGJgtHDGGZSKEwlkOdDv6RwDlnNFHzKikCE7F4WAroentbiRbiElhVwuqyF1eXupTgA5gwGj28mlrJhIPt-Bx0-7930Yoh_ygDA9IAkXJDQnT4Ef8x6GqL5yaaUTLFVAODawf6hNY5vA5IJ2FZ4jCpgPc8hlm73aQjce3OF_zpMsTTPV_jyV77s0xvhGXp66YQg9yThMXcAl8fjeEHJ3laymVjx5ubhtC8ikN0Krm8GmYwoVHxJCfziuh7-Zbv_wFwMqTgShStPL-zgvNjFQPk9/http%3A%2F%2Fwww.posteritygroup.ca)



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## Paula Claudino

---

**From:** Whitney Wong <Whitney.Wong@enbridge.com>  
**Sent:** May 27, 2022 5:23 PM  
**To:** Julian Nappert  
**Cc:** Paula Claudino; Alex Tiessen  
**Subject:** RE: [External] Leamington IRP analysis memos - responses to questions and updated memos

Thanks Julian - really appreciate the quick turnaround! I've circulated it once more internally and hoping we can close the books on this one.

For my own understanding as I'm still getting up to speed with the APS and everything - the NTG factor was only applied to the costs, would that imply that the peak hour savings are already considered gross values?

Thanks & hope you all have a great weekend!

Whitney

---

**From:** Julian Nappert <nappert@posteritygroup.ca>  
**Sent:** Friday, May 27, 2022 3:14 PM  
**To:** Whitney Wong <Whitney.Wong@enbridge.com>  
**Cc:** Paula Claudino <paula@posteritygroup.ca>; Kurtis Lubbers <Kurtis.Lubbers@enbridge.com>; Geoff Chung <Geoff.Chung@enbridge.com>; Chris Ripley <CRipley@uniongas.com>; Alex Tiessen <tiessen@posteritygroup.ca>  
**Subject:** Re: [External] Leamington IRP analysis memos - responses to questions and updated memos

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Hi Whitney,

We have updated the Results Memo to reflect the change to gross costs using the 75% NTG factor provided by EGI. The forecasted growth demand for 2029 has been left as is in the Results Memo but a note on the effect of the 2% demolition rate and the increasing industrial sector energy usage has been added to the Approach Memo in case it needs to be referenced. As we have not updated any of the underlying results in the supporting MS Excel file, the previous link Alex sent out is still the most up to date version.

Please let us know if anything else comes up from this new update. Enjoy your weekend!

Cheers,

Julian

On Fri, May 27, 2022 at 1:29 PM Whitney Wong <[Whitney.Wong@enbridge.com](mailto:Whitney.Wong@enbridge.com)> wrote:

Hi Paula,

We've decided on just updating the memo to reflect gross peak hour reduction and costs instead of net, using an assumed 75% blanket NTG factor. And some corresponding wording/footnote that the costs do not include fixed portfolio overhead costs.

With regards to the forecasted growth demand in 2029, we can leave that as is. Thinking we can document those assumptions separately and not in the memo (i.e. 2% demolition rate and inc industrial energy usage); just to be prepared in case we get any questions around that value.

Would it be possible to get the memo updated by Monday latest?

Thanks!

**Whitney Wong**

C: 437.234.1293

---

**From:** Whitney Wong  
**Sent:** Thursday, May 26, 2022 4:20 PM  
**To:** Paula Claudino <[paula@posteritygroup.ca](mailto:paula@posteritygroup.ca)>  
**Cc:** Julian Nappert <[nappert@posteritygroup.ca](mailto:nappert@posteritygroup.ca)>; Kurtis Lubbers <[Kurtis.Lubbers@enbridge.com](mailto:Kurtis.Lubbers@enbridge.com)>  
**Subject:** RE: [External] Leamington IRP analysis memos - responses to questions and updated memos

Hi Paula,

Just wanted to drop you a note - we are still discussing what to do with the forecasted demand. Hoping we can confirm and get back to you by late tomorrow morning.

I'll also find out if we can push out the deadline for this memo to Monday to help accommodate for all these last minute requests.

Thanks!

**Whitney Wong**

C: 437.234.1293

---

**From:** Paula Claudino <[paula@posteritygroup.ca](mailto:paula@posteritygroup.ca)>  
**Sent:** Thursday, May 26, 2022 11:38 AM  
**To:** Whitney Wong <[Whitney.Wong@enbridge.com](mailto:Whitney.Wong@enbridge.com)>  
**Subject:** Re: [External] Leamington IRP analysis memos - responses to questions and updated memos

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Would 12:30 work? I think we only need about 10-15 minutes.

On Thu, May 26, 2022 at 11:25 AM Whitney Wong <[Whitney.Wong@enbridge.com](mailto:Whitney.Wong@enbridge.com)> wrote:

Hi Paula, sorry I had to step out of the office for a bit this morning. I'm free anytime today, except 2-3pm.

Let me know what time works best for you. I can set up a quick meeting and loop in Geoff and Kurtis if their calendars allow.

Thanks,

**Whitney Wong**

C: 437.234.1293

---

**From:** Paula Claudino <[paula@posteritygroup.ca](mailto:paula@posteritygroup.ca)>  
**Sent:** Thursday, May 26, 2022 9:34 AM  
**To:** Whitney Wong <[Whitney.Wong@enbridge.com](mailto:Whitney.Wong@enbridge.com)>  
**Cc:** Alex Tiessen <[tiessen@posteritygroup.ca](mailto:tiessen@posteritygroup.ca)>; Julian Nappert <[nappert@posteritygroup.ca](mailto:nappert@posteritygroup.ca)>; Amrit Kuner <[Amrit.Kuner@enbridge.com](mailto:Amrit.Kuner@enbridge.com)>; Chris Ripley <[CRipley@uniongas.com](mailto:CRipley@uniongas.com)>; Geoff Chung <[Geoff.Chung@enbridge.com](mailto:Geoff.Chung@enbridge.com)>;

Kurtis Lubbers <[Kurtis.Lubbers@enbridge.com](mailto:Kurtis.Lubbers@enbridge.com)>

**Subject:** Re: [External] Leamington IRP analysis memos - responses to questions and updated memos

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Hi Whitney,

I think it would be best if we have a quick call to discuss the results. Will you be free to chat this morning at 11am?

Thanks,

Paula

On Wed, May 25, 2022 at 5:16 PM Whitney Wong <[Whitney.Wong@enbridge.com](mailto:Whitney.Wong@enbridge.com)> wrote:

Thanks Alex & Julian for the quick turnaround in making the updates!

Just a few more (hopefully minor) requests:

- To confirm, are the peak hour reduction and costs presented as net values? Can the modeled results be updated to gross values by applying a blanket 75% NTG conversion factor, and if that could that stated somewhere as a high level assumption. For the purposes of assessing the technical potential, providing the gross values would be more illustrative. But since there was no NTG conversion factor specified in the original APS, we're suggesting a general blanket conversion for now.
- With regards to the growth demand in 2029, the 71,600m<sup>3</sup>/hr still seems higher than what was forecasted. Looking at the General Service Growth, we should only be taking into account the growth between 2021 to 2029 – which would be ~1572m<sup>3</sup>/hr. Since the customer extract was pulled fairly recently, any growth before 2021 that would have already been captured in the existing customer extract.



General Service Growth													
*Based on 2018 FBP for Leamington, Kingsville and Wheatley													
GENERAL SERVICE GROWTH COUNTS*													
Year	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
RESIDENTIAL	181	112	112	112	112	112	112	112	112	112	112	112	112
COMMERCIAL	15	15	15	15	15	15	15	15	15	15	15	15	15
INDUSTRIAL	2	0	0	0	0	0	0	0	0	0	0	0	0
			Residential	109	109	109	109	109	109	109	109	109	978
			Commercial	66	66	66	66	66	66	66	66	66	594
													Total Growth (2021-2029) 1571.76
Peak Load Assumptions Per Customer													
Customer Type	Peak Load (m3/hr)												
Residential	0.97												
Commercial	4.4												

Let me know if you require any additional details!

Thanks,

Whitney Wong

C: 437.234.1293

**From:** Alex Tiessen <[tiessen@posteritygroup.ca](mailto:tiessen@posteritygroup.ca)>  
**Sent:** Wednesday, May 25, 2022 1:48 PM  
**To:** Julian Nappert <[nappert@posteritygroup.ca](mailto:nappert@posteritygroup.ca)>  
**Cc:** Whitney Wong <[Whitney.Wong@enbridge.com](mailto:Whitney.Wong@enbridge.com)>; Paula Claudino <[paula@posteritygroup.ca](mailto:paula@posteritygroup.ca)>; Amrit Kuner <[Amrit.Kuner@enbridge.com](mailto:Amrit.Kuner@enbridge.com)>; Chris Ripley <[CRipley@uniongas.com](mailto:CRipley@uniongas.com)>; Geoff Chung <[Geoff.Chung@enbridge.com](mailto:Geoff.Chung@enbridge.com)>; Kurtis Lubbers <[Kurtis.Lubbers@enbridge.com](mailto:Kurtis.Lubbers@enbridge.com)>  
**Subject:** Re: [External] Leamington IRP analysis memos - responses to questions and updated memos

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The accompanying excel output file is located here:

<https://esites.enbridge.com/sites/csd/EGDcarbonstrategy/Shared%20Documents/Forms/AllItems.aspx?RootFolder=%2Fsites%2Fcsd%2FEGDcarbonstrategy%2FShared%20Documents%2FEnergy%20Transition%2Fscenario%20Planning%2Fposterity%20Related%20Documents%2FIRPA%20Files%2FPREP%20Leamington&FolderCTID=0x01200000C75F39DB208D429152E471DD291A79&View=%7B3AEF3AE7%2DE532%2D422E%2DBB47%2D81BC19FC8792%7D&InitialTabId=Ribbon%2ERead&VisibilityContext=WSSTabPersistence#InplviewHash3aef3ae7-e532-422e-bb47-81bc19fc8792=RootFolder%3D%252Fsites%252Fcsd%252FEGDcarbonstrategy%252FShared%2520Documents%252FEnergy%252>

[OTransition%252FScenario%2520Planning%252FPosterity%2520Related%2520Documents%252FIRPA%2520Files%252FPREP%2520Leamington](#)

**Alex Tiessen**, P.Eng., CMVP, PMP | Principal | 613.219.5312 | [tiessen@posteritygroup.ca](mailto:tiessen@posteritygroup.ca)  
**POSTERITY GROUP** | [posteritygroup.ca](http://posteritygroup.ca)

On Wed, May 25, 2022 at 12:56 PM Julian Nappert <[nappert@posteritygroup.ca](mailto:nappert@posteritygroup.ca)> wrote:

Hi Whitney,

I have attached the two updated memos to reflect the comments brought forward last week. Alex will provide the link to the supporting MS Excel file shortly.

We were able to calibrate the peak hourly load in the model to match the existing 2021 peak hourly load and have updated the new customers' peak hourly volumes to match those provided in the growth rate data. This has been added to the Approach Memo and the updated findings are reflected in the Results Memo (where the findings for 2037 have also been removed).

Please let us know if you have any further questions or comments!

Cheers,

Julian

On Tue, May 24, 2022 at 9:20 AM Whitney Wong <[Whitney.Wong@enbridge.com](mailto:Whitney.Wong@enbridge.com)> wrote:

Hi Paula,

That's understandable and appreciate you working within the tight timelines. Please do track the additional time spent on this request, we can sort out the payment for that afterwards.

With regards to question 2, it would be the intent that all new customers/growth have the same hourly volumes applied (0.97m<sup>3</sup>/hr for RES and 4.4m<sup>3</sup>/hr for COM) over the entire reference period. That would help align with our internal modelling assumptions for growth.

Let me know if you have any additional questions/clarifications!

Thanks,

Whitney

-----Original Message-----

From: Paula Claudino <[paula@posteritygroup.ca](mailto:paula@posteritygroup.ca)>

Sent: Thursday, May 19, 2022 5:25 PM

To: Whitney Wong <[Whitney.Wong@enbridge.com](mailto:Whitney.Wong@enbridge.com)>

Cc: Julian Nappert <[nappert@posteritygroup.ca](mailto:nappert@posteritygroup.ca)>; Alex Tiessen <[tiessen@posteritygroup.ca](mailto:tiessen@posteritygroup.ca)>; Amrit Kuner <[Amrit.Kuner@enbridge.com](mailto:Amrit.Kuner@enbridge.com)>; Chris Ripley <[CRipley@uniongas.com](mailto:CRipley@uniongas.com)>; Geoff Chung <[Geoff.Chung@enbridge.com](mailto:Geoff.Chung@enbridge.com)>; Kurtis Lubbers <[Kurtis.Lubbers@enbridge.com](mailto:Kurtis.Lubbers@enbridge.com)>

Subject: Re: [External] Leamington IRP analysis memos - responses to questions and updated memos

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Hi Whitney,

We should be able to make these changes but they represent a scope change as this approach differs from the approach we agreed to and it will take us extra time compared to our budget to make these changes to the model. We will track our time spent modifying the model separately and we request that we be approved to bill hourly for this additional time spent. We will do our best to meet your deadline but it will be difficult due to vacation schedules around the long weekend.

We will be able to calibrate the model to peak hourly load rather than to annual consumption but we are not yet sure if we can use Enbridge's assumed hourly volumes for RES and COM for new accounts. Would the intent be that all new customers have the same hourly volumes (0.97 m<sup>3</sup>/hr for RES and 4.4 m<sup>3</sup>/hr for COM) over the entire reference period?

We can certainly edit the memo to only include data up to 2029/2030.

If you can provide further guidance on what you mean in your second question (i.e. do you want all new customers to have hourly volumes of

0.97 m<sup>3</sup>/hr for RES and 4.4 m<sup>3</sup>/hr for COM over the entire reference period?), we can work to update the model accordingly tomorrow and try to have the updated memo ready for you by next week.

Thanks,

Paula

On Thu, May 19, 2022 at 12:24 PM Whitney Wong <[Whitney.Wong@enbridge.com](mailto:Whitney.Wong@enbridge.com)> wrote:

>

> Hi Paula,

>

>

>

> Thanks for providing the updated files. We did have a few additional comments with regards to the memos. We're hoping to address some of the differences in the modelling inputs to better align Posterity's reference demand forecast with our model outputs.

>

>

>

> For the peak hourly load in the 2021 reference case, would it be

- > possible to use the existing peak hourly loads to calibrate the
- > Posterity model instead of calibrating to annual consumption? (i.e.
- > align to the ~67,000m<sup>3</sup>/hr from the spreadsheet)
- >
- >
- >
- > For the expected peak hourly load, instead of using the average peak demand from existing accounts, can Enbridge's assumed hourly volumes of 0.97 m<sup>3</sup>/hr for RES and 4.4 m<sup>3</sup>/hr for COM be applied instead?
- >
- >
- >
- > The forecast for our Leamington filing only goes up to 2029/2030, can we remove the forecasted 2037 peak hour reduction (in Section 1) and provide the 2029 growth forecast in Section 3 instead of the 2037 (i.e. the 94,000m<sup>3</sup>/hr in 2037)?
- >
- >
- >
- > Unfortunately we are on somewhat tight timelines with this, and hoping to have a finalized memo by mid next week (May 25th). Can you let us know if it any/all of the above updates could be accommodated within this timeframe?
- >
- >
- >
- > Let me know if you require any additional clarifications or would like to set up a quick call to discuss!
- >
- >
- >
- > Thanks,

>  
>  
>  
> Whitney Wong | P.ENG  
> ADVISOR, INTEGRATED RESOURCE PLANNING  
>  
> ENERGY TRANSITION PLANNING  
>  
> C: 437.234.1293  
>  
>  
>  
> From: Paula Claudino <[paula@posteritygroup.ca](mailto:paula@posteritygroup.ca)>  
> Sent: Wednesday, May 11, 2022 3:28 PM  
> To: Amrit Kuner <[Amrit.Kuner@enbridge.com](mailto:Amrit.Kuner@enbridge.com)>  
> Cc: Julian Nappert <[nappert@posteritygroup.ca](mailto:nappert@posteritygroup.ca)>; Alex Tiessen  
> <[tiessen@posteritygroup.ca](mailto:tiessen@posteritygroup.ca)>  
> Subject: [External] Leamington IRP analysis memos - responses to  
> questions and updated memos  
>  
>  
>  
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>

> Hello Amrit,

>

>

>

> Attached are our updated drafts of the results and approach memos as well as a question tracker, which includes answers to each of your questions. Alex will provide a link to the supporting MS Excel file shortly.

>

>

>

> Please note both the reference case and estimated savings figures have changed since the first draft as we made several changes to the model to address a couple of your questions. These changes include:

>

> - We removed the years 2019 and 2020 to prevent any further confusion

>

> - We added in the missing residential demand response measure, which

> had been accidentally omitted from the first version

>

> - We adjusted the measure implementation timing so that all measures

> begin to be applied in 2023

>

> - We accounted for a missing set of accounts in the industrial sub

> sector, which had been missed earlier

>

>

>

> We would be happy to answer any further questions you may have or discuss any of the answers we have already provided.

>

>

>

> Thanks,

>

> Paula

> --

>

> Paula Claudino, P.Eng., M.ASc | Senior Consultant | 613.608.8000 |

> [paula@posteritygroup.ca](mailto:paula@posteritygroup.ca)

>

> POSTERITY GROUP | [posteritygroup.ca](https://posteritygroup.ca)

>

> Please note: Posterity Group staff are following social distancing guidelines and will be working remotely until further notice. Our office space will be closed during this time.

>

> Many Posterity Group staff are taking on additional family responsibilities during this period. To the extent that these responsibilities affect deadlines and deliverables, this will be communicated directly.

>

> We remain committed to providing our clients the same flexibility and responsiveness that they have come to expect.

--

Paula Claudino, P.Eng., M.ASc | Senior Consultant | 613.608.8000 | [paula@posteritygroup.ca](mailto:paula@posteritygroup.ca) POSTERITY GROUP | [posteritygroup.ca](https://posteritygroup.ca)



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--

**Julian Nappert** | Consultant

613-850-5915 | [http://secure-web.cisco.com/1daNGMesNUsNwxqKMSwBQLdcNMnPXVDS13KdlRuT2dsGJgtHDGGZSKEwkOdDv6RwDInNFHzKikCE7F4WAroentbiRbiElhVwugyF1eXupTgA5gwGj28mlrJhIPt-Bx0-7930Yoh\\_ygDA9IAkXJDQnT4Ef8x6GqL5yaaUTLFVAODawf6hNY5vA5IJ2FZ4jCpgPc8hlm73aQjce3OF\\_zpMsTTPVjyV77s0xvhGXp66YQg9yThMXcAl8fjeEHJ3laymVjx5ubhtC8ikN0Krm8GmYwoVHxJCfziuh7-Zbv\\_wFwMqTgShStPL-zgvNjFQPk9/http%3A%2F%2Fwww.posteritygroup.ca](http://secure-web.cisco.com/1daNGMesNUsNwxqKMSwBQLdcNMnPXVDS13KdlRuT2dsGJgtHDGGZSKEwkOdDv6RwDInNFHzKikCE7F4WAroentbiRbiElhVwugyF1eXupTgA5gwGj28mlrJhIPt-Bx0-7930Yoh_ygDA9IAkXJDQnT4Ef8x6GqL5yaaUTLFVAODawf6hNY5vA5IJ2FZ4jCpgPc8hlm73aQjce3OF_zpMsTTPVjyV77s0xvhGXp66YQg9yThMXcAl8fjeEHJ3laymVjx5ubhtC8ikN0Krm8GmYwoVHxJCfziuh7-Zbv_wFwMqTgShStPL-zgvNjFQPk9/http%3A%2F%2Fwww.posteritygroup.ca)



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--

**Paula Claudino, P.Eng., M.ASc** | Senior Consultant | **613.608.8000** | [paula@posteritygroup.ca](mailto:paula@posteritygroup.ca)

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--

**Paula Claudino, P.Eng., M.ASc | Senior Consultant | 613.608.8000 | [paula@posteritygroup.ca](mailto:paula@posteritygroup.ca)**

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*We remain committed to providing our clients the same flexibility and responsiveness that they have come to expect.*

--

**Julian Nappert | Consultant**

613-850-5915 | [http://secure-web.cisco.com/13Jhv3YrMNb-sijqDxIMfHeuQ7sLjTnxMKIEYUzItsCSYFc8J9RwmNtXuHTO\\_fgDFLUgX3FjlgenCQrixzTkSHYK4pNI6SyBhEqV-MRFhybiwKXyRr0TziVETac0iB2LXzRQejBTYDJaAiZNPoWziGRs1d80GLuTZ0pWADiH8zWLuTduw-aRbhllc39gnbQhZ0\\_6X7gU-6TqRUAtbR7Oyx6SSJWsbRHLepIfdcuYmcNoX5Br54zPEekNSHllcEZ\\_vBA8Ca31akGFR4Qla3hisp-Qeh0BrgdDTZojn-xXmuG06fcwjd2hv35oRhHmjDMA3/http%3A%2F%2Fwww.posteritygroup.ca](http://secure-web.cisco.com/13Jhv3YrMNb-sijqDxIMfHeuQ7sLjTnxMKIEYUzItsCSYFc8J9RwmNtXuHTO_fgDFLUgX3FjlgenCQrixzTkSHYK4pNI6SyBhEqV-MRFhybiwKXyRr0TziVETac0iB2LXzRQejBTYDJaAiZNPoWziGRs1d80GLuTZ0pWADiH8zWLuTduw-aRbhllc39gnbQhZ0_6X7gU-6TqRUAtbR7Oyx6SSJWsbRHLepIfdcuYmcNoX5Br54zPEekNSHllcEZ_vBA8Ca31akGFR4Qla3hisp-Qeh0BrgdDTZojn-xXmuG06fcwjd2hv35oRhHmjDMA3/http%3A%2F%2Fwww.posteritygroup.ca)



*Please note: Posterity Group staff are following social distancing guidelines and will be working remotely until further notice. Our office space will be closed during this time.*

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Environmental Defence (“ED”)

INTERROGATORY

Reference:

Exhibit E, Tab 1, Schedule 5

Question:

- (a) Please provide the DCF analysis in a live excel format.
- (b) Please re-calculate the project NPV and PI based on there being zero revenue attributable to the expansion project (i) from 2035 onward, (ii) from 2040 onward, and (iii) from 2050 onward. We are not asking Enbridge to opine on these figures as if they are likely scenarios.
- (c) If the project is built but demand does not increase above the current capacity of 713 TJ/d, does Enbridge agree that there would be no incremental revenue attributable to the project? If Enbridge disagrees, please explain.
- (d) If the project is built, demand initially increases beyond 713 TJ/d, but then declines to below 713 TJ/d from 2035 onward, does Enbridge agree that there would be no incremental revenue attributable to the project from 2035? If Enbridge disagrees, please explain.
- (e) In light of federal decarbonization mandates, what is the probability that the design day demand of the panhandle system is at or below 713 TJ/d in (i) 2035, (ii) 2040, or (iii) 2050. Please provide an answer on a best estimate basis.

Response

- a) Please see Attachment 1.
- b) See Table 1 below.

/U

Table 1: Project NPV and PI Based on Zero Revenue from 2035, 2040, and 2050 Onwards

	<b>Scenario</b>	<b>NPV (\$million)</b>	<b>PI</b>
i	2035 onward	(202)	0.30
ii	2040 onward	(186)	0.35
iii	2050 onward	(165)	0.43

c) and d)

Enbridge Gas agrees that incremental revenue is tied to incremental demands.

However, as set out in Exhibit B, Tab 1, Schedule 1, the needs for the Project were determined by demands reported by customers through the EOI process. As such, the Company has no basis to expect system demands will decline in the manner suggested by ED.

e) ED's question seeks to have the Company create new evidence based on hypothetical scenarios that would see demand for natural gas decline significantly from current levels. It is not reasonably possible to produce the forecast sought by ED with any certainty as it is unclear how and when the Federal Guidelines will be implemented in Ontario, and what the rate of adoption and/or conversion to alternative energy sources will ultimately be.

Not only does Enbridge Gas not routinely produce forecasts for the durations sought by ED (in part due to escalating forecast uncertainty that is increasingly inherent in longer term forecasts), but it is not practically possible for the Company to completely re-assess the hydraulic models, demand forecasting methodology, engineering design principles, and other factors that currently guide its assessment of projects as part of a response to interrogatories in the current proceeding.

**Panhandle Regional Expansion Project**

**DCF Analysis**

**InService Date: Nov-01-2023**

<u>Project Year</u> (\$000's)	<u>Project Total</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>
<b><u>Operating Cash Flow</u></b>											
Revenue	428,859	1,657	6,253	7,697	9,142	10,586	11,202	11,245	11,245	11,245	11,245
Expenses:											
O & M Expense	(5,060)	(127)	(127)	(127)	(127)	(127)	(127)	(127)	(127)	(127)	(127)
Municipal Tax	(38,843)	(818)	(975)	(975)	(975)	(975)	(975)	(975)	(975)	(975)	(975)
Income Tax	(100,799)	776	(1,115)	(1,748)	(2,131)	(2,513)	(2,677)	(2,688)	(2,688)	(2,688)	(2,688)
Net Operating Cash Flow	(144,702)	1,489	4,036	4,848	5,909	6,971	7,424	7,455	7,455	7,455	7,455
<b><u>Capital</u></b>											
Incremental Capital	(260,174)	(207,255)	(49,571)	(3,348)	-	-	-	-	-	-	-
Change in Working Capital	(6)	(6)	-	-	-	-	-	-	-	-	-
Total Capital	(260,180)	(207,261)	(49,571)	(3,348)	-	-	-	-	-	-	-
<b><u>CCA Tax Shield</u></b>											
CCA Tax Shield	65,898	8,560	6,467	5,676	4,912	4,272	3,733	3,278	2,891	2,561	2,277
<b><u>Net Present Value</u></b>											
PV of Operating Cash Flow	116,814	1,452	3,747	4,284	4,970	5,580	5,655	5,405	5,144	4,896	4,659
PV of Capital	(257,466)	(207,261)	(47,173)	(3,032)	-	-	-	-	-	-	-
PV of CCA Tax Shield	46,113	8,351	6,004	5,015	4,131	3,419	2,844	2,376	1,995	1,681	1,423
Total NPV by Year	(94,538)	(197,458)	(37,421)	6,267	9,101	8,999	8,499	7,781	7,139	6,577	6,082
<b>Project NPV</b>	<b>(94,538)</b>										
<b>Project PI</b>	<b>0.63</b>										









ENBRIDGE GAS INC.

Answer to Interrogatory from  
Environmental Defence (“ED”)

INTERROGATORY

Reference:

Exhibit E, Tab 1, Schedule 1

Question:

- (a) Please confirm that Canada’s 2030 Emissions Reduction Plan includes a target for carbon emissions associated with buildings to decline by 41% by 2030 from 2019 levels (to 53 CO2e from 91 CO2e) and that it targets a 22% reduction by 2026 from 2019 levels (to 71 CO2e from 91 CO2e).<sup>1</sup> If not, please explain.
- (b) Please confirm that Canada’s 2030 Emissions Reduction Plan has formal legal status under s. 9 of the *Canadian Net-Zero Emissions Accountability Act* in relation to the legally binding targets under that Act.<sup>2</sup> If not, please explain.
- (c) Please complete the following table:

Demand Reduction Scenarios					
	2019 Levels	Reduced by 5%	Reduced by 10%	Reduced by 22%	Reduced by 41%
Annual demand for the relevant area (TJ)					
Design day demand for the relevant area (TJ/d)					

- (d) Please complete the table above but in m3 figures instead of joules.
- (e) Approximately what percent of Enbridge customer demand is used for buildings?

<sup>1</sup> <https://www.canada.ca/en/environment-climate-change/news/2022/03/2030-emissions-reduction-plan--canadas-next-steps-for-clean-air-and-a-strong-economy.html>

<sup>2</sup> *Canadian Net-Zero Emissions Accountability Act*, s. 9.

- (f) Please confirm that Canada has committed to net-zero emissions from electricity generation by 2035. If not, please explain.
- (g) Please confirm that Canada’s 2030 Emissions Reduction Plan includes its commitment to net-zero emissions from electricity generation by 2035. If not, please explain.

**Response**

- a) f) and g)  
 Please refer to the federal government’s 2030 Emissions Reduction Plan for information related to any such targets established by the government.<sup>3</sup>
- b) Please refer to the *Canadian Net-Zero Emissions Accountability Act, (2021)* for information regarding the legal status of the federal government’s 2030 Emissions Reduction Plan.<sup>4</sup>
- c) and d)

Table 1

<b>Demand</b>		
	<b>2019 Levels</b>	
Annual demand for the relevant area (TJ) Conversion assumes heat value of 38.98 GJ/10 <sup>3</sup> m <sup>3</sup>	58,414 TJ	1,498,556,891 m <sup>3</sup>
Design day demand for the relevant area Conversion assumes heat value of 38.98 GJ/10 <sup>3</sup> m <sup>3</sup>	640 TJ/day	16,427,593m <sup>3</sup> /day

Note: Annual demand was calculated using (contract customer consumption in the Project area) + (general service consumption actuals for the Windsor/Chatham region). The Company does not have general service consumption actuals for the Project area specifically.

ED can reduce 2019 demands set out in Table 1 at whatever rate it desires. However, Enbridge Gas cautions that there is no simplifying correlation between annual demand and design day demand in the Project area.

<sup>3</sup> <https://www.canada.ca/en/environment-climate-change/news/2022/03/2030-emissions-reduction-plan--canadas-next-steps-for-clean-air-and-a-strong-economy.html>

<sup>4</sup> <https://laws-lois.justice.gc.ca/eng/acts/c-19.3/FullText.html>

- e) Please see the response at Exhibit I.ED.11 for a breakdown of volumes in the Project area by sector.

Enbridge Gas is not able to separate natural gas demand for commercial or industrial sectors in the Project area into separate end-uses. However, certain commercial or industrial demand would also be attributed to building heating (in addition to the residential sector).

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Environmental Defence (“ED”)

INTERROGATORY

Reference:

Exhibit E, Tab 1, Schedule 1

Preamble:

For the below questions, please make and state assumptions as needed. Please also include any necessary caveats.

Question:

- (a) On a best efforts basis, please estimate the impact on the gas demand in the project area if Canada achieves (or at least comes close to achieving) its 2030 Emissions Reduction Plan, including its a target for carbon emissions associated with buildings to decline by 41% by 2030 from 2019 levels.
- (b) Please reflect the answer to (a) in a reproduction of table 1 on page 11 of Ex. B, Tab 1, Schedule 1.
- (c) Please estimate how the answer to (a) would impact the project economics, including the NPV and PI.
- (d) On a best efforts basis, please estimate the impact on the gas demand in the project area if Canada achieves its legislated mandate 2050 net zero target.
- (e) Please reflect the answer to (c) in a reproduction of table 1 on page 11 of Ex. B, Tab 1, Schedule 1.
- (f) Please estimate how the answer to (c) would impact the project economics, including the NPV and PI.

Response

a) - f)

ED’s questions seek to have the Company alter its demand forecast in order to perform unique analysis based on hypothetical scenarios, namely the federal 2030 Emissions Reduction Plan and 2050 net-zero targets.

Enbridge Gas utilizes a demand forecasting methodology that includes known and quantifiable data, such as: economic forecast data, public policy information municipal planning data, individual customer data, tacit knowledge, and historical growth rates in geographic areas to inform the Project economics set out at Exhibit E. It is not reasonably possible to produce the forecasts sought by ED with any certainty as it is unclear how and when the federal 2030 Emission Reduction Plan and 2050 net-zero targets will be implemented in Ontario, and what the rate of adoption and/or conversion to alternative energy sources will be.

It is not practically possible for the Company to completely re-assess the hydraulic models, demand forecasting methodology, engineering design principles, and other factors that currently guide its assessment of projects (including the Project NPV and PI) as part of a response to interrogatories in the current proceeding.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Environmental Defence ("ED")

INTERROGATORY

Reference:

Exhibit E, Tab 1, Schedule 1

Question:

- (a) Please reproduce table 1 on page 11 of Ex. B, Tab 1, Schedule 1, adding rows showing:
- i. A breakdown of the demand based on customer classes (residential, commercial, and industrial); and
  - ii. A breakdown of demand for forecast years based on that from new versus existing customers.

Please also add three columns to the left with three additional years of historical figures.

**Response**

a)

- i. Below is the summary of demand breakdown by the customer classes indicated (residential, commercial, and industrial) using best available information. /U
- ii. There is no forecast demand change for existing general service customers.

	Historical Actuals (TJ/d)						FORECAST (TJ/d)								
	Winter 16/17	Winter 17/18	Winter 18/19	Winter 19/20	Winter 20/21	Winter 21/22	Winter 22/23	Winter 23/24	Winter 24/25	Winter 25/26	Winter 26/27	Winter 27/28	Winter 28/29	Winter 29/30	Winter 30/31
<b>General Service Firm (Total System Demand)</b>	298	291	298	317	308	310	306	308	310	312	314	315	317	319	320
Residential Demand (M1)	158	157	163	171	166	167	171	164	165	167	169	169	170	170	169
Commercial/Industrial (estimated M1/M2)	140	134	135	146	142	143	135	144	145	145	145	146	147	149	151
<b>Contract Firm (Total System Demand)</b>	259	321	326	323	348	362	392	422	492	537	550	562	575	588	601
<b>Total System Demand Forecast</b>	<b>557</b>	<b>612</b>	<b>624</b>	<b>640</b>	<b>656</b>	<b>672</b>	<b>698</b>	<b>730</b>	<b>802</b>	<b>849</b>	<b>863</b>	<b>878</b>	<b>892</b>	<b>906</b>	<b>921</b>

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Environmental Defence (“ED”)

INTERROGATORY

Reference:

Exhibit E, Tab 1, Schedule 1

Question:

- (a) What is the expected lifetime of the proposed pipeline?
- (b) When would the proposed pipeline be fully depreciated?
- (c) What will the undepreciated balance of the proposed pipeline costs be in (i) 2035, (ii) 2040, and (iii) 2050?
- (d) Has Enbridge conducted an analysis to assess the likelihood, if any, that the proposed pipeline will be stranded or underutilized before the end of its lifetime? If yes, please file said analysis.
- (e) Please estimate the probability (if any) that the proposed pipeline will be stranded or underutilized before the end of its lifetime. Please provide the response as a probability (%) or a range of probabilities. For instance, if there is no chance, please indicate the probability as 0%.

Response

- a) The current OEB-approved depreciation rate for transmission pipelines in the Union Rate Zone assumes an economic life of 55 years.
- b) Assuming current OEB-approved depreciation rates, the proposed pipeline will be fully depreciated in 2075. /U
- c) The undepreciated balance of the proposed pipeline(s) is: /U
  - i. in 2035 = \$146 million
  - ii. in 2040 = \$128 million
  - iii. in 2050 = \$91 million
- d) and e)



No, the proposed Project is based on best available demand forecasts, customer commitments, and is designed to reliably serve known increased demands for firm service in the Panhandle Market, including, in particular, incremental demands from the greenhouse, automotive, and power generation sectors. The Company has no basis to believe the proposed pipeline will be undersubscribed or stranded.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Environmental Defence (“ED”)

INTERROGATORY

Reference:

Exhibit E, Tab 1, Schedule 1

Question:

- (a) How many cubic metres of gas is associated with the incremental revenue included in the stage 1 DCF calculations?
- (b) How many tonnes of carbon emissions will be emitted due to the combustion of those m3s of gas?
- (c) Does Enbridge believe that carbon emissions are a public interest consideration relevant to stage 3 of the test?

Response

- a) Approximately 18.5 billion m<sup>3</sup>. /U
- b) The greenhouse gas (“GHG”) emissions emitted due to the combustion of the natural gas volumes provided in part a) above are approximately 36 million tonnes of carbon dioxide equivalent (“tCO<sub>2e</sub>”). Enbridge Gas notes that approximately half of the gas will be delivered to greenhouse customers, and as such a portion of these emissions will be sequestered within plants. /U
- c) Enbridge Gas believes carbon emissions are relevant to stage 2 of the Project economics.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Environmental Defence (“ED”)

INTERROGATORY

Reference:

Exhibit E, Tab 1, Schedule 6

Question:

- (a) Please provide all spreadsheets and detailed calculations underlying Exhibit E, Tab 1, Schedule 6. Please include live excel spreadsheets.
- (b) Please provide Enbridge’s best forecast of gas prices starting at the in-service date for (i) 20 years and (ii) 40 years.
- (c) Please approach the gas supply group and the DSM group and ask them to provide their best forecast of gas prices.
- (d) Please provide ICF’s latest annual gas price forecast. As this is proprietary, this can be provided confidentially. Please also provide the forecast as percent increases and apply those values to the prices in the relevant area.
- (e) Please describe how Enbridge generated its electricity price, including underlying calculations.
- (f) Please provide Enbridge’s best forecast of electricity prices starting at the in-service date for (i) 20 years and (ii) 40 years.
- (g) Please justify the assumption that the carbon tax will remain at \$170 from 2031 to 2063. How confident is Enbridge in this prediction?
- (h) Please confirm that Enbridge estimated the cost of electric heating on the assumption that resistance heating is used, not a high efficiency heat pump.
- (i) Please describe the methodology used to generate Exhibit E, Tab 1, Schedule 6. Please also how this meets the requirements in E.B.O. 134 with specific references to the relevant sections of E.B.O. 134.
- (j) Please confirm whether Enbridge used customer-facing prices or avoided costs in this analysis. Please provide Enbridge’s understanding of what E.B.O. 134 requires in this regard.
- (k) Please confirm that in the stage 2 analysis in EB-2016-0186 (Panhandle Reinforcement Project), which was filed in June if 2016, Union Gas used the following assumption: “Gas and alternative fuel prices are the average posted prices for the 12 month period June 2015 to May 2016.”

## **Response**

- a) Please see Attachment 1.
- b) - d)  
Please see the response at Exhibit I.PP.11. Enbridge Gas is not able to produce the forecast information sought by ED at this time.
- e) Enbridge Gas generated its electricity pricing based upon the posted electricity pricing from the Ontario Energy Board website for the 12 months ending March 2023.<sup>1</sup> The posted pricing was converted from a cents per kilowatt hour to a dollar per gigajoule. The dollar per gigajoule was then converted to a dollar per m<sup>3</sup> assuming a heat content of 0.03932 GJ per m<sup>3</sup>. Please see Attachment 2 to this response for the supporting calculation. /U
- f) Enbridge Gas is not able to produce the forecast information sought by ED at this time. Electricity prices can be found at the IESO website, and any questions regarding electricity prices are more appropriately directed to the IESO:  
<https://www.ieso.ca/en/Power-Data/Monthly-Market-Report>
- g) To date, the Government of Canada has only announced the annual carbon price to 2030; however, the updated pricing has not been included in the Greenhouse Gas Pollution Pricing Act. Further, the Government of Canada has not provided any indication if carbon pricing will continue in 2031 or beyond, or at what rates. Absent this information, Enbridge Gas has assumed that carbon pricing will continue beyond 2030 remaining at a cost of \$170 per tonne.
- h) The Stage 2 analysis does not consist of an explicit variable related to the type of end-use equipment, for any fuel types. Enbridge Gas does not believe E.B.O. 134 identifies a specific requirement in this regard. Please see parts a) and e) above for more information on the methodology employed.
- i) The Stage 2 analysis determines the net present value of the difference in energy prices of alternative energy sources (heating oil, propane, electricity) versus natural gas. The price difference is applied to the forecast natural gas energy that the Project will provide to future general service customers. This aligns with E.B.O. 134 paragraph 6.74 which states:

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<sup>1</sup> <https://www.oeb.ca/consumer-information-and-protection/electricity-rates/historical-electricity-rates>

The second stage should be designed to quantify other public interest factors not considered at stage one. All quantifiable other public interest information as to costs and benefits should be provided at the stage.<sup>2</sup>

This methodology has been accepted by the OEB in numerous past applications. For details on the methodology used to develop Exhibit E, Tab 1, Schedule 6, please refer to part a) above.

- j) Enbridge Gas used retail costs in this analysis (please see the response to Exhibit I.STAFF.15 c) part iii). Enbridge Gas does not believe that E.B.O. 134 identifies a specific requirement in this regard.
- k) Confirmed.

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<sup>2</sup> Ontario Energy Board, E.B.O. 134 Report of the Board, June 1, 1987, paragraph 6.74





Date	OEB Posted Rate (cents / kWh)			kWh to GJ Conversion	\$ / GJ			Weighted Average
	Off-peak	Mid-peak	On-peak		Off-peak	Mid-peak	On-peak	
Feb 8, 2022	8.2	11.3	17.0	0.36	22.78	31.39	47.22	28.68
Nov 1, 2022	7.4	10.2	15.1		20.56	28.33	41.94	25.76

Date	Price (\$/GJ)
Apr 2022	28.68
May 2022	28.68
Jun 2022	28.68
Jul 2022	28.68
Aug 2022	28.68
Sep 2022	28.68
Oct 2022	28.68
Nov 2022	25.76
Dec 2022	25.76
Jan 2023	25.76
Feb 2023	25.76
Mar 2023	25.76
<b>Average</b>	<b>27.47</b>
GJ to m3 conversion	0.03932
<b>Electricity Price (\$/m3) \$</b>	<b><u>1.080</u></b>



ENBRIDGE GAS INC.

Answer to Interrogatory from  
Environmental Defence (“ED”)

INTERROGATORY

Reference:

Exhibit E, Tab 1, Schedule 6

Question:

- (a) Please recalculate Exhibit E, Tab 1, Schedule 6 with the following assumptions and provide both the output (i.e. Schedule 6) and the underlying excel spreadsheet:
- i. Gas and alternative fuel prices are the average posted prices for the most recent 12 month period; and
  - ii. Use of electricity is on average three times as efficient as the use of gas (e.g. cold climate heat pump versus gas furnace).
- (b) Please recalculate Exhibit E, Tab 1, Schedule 6 with the following assumptions and provide both the output (i.e. Schedule 6) and the underlying excel spreadsheet:
- i. Gas and alternative fuel prices are the average posted prices for the most recent 12 month period;
  - ii. Use of electricity is on average three times as efficient as the use of gas (e.g. cold climate heat pump versus gas furnace); and
  - iii. Carbon prices increase by \$15/tonne to 2035 and increase with inflation thereafter.

Response

- a) Please see Attachment 1 to this response for the Stage 2 results using the average posted prices for the 12 months ending August 2023. Please see Attachment 2 to this response for the underlying excel spreadsheet. /U
- b) Please see Attachment 3 to this response for the Stage 2 results using the average posted prices for the 12 months ending August 2023 and the increasing carbon pricing scenario requested by ED. Please see Attachment 4 for the underlying excel spreadsheet. /U

Stage 2 (Customer Fuel Savings) Data for Panhandle Regional Expansion Project

Line	Assumptions				Fuel Mix in the Event Gas is Not Available		
	(a)	(b)	(c)	(d)=(b)-(c)	(e)	(f)=(d)*(e)	
			Gas		General Service		
	Fuel Prices	\$/m <sup>3</sup>	\$/m <sup>3</sup>	Diff \$/m <sup>3</sup>		Fuel Mix	Wt Ave Diff \$/ M <sup>3</sup>
1	Heating Oil	1.64	0.20	1.43	Heating Oil	24%	0.342
2	Propane	1.14	0.20	0.93	Propane	10%	0.089
3	Electricity	1.11	0.20	0.91	Electricity	67%	0.604
4					Total %	100%	
5					Weighted Savings \$/m <sup>3</sup>		1.035

Gas and alternative fuel prices are the average posted prices for the 12 month period ending August 2022  
Prices in the table are before the added cost of Carbon.

**Carbon Prices** The cost of carbon is added to the price of each fuel excluding electricity.

	2023	2024	2025	2026	2027	2028	2029	2030
Cost per tonne	\$65	\$80	\$95	\$110	\$125	\$140	\$155	\$170
Cost per tonne	Future Yrs 2031 and beyond \$170							

**Calculation for Stage 2 Incremental Energy Demand**

Estimated Energy Demand with Pipeline Built  
 Equals Potential annual energy demand (for Stage 2 calculations)  
 Times Weighted Average Savings per M3 plus Cost of Carbon  
 Equals Annual Fuel Savings: Natural Gas Vs Alt Fuels

**Discount Rate for Net Present Values** 4.0%

**Length of Term for Fuel Savings**

Stage 2 estimated based on 20 years and 40 years

**Present Value of Customer Fuel Savings**

For conservatism, the NPV is assessed over 20 years with sensitivity at 40 years

Figures in \$ Millions	20 Years	40 Years
General Service Fuel Savings	234	366

NPV Fuel Savings Range from \$234 Mil over 20 yrs to \$366 Mil over 40 yrs





Stage 2 (Customer Fuel Savings) Data for Panhandle Regional Expansion Project

Line	Assumptions				Fuel Mix in the Event Gas is Not Available		
	(a)	(b)	(c)	(d)=(b)-(c)	(e)	(f)=(d)*(e)	
			Gas		General Service		
	Fuel Prices	\$/m <sup>3</sup>	\$/m <sup>3</sup>	Diff \$/m <sup>3</sup>		Fuel Mix	Wt Ave Diff \$/ M <sup>3</sup>
1	Heating Oil	1.64	0.20	1.43	Heating Oil	24%	0.342
2	Propane	1.14	0.20	0.93	Propane	10%	0.089
3	Electricity	1.11	0.20	0.91	Electricity	67%	0.604
4					Total %	100%	
5					Weighted Savings \$/m <sup>3</sup>		1.035

Gas and alternative fuel prices are the average posted prices for the 12 month period ending August 2022  
Prices in the table are before the added cost of Carbon.

**Carbon Prices** The cost of carbon is added to the price of each fuel excluding electricity.

	<u>2023</u>	<u>2024</u>	<u>2025</u>	<u>2026</u>	<u>2027</u>	<u>2028</u>	<u>2029</u>	<u>2030</u>
Cost per tonne	\$65	\$80	\$95	\$110	\$125	\$140	\$155	\$170
	<u>2031</u>	<u>2032</u>	<u>2033</u>	<u>2034</u>	<u>2035</u>	Future Yrs 2036 and beyond		
Cost per tonne	\$185	\$200	\$215	\$230	\$245	increases annually by 2% inflation		

**Calculation for Stage 2 Incremental Energy Demand**

Estimated Energy Demand with Pipeline Built  
 Equals Potential annual energy demand (for Stage 2 calculations)  
 Times Weighted Average Savings per M3 plus Cost of Carbon  
 Equals Annual Fuel Savings: Natural Gas Vs Alt Fuels

**Discount Rate for Net Present Values** 4.0%

**Length of Term for Fuel Savings**

Stage 2 estimated based on 20 years and 40 years

**Present Value of Customer Fuel Savings**

For conservatism, the NPV is assessed over 20 years with sensitivity at 40 years

Figures in \$ Millions	20 Years	40 Years
General Service Fuel Savings	222	326

NPV Fuel Savings Range from \$222 Mil over 20 yrs to \$326 Mil over 40 yrs





ENBRIDGE GAS INC.

Answer to Interrogatory from  
Environmental Defence (ED)

INTERROGATORY

Reference:

Updated evidence

Question(s):

(a) Please provide updated responses to Exhibit JT2.3 and Exhibit JT2.7 or explain why they are not relevant.

Response:

Please see the responses at Exhibit JT2.3 (updated October 3, 2023) and Exhibit JT2.7 (updated October 3, 2023).



ENBRIDGE GAS INC.

Answer to Interrogatory from  
Environmental Defence (ED)

INTERROGATORY

Reference:

Exhibit E, Tab 1, Schedule 6, Page 1 of 1

Question(s):

(a) The updated evidence changed the cost per tonne for carbon for 2031 and beyond from \$170 to \$0 in Schedule 6. Please explain this change.

(b) Please provide an update to Schedule 6 and all interrogatories and undertaking response based on Schedule 6 with the previous carbon price assumption of \$170 per tonne for 2031 and beyond

Response:

- a) This is a typographical error in Exhibit E, Tab 1, Schedule 6 which only impacts the figure displayed in this Schedule and does not impact the underlying calculations. The cost per tonne for carbon used in the underlying calculations for Enbridge Gas's Stage 2 analysis for 2031 and beyond is \$170, not \$0.
- b) Please see Attachment 1 for a corrected version of Exhibit E, Tab 1, Schedule 6. Please also see the response to part a) above. No other updates to Enbridge Gas's evidence are required.

Stage 2 (Customer Fuel Savings) Data for Panhandle Regional Expansion Project

Line	Assumptions			Fuel Mix in the Event Gas is Not Available			
	(a)	(b)	(c)	(d)=(b)-(c)	(e)	(f)=(d)*(e)	
			Gas		General Service		
	Fuel Prices	\$/m <sup>3</sup>	\$/m <sup>3</sup>	Diff \$/m <sup>3</sup>	Fuel Mix	Wt Ave Diff \$/ M <sup>3</sup>	
1	Heating Oil	1.90	0.30	1.60	Heating Oil	24%	0.382
2	Propane	1.14	0.30	0.84	Propane	10%	0.080
3	Electricity	1.08	0.30	0.78	Electricity	67%	0.520
4					Total %	100%	
5					Weighted Savings \$/m <sup>3</sup>		0.982

Gas and alternative fuel prices are the average posted prices for the 12 month period ending March 2023

Prices in the above table are before the added cost of Carbon.

**Carbon Prices** The cost of carbon is added to the price of each fuel in above table

	2024	2025	2026	2027	2028	2029	2030
Cost per tonne	\$80	\$95	\$110	\$125	\$140	\$155	\$170
Cost per tonne	Future Yrs 2031 and beyond \$170						

**Calculation for Stage 2 Incremental Energy Demand**

	Estimated Energy Demand with Pipeline Built
Equals	Potential annual energy demand (for Stage 2 calculations)
Times	Weighted Average Savings per M3
Equals	Annual Fuel Savings: Natural Gas Vs Alt Fuels

**Discount Rate for Net Present Values** 4.0%

**Length of Term for Fuel Savings**

Stage 2 estimated based on 20 years and 40 years

**Present Value of Customer Fuel Savings**

For conservatism, the NPV is assessed over 20 years with sensitivity at 40 years

Figures in \$ Millions	20 Years	40 Years
General Service Fuel Savings	226	353

NPV Fuel Savings Range from \$226 Mil over 20 yrs to \$353 Mil over 40 yrs

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Environmental Defence (ED)

INTERROGATORY

Reference:

Exhibit A, Tab 4, Schedule 1, Page 2

Preamble:

Enbridge states:

“On February 1, 2023, Enbridge Gas filed a letter stating that, following receipt of the new cost information, the Company also re-assessed the capacity position of the Panhandle System based on actual 2022 attachments and their system locations, as well as updated 2023 customer demand. As a result of that re-assessment, the Company anticipated that incremental demand for Winter 2023/2024 could be accommodated and that the Project’s in-service date can be deferred one year (from November 1, 2023, to November 1, 2024).”

Question(s):

- (a) Please provide a table showing the details of the re-assessed capacity position, including a before and after breakdown of the design hour and day demand by customer type.
- (b) Please provide a table showing the details of the re-assessed attachment figures, including a before and after breakdown by customer type.
- (c) Please provide Enbridge’s best estimate for the reasons for the changed capacity position.

Response:

- a) Details regarding updates to the existing system's capacity position between the initial application filed June 2022 and the amended application filed June 2023 are provided in Table 1 below. Please note that system capacity is not established by customer type and design hour is not applicable to transmission system design.

Table 1: Panhandle System Capacity Position Updates

<b>System Capacity (TJ/d)</b>	<b>Capacity Change (TJ/d)</b>	<b>Details</b>
713.2	--	Best available information at the time of initial application (June 2022)
740.3	+27.1	Existing and forecast customer demands shifting towards more hydraulically favorable areas.
736.5	-3.8	SWAHV <sup>1</sup> decrease

<sup>1</sup> The System-Wide Average Heating Value ("SWAHV") is the energy content of natural gas and is updated on an annual basis. From the time of the initial application and evidence filed June 2022 to the amended application and evidence filed June 2023, the SWAHV changed from 0.00003932 TJ/m<sup>3</sup> to 0.00003912 TJ/m<sup>3</sup>.

b) Please see Table 2 below for a comparison of the demand forecast included within the initial application filed June 2022 (“Before”) and the amended application filed June 2023 (“After”) by customer type.

To preserve confidentiality of customer-specific commercially sensitive information that could divulge the nature and timing of investment decisions, Enbridge Gas is seeking confidential treatment of redacted content in Table 2. The “Large Commercial/Industrial” category reveals information about the timing and volume of incremental demand attributable to an individual customer, NextStar Energy.

The “Greenhouse” line must also be redacted so that the demand for the “Large Commercial/Industrial” category could not be calculated using aggregate figures which have been provided at other Exhibits. For example, Exhibit B, Tab 1, Schedule 1, Table 2 displays demand figures for the “Contract Firm (Total excluding Power Generators)” category which is the aggregate of the “Greenhouse” and “Large Commercial/Industrial” categories in Table 2 below. If the “Greenhouse” category in Table 2 below is not redacted, the “Large Commercial/Industrial” category could be calculated.

**Table 2: Demand Forecast Comparison by Customer Type (TJ/d)**

	Winter 21/22		Winter 22/23		Winter 23/24		Winter 24/25		Winter 25/26		Winter 26/27		Winter 27/28		Winter 28/29		Winter 29/30		Winter 30/31	
	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After
General Service Firm (M1/M2)	304	304	305	298	306	299	307	301	308	303	310	305	311	307	312	308	313	310	314	311
General Service Firm (M2 with hourly measurement available)	6	6	6	9	6	9	6	9	6	9	6	9	5	9	6	9	6	9	6	9
Greenhouse - Firm Contract Only																				
Power Generators - Firm Contract only	106	106	106	106	106	106	164	163	164	195	164	195	164	195	164	195	164	195	164	195
Large Commercial/Industrial - Firm Contract only																				
<b>Total System Demand Forecast</b>	<b>672</b>	<b>672</b>	<b>694</b>	<b>698</b>	<b>744</b>	<b>730</b>	<b>828</b>	<b>802</b>	<b>854</b>	<b>849</b>	<b>880</b>	<b>863</b>	<b>905</b>	<b>878</b>	<b>932</b>	<b>892</b>	<b>958</b>	<b>906</b>	<b>983</b>	<b>921</b>
<b>Before and After Demand Difference</b>		0		4		-14		-26		-5		-16		-28		-39		-51		-63

- c) There were two reasons for the change in the system's capacity position between the initial application filed June 2022 and the amended application filed June 2023 (i.e., existing and forecast customer demands shifting towards more hydraulically favorable areas, and the SWAHV update). Please see the responses to part a) above and to Exhibit I.APPrO.11, part 1 for more information.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Environmental Defence (ED)

INTERROGATORY

Reference:

Exhibit A, Tab 4, Schedule 1, Page 4

Question(s):

- (a) Please provide a copy of the original and the revised EOI/ROS, highlighting the change in text.
- (b) Please provide a copy of all communications to customers referred to in paragraph 16 and all responses from customers.
- (c) Please explain why Enbridge undertook the steps described in paragraph 16 for the updated application but did not do so prior to filing the original application.
- (d) Please provide a breakdown of the changes that resulted from (i) more interruptible service, (ii) accounting for planned conservation, or (iii) other reasons.
- (e) Are the steps described in paragraph 16 the standard Enbridge practice?
- (f) Has Enbridge ever conducted the steps described in paragraph 16 before? If yes, please describe when and provide examples. If not, why not, and why start now?
- (g) Will Enbridge be conducting the steps described in paragraph 16 on a going forward basis?

Response:

- a) Please see Attachment 1 to this response for the 2021 EOI/ROS forms (i.e., Exhibit B, Tab 1, Schedule 1, Attachment 1 and 2) with yellow highlights indicating information that was changed or not included in relation to the 2023 EOI/ROS forms.

Please see Attachment 2 to this response for 2023 EOI/ROS forms (i.e., Exhibit B, Tab 1, Schedule 1, Attachment 8 and 9) with blue highlights indicating information that was changed or not included in relation to the 2021 EOI/ROS forms.

- b) Regarding communications to customers, please see the response at Exhibit I.FRPO.15, part c). Regarding response, please see Exhibit I.FRPO.15, Attachment 1.
- c) The enhancements made to the 2023 EOI/ROS forms described at Exhibit A, Tab 4, Schedule 1, paragraph 16 were made “to gain further clarity and certainty regarding the nature of customer interest/bids.” Enhancements to the EOI/ROS forms, such as those described at paragraph 16, are an outcome of Enbridge Gas’s focus on improving its understanding of customer needs, which is informed by stakeholder input where appropriate. For clarity, the demand forecast underpinning the need for the Project was informed by the 2023 EOI/ROS and not the 2021 EOI/ROS.
- d) Enbridge Gas does not have the information broken down in the manner requested by ED. The 2023 EOI/ROS process was designed to update Enbridge Gas’s understanding of the natural gas needs of customers – it was not designed to understand the changes between the 2021 and 2023 EOI/ROS. For information regarding the outcomes of the 2023 EOI/ROS process in relation to paragraph 16, please see Exhibit B, Tab 1, Schedule 1, paragraphs 23 – 31.

e) and g)

EOI/ROS forms have evolved (and are expected to continue to evolve) based on learnings from previous EOI/ROS processes as well as stakeholder feedback where appropriate. As such, EOI/ROS forms can differ between projects to reflect the needs of each project in question. Enbridge Gas does not have a “standard practice”.

- f) Enbridge Gas has not explicitly included the enhancements described at paragraph 16 within EOI/ROS forms for previous projects, however the topics (for example, providing information regarding the availability of interruptible service as an alternative to new firm service and providing information regarding the Company's DSM programs) are part of the utility's regular/ongoing discussions with existing and prospective customers. Also, contract parameters are reviewed annually, and customers can re-visit and discuss contract parameter changes if their business needs have changed. For reasons why Enbridge Gas made the enhancements to the 2023 EOI/ROS forms for this Project, please see the response to part c) above.





February 17, 2021

**Panhandle Regional Expansion Project**  
**Expression of Interest and Capacity Request Form**

To serve a growing demand for natural gas across all sectors in Essex County, including Windsor, LaSalle, Amherstburg, Tecumseh, Essex, Leamington, Lakeshore, Kingsville, and in western Chatham-Kent, Enbridge Gas Inc. (“**Enbridge**”) is pleased to announce this Expression of Interest for natural gas distribution service, which may require incremental facilities to serve this area (see attached map on page 4).

This Panhandle Regional Expansion Project (the “**Project**”) is considering alternatives that could provide 65,000 to 130,000 m<sup>3</sup>/hour of additional natural gas capacity. Depending on customer location additional local reinforcement may also be required to serve new and existing customers in this developing area. The potential Project is targeting incremental net demand from all sectors and is focused on the Large Volume commercial, industrial and greenhouse growth planned over the next five to ten years. Large Volume customers would include those consuming at least 50,000 m<sup>3</sup>/year or more. Small Volume customers interested in capacity should submit their request via the [Get Connected](#) website. The purpose of this expression of interest is to gather Large Volume customer input to help prepare a forecast that identifies the location, timing and magnitude of customer growth. The information gathered through the Expression of Interest process will be used to evaluate and finalize alternatives necessary to meet the demands and timing identified (potentially as early as fall 2023 or 2024).

Enbridge Gas recognizes that with the COVID-19 pandemic, many businesses are currently facing significant challenges; however, many others are planning significant growth. To ensure adequate capacity is available to accommodate the timing of any growth, the process must move forward at this time. Concurrent with this process to express interest in new capacity, all existing contract rate class customers in the Area of Benefit (see attached map on page 4) will be offered the opportunity to “turn back” or de-contract their capacity via a concurrent Reverse Open Season using the same bid form. Bids under the Reverse Open Season will be subject to other customers contracting to take on that “turned back” capacity. In this way, Enbridge will minimize the facilities required to serve incremental demand while optimizing any unwanted existing capacity. Existing customers should submit only one form for each site. Existing customers or potential new customers contemplating an expansion on a new site/address should submit a form for each new site/address.

The development of this Project is contingent upon sufficient net market demand and approval of the Project by the Ontario Energy Board (“**OEB**”). If sufficient demand is demonstrated, Enbridge Gas will file a Leave to Construct application with the OEB, with the goal of making the Project economically viable for customers in the area. Included in that application will be a proposed economic allocation methodology. Assuming the proposed economic allocation methodology is approved; large volume customers would be expected to execute distribution contracts of at least 10 years in order to make an economic contribution towards the transmission component of the Project. The Hourly Allocation Factor process recently approved by the OEB will be used for any additional distribution facilities that may be required related to the demands served by the transmission facilities. By proposing this approach, Enbridge Gas is trying to ensure the Project is economic for customers. This allocation will



address the facilities needed to serve the area shown on the attached map (page 4). This allocation does not include costs that are required to serve each specific customer such as new facilities built at the customer's site. The proposed allocation methodology will be subject to an economic review and approval of the OEB.

Enbridge Gas will consider the size and location of all requests for new capacity in designing the optimal facilities. If insufficient net customer interest or economic approval is not forthcoming, the Project is unlikely to proceed as proposed herein.

Capacity would be available for the following services, depending on market support:

1. New firm distribution service
2. Conversion of existing interruptible distribution service to firm service
3. New interruptible distribution service

This Expression of Interest process closes, and completed Expressions of Interest Bid Forms are due, no later than **12:00 p.m. EDT on Wed. March 31, 2021.**

### **Service Description and Details**

1. As this Project requires a significant capital investment by Enbridge Gas, the term of the customer's natural gas distribution contracts will be no less than five years and not to exceed 20 years; and/or may include upfront payments for capacity and/or negotiated rates above currently OEB approved and posted, which do change over time. The facilities, rates and services included in this Expression of Interest will be subject to OEB approval and sufficient interest being received to justify a Project. The final scope of the proposed facilities will be determined using the demands from the forecast resulting from the EOI process and may change from those contemplated herein.
2. Submitting an Expression of Interest form:  
If you wish to participate in this Expression of Interest in the **Panhandle Regional Expansion Project**, please complete, sign and return the attached non-binding Expression of Interest Bid Form via email to [Economic.Development@enbridge.com](mailto:Economic.Development@enbridge.com). Completed forms must be returned by email on or before 12 p.m. EDT on Wed. March 31, 2021. The returned Bid Forms will be time-stamped by the date on the bidder's email.

### **Expression of Interest Process and Bid Form**

This process is designed to gauge interest in the Project and to assist Enbridge Gas with determining the optimal facility requirements to meet market needs and prepare an application to the Ontario Energy Board. Enbridge Gas will acknowledge receipt of all Bid Forms by email on or before the end of day on Friday, April 2, 2021. Enbridge Gas in its sole discretion reserves the right to reject any and all bids received.

Any suggested contractual Condition(s) Precedent that the customer proposes should be clearly articulated and attached to the Bid Form and will be considered during the capacity allocation process.

Enbridge Gas anticipates allocating capacity on a preliminary and conditional basis to successful



**bid**ders by the end of June 2021. Successful bidders will then be asked to commit to the capacity by executing a Letter of Indemnity or an Enbridge Gas Distribution Contract **or Letter of Agreement** to more formally support the need for the project. **Any updates to the EOI process or timelines will be posted online here: [www.enbridgegas.com/PanhandleRegionalExpansion](http://www.enbridgegas.com/PanhandleRegionalExpansion)**

If you have any questions about the Panhandle Regional Expansion Project, please contact your account manager or one of the following:

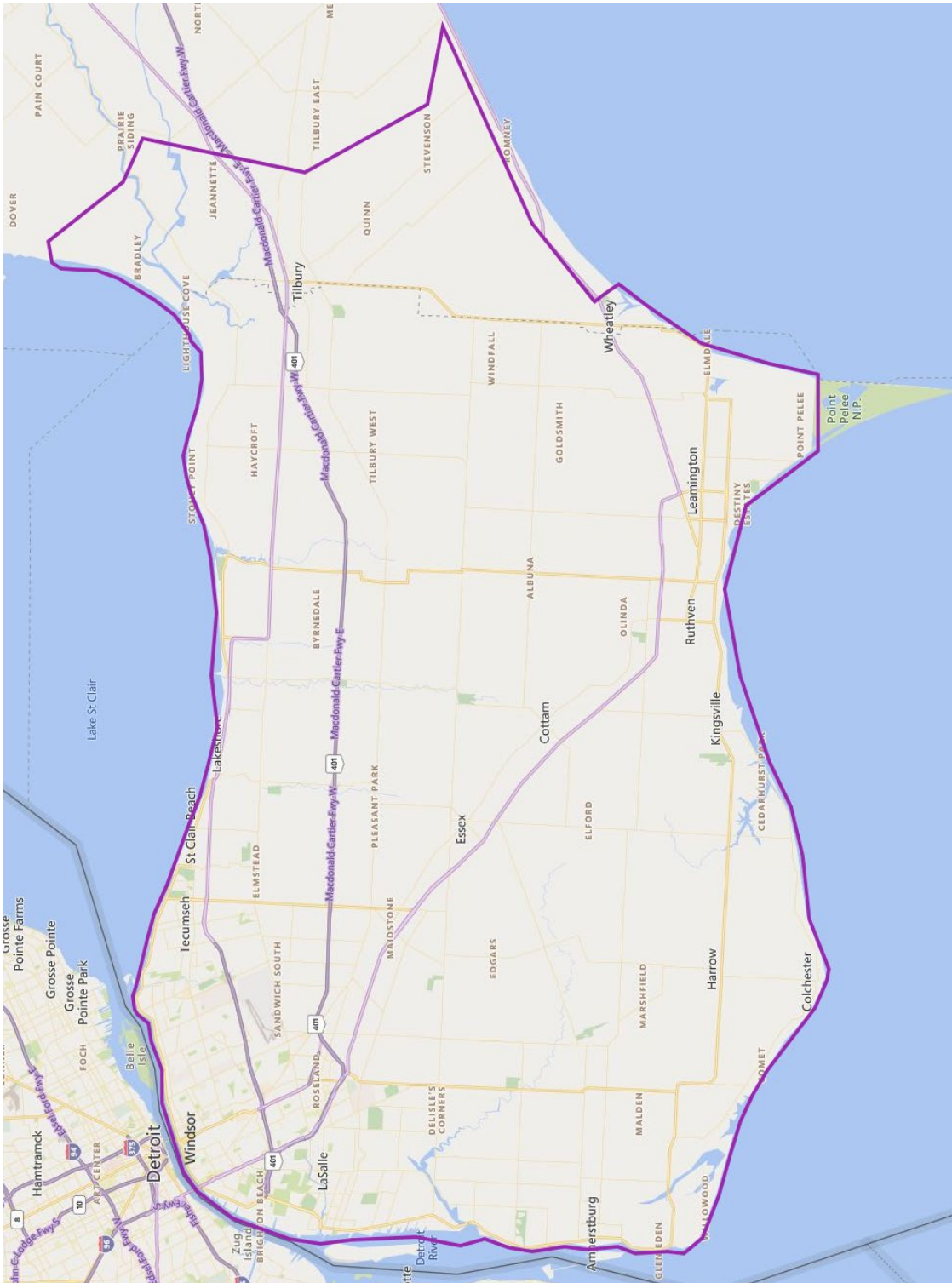
Patrick Boyer  
Account Manager  
Cell: (519) 436 4915  
[Patrick.Boyer@enbridge.com](mailto:Patrick.Boyer@enbridge.com)

Paul Rikley  
Account Manager  
Cell: (519) 350 2570  
[Paul.Rikley@enbridge.com](mailto:Paul.Rikley@enbridge.com)

Sutha Ariyalingham  
Manager, Strategic and Power Markets  
Cell: (647) 241 9969  
[Sutha.Ariyalingham@enbridge.com](mailto:Sutha.Ariyalingham@enbridge.com)

### Map of proposed project service area

The map below outlines the area that is under consideration for a potential project to expand natural gas capacity. **All potential large volume commercial, greenhouse or industrial customers** considering developments within this area over the next five to ten years are encouraged to participate in this Non-Binding Expression of Interest.





**Expression of Interest Non-Binding Bid Form:**

Please complete, sign and return this Expression of Interest Non-Binding Bid Form (“**Bid Form**”) on or before 12:00 p.m. EDT on **Wed. March, 31, 2021**, via email to [Economic.Development@enbridge.com](mailto:Economic.Development@enbridge.com)

Based on the responses received through this Bid Form and the Reverse Open Season, Enbridge Gas will be able to define the optimal facilities required to support market needs. Enbridge Gas will determine whether to proceed with the Project, as proposed or with a refined scope, or not at all, based on the assessment of the results from this signed Bid Form and project economics. Customers may only submit one Bid Form per property. Bid Forms will be treated as confidential and only aggregated or non-identifiable data will be used to support any application to the Ontario Energy Board.

Property address: \_\_\_\_\_ SA: \_\_\_\_\_  
 911 address X,Y (latitude and longitude, if known) (if known)

**New FIRM natural gas needs.** An increase of firm gas needs at the above location (i.e. new equipment, new processes), or a new firm gas load as a result of a new build.

Year	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Incremental (m <sup>3</sup> /h)											
Cumulative											

Ultimate incremental **firm** gas needs over planning horizon: \_\_\_\_\_ m<sup>3</sup>/hour (please provide details on estimated timing above)

**Conversion from interruptible distribution service to firm distribution service.** The amount of incremental firm distribution service needed net of any existing firm distribution service resulting from conversion of existing interruptible service to firm distribution service.

Year	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Incremental (m <sup>3</sup> /h)											
Cumulative											

**New INTERRUPTIBLE natural gas needs.** An increase of interruptible gas needs at the above location (i.e. new equipment, new processes), or a new interruptible gas load as a result of a new build where customer is willing to accept the terms and conditions of interruptible service (for example periodic curtailment of gas distribution service).

Year	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Incremental (m <sup>3</sup> /h)											
Cumulative											

Ultimate incremental **interruptible** gas needs (over planning horizon): \_\_\_\_\_ m<sup>3</sup>/hour (please provide details on estimated timing above)

**Economic Development impacts related to incremental gas needs:**

Number of net new jobs related to this expansion: \_\_\_\_\_ direct + \_\_\_\_\_ indirect = \_\_\_\_\_ total

Number of current jobs at risk if economical access to gas is not available: \_\_\_\_\_

Capital investment by Customer at the site conditional on economical access to gas: \$ \_\_\_\_\_

Please detail any other benefits from increased access to gas (lower GHG emissions or costs by displacing an alternative energy source etc.): \_\_\_\_\_

Total Incremental distribution service capacity (New firm + conversion of Interruptible): \_\_\_\_\_ m<sup>3</sup>/hour.

Total job impacts related to economical access to natural gas (total new + current “at risk”): \_\_\_\_\_ jobs



**Customer Conditions Precedent for growth:** If the Customer's Expression of Interest for growth is subject to Conditions Precedent, (please attach a separate page with details if space insufficient):

\_\_\_\_\_

\_\_\_\_\_

**Option for Reverse Open Season (Turnback of existing capacity under contract at an existing site)**

**Turn back existing FIRM distribution service.** The amount of **firm** distribution service at the identified location no longer required by the customer.

Year	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Turnback (m <sup>3</sup> /h)											
Cumulative											

**Turn back existing INTERRUPTIBLE distribution service.** The amount of **interruptible** distribution service at the identified location no longer required by the customer.

Year	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Turnback (m <sup>3</sup> /h)											
Cumulative											

**Customer Conditions Precedent for turnback of capacity:** If the Customer's request to turn back excess or unwanted capacity is subject to Conditions Precedent, (please attach a separate page with details if space insufficient):

\_\_\_\_\_

\_\_\_\_\_

Customer's legal name: \_\_\_\_\_

Name of Authorized Representative: \_\_\_\_\_  
Please Print Signature

Phone: \_\_\_\_\_ Email: \_\_\_\_\_

Dated this \_\_\_\_ day of \_\_\_\_\_, 2021



**September 29, 2021**

**Panhandle Regional Expansion Project**

**In Franchise Binding Reverse Open Season**

On February 17, 2021, Enbridge Gas Inc. (“**Enbridge Gas**”) issued a Panhandle Regional Expansion Project Expression of Interest and Capacity Request (“**EOI**”). Based on the interest received from the EOI, Enbridge Gas expects expansion facilities will be required to meet the incremental demands for gas distribution service. To ensure economically efficient expansion of Enbridge Gas’s pipeline system, we are now inviting binding bids for existing capacity turn-back.

Enbridge Gas is offering all existing distribution contract rate customers in the proposed project service area (see attached map on page 3) the opportunity to “turn-back” or de-contract existing distribution capacity.

Bids submitted in this Binding Reverse Open Season represent a legally binding commitment to turn back capacity. Existing customers should submit only one binding bid form for each distribution contract. Enbridge Gas, in its sole discretion, reserves the right to reject any and all bids received.

For details on the proposed Panhandle Regional Expansion Project, please visit:

[www.enbridgegas.com/PanhandleRegionalExpansion](http://www.enbridgegas.com/PanhandleRegionalExpansion)

This Binding Reverse Open Season closes, and bid forms are due, no later than **12:00 p.m. EDT Friday October 15, 2021.**

**Submitting a Bid Form**

If you wish to participate in this Binding Reverse Open Season please complete, sign and return the attached Binding Reverse Open Season Bid Form via email to [Economic.Development@enbridge.com](mailto:Economic.Development@enbridge.com). Completed forms must be returned by email on or before 12 p.m. EDT on Friday October 15, 2021. The returned Binding Reverse Open Season Bid Forms will be time-stamped by the date on the bidder’s email.

This process is designed to assist Enbridge Gas with determining the optimal facility requirements to meet market needs and prepare an application to the Ontario Energy Board for the proposed Panhandle Regional Expansion Project. Enbridge Gas will acknowledge receipt of all Reverse Open Season Bid Forms by email on or before the end of day on Monday October 18, 2021.

Any suggested contractual Condition(s) Precedent that the bidder proposes should be clearly articulated and attached to the Binding Reverse Open Season Bid Form and will be considered during the capacity turnback process.



If you have any questions about this Binding Reverse Open Season or the Panhandle Regional Expansion Project, please contact your account manager or one of the following:

Patrick Boyer  
Account Manager  
Cell: (519) 436 4915  
[Patrick.Boyer@enbridge.com](mailto:Patrick.Boyer@enbridge.com)

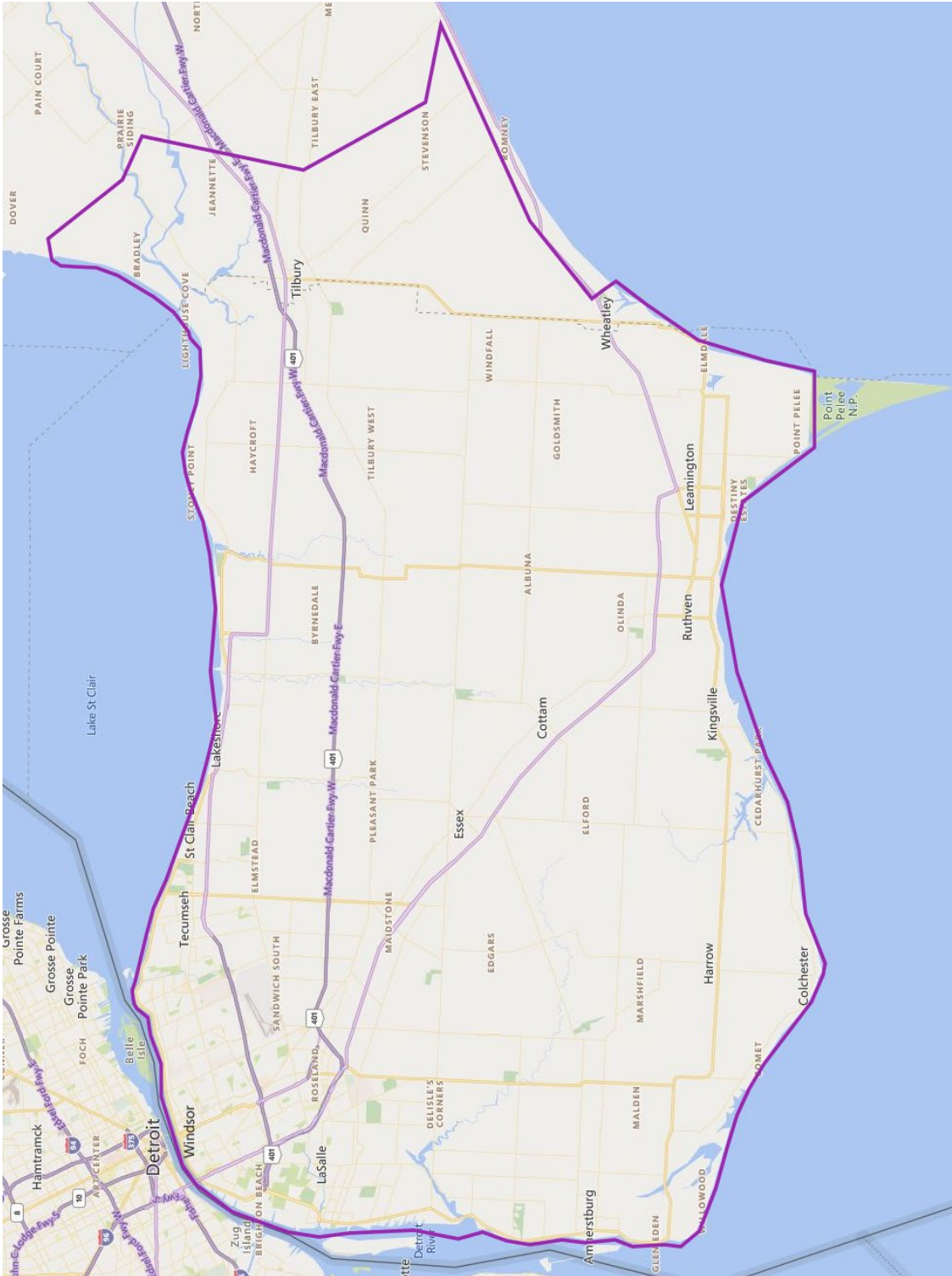
Paul Rikley  
Account Manager  
Cell: (519) 350 2570  
[Paul.Rikley@enbridge.com](mailto:Paul.Rikley@enbridge.com)

Mark Noce  
Account Manager  
Cell: (289) 659 3667  
[Mark.Noce@enbridge.com](mailto:Mark.Noce@enbridge.com)



### **Proposed project service area for Binding Reverse Open Season**

The map below outlines the area that is under consideration for a potential project to expand natural gas capacity. All distribution contract rate customers holding existing Firm or Interruptible distribution capacity in this area that wish to turn back some or all of this capacity are invited to participate in this Binding Reverse Open Season.





**Binding Reverse Open Season Bid Form:**

Please complete, sign and return this Binding Reverse Open Season Bid Form (“**Bid Form**”) on or **before 12:00 p.m. EDT on Friday October 15, 2021**, via email to [Economic.Development@enbridge.com](mailto:Economic.Development@enbridge.com)

It is understood that Enbridge will review all Bid Forms and acknowledge all Bid Forms received on or before **October 15, 2021**. If Bidder’s bid is accepted, with or without conditions, Enbridge will notify Bidder accordingly.

Bidders may only submit one Bid Form per distribution contract. Bid Forms will be treated as confidential and only aggregated or non-identifiable data will be used to support any application to the Ontario Energy Board.

Site address: \_\_\_\_\_ Distribution Contract SA: \_\_\_\_\_  
911 address

**Binding Reverse Open Season (Turnback of existing capacity under contract at an existing site)**

**Turn back existing FIRM distribution service.** The amount of **firm** distribution service at the identified location no longer required by the customer.

Year	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Turnback (m <sup>3</sup> /hr)											
Cumulative											

**Turn back existing INTERRUPTIBLE distribution service.** The amount of **interruptible** distribution service at the identified location no longer required by the customer.

Year	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Turnback (m <sup>3</sup> /hr)											
Cumulative											

**Bidder** Conditions Precedent for **turnback of capacity**: If the **Bidder’s** request to turn back excess or unwanted capacity is subject to Conditions Precedent, please include these Conditions Precedent in the space below or attach a separate page to this Bid Form:

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Bidder’s legal name: \_\_\_\_\_

Name of Authorized Representative: \_\_\_\_\_  
Please Print Signature

Phone: \_\_\_\_\_ Email: \_\_\_\_\_

Dated this \_\_\_\_ day of \_\_\_\_\_, **2021**



February 23, 2023

**Panhandle Regional Expansion Project  
Expression of Interest and Reverse Open Season**

On February 1, 2023, Enbridge Gas Inc. (“Enbridge Gas”) submitted a request to the Ontario Energy Board (“OEB”) to hold the leave-to-construct application for the Panhandle Regional Expansion Project (the “Project”) in abeyance until August 2023 to allow time to update Project costs, the capacity position of the Panhandle System and customer demand forecasts (OEB Case No. EB-2022-0157). This will ensure the efficient expansion of natural gas facilities in the region.

The proposed Project is a transmission project that will help meet forecast demand within a large area of benefit and will supply the distribution networks which directly serve end-use customers. No customers will be directly connected to the proposed transmission facilities.

Enbridge Gas is conducting this second Expression of Interest and a concurrent Binding Reverse Open Season to reconfirm market demand in the Panhandle market area. It is important that in the contemplation of any bid, customers fully consider opportunities that may reduce their firm demand requirements, including Demand Side Management, interruptible rates, and alternative sources of energy.

Information received during this process will inform Enbridge Gas as to whether any changes to the Project are required.

Enbridge Gas is also requesting that customers expressing interest in new firm capacity provide additional information regarding their request to support the updates to the Project application that will be filed later this year.

**Non-Binding Expression of Interest:**

Enbridge Gas is once again inviting all large volume commercial, industrial, power generation and greenhouse customers to submit non-binding bids to express interest in new capacity (relative to their existing contracted capacity). For clarity, any customers who participated in Enbridge Gas’ 2021 Non-Binding Expression of Interest should submit a new bid form as part of this Expression of Interest for the full amount of additional capacity required in 2024 and beyond. Unless Enbridge Gas receives a new bid form, the company will assume that no new capacity is required. The purpose of this Expression of Interest is to gather large volume customer input to generate an informed forecast that identifies the location, timing and magnitude of customer growth. Large volume customers are those consuming at least 50,000 m<sup>3</sup>/year or more. Small volume customers interested in capacity should submit their request via the [Get Connected](https://www.enbridgegas.com/connect-to-gas) website.<sup>1</sup>

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<sup>1</sup> <https://www.enbridgegas.com/connect-to-gas>



The information gathered through the Expression of Interest process will be used to confirm and evaluate the alternatives with the potential to meet the demands and timing identified.

Depending on customer location, additional local reinforcement may also be required to serve new and existing customers in this developing area.

Existing customers should submit only one bid form for each site. Existing customers or potential new customers contemplating an expansion on a new site/address should submit a bid form for each new site/address.

Enbridge Gas will consider the size and location of all requests for new capacity in designing the optimal facilities. If there is insufficient net customer interest, or if economic approval is not forthcoming, the Project is unlikely to proceed as proposed herein.

Depending upon market interest received, the Project will create capacity for the following services:

1. New firm distribution service
2. Conversion of existing interruptible distribution service to firm service
3. New interruptible distribution service

This Expression of Interest and Binding Reverse Open Season process will close by, and completed bid forms are due no later than, **12 p.m. EDT on Thursday, April 6, 2023.**

### **Service Description and Details**

1. As this Project requires a significant capital investment by Enbridge Gas, the term of customers' associated natural gas distribution contracts will be no less than five years and not to exceed 20 years; and/or may include upfront payments for capacity and/or negotiated rates above those currently approved and posted by the OEB to support the cost of constructing customer-specific distribution related facilities. The facilities, rates and services included in this Expression of Interest are subject to OEB approval and sufficient interest being received to justify the Project. To ensure the continued efficient expansion of natural gas facilities in the region, the final scope of the proposed Project facilities will be informed by the demand forecast that results in part from this Expression of Interest process.
2. Submitting an Expression of Interest form:  
If you wish to participate in this Expression of Interest relating to the **Panhandle Regional Expansion Project**, please complete, sign and return the attached non-binding Expression of Interest Bid Form via email to [Economic.Development@enbridge.com](mailto:Economic.Development@enbridge.com). Completed bid forms must be returned by email on or before 12 p.m. EDT on **Thursday April 6, 2023.**

### **Expression of Interest Process and Bid Form**

This process is designed to gauge market demand in the Panhandle market area and to assist Enbridge Gas with determining the optimal facility requirements to meet market needs. Enbridge Gas will acknowledge receipt of all bid forms by email on or before the end of day on **Tuesday, April 11, 2023.** Enbridge Gas in its sole discretion reserves the right to reject any and all bids received.



Any suggested contractual Condition(s) Precedent that the customer proposes should be clearly articulated and attached to the bid form.

Successful bidders will then be asked to commit to the capacity by executing a Letter of Indemnity or an Enbridge Gas Distribution Contract to more formally support the need for the Project. **Any updates to the Expression of Interest process or timelines will be posted online here: [www.enbridgegas.com/PanhandleRegionalExpansion](http://www.enbridgegas.com/PanhandleRegionalExpansion)**

**Binding Reverse Open Season:**

Concurrent with this process to express interest in new or incremental capacity, all existing contract rate class customers in the area of benefit are being offered the opportunity to “turn back” or de-contract their capacity via a concurrent Binding Reverse Open Season. Customers also have the option to convert existing firm distribution service to interruptible service.

Any capacity turned back by customers through the Binding Reverse Open Season will be used to minimize any facilities deemed to be required to serve incremental demand.

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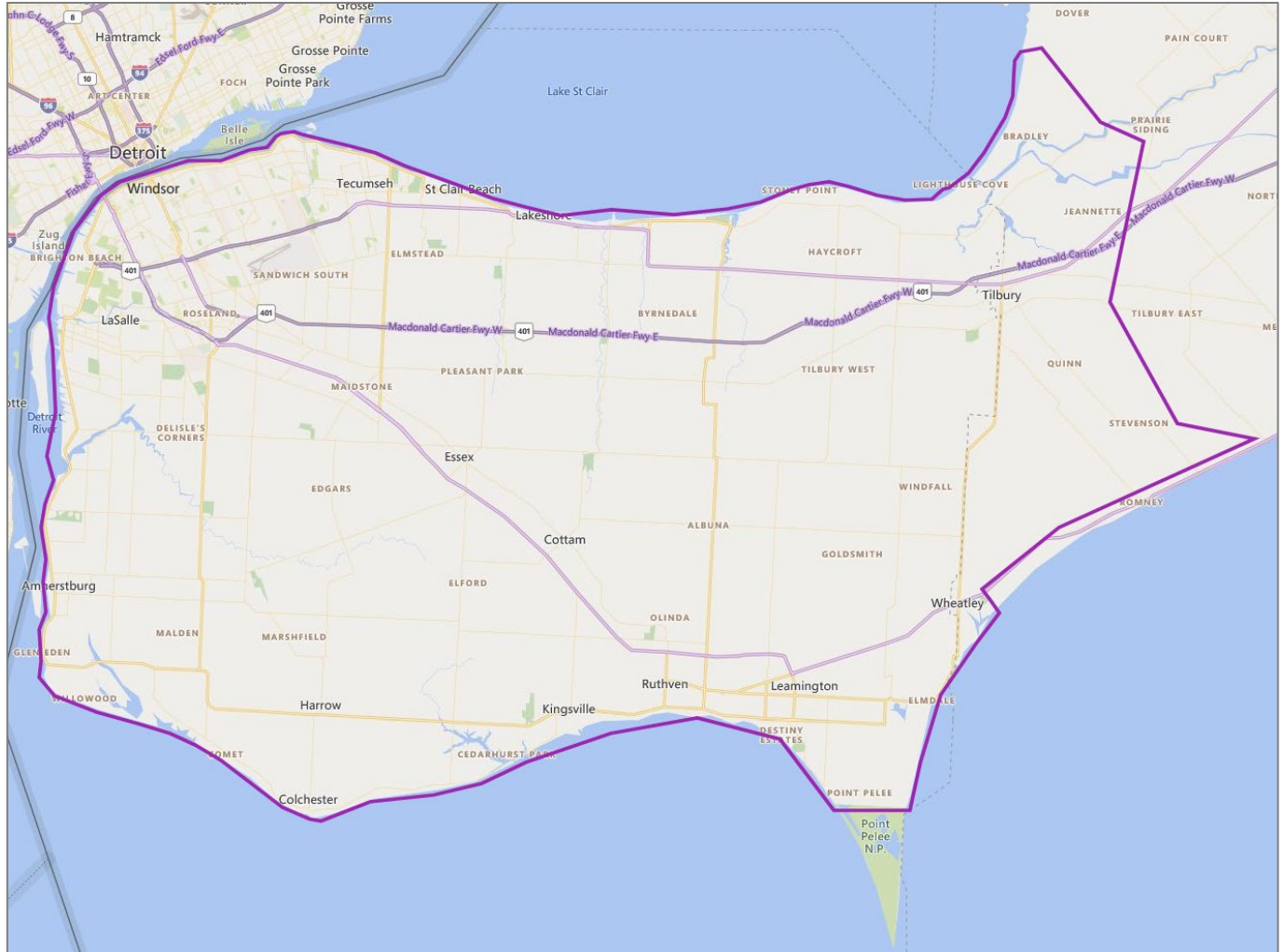
If you have any questions about the Panhandle Regional Expansion Project, **please contact your account manager** or one of the following individuals:

Patrick Boyer Account Manager Cell: (519) 436 4915 <a href="mailto:Patrick.Boyer@enbridge.com">Patrick.Boyer@enbridge.com</a>	Awais Zulfiqar Account Manager Cell: (519) 784 6567 <a href="mailto:Awais.Zulfiqar@enbridge.com">Awais.Zulfiqar@enbridge.com</a>	Matt Ciupka Economic Development Specialist Cell: (519) 784 3919 <a href="mailto:Matt.Ciupka@enbridge.com">Matt.Ciupka@enbridge.com</a>
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### **Map of proposed Project service area**

The map below outlines the area that is under consideration for a potential project to expand natural gas capacity. **All potential large volume commercial, greenhouse, industrial or power generation** customers considering developments within this area over the next five to ten years are encouraged to participate in this Non-Binding Expression of Interest.





**Expression of Interest Non-Binding Bid Form:**

Please complete, sign and return this Expression of Interest Non-Binding Bid Form (“**Bid Form**”) on or before **12 p.m. EDT on Thursday April 6, 2023**, via email to [Economic.Development@enbridge.com](mailto:Economic.Development@enbridge.com)

Based on the responses received through this Expression of Interest and Binding Reverse Open Season, Enbridge Gas will be able to confirm the optimal solution required to support market needs, including whether to proceed with the Project as proposed or with a refined scope. Customers may only submit one Bid Form per property. Bid Forms will be treated as confidential and only aggregated or non-identifiable data will be used to support any public submissions to the Ontario Energy Board. Enbridge Gas in its sole discretion reserves the right to reject any and all bids received.

Property address: \_\_\_\_\_ 911 address \_\_\_\_\_ X,Y (latitude and longitude, if known) SA: \_\_\_\_\_ (if known)

**New INTERRUPTIBLE natural gas needs.** An increase of interruptible gas needs at the above location (i.e. new equipment, new processes), or a new interruptible gas load as a result of a new build where customer is willing to accept the terms and conditions of interruptible service (for example periodic curtailment of gas distribution service)

Year	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Incremental (m <sup>3</sup> /h)										
Cumulative (m <sup>3</sup> /h)										

Total new **interruptible** gas needs (over planning horizon): \_\_\_\_\_ m<sup>3</sup>/hour

**Conversion of existing interruptible distribution service to firm distribution service.** The amount of incremental firm distribution service needed net of any existing firm distribution service resulting from conversion of existing interruptible service to firm distribution service.

Year	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Incremental (m <sup>3</sup> /h)										
Cumulative (m <sup>3</sup> /h)										

What are the driving factors behind the request to convert current interruptible service to firm service?

\_\_\_\_\_

**New FIRM natural gas needs.** An increase of firm gas needs at the above location (i.e. new equipment, new processes), or a new firm gas load as a result of a new build.

Year	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Incremental (m <sup>3</sup> /h)										
Cumulative (m <sup>3</sup> /h)										

Total new **firm** gas needs over planning horizon: \_\_\_\_\_ m<sup>3</sup>/hour

Please provide responses to following questions if you have expressed interest in new **FIRM** natural gas needs in the table above.



**Interruptible service as an alternative to new Firm service:**

Is interruptible service a viable option for your business/operations (i.e., could your operations accommodate service interruptions lasting one or more days on multiple occasions per year?) Yes / No

- If no, please explain why.

[Redacted]

(i.e. disruption to operations, alt fuel cost/availability/emissions, potential loss of production/product, etc.)

- If yes, how would you ensure compliance with a service interruption?

[Redacted]

(i.e. switch to alternate fuel source, shut down operations/processes etc.)

Would you be more inclined to consider interruptible service over new Firm service if the ability to negotiate lower than posted interruptible rates was available? Yes / No

- If no, please explain why.

[Redacted]

- If yes, please indicate the interruptible distribution delivery rate that would be required for you to consider interruptible service as an alternative to new Firm service (\$/m<sup>3</sup>/day or percentage reduction in the distribution rate)

[Redacted]

**Natural Gas Conservation:**

Has Enbridge Gas discussed energy conservation program offerings with you? Yes / No

By checking this box, we confirm that the bid amounts reflected above are inclusive of all future expected natural gas conservation activities (including natural gas conservations activities within and outside of Enbridge Gas' Demand Side Management programs, and the use of non-natural gas alternative options).

**Economic Development impacts related to incremental gas needs:**

Number of net new jobs related to this expansion: \_\_\_\_\_ direct + \_\_\_\_\_ indirect = \_\_\_\_\_ total

Number of current jobs at risk if economical access to gas is not available: \_\_\_\_\_

Capital investment by Customer at the site conditional on economical access to gas: \$ \_\_\_\_\_

Please detail any other benefits from increased access to gas (lower greenhouse gas emissions or costs by displacing an alternative energy source etc.): \_\_\_\_\_

Total Incremental distribution service capacity (New firm + conversion of Interruptible): \_\_\_\_\_ m<sup>3</sup>/hour

Total job impacts related to economical access to natural gas (total new + current "at risk"): \_\_\_\_\_ jobs





**Customer Conditions Precedent for growth:** If the Customer's Expression of Interest for growth is subject to Conditions Precedent, please indicate those conditions below. Please attach a separate page with details if additional space is required.

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Customer's legal name: \_\_\_\_\_

Name of Authorized Representative: \_\_\_\_\_  
Please Print Signature

Phone: \_\_\_\_\_ Email: \_\_\_\_\_

Dated this \_\_\_\_ day of \_\_\_\_\_, 2023



**Distribution Service Binding Reverse Open Season Bid Form:**

Please complete, sign and return this Binding Reverse Open Season Bid Form (“**Bid Form**”) on or **before 12 p.m. EDT on Thursday April 6, 2023**, via email to [Economic.Development@enbridge.com](mailto:Economic.Development@enbridge.com)

It is understood that Enbridge Gas will review and acknowledge all Bid Forms received on or **before April 11, 2023**. If a bid is accepted, with or without conditions, Enbridge Gas will notify the Bidder accordingly.

Bidders may only submit one Bid Form per distribution contract. Bid Forms will be treated as confidential and only aggregated or non-identifiable data will be used to support any application to the Ontario Energy Board. **Enbridge Gas in its sole discretion reserves the right to reject any and all bids received.**

Site address: \_\_\_\_\_ Distribution Contract SA: \_\_\_\_\_

Binding Reverse Open Season (Turnback of existing capacity under contract at an existing site)

**Turn back existing FIRM distribution service.** The amount of **firm** distribution service at the identified location no longer required by the customer.

**Reduction start date:** November 1, 2024      **Reduction volume:** \_\_\_\_\_ (m<sup>3</sup>/hr)

**Conversion of existing FIRM distribution service to INTERRUPTIBLE distribution service.** The amount of **firm** distribution service at the identified location that the customer would like to convert to **interruptible** service.

**Conversion start date:** November 1, 2024      **Conversion volume:** \_\_\_\_\_ (m<sup>3</sup>/hr)

**Turn back existing INTERRUPTIBLE distribution service.** The amount of **interruptible** distribution service at the identified location no longer required by the customer.

**Reduction start date:** November 1, 2024      **Reduction volume:** \_\_\_\_\_ (m<sup>3</sup>/hr)

**Interruptible service as an alternative to existing Firm service:**

Is interruptible service a viable option for your business/operations (i.e., could your operations accommodate service interruptions lasting one or more days on multiple occasions per year?) **Yes / No**

- If no, please explain why.

\_\_\_\_\_

(i.e. disruption to operations, alt fuel cost/availability/emissions, potential loss of production/product, etc.)

- If yes, how would you ensure compliance with a service interruption?

\_\_\_\_\_

(i.e. switch to alternate fuel source, shut down operations/processes etc.)



Would you be more inclined to consider converting existing firm distribution service to interruptible distribution service if the ability to negotiate lower than posted interruptible rates was available?

Yes / No

- If no, please explain why.

- If yes, please indicate the interruptible distribution delivery rate that would be required for you to consider converting existing firm service to interruptible service. (\$/m<sup>3</sup>/day or percentage reduction in the distribution rate)

**Customer** Conditions Precedent for **turnback/conversion of capacity**: If the **Customer's** request to turn back excess or unwanted capacity, **or to convert existing firm service to interruptible service**, is subject to Conditions Precedent, please indicate those conditions below. Please attach a separate page with details if additional space is required:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Customer's legal name: \_\_\_\_\_

Name of Authorized Representative: \_\_\_\_\_  
Please Print Signature

Phone: \_\_\_\_\_ Email: \_\_\_\_\_

Dated this \_\_\_\_ day of \_\_\_\_\_, 2023

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Environmental Defence (ED)

INTERROGATORY

Reference:

Exhibit A, Tab 4, Schedule 1, Page 5

Question(s):

- (a) Please provide a copy of the detailed calculations and figures underlying the comments in paragraph 19, including the forecast and actual 2022 customer demands, the original and updated forecasts, and so on.
- (b) Please explain why Enbridge undertook the steps described in paragraph 19 for the updated application but did not do so prior to filing the original application.
- (c) Are the steps described in paragraph 19 the standard Enbridge practice?
- (d) Has Enbridge ever conducted the steps described in paragraph 19 before? If yes, please describe when and provide examples. If not, why not, and why start now?
- (e) Will Enbridge be conducting the steps described in paragraph 19 on a going forward basis

Response:

a) The underlying analysis is completed through hydraulic modelling of the Panhandle Transmission System and therefore the requested calculations and figures cannot be reasonably provided. As stated in paragraph 19, the hydraulic model considers several factors including the magnitude and location of actual customer demands attaching to or leaving the system, forecasted new customer demands with anticipated locations, and assumption updates such as the system wide annual heat value (SWAHV). Please see Table 1 at the response to Exhibit I.ED.26, part a) for a detailed summary of changes to system capacity.

b) – e)

The information described in paragraph 19 are part of Enbridge Gas's standard practice for engineering hydraulic design, which is performed on an annual basis for

transmission and distribution systems. This practice was used for the initial application filed June 2022, the amended application filed June 2023, and will continue to be Enbridge Gas's practice on an ongoing basis.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Environmental Defence (ED)

INTERROGATORY

Reference:

Exhibit A, Tab 4, Schedule 1, Page 5-6

Question(s):

- (a) Please provide a copy of all correspondence to customers and all responses in relation to paragraphs 21 to 23.
- (b) Please provide a list of the customers that Enbridge communicated with in paragraphs 21 to 23 along with each customer's design day and design hour demand.
- (c) Why did Enbridge not ask customers whether they would be willing to contract for incremental capacity based if they had to pay \$X, with \$X being Enbridge's forecast of the CIAC that the customer would need to pay?
- (d) Please reach out to customers again and ask if they would still be interested in contracting for more capacity if they had to pay, with \$X being Enbridge's forecast of the CIAC that the customer would need to pay.
- (e) Please provide a table showing the CIAC per customer that would be necessary to achieve a PI of 1. Please make and state assumptions as necessary. Please also include a column with each customer's most recent annual gas costs (both commodity and delivery, or just delivery costs and volumes if they are a direct purchaser for which Enbridge does not have commodity costs) to contextualize the cost of the CIAC.
- (f) Please provide a table showing the CIAC per customer that would apply were the HAF rule to be applied here. Please make and state assumptions as necessary. Please also include a column with each customer's most recent annual gas costs (both commodity and delivery, or just delivery costs and volumes if they are a direct purchaser for which Enbridge does not have commodity costs) to contextualize the cost of the CIAC.

Response:

a) and b)

Please see the response at Exhibit I.STAFF.25, part a) including Attachment 1 to the response.

The requested demand information is not available until contracts are executed. Please see the response to Exhibit I.STAFF. 24, part a) for the status of contracts related to incremental capacity crated by the Project. For clarity, the EOI process is used to gather market intelligence from existing and new customers regarding their need for incremental natural gas capacity. The EOI results are then aggregated by year, analyzed against historical demand trends, and used as an input into the generation of an informed demand forecast.

c) Enbridge Gas did not discuss a specific CIAC or range of CIAC with customers. Rather, as part of the 2023 EOI, Enbridge Gas conducted outreach to customers who indicated their intention to submit an EOI bid to obtain their position on paying a CIAC. Enbridge Gas asked these customers how a requirement for a CIAC may impact their demands for new/incremental service. This outreach was a result of the OEB's Procedural Order No. 4 dated December 14, 2022, which stated:<sup>1</sup>

“Enbridge may also wish to consider whether it should be communicating with potentially affected customers regarding the position of some parties that contributions in aid of construction should be required.”

Calculating and/or providing a CIAC amount for a specific customer for a transmission project like the Project is not appropriate and not possible from a regulatory perspective. First, requiring CIAC for transmission assets is not a feature of EBO 134 and there is no OEB-approved methodology for its application. The contribution and the methodology to calculate the contribution is in effect a rate that must be approved by the OEB as being just and reasonable. If Enbridge Gas were to provide a number (even if one could be calculated) it would be highly speculative, a departure from past practice, and would represent to customers a rate that has never been considered and is not approved by the OEB.

From a practical perspective a number of unknowns including mass market demands, unidentified loads, final contracted demands, varying pressures and locations and benefits from a hydraulic perspective must be captured in any calculation or allocation. Furthermore, there is a temporal aspect that must also be considered. Not only are there unidentified loads that have yet to manifest but will benefit from the Project, the expected location and size of demands can vary by the time the Project is constructed. Larger greenhouses are being built, some more than

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<sup>1</sup> OEB Procedural Order No. 4 (December 14, 2022), p. 3.

90 acres, in response to the availability of other utilities such as water, wastewater and power. Greenhouses have shifted away from some of the traditional areas where they were once centered. For greater clarity, demands over a geographic area in question do not have a proportionate effect on the capacity consumed; so there is not an apparent approach to determine an allocation in a fair manner such that demands known today are not paying an inordinate amount relative to future demands. In essence, much of this issue arises because the Project is not a dedicated facility and is instead a dynamic system serving and benefiting both new (both known and unknown) and existing demands across a system west of Dawn. In addition, more importantly, the method suggested by some intervenors to simply applying a HAF methodology, which is not approved by the OEB for transmission projects, is not appropriate based on the large geographic area of the Panhandle region combined with the multi-year forecast of the Project.

Second, from a customer perspective, when contemplating transmission facility applications under E.B.O. 134, project costs are not directly allocated to end-use customers and customers are not required to provide a CIAC to improve Stage 1 economics. Historically, transmission projects have required Stages 2 and 3 to pass the economic feasibility test under E.B.O. 134. Changing the established framework of E.B.O 134 within a single leave to construct application to require a CIAC contribution framework is inappropriate. Such a change would have a wide-ranging impact on the ability to meet increased demand for energy for future growth in Ontario, regardless of whether a project is being built to meet contract or general service growth.

Please also see the response at Exhibit I.STAFF.26, part a).

d) – f)

Please see the response to part c) above.



ENBRIDGE GAS INC.

Answer to Interrogatory from  
Environmental Defence (ED)

INTERROGATORY

Reference:

Exhibit B, Tab 1, Schedule 1, Page 10 of 22

Preamble:

Enbridge states:

“Contract rate customer demand makes up approximately 94% of the capacity of the proposed Project. As of May 2023, approximately 34% of the contract rate customer demand is underpinned by a firm distribution contract. The commitment letters received in 2021 are no longer being relied upon by Enbridge Gas as they were applicable to the former 2021 EOI process only. Based on the timing of the 2023 EOI process and updated leave to construct application, Enbridge Gas will be executing firm distribution contracts with customers that are requesting service in 2024 and 2025 first, followed by securing customer demands for the future years.”

Question(s):

(a) Please provide a copy of JT1.33 that reflects the application updates and the current state of contracting.

(b) Please provide add three columns to the answer to (a) with the following: (i) the forecast revenue associated with each customer’s demand consistent with the forecast revenues underlying the DCF tables, (ii) the penalty that the customer would pay if they break the contract/commitment on day one and take no additional gas, and (iii) the penalty that the customer would pay if they break the contract/commitment 50% into the term and take no additional gas going forward.

(c) Please provide a copy of the latest versions of the: distribution contract, letter of indemnity, and commitment letter that Enbridge is using in relation to this project.

(d) Please provide a table with (i) an excerpt of any applicable penalty provisions and (ii) a description of the available penalties for the latest distribution contract, letter of indemnity, and commitment letter that Enbridge is using in relation to this project.

Response:

- a) Please see the response at Exhibit I.STAFF.24, part a) for the current state of customer contracting.
- b) i) Enbridge Gas is only able to provide the total revenue associated with the one executed contract identified in the response at Exhibit I.STAFF.24, part a). The annual revenue for the executed contract is \$2.25 million or a term value of \$11.25 million, which is based on the rate and is different from the DCF calculation. The revenues underpinning the DCF calculation use transmission margin only.

Enbridge is not able to provide the requested information for the other listed contracts for the following reasons:

- The revenue underlying the DCF analysis is not established at the customer level. Rather, it relies on the transmission margin for the forecasted contract and general service demands on an aggregate basis. The DCF analysis uses the transmission margin on an aggregated demand forecast level only as identified in Exhibit E, Tab 1, Schedule 4, p. 1.
- Forecasted contract demands are not calculated at a customer level until contracts are executed.
- Enbridge Gas is currently negotiating contracts with customers. Please see the response at Exhibit I.STAFF.24, part a) for the current state of customer contracting.

ii) and iii)

A customer who requests to terminate their contract prior to the end of their initial contract term will be required to pay the remaining financial obligations as per the contract. Please also see the response to part b) i) above.

- c) Please see Attachment 1 to response at Exhibit I.PP.5, specifically:
- Distribution Contracts (Pages 1-55)
  - Commitment Letter (Pages 56-58)
  - Letter of Indemnity (Pages 59-60)
- d) The requested information is provided below. The information can also be found at Attachment 1 to the response at Exhibit I.PP.5 as follows:
- Distribution Contracts (Pages 1-55): Pages 6-7, 25-26, and 43-44.
  - Commitment Letter (Pages 56-58): No penalties.
  - Letter of Indemnity (Pages 59-60): Pages 59-60.

Also included below is relevant information regarding General Terms and Conditions (Union Rate Zones - In-Franchise Contracted Services).

Document	Excerpt of applicable penalty provisions	Description of the available penalties
Distribution Contract	<p>11. TERMINATION PRIOR TO COMPLETION OF EXPANSION FACILITIES</p> <p>The Company shall have the right to terminate this Contract at any time prior to the Day of First Delivery, pursuant to Section 2, by giving written notice hereof, subject to the terms hereof.</p> <p>Notice of termination by the Company, the Company will use commercially reasonable efforts to cease incurring Project Costs and to mitigate Cancellation Costs upon such termination. In no event shall the Company invoice Customer for any Cancellation Costs or Project Costs not previously invoiced by the Company after 12 months from the termination date. Without limiting the foregoing, Customer shall have the right to audit at Customer’s expense the costs claimed for reimbursement by the Company for a period of six (6) months after each invoice is issued.</p> <p>“Project Costs” means any and all reasonable costs (including litigation costs, cancellation costs, carrying costs, and third party claims) expenses, losses, demands, damages, obligations, or other liabilities (whether of a capital or operating nature, and whether incurred or suffered before or after the date of this Contract) of the Company (including amounts paid to affiliates in accordance with the Affiliate Relationship Code as established by the Ontario Energy Board) in connection with or in respect of development and construction of the Expansion Facilities (including without limitation the construction and placing into service of the Expansion Facilities, the obtaining of all governmental, regulatory, and other third party approvals, and the obtaining of rights of way)</p>	<p>If this Contract is terminated by the Company as outlined above, then:</p> <p>(a) Upon such termination, this Contract shall be of no further force and effect and each of the parties shall be released from all further obligations hereunder, provided that any rights or remedies that a party may have for breaches of this Contract prior to such termination and any liability that a party may have incurred prior to such termination, and the parties’ obligations under this Section</p> <p>11, shall not thereby be released;</p> <p>(b) Customer shall reimburse the Company for all Project Costs; and</p> <p>(c) Customer shall reimburse the Company for all cancellation costs, fees or other amounts paid under contracts entered into by the Company to support the satisfaction of the conditions precedent set out in Section 2 (“Cancellation Costs”).</p> <p>The Company may invoice amounts under this Section from time to time, with the expectation that there will be an invoice rendered within 30 days of termination, and subsequent invoices as additional amounts payable hereunder are incurred from time to time. After delivery of such</p>

	except for costs that have arisen from the gross negligence, fraud, or willful misconduct of the Company.	
Commitment Letter	No penalties	
Letter of Indemnity	<p>Until a definitive natural gas distribution services agreement (“Contract”) is executed by the parties hereto, the Company requires a written covenant from Customer to indemnify and save harmless the Company for all of the Project Costs related to the development and construction of any new Enbridge Gas Inc. facilities (“Expansion Facilities”) needed to serve the new facilities.</p> <p>... Customer hereby irrevocably and unconditionally indemnifies and holds harmless the Company, and all of the Company’s affiliates, employees, officers, and directors (collectively, the “Indemnitees”) from all Project Costs which the Indemnitees or any of them may incur or suffer in respect of, or in connection with, or in any manner arising out of the development and construction of the Expansion Facilities.</p> <p>“Project Costs” means any and all costs, (including litigation costs, cancellation costs, carrying costs, and third party claims) expenses, losses, demands, damages, obligations, or other liabilities (whether of a capital or operating nature, and whether incurred or suffered before or after the date of this Indemnity Letter) by any of the Indemnitees (including amounts paid to affiliates for services rendered in accordance with the Affiliate Relationships Code as established by the Ontario Energy Board), in connection with or in respect of development and construction of the Expansion Facilities (including without limitation the construction and placing into service of the Expansion Facilities, the obtaining of all governmental, regulatory and other</p>	<p>Except to the extent of any Project Costs arising out of the Customer’s breach of contract, negligence, fraud, or wilful misconduct, Customer’s liability under this Indemnity Letter will not exceed \$ [Amount] CAD [including/excluding] taxes.</p> <p>This Indemnity Letter will terminate on the earlier of (a) the date that the Contract is executed, or (b) [Expiry Date] unless extended in writing by mutual consent, provided, however, that if the termination occurs pursuant to item (b) of this Indemnity Letter, Customer shall pay to the Company for all Project Costs as herein defined. Such payment shall be within 30 days of the Company submitting an invoice for Project Costs to Customer. Interest on any amounts due hereunder will accrue at an effective monthly interest rate of 1.5%, compounded monthly, for a nominal annual interest rate of 18%. In the event of termination under item (b), the Company may invoice Customer for Project Costs, from time to time and at any time within 12 months of such termination.</p>

	third party approvals, and the obtaining of rights of way,) whether resulting from any of the Indemnitees' negligence or not, except for any costs that have arisen from the fraud or wilful misconduct of any of the Indemnitees.	
General Terms and Conditions (Union Rate Zones - In-Franchise Contracted Services) <sup>1</sup>	3.02 Effect of Termination Notwithstanding the termination of this Contract, each party shall continue to be liable to pay on the terms herein specified any amount accrued and payable up to the time of termination. Termination will be without waiver of any other remedy to which the party not in default may be entitled including breaches of contract, for past and future damages, and losses.”	

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<sup>1</sup> <https://www.enbridgegas.com/-/media/Extranet-Pages/Business-and-industrial/Commercial-and-Industrial/Large-Volume-Rates-and-Services/Contracts/gtc.ashx?rev=2748f1bad46947e0bc27a5eb0fa98e8a&hash=3B650D4F93963DF8FF7FA31DB6F33604>

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Environmental Defence (ED)

INTERROGATORY

Reference:

EB-2022-0157, Exhibit C, Tab 1, Schedule 1, Attachment 3,

Question(s):

(a) Please provide an updated table of the forecast design day demand for the project area including a breakdown of demand attributable to (i) new greenhouses and (ii) existing greenhouses. Please also provide a breakdown of the greenhouses that are general service customers versus contract customers.

(b) Please ask Posterity to estimate the design day demand reductions in the greenhouse gas sector that are (i) cost-effective (i.e. technical potential) and (ii) both cost effective and attainable (i.e. achievable potential). Please provide this estimate for at least the next five year, plus as long out into the future as is possible.

(c) Please provide Posterity's answer to (b), identify the name of the Posterity witness, and provide their CV.

Response:

a) Enbridge Gas does not have a breakdown of general service demand for the greenhouse category specifically. Please see the response at Exhibit I.ED.11 for general service demand by residential and small commercial/industrial customers, which would include greenhouse customers.

Enbridge Gas does not have a breakdown of greenhouse contract demand between new and existing customers. Please see Table 2 at the response at Exhibit I.ED.26, part b), for greenhouse demand from existing and new greenhouse contract customers ("Greenhouse – Firm Contract Only" line item).

b) Enbridge Gas interprets "greenhouse gas sector" referenced within the interrogatory as "greenhouse sector". Also, the interrogatory describes the "cost-effective" scenario as the "Technical Potential", however the "cost-effective scenario" is the "Economic Potential". The "Technical Potential" includes non-cost-effective

measures/reductions. Enbridge Gas interprets the interrogatory as requesting information regarding the “Economic Potential” and not the “Technical Potential”.

The requested information (i.e., design day demand reduction in the greenhouse sector) cannot be provided, as the analysis does not include the greenhouse sector as a separate sector but includes greenhouse data within a broader agriculture sector (which includes non-greenhouse sectors). Furthermore, the analysis consisted of general service customers only and not contract customers.

- c) Dave Shipley is Posterity’s witness. Mr. Shipley’s CV is provided at Attachment 1 to this response.



## David F. Shipley

### Director

#### Experience Overview

David Shipley has over 25 years of experience as an energy engineer. His areas of expertise include: stock-and-flow models for energy efficient buildings and technologies, load forecasting, CDM potential estimates, building energy modelling, building commissioning, building energy systems, energy efficiency, renewable energy, energy and environmental systems modelling, and demand-side management. Mr. Shipley recently served on the expert panel for the 2019 Ontario Achievable Potential Study, as a recognized national expert on these studies.

In recent years, Mr. Shipley has coordinated the residential sector analysis for conservation potential studies for electric and gas utilities in six provinces, and has developed modeling tools used for analysis by the commercial and industrial teams in these studies. This has led to the development of Posterity Group's Navigator™ suite of energy and emissions simulation tools. He has also conducted market studies on building commissioning, HVAC and lighting technologies for commercial buildings, and efficient equipment for industry. Before joining Posterity Group, Mr. Shipley was a Senior Consultant in energy efficiency with ICF/Marbek, and Project Manager with the Energy Center of Wisconsin.

#### Select Project Experience

##### *Conservation Potential and High Efficiency Buildings*

APS Engagement Workshop: Enbridge Gas (June 2023). Posterity Group prepared and conducted a workshop to better enable EGI staff to provide input into and review outputs from Ontario's 2023 Achievable Potential Study.

Measure Library Development and Maintenance: FortisBC (May 2023 – ongoing). Posterity Group is developing a new measure library for FortisBC's gas and Electric DSM measures and conducting ongoing upkeep and maintenance.

FortisBC is seeking a review and update of its internal measure library, accounting for new and updated measures included in the recent Conservation Potential Review and Demand Side Management Expenditure Plan. FortisBC also wants to optimize the organization of the measure library for ease of maintenance and usability.

Potential Study Meta-Analysis: NRCan (August 2022 – October 2022). The Canada's Green Building Strategy Secretariat within the Office of Energy Efficiency (OEE) will act as the "gatekeeper" for the 2023 budget submission to the Department of Finance for the Canada's Green Building Strategy which will be underpinned by various policy measures, programs, codes, regulations. As OEE is developing the first phase of the Canada's Green Building Strategy, they are tasked with assessing the impact of the programs administered by various departments in preparation of the 2023 budget process.

This task requires estimates of energy efficiency and GHG emission mitigation potential in the built environment but lacks suitable information of this type. In the short term, NRCan has hired Posterity Group to address this gap by collecting and summarizing the results of past energy efficiency potential studies conducted in Canada. This meta-analysis will serve as a high-level estimate of technical and economic potential until more detailed modelling and analysis is conducted.







Conservation Potential Study: Pacific Northern Gas (August 2021-November 2021). Posterity Group developed a Conservation Potential Review study for Pacific Northern Gas. This analysis built on resource planning and conservation potential work Posterity Group has recently completed in BC, including FortisBC's 2021 CPR. It has been used to support adjustments to PNG's current portfolio of DSM programs and PNG's 2023 DSM Plan and Resource Plan filing. Dave was Technical Lead and Residential Advisor.

2021 Conservation Potential Review: FortisBC Energy Inc. (January 2020-September 2021). FortisBC's 2021 Conservation Potential Review Study (CPR) supported two of FortisBC's major regulatory filings in 2022: the long-term gas resource plan (LTGRP) and the demand side management plan. Posterity Group estimated BC's technical, economic and market potential savings over a 20-year period for natural gas using its Navigator Energy and Emissions Simulations Suite™, which enables complex, multi-variable modelling, detailed scenario exploration and solution optimization. The CPR is an important guiding document for ongoing conservation and energy management program development and support at FortisBC. Posterity Group proposed a transparent, well-documented approach to develop the CPR and facilitated the engagement of internal and external stakeholders. Posterity Group completed end-use modelling and scenario development for FortisBC's 2022 Long Term Gas Resource Plan (LTGRP) in parallel with the CPR, to ensure technical consistency across the projects. Dave was Technical Director and Residential Sector Lead.

2022 Long Term Gas Resource Plan Demand Forecast and Resource Planning: FortisBC Energy Inc. (February 2020-July 2021). Following a successful engagement in 2017, FortisBC again engaged Posterity Group to generate a natural gas end-use forecast in support of their 2022 Long Term Gas Resource Plan (LTGRP) filing. The analysis uses baseline end-use energy intensities for over 40 customer segments across 5 provincial regions developed by Posterity Group through the 2021 Conservation Potential Review. Forecasting analysis incorporates multiple data sources including customer end-use surveys, customer energy use data, and price and commodity forecasts. In addition to the reference case forecast, Posterity Group conducted scenario analysis to estimate the impact on gas demand from a number of policy drivers including anticipated federal, provincial and municipal codes and standards, carbon pricing, efficiency activity, natural gas transportation, liquefied natural gas production, renewable natural gas production, and availability of district energy. Dave was Technical Director for the project.

Integrated Resource Planning and Achievable Potential Study Support: Enbridge (2019-Present). Technical lead on modeling and analysis to support Enbridge Gas in their planning and DSM activities. Building on the results of the provincial Achievable Potential Study (APS), used the Navigator™ Energy and Emissions Simulation Suite to construct a model of Enbridge's service territory to estimate DSM potential and peak demand impacts. The detailed model will permit the client-consultant team to better understand the outputs from the 2019 APS, identify limitations in the underlying dataset, and integrate additional data to estimate program potential and budgets. The Navigator™ Energy and Emissions Simulation Suite enables complex, multi-variable modelling, detailed scenario exploration and solution optimization. It also has an 8760 peak analysis module, which we are using to develop full annual load shape profiles for the gas end uses relevant to Enbridge's service territory.

Greenhouse Energy Profile Study: Ontario IESO (2018-2019). Technical lead on modeling and analysis of economic and achievable potential for energy conservation in covered agricultural facilities in Ontario, including greenhouses and indoor agriculture. Developed the stock-and-flow model for three different scenarios of sector expansion, for technical, economic, and achievable energy savings potential, and for peak demand reduction. Provided full 8760-hour profiles of demand before and after the application of energy and demand reduction measures.





2019 Ontario Achievable Potential Study Technical Advisory Panel: IESO (2018-2019). Acted as an Expert Panel Member to the Independent Electricity System Operator (IESO) and the Ontario Energy Board (OEB) for the 2019 Ontario Achievable Potential Study (APS). Provided advice on the integrated electricity and natural gas APS, which will seek to identify and quantify energy savings, GHG emission reductions, and associated costs from demand side resources for 2019-2038. Helped the IESO and OEB ensure that the APS is conducted using industry best practices. Reviewed and provided guidance on all aspects of the APS including the methodology and workplan, base case and reference forecast, energy efficiency and conservation measures, technical and economic potential analysis, achievable potential analysis, and final report.

Conservation Potential Study: Ontario Energy Board (2015-2016). Technical lead on modeling and analysis of economic and achievable potential for energy conservation in Ontario, covering the service territories of both natural gas companies. Led the residential analysis and was principal model developer, including development of stock-and-flow models, economic screening models, and achievable adoption models.

Conservation and Demand Management Study: Newfoundland Power and Newfoundland Labrador Hydro (2014-2015). Technical lead on modeling and analysis of economic and achievable potential for conservation and demand management in Newfoundland and Labrador. Led the residential analysis and was principal model developer.

Tailored Achievable Potential Studies for Ontario LDCs: Hydro One Networks, NPEI, Powerstream, Horizon Utilities, Thunder Bay Hydro, Waterloo North Hydro, Entegrus, Canadian Niagara Power, Algoma Power, Brantford Power, Milton Hydro, Oakville Hydro, Oshawa PUC, Haldimand County Power, Halton Hills Hydro, Burlington Hydro, Brant County Power (2014-2015). Developed tailored versions of the OPA achievable potential model (see the project immediately below), to provide detailed conservation potential estimates for the service territories of several Ontario LDCs.

Achievable Potential Study: Ontario Power Authority (2013). Led the analysis of conservation potential for all sectors, deriving much of the economic potential from outputs of OPA's End Use Forecaster model, but applying data from ICF Marbek's internal databases to estimate achievable potential. After a market characterization phase targeting the application of measures in Ontario, produced a fine-tuned estimate of achievable potential.

Conservation Potential Study for Yukon Government: YEC, and YECL (2011-2012). Led residential analysis of conservation potential, including developing detailed end-use baseline profiles calibrated to utility data, deriving economic potential for cost-effective actions in the residential sector, and forecasting 20-year economic and achievable savings.

Conservation Potential Study: SaskPower (2010-2011). Led residential analysis of conservation potential, including developing detailed end-use baseline profiles calibrated to utility data, deriving economic potential for cost-effective actions in the residential sector, and forecasting 20-year economic and achievable savings.

Conservation Potential Study: Terasen Gas (2010-2011). Led residential analysis of conservation potential, including developing detailed end-use baseline profiles calibrated to utility data, deriving economic potential for cost-effective actions in the residential sector, and forecasting 20-year economic and achievable savings.

DSM Potential Study: Enbridge Gas (2008). Led residential analysis of conservation potential, as part of a major update to the DSM study Marbek did in 2004. Developed detailed end-use baseline profiles





calibrated to utility data, derived economic potential for cost-effective actions in the residential sector, and forecast 10-year economic and achievable savings.

DSM Potential Study: Enbridge Gas Inc. (formerly Union Gas) (2008). Led residential analysis of conservation potential for Union Gas, as part of a project similar to Enbridge project above.

CPR 2007: BC Hydro (2007). Led analysis of residential savings potential for BC Hydro, as part of a project to estimate potential for all sectors. Derived detailed end-use baseline profiles calibrated to utility data, derived economic potential for cost-effective actions in the residential sector, and forecast 20-year savings. This was an update to an earlier CPR Marbek performed for BC Hydro in 2002.

CPR: Newfoundland Power and Newfoundland and Labrador Hydro (2007). Led analysis of residential savings potential for Newfoundland and Labrador, as part of a project to estimate potential for all sectors. Project included same elements as the BC Hydro study.

Fuel Switching Potential: Ontario Power Authority (2006). Developed the residential fuel switching potential estimate as part of a full fuel switching potential study for Ontario.

DSM Potential Study: Terasen Gas (2005). Developed the residential energy savings and fuel switching potential estimate as part of a full DSM potential study for the Terasen service territory. Conducted part of the commercial energy savings and fuel switching potential analysis.

DSM Potential Study: Enbridge Gas (2004). Developed the residential energy savings potential estimate as part of a full DSM potential study for the Enbridge service territory.

DSM Study: Manitoba Hydro (2003). Led residential analysis for DSM study.

Statewide Technical and Economic Potential: Consortium of Wisconsin Utilities (1993). While at Energy Center of Wisconsin, managed the completion phase of the estimate of conservation, fuel switching and load management potential, as part of IRP filing.

### *End-Use Energy Efficiency and GHG Mitigation Modelling & Load Forecasting*

Resource Plan and Long-Term DSM Plan: Pacific Northern Gas (Feb. 2023-ongoing). Pacific Northern Gas selected Posterity Group to help develop PNG's 2023 Consolidated Resource Plan and Long-Term DSM Plan. The resource plan development involves the development, analysis, and reporting of energy consumption forecasts (for 20 years from 2023-2042) under various scenarios and modeling different critical uncertainties. The project also involves developing and incorporating into the resource plan a long-term DSM plan including draft sector DSM portfolios.

DSM Plan 2024-2027: FortisBC Energy Inc. (September 2022 – October 2022). FortisBC has assigned the development of its next five-year DSM Expenditure Plan (for both FortisBC natural gas and electricity utilities) to Posterity Group. The scope of work involves program and portfolio development, cost effectiveness modelling and reporting and filing of the 2024 – 2027 DSM plans. Dave is the Senior Advisor as well as the lead analyst for this project.

Resource Planning Support: SoCal Gas (April 2022-ongoing): Posterity Group is developing an end use model to support SoCal Gas with ongoing long term planning activities in both SoCal Gas' and SDG&E's service territories. PG will build a model that "mirrors" the results from the current End Use Forecaster (EUF) model and then add enhanced capability allowing users to accomplish modeling tasks that are either not currently possible (e.g., scenario analysis) or completed outside of the EUF model (e.g., policy impact analysis or electrification analysis). Dave is the Technical Director for the project.





2022 Long Term Resource Plan Load Forecast Additional Analysis: FortisBC (March 2022-August 2022): Posterity Group continued to support FortisBC Energy Inc (FEI's) 2022 Long-term Gas Resource Plan (LTGRP) filing by conducting additional analysis related to the load forecast scenarios. PG provided several demand-side management setting options for FEI's Diversified Energy Planning scenario, reviewed calculation methods for the provincial GHG reduction requirements, and modelled impacts of FEI's system from BC Hydro's resource planning scenarios. Erika was the project manager and analyst for this project. She worked closely with the FEI client team, BC Hydro and their consultants, and PG's project team to execute the analysis on the tight schedule. Dave was the technical director for this project.

Renewable Gas Program Review – Cost Recovery: FortisBC Energy Inc. (July 2021-October 2021). FortisBC Energy Inc (FEI) reassessed the pricing scheme of their voluntary renewable gas (RG) program, including how to recover supply costs from customers who did not volunteer to pay a premium for RNG. Posterity Group (PG) focused on assessing how non-participants may respond to changes in their annual gas bill from RG-related costs. Posterity Group estimated impacts to annual demand and customer defection from price signals. The results of this project helped inform FEI's proposed design of the RG program to minimize impact on customers. Dave acted as Advisor.

DSM Planning Support: Enbridge Gas Inc. (January 2021-January 2022). In 2019 and 2020, Posterity Group worked with EGI to develop a Navigator end-use energy model to support DSM planning. The model aligns closely to the Ontario Energy Board's 2019 Achievable Potential Study but includes adjustments that better reflect Enbridge's input and experience, and to correct for identified limitations. Model outputs are housed within Power BI to provide an interactive means to support future EGI planning efforts. In 2021, Posterity Group worked with EGI to update and enhance the end-use model dataset to support its next multi-year DSM plan submission. Priorities include: Developing evidence to position the APS in a context that more accurately reflects EGI's knowledge and experience; Make further adjustments to the APS dataset to address deficiencies and enable sensitivity analysis; and Interrogatory and Witness Support. Dave was Technical Director and Lead Analyst.

Load Forecasts for the Southwest Ontario Greenhouse Sector: IESO (February 2021-August 2021). Greenhouse energy demand continues to expand in the Windsor-Essex and Chatham-Kent regions. To support planning efforts in these regions, the IESO developed three load forecast scenarios (a low growth, reference case, and high growth scenario) for greenhouse non-coincident winter-peak load. Posterity Group was hired to review the information and assumptions used by the IESO and provide additional information to validate the IESO's forecast scenarios or identify possible areas for adjustment. The main activities included in this project were data collection, review and analysis, scenario development, modelling, and a comparison of the data and model results to the IESO's assumptions and models. Dave acted as Expert Advisor.

Energy Transition Scenario Analysis: Enbridge (July 2020-March 2021). Posterity Group supported Enbridge's Energy Transition Planning team to conduct scenario analysis of the consider the financial and operational impacts of the range of climate policy related impacts Enbridge could face over the next 30 years. Posterity Group modeled future load at the granular level of energy end uses, different building types, rate classes, and regions, and undertaking scenario analysis to explore several possible economic and policy scenarios under which Enbridge may operate in the future. The goal of the project was for Posterity Group to provide Enbridge with a comprehensive end-use level dataset that reflects several possible futures and a user-interface tool that allows decision makers to explore this dataset and distill quantitative impacts (e.g., how gas use and GHG emissions will change) under different forecast scenarios. Dave was Technical Director and Residential Sector Lead.





Energy Management Best Practices for Cannabis Greenhouses and Warehouses: CEATI International Inc. (November 2019-May 2020). Posterity Group, in partnership with Cultivate Energy Optimization and D+R International, assessed and documented best practices of energy management for cannabis production in both greenhouse and warehouse facilities. The study developed a five-year forecast of energy use in three regions (Ontario, British Columbia and the Pacific Northwest) for the sector and assessed energy saving opportunities. The outcome of this work formed an important base of industry knowledge and bridge the gap to provide current and comprehensive information regarding energy use in cannabis facilities, from which future conservation activities might be developed. Dave acted as Senior Analyst.

Long Term Resource Plan Model Enhancement: FortisBC Gas (November 2018-February 2020). Posterity Group added several new features to the Long Term Resource Plan model used to support FortisBC's regulatory filings. New features included the ability to output avoided cost and customer cost of energy, ability to vary short-term and long-term elasticity of energy demand based on the latest research, and the ability to run hundreds of stochastically-generated scenarios with inputs varying probabilistically.

Long Term Resource Plan Regulatory Support: FortisBC Gas (March 2018-November 2018). Posterity Group supported FortisBC in responding to BC Utilities Commission and intervener Information Requests (IRs) regarding its 2017 Long Term Gas Resource Plan (LTGRP). Posterity Group provided FortisBC with information and analysis in support of such inquiries related to the load forecast and subsequent scenario analysis conducted by Posterity Group for inclusion in FortisBC's LTGRP.

Analysis of Fenestration Products in Support of Canadian Market Transformation Activities: NRCan (July 2017-June 2018). Posterity Group provided analysis of the current market for low-rise residential fenestration products, including windows, doors, and skylights and developed estimates of the energy savings potential from changing performance levels in ENERGY STAR or introducing national performance standards. Dave was the technical lead on this project. To produce the estimate, he developed a detailed model of HVAC consumption in different types and vintages of low-rise housing in 22 regions, and modeled the application of several different fenestration energy performance improvements. Developed from publicly available data, this model can be applied for other future projects.

Low Carbon Heating Options for Ontario: Ontario Ministry of the Environment and Climate Change (November 2017-June 2018). Posterity Group estimated the GHG reduction impact potential of strategies targeting low carbon space, water and process heating technologies and fuels in Ontario's residential, commercial and industrial sectors. The project included four main activities: Development of energy and GHG Inventory and accompanying business as usual forecast for Ontario's thermal end-uses by fuel, sector/subsector, and end use; Development of a long list of fuels and technologies with abatement potential, and an evaluation matrix to build a short list of the 10 preferred, most promising technologies and fuels for detailed analysis; Detailed analysis of the short list of fuels and technologies to understand their current market structure, barriers, and applicability; and, development of illustrative deployment scenarios to estimate the potential impacts of the shortlisted fuels. Dave developed the inventory model and the illustrative deployment scenario models.

Natural Gas Demand Scenarios: FortisBC (July 2017-November 2017). Posterity Group provided demand scenario analysis to support FortisBC demand forecasting, with Dave acting as Technical Director and Residential sector lead. This work involved analysis of six scenarios that built on the core end-use forecast completed in June 2017. The project results helped FortisBC assess the impact of various policies, including the City of Vancouver zero emissions plan and the BC Step Code. As part of this work, Posterity Group added new features to the processing software at the heart of the forecasting model. These features allow users to dynamically select the municipalities that are expected to opt into new energy efficiency requirements.





Long Term Resource Plan Model and Forecast: FortisBC Gas (October 2016-June 2017). FortisBC turned to Posterity Group to develop a new end-use forecasting model to enhance their current end-use resource forecasting approach, and to generate a new 2017 forecast. The model provides value to the load forecasting, integrated resource planning, system planning, and conservation potential teams at FortisBC. Enhancements include: a full integration of energy efficiency impacts at the individual measure level, improved transparency of the model; features to allow casual users to vary parameters and review the effects on the results; outputs for every year in the forecast period (rather than milestone years); closer linkage between the annual demand and peak demand forecasting approaches; the ability to analyze the impact of changes such as municipal policy activity, ability to analyze the impact of liquefied natural gas and natural gas transportation initiatives. Dave was technical director and lead model developer.

End Use Load Forecast: FortisBC (2012-2014). Developed an end-use based load forecasting system for FortisBC, using detailed customer data and models built for an earlier conservation potential study. The model could forecast account growth and consumption of five fuels under five economic scenarios, over a twenty-year period, for three sectors, six regions, 33 rate classes, 36 building types, and 29 end uses. The model also estimated potential for conservation programs and reported on the sensitivity of the potential to different economic scenarios.

Integrated Resource Plan: NB Power (2009). Led residential analysis as part of a project to provide input data to NB Power's integrated resource planning process.

Conservation Potential Review and 20 Year Load Forecast: Ontario Power Authority (2009-2010). Led residential analysis of conservation potential for OPA, as part of project to develop a model combining forecasting and DSM potential.

Market Characterization of the Commercial/Institutional and Residential Sectors in Yukon: YEC and YECL (2012). Prepared initial program focus assessment documents, based on results from the Conservation Potential Study. Assisted in planning and preparing interview guides for market research, and conducted interviews. Provided input to program concept documents, which will lead to commercial and residential programs offered by the Yukon utilities.

Residential Market Segmentation Study: Enbridge Gas Inc. (formerly Union Gas) (2010). Led this analysis to assess the potential for DSM technologies in specific niche markets. In a mature market for DSM activities such as Union's service territory, many measures no longer pass the TRC test in a typical or average application, but often will pass in niche applications. We provided a strategic assessment of potential niche markets, to target DSM program activities.

## EDUCATION

M.Sc., Energy Studies, University of Sussex - Brighton, Sussex, United Kingdom, 1987

B.A.Sc., Mechanical Engineering, Minor: Management Science, University of Waterloo – Waterloo, Ontario, Canada, 1986

## CERTIFICATIONS

Licensed Professional Engineer (Ontario)

## PROFESSIONAL AFFILIATIONS

American Society of Heating, Refrigeration, and Air-conditioning Engineers





**EMPLOYMENT HISTORY**

Posterity Group	Senior Consultant	2016-Present
ICF International	Senior Technical Specialist	2011-2016
Marbek Resource Consultants	Senior Consultant	2000-2010
Energy Center of Wisconsin	Project Manager	1993-2000
Resource Management Associates	Energy Engineer	1991-1993
University of Waterloo	WATSUN Engineer	1987-1991



ENBRIDGE GAS INC.

Answer to Interrogatory from  
Environmental Defence (ED)

INTERROGATORY

Reference:

Updated evidence

Question(s):

(a) Please review the answers to questions from Environmental Defence during the technical conference, advise if any answers are no longer accurate, and provide an accurate response to each of those.

Response:

Enbridge Gas respectfully declines to update the Technical Conference transcript since it would not be appropriate to do so as it would not reflect an accurate depiction of the exchanges between witnesses and examiners at the time the transcription was made. A two-day technical conference occurred on October 6 and October 7, 2022 where parties asked a significant number of clarifying questions on a number of interrogatories and areas. The Technical Conference is an oral exchange between the examiner and witness wherein the witness has provided his or her response as that person thinks best at the time the examination occurs. An update to the transcript of that exchange would mean that the transcript no longer is an accurate representation of a witness's responses at the time they were given and transcribed on October 6 and 7, 2022.

Furthermore, as indicated in Enbridge Gas's letter of August 25, 2023, Enbridge Gas has identified responses to interrogatories and undertakings that are no longer applicable and those that will be updated to reflect the Company's June 16, 2023 amended application. As noted in the correspondence, Enbridge Gas will file updated responses to interrogatories and undertakings with the responses to interrogatories on its amended application. Parties were initially permitted to ask follow-up questions to the updated interrogatories (and any related technical conference questions) at the originally scheduled technical conference scheduled for October 10, 2023 and can now, with the oral hearing, pose those questions as part of cross-examination. This is the best forum for the examiner and witness to update any oral technical conference responses that the examiner considers to be material since it will provide a proper oral record reflecting the statements of both examiner and witness.



ENBRIDGE GAS INC.

Answer to Interrogatory from  
Energy Probe ("EP")

INTERROGATORY

Reference:

Exhibit A, Tab 3, Schedule 1, Page 5, paragraph 13

Preamble:

"If the Project meets the criteria for rate recovery through the ICM mechanism, then an ICM request for the costs of the Project may form part of the Company's 2023 Rates (Phase 2) application."

Question:

Please confirm that Enbridge will not be requesting rate recovery through the ICM mechanism for this project.

**Response**

Confirmed.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Energy Probe ("EP")

INTERROGATORY

Reference:

Exhibit B, Tab 1, Schedule 1, page 10, paragraph 29

Preamble:

"Enbridge Gas is aware of, has reviewed, and is working in conjunction with the municipalities within the Panhandle Market to determine whether the expansion of the Panhandle System impacts their ability to achieve the greenhouse gas emissions (GHG) reduction goals outlined within their respective Community Energy Plans ("CEPs")."

Question:

Please file copies of CEPs of the municipalities within the Panhandle market.

**Response**

- City of Windsor Community Energy Plan<sup>1</sup>
- County of Essex Regional Energy Plan Executive Summary<sup>2</sup>
- Municipality of Chatham-Kent Climate Change Action Plan (currently under development)<sup>3</sup>

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<sup>1</sup> <https://www.citywindsor.ca/residents/environment/climate-change-mitigation/community-energy-plan/Documents/Windsor%20Community%20Energy%20Plan%20FINAL%20-%20July%2017-2017.pdf>

<sup>2</sup> [https://www.countyofessex.ca/en/discover-the-county/resources/Documents/ECREP-Executive-Summary---May-2021\\_UA.pdf](https://www.countyofessex.ca/en/discover-the-county/resources/Documents/ECREP-Executive-Summary---May-2021_UA.pdf)

<sup>3</sup> <https://pub-chatham-kent.escribemeetings.com/filestream.ashx?DocumentId=6875>

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Energy Probe ("EP")

INTERROGATORY

Reference:

Exhibit B, Tab 1, page 11, paragraph 31, Table 1

Question:

What percentage of the increase in the demand day forecast is due to contract firm customers?

Response

Please see Table 1.

/U

Table 1

	FORECAST (TJ/d)								
	Winter 22/23	Winter 23/24	Winter 24/25	Winter 25/26	Winter 26/27	Winter 27/28	Winter 28/29	Winter 29/30	Winter 30/31
General Service Firm (Total Incremental Demand)	-4	2	2	2	2	2	2	2	1
Contract Firm (Incremental excluding Power Generators)	30	30	70	45	13	13	13	13	13
<b>Total Incremental Demand Forecast</b>	<b>26</b>	<b>32</b>	<b>72</b>	<b>47</b>	<b>15</b>	<b>14</b>	<b>14</b>	<b>14</b>	<b>14</b>
<b>Percent contract of Incremental Demand (%)</b>	<b>114.3%</b>	<b>94.1%</b>	<b>97.4%</b>	<b>96.1%</b>	<b>87.9%</b>	<b>88.4%</b>	<b>88.8%</b>	<b>89.2%</b>	<b>89.7%</b>

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Energy Probe ("EP")

INTERROGATORY

Reference:

Exhibit B, Tab 1, page 11, paragraph 39

Preamble:

"As indicated by the letters of support received by Enbridge Gas (see Attachment 3 to this Exhibit), the Project has broad support from various parties, including regional municipalities and chambers of commerce"

Question:

Please confirm that Enbridge asked various parties for letters of support.

**Response**

In discussion with Ontario Greenhouse Vegetable Growers ("OGVG") related to the Project prior to the filing of the application, OGVG expressed support for the project. OGVG later provided a letter of support.

In other circumstances, Enbridge Gas informed various parties of the Project and provided them an opportunity to submit a letter of support.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Energy Probe ("EP")

INTERROGATORY

Reference:

Exhibit B, Tab 2, Schedule 1, page 4

Preamble:

"Ex-franchise easterly C1 Rate transportation and Interruptible in-franchise contract rate demands are not included in the Design Day demand as they are not controlled by Enbridge Gas and are not guaranteed to arrive on Design Day."

Question:

- a) Please explain what is ex-franchise easterly C1 Rate transportation contract rate demand?
- b) Is there in-franchise easterly C1 Rate transportation contract rate demand? If the answer is yes, what is the amount, and has it been included in the Design Day demand?
- c) Who controls easterly C1 Rate transportation contract demand?

**Response**

- a) The Enbridge Gas C1 Transportation service provides a reliable, cost-effective means to move gas from any one point on the Enbridge Gas transmission system to another. C1 Transportation service also allows for the movement of gas to and from interconnecting pipelines.

The Enbridge Gas Panhandle System interconnects with the Panhandle Eastern Pipeline Company ("PEPL") system at Ojibway. Therefore, the Enbridge Gas Panhandle System provides C1 Transportation service between Dawn and Ojibway.

There is currently one C1 Rate ex-franchise customer of Enbridge Gas, with a firm transportation contract of up to 37 TJ/d, to transport natural gas easterly from Ojibway to Dawn on a year-round basis. There are currently no C1 ex-franchise customers with C1 service westerly from Dawn to Ojibway.

b) No, C1 Transportation is a service designed for use by ex-franchise customers. In-franchise customers pay for their use of the Panhandle System within in-franchise service rates.

c) Ex-franchise C1 transportation service customers control easterly C1 rate transportation contract demand. C1 transportation is a non-obligated service meaning customers have the exclusive option to nominate quantities under the contract when needed. As a result, Enbridge Gas cannot rely on natural gas transported under C1 rate contracts to be delivered to Ojibway on a daily basis. Ex-franchise C1 transportation from Ojibway to Dawn can be limited by three factors: i) the quantity of capacity held by Enbridge Gas; ii) the capacity of the upstream pipeline system connected to Ojibway; and iii) the physical Panhandle System assets and the minimum Panhandle Market available to consume gas between Ojibway and Dawn as discussed at Exhibit B, Tab 2, Schedule 1, Pages 7-9.

/U

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Energy Probe ("EP")

INTERROGATORY

Reference:

Exhibit B, Tab 2, Schedule 1, page 6, paragraph 12

Preamble:

"The BBGS is located at the extreme western end of the Panhandle System just east of Ojibway. The pressure constraint for the entire Panhandle System is located at the outlet of the BBGS customer station, where the contracted minimum delivery pressure must be maintained at or above 1,724 kPag;"

Question:

- a) Please confirm that BBGS can be supplied by easterly flow from Ojibway.
- b) Please file a copy of the contract between Enbridge and BBGS which specifies the minimum delivery pressure.
- c) What is the term of the contract between Enbridge and BBGS and when does it expire?
- d) Has Enbridge discussed with BBGS a revised contract for a lower minimum delivery pressure?

**Response**

- a) Confirmed.
- b) Please see Figure 1 below, which is an excerpt from the contract between Enbridge Gas and BBGS which specifies the minimum delivery pressure:

Figure 1

**5. DISTRIBUTION PARAMETERS**

**Delivery Pressures and Volumes**

<b>BBP</b>		
<b>Station #</b>	<b>Meter Number</b>	<b>Minimum Delivery Pressure (kPa)</b>
06A-625I	2548275	1,724
	2548276	

- c) The current contract between Enbridge Gas and BBGS has a term of April 2003 to December 2023. The new contract will be effective for a period of 5 years and will continue to renew thereafter on a year-to-year basis.
  
- d) Enbridge Gas confirmed with BBGS that the existing delivery pressure will continue to be required going forward.



ENBRIDGE GAS INC.

Answer to Interrogatory from  
Energy Probe ("EP")

INTERROGATORY

Reference:

Exhibit C, Tab 1, Schedule 1, page 5, paragraph 12

Question:

- a) Did Enbridge consider an alternative that would use a compressor close to BBGS to maintain the delivery pressure to BBGS? Please discuss.
- b) Did Enbridge consider an alternative of having BBGS replace its fuel gas compressor with a compressor that would accept a lower delivery pressure? Please discuss.

**Response**

a) and b)

No. The use of a compressor station to meet the required delivery pressure to BBGS located in an area around BBGS is not practical.

For a compressor station to operate, there must be a pressure differential between the discharge pressure (at BBGS required pressure) and the suction pressure of the compressor station. This suction pressure must be lower than the discharge pressure.

The suction pressure, which would have to be lower than BBGS delivery pressure, would require the entire Panhandle System pressure in the 3450 kPag MOP system to be lowered. This would subsequently impact all of the inlet pressures in the other customer and distribution stations located between Sandwich Compressor and Grand Marais station. These stations have minimum inlet pressures in a similar range to BBGS (between 1724 and 2070 kPag). For example, West Windsor Power Generator, which is located adjacent to BBGS has the same delivery pressure requirement as BBGS.

This scenario would require additional compression at other power generators and multiple distribution station rebuilds and system reinforcement between Sandwich, Grand Marais and Ojibway.

Please also see the response to Exhibit I.FRPO.13, for more discussion on why the approach of moving constraints/issues elsewhere on the system does not resolve system-wide issues, and the response to Exhibit I.EP.6 part d) regarding the customers' confirmed pressure requirements.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Energy Probe ("EP")

INTERROGATORY

Reference:

Exhibit C, Tab 1, Schedule 1, page 11, Table 3, Pipeline Loop, and Lateral Interconnect Economic Assessment

Question:

- a) Please confirm that the alternative with the least negative NPV would require the least subsidy from ratepayers over its life.
- b) Please confirm that the NPS 30 line with the NPS 16 lateral has the least negative NPV and would require a lower subsidy than the preferred alternative.

Response

a) & b)

/U

The differences in NPV between the NPS 36 and NPS 30 alternatives are primarily attributable to total capital and annual property taxes. However, in Enbridge Gas's experience, NPV results alone should not be the sole contributing factor in selecting a preferred alternative.

In this instance in particular, there are at least three other critically important factors that the OEB must consider in selecting between the NPS 36 and NPS 30 pipelines:

- i. **Future System Capacity Benefit** - As discussed in Exhibit B, Tab 1, Schedule 1, the Panhandle System has experienced significant demand growth in recent history, in part due to the rapid expansion of the greenhouse market, increasing in size from approximately 1,500 acres in 2007 to over 3,500 acres in 2022.<sup>1</sup> To serve such growth, the Panhandle System has

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<sup>1</sup> <https://www.ogvg.com/post/ogvg-applauds-the-province-for-supporting-economic-development-in-southwestern-ontario>

expanded in 2013, 2016, 2017, and 2019. This growth trend is anticipated to continue based on the results of the EOI and planned expansion of the Automotive and Power Sectors in the region in order to meet growing demands for electric vehicles.

The proposed Project provides current and future system capacity benefits and thus positions the Panhandle System to provide cost-effective capacity to meet the long-term needs summarized above. More specifically, the NPS 36 Panhandle Loop provides the best long-term solution to alleviate the NPS 20 bottleneck between Dover Transmission and Comber Transmission stations as the NPS 36 loop is extended to Comber Transmission. The NPS 36 alternative provides an additional 8 TJ/d of capacity in the short-term when compared to the NPS 30 alternative. Please note, the full potential increase in capacity that could be created by the NPS 36 is limited at this time by the existing downstream bottlenecks. As future demand growth and associated reinforcement continues to occur and as bottlenecks are alleviated, the NPS 36 alternative provides an additional 28 to 117 TJ/d of incremental capacity compared to the NPS 30 alternative.

- ii. **Cost Per Unit of Capacity** - The proposed Project is more cost effective than the NPS 30 alternative because it creates an additional 8 TJ/d of capacity in comparison (168 TJ/d vs 160 TJ/d)<sup>2</sup> and results in a lower cost per unit of capacity (\$2.13/TJ vs \$2.14/TJ).<sup>3</sup> This additional capacity is critical when considering how best to serve the long-term demands discussed in part i. above.
- iii. **Operational Benefits** - The NPS 36 Panhandle Loop is a natural extension of the existing NPS 36 Panhandle Pipeline constructed as part of the 2017 Panhandle Reinforcement Project (EB-2016-0186). This continuity of pipeline diameter ensures that the Company can complete consistent in-line inspections throughout the length of the system using a single tool which reduces:
  - (i) high-risk gas handling activities associated with pipeline cleaning and integrity assessments;
  - (ii) the station facilities and footprint that would otherwise be required if the pipeline diameter was reduced to NPS 30; and
  - (iii) the cost of the integrity program itself.

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<sup>2</sup> Exhibit I.STAFF.7 Attachment 1

<sup>3</sup> Exhibit I.STAFF.7 Attachment 1

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Energy Probe ("EP")

INTERROGATORY

Reference:

Exhibit E, Tab 1, Schedule 1. Page 6, paragraph 9

Preamble:

This schedule indicates that the Project has a NPV of negative \$95 million and a PI of 0.63.

Question:

Considering the large negative NPV and a low PI of the proposed project did Enbridge consider asking contract customers with increased demand to pay a contribution or a surcharge? Please discuss.

**Response**

The economic analysis of the Project was completed in accordance with E.B.O. 134 Report of the Board ("E.B.O. 134"), as the Project consists entirely of transmission pipeline infrastructure to which distribution customers do not directly connect. Asking customers to pay a contribution or a surcharge is not applicable to the Project.

/U

Please see Exhibit A, Tab 4, Schedule 1, Paragraphs 21-23 regarding Enbridge Gas's outreach to customers who indicated their intention to submit an EOI bid regarding the requirement for CIAC.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Energy Probe Research Foundation (EP)

INTERROGATORY

Reference:

Exhibit A, Tab 4, Schedule 1, Pages 5 and 6, paragraph 21

Preamble:

“Following the OEB’s remarks in Procedural Order No. 4 regarding CIAC, Enbridge Gas account managers conducted outreach to customers who indicated their intention to submit an EOI bid. Customers were asked about the impact a requirement for CIAC would have on their demands for new/incremental service.”

The themes of the feedback are as follows:

- Customers submitting EOI bids for new/incremental service were generally doing so under the assumption that the OEB would apply the established regulatory framework for transmission system expansion projects, which does not require CIAC, consistent with similar projects constructed in the past. Customers generally indicated opposition to being required to provide CIAC to support transmission system expansion in this instance.
- No customer indicated that they would be willing to provide CIAC for a transmission system expansion project without understanding the magnitude of the CIAC and the unique justification for its selective application in this instance.

Question(s):

- a) When did the outreach to customers take place? Please provide exact dates.
- b) Was the outreach to customers in written form? If the answer is yes, please file all written documents, including e-mails, used in the outreach. If the outreach was not in written form, please explain why not and file scripts of the oral communications with customers.
- c) The evidence indicates that Enbridge did not provide estimates of the magnitude of potential CIAC to the customers that it contacted. Please explain why not.
- d) Please file a list of customers that were contacted by Enbridge regarding CIAC.

e) Did Enbridge gas account managers explain to the customers the difference between a distribution and a transmission project? If the answer is yes, please describe what the Enbridge gas account managers said to the customers. If the answer is no, please explain why not.

f) Please confirm that contributions paid by customers reduce rate base, and therefore it is in the interest of both Enbridge Gas and the customers that the customers do not pay contributions.

g) Please confirm that the OEB has the jurisdiction to order Enbridge Gas to charge customer contributions.

Response:

a) and b)

Please see the response at Exhibit I.STAFF.25, part a).

c) Please see the response at Exhibit I.ED.29, part c).

d) Please see Attachment 1 at the response to Exhibit I.STAFF.25.

e) As per the response to Exhibit I.STAFF.25, part a) there was no information sent to customers regarding CIAC, and Enbridge Gas account managers were not provided with a script to deliver to customers. Enbridge Gas understands that many of the customers who bid in the 2023 EOI have the general knowledge, sophistication and experience from previous natural gas facility expansion projects constructed by Enbridge Gas.

Enbridge Gas account managers support customers with a variety of questions they may have. Please see the response to Exhibit JT1.2 regarding the definition of transmission and distribution.

f) Contributions have the effect of reducing the rate base addition. The purpose of a contribution is to ensure there is no cross subsidization between rate payers for facilities constructed for the dedicated use of a customer. It is a regulatory purpose and it is in the interest of Enbridge Gas and customers that an appropriate regulatory regime apply.

g) A contribution and the basis on which it is calculated is a rate and as such is within the jurisdiction of the OEB to establish just and reasonable rates.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Energy Probe Research Foundation (EP)

INTERROGATORY

Reference:

Exhibit A, Tab 4, Schedule 1, Pages 6, paragraph 22

Preamble:

“On this basis, and for the reasons already set out on the record for the current Application, the Company re-iterates that it is not appropriate to require CIAC from specific customers for the proposed Project because, as a transmission system, the Panhandle System transports natural gas for the benefit of all customers within the Panhandle Market – rather than individual or specific customers.”

Question(s):

- a) Is the Panhandle Market the area served by the Panhandle System Expansion Project? If the answer is no, please explain what the Panhandle Market is.
- b) Will the Panhandle System Expansion Project increase the size of the Panhandle Market? If the answer is yes, please explain the extent of the increase. If the answer is no, please explain why not.
- c) Please explain and quantify the benefits of the Panhandle System for the customers in the Panhandle Market.
- d) Will the costs of the Panhandle System Expansion be recovered in rates only from customers in the Panhandle Market or will the costs also be recovered from customers outside the Panhandle Market?
- e) Please define the term “transmission system” with references to the OEB Act and any other relevant document.



Response:

- a) The Panhandle Market consists of residential, commercial, and industrial markets in the municipalities of Dawn-Euphemia, St. Clair, Chatham-Kent, Windsor, Lakeshore, Leamington, Kingsville, Essex, Amherstburg, LaSalle, and Tecumseh.<sup>1</sup>

A map of the existing Panhandle System can be found at Figure 1 at Exhibit B, Tab 2, Schedule 1, p. 2. A map of the Project (in red) can be found at Figure 1 at Exhibit D, Tab 1, Schedule 1, p. 2.

- b) No. The Project creates natural gas capacity for existing and new customers within Enbridge Gas's franchise area within the Panhandle Market.
- c) For Project benefits that extend beyond identified contract customers, please see the response at Exhibit I.STAFF.25, part c).
- d) Enbridge Gas is not seeking cost recovery of the Project as part of this application.<sup>2</sup>

Please see response at Exhibit I.IGUA.1, part b) for an explanation of the current approved cost allocation methodology for the Panhandle transmission system for the Union South rate zone that underpins the Company's existing rates.

Rates for 2024 will be set per the 2024 Rebasing (EB-2022-0200) Settlement Agreement approved by the OEB on August 17, 2023. Confirmed at Issue 24, interim rates for 2024 will be set by adjusting existing rates by a proportional allocation of the impact of any revenue deficiency/sufficiency determined in Phase 1 to each rate zone and rate class.

The allocation of the Panhandle transmission system inclusive of the Panhandle Reinforcement Expansion Project to rate zones and rate classes in the Company's next cost allocation study will be reviewed in Phase 3 of the 2024 Rebasing (EB-2022-0200) proceeding.

- e) Please see the response at Exhibit JT1.2.

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<sup>1</sup> Exhibit A, Tab 1, Schedule 2, p. 2.

<sup>2</sup> Exhibit A, Tab 3, Schedule 1, para. 13.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Energy Probe Research Foundation (EP)

INTERROGATORY

Reference:

Exhibit A, Tab 4, Schedule 1, Page 6, paragraph 23

Preamble:

“The Panhandle System transports natural gas supply and stored volumes from the Dawn Hub and upstream supply basins into and through Enbridge Gas’s integrated storage and transmission systems, and ultimately distribution systems to end use customers.”

Question(s):

- a) How many “distribution systems” are directly served by the Panhandle System? Please describe each distribution system and the location of its connection with the Panhandle System.
- b) The quoted sentence indicates that the direction of flow is from the Dawn Hub into the Panhandle System. Please confirm that the “end use customers” referred to in the sentence are the customers served by the distribution systems connected to the Panhandle System.

Response:

- a) There are six distribution systems directly served by the Panhandle system, with varying levels of connectivity downstream. Please see the table below for a list of each six systems, the system description and a schematic reference number to align with the schematic shown at Exhibit B, Tab 2, Schedule 1, Attachment 1 for a visual representation of the station locations.

System	Schematic Reference No. <sup>1</sup>	Connection Name	System Description	Municipality Served by Connection
1	12	Couture Beach Station	420 kPa System	Lakeshore
	11	Lighthouse Station		
2	12	Jeanettes Creek Station	420 kPa System	Lakeshore
3	14	Stoney Point Station	420 kPa System	Lakeshore
	13	Tilbury N Twp 2nd Con Station		
4	4	Lindsey Tile Yard Station	420 kPa System	Chatham-Kent
5	12	Tilbury North Station	Various MOP Systems 3450 kPa to 2.5 kPa	Windsor, LaSalle, Tecumseh, Lakeshore, Amherstburg, Essex, Kingsville, Leamington, and Chatham-Kent
	15	St. Joachim Gate Station		
	16	Belle River Gate Station		
	17	Puce Road Station		
	18	Puce Wallace Line Station		
	19	Patillo Rd Gate Station		
	20	Elmstead Gate Station		
	21	Manning Road Station		
	22	Lauzon Road Station		
	23	Marentette Station		
	25	Walker Rd Station		
	26	Grand Marais Station		
	28	Bruce Ave Station		
	29	California Ave Station		
	30	Titcombe Rd Station		
	32	LaSalle Gate Station		
	32	Sprucewood Station		
	32	Turkey Creek Station		
	38	Essex Trans Gate Station		
	37	Kingsville East Gate Station		
36	Mersea Gate Station			
35	Leamington North Gate Station			
35	County Road Rd 18 Station			
35	Mersea Twp Conc 6 Station			
35	County Rd 14 Gate Station			
35	Mersea Rd 11 Station			
35	Comber Transmission Station			
39	Sandwich Transmission Station			
6	10	Bradley Farms Station	Various MOP Systems 3450 kPa to 2.5 kPa	Chatham-Kent Dawn-Euphemia, St. Clair
	8	Bechard Station		
	7	Dover Twp Cartier Line Station		
	5	Tupperville Transmission Station		
	5	Kent Bridge Rd Station at Base Line Station		
	6	Dover Centre Takeoff		
	1	Dawn West Takeoff		

b) Confirmed.

<sup>1</sup> This number aligns with the information presented within the schematic at Exhibit B, Tab 2, Schedule 1, Attachment 1.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Energy Probe Research Foundation (EP)

INTERROGATORY

Reference:

Exhibit B, Tab 1, Schedule 1, Page 2, Paragraph 9

Preamble:

Paragraph "Consistent with these past experiences, significant growth has continued within the Panhandle Market and demand is forecast to exceed the Panhandle System capacity sooner than anticipated, resulting in the need to address a forecasted system capacity shortfall by November 1, 2024."

Question(s):

- a) The quoted paragraph indicates that there were two forecasts of when the demand was to exceed capacity. Please file the two forecasts and give the date of each forecast.
- b) Please file a table showing the numbers of Panhandle Market customers by categories of general service and contract customers. For each category show the original demand forecast and the current demand forecast, and a column showing the increases or decreases for each category.

Response:

- a) Kingsville Transmission Reinforcement Project (KTRP) facilities were anticipated to meet forecasted demand in the Panhandle Market until Winter 2025/2026, based on the best available demand forecast at the time.<sup>1</sup> The demand forecast at that time can be found at Table 7-1 at EB-2018-0013, Exhibit A, Tab 7, page 9 (filed January 25, 2018) and provided below:

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<sup>1</sup> Exhibit B, Tab 1, Schedule 1, para. 8.

**Table 7-1  
 Design Day (TJ/d)**

Panhandle	Rate Class	Historical					W 17/18 (Panhandle Reinforcement Project)	Forecast							
		W 12/13	W 13/14	W 14/15	W 15/16	W 16/17		W 18/19	W 19/20	W 20/21	W 21/22	W 22/23	W 23/24	W 24/25	W 25/26
<b>System Capacity (43.1 IOFF) (TJ/d)</b>		<b>490</b>	<b>527</b>	<b>529</b>	<b>529</b>	<b>564</b>	<b>666</b>	<b>666</b>	<b>666</b>	<b>666</b>	<b>666</b>	<b>666</b>	<b>666</b>	<b>666</b>	<b>666</b>
System Demand (43.1 IOFF) (TJ/d)	M1/ M2	278	284	308	292	291	291	294	296	297	299	300	302	303	304
	M4	49	64	44	45	43	92	99	126	137	147	151	158	165	171
	M5	3	2	8	5	12	1	1	1	1	1	1	1	1	1
	M7	5	4	7	15	32	44	45	45	48	57	62	65	68	71
	T-1	155	162	34	31	28	30	30	31	31	31	31	31	31	31
T-2	0	0	127	141	151	155	155	155	155	155	155	155	155	155	
<b>System Demand (43.1 IOFF) (TJ/d)</b>	<b>Total</b>	<b>490</b>	<b>515</b>	<b>527</b>	<b>528</b>	<b>557</b>	<b>612</b>	<b>624</b>	<b>655</b>	<b>669</b>	<b>690</b>	<b>701</b>	<b>712</b>	<b>723</b>	<b>734</b>

For the current Panhandle Market demand forecast, please refer to Table 2 at Exhibit B, Tab 1, Schedule 1, page 13 (filed June 16, 2023).

b) Please see Table 1 below.

Table 1: EB-2018-0013 and EB-2022-0157 Comparison of Design Day Demands (TJ/d)

	Winter 19/20		Winter 20/21		Winter 21/22		Winter 22/23		Winter 23/24		Winter 24/25		Winter 25/26	
	EB-2018-0013	EB-2022-0157	EB-2018-0013	EB-2022-0157	EB-2018-0013	EB-2022-0157	EB-2018-0013	EB-2022-0157	EB-2018-0013	EB-2022-0157	EB-2018-0013	EB-2022-0157	EB-2018-0013	EB-2022-0157
General Service Rate Firm	296	317	297	308	299	310	300	306	302	308	303	310	304	312
Contract Rate Firm	359	323	372	348	391	362	401	392	410	422	420	492	430	537
<b>Total System Demands</b>	<b>655</b>	<b>640</b>	<b>669</b>	<b>656</b>	<b>690</b>	<b>672</b>	<b>701</b>	<b>698</b>	<b>712</b>	<b>730</b>	<b>723</b>	<b>802</b>	<b>734</b>	<b>849</b>
<b>Difference in Design Day Demands</b>		-14		-13		-18		-3		18		79		115

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Energy Probe Research Foundation (EP)

INTERROGATORY

Reference:

Exhibit C, Tab 1, Schedule 1, Page 2

Preamble:

“The industrial sector makes up 55 percent of the total peak hour consumption but only accounts for 23 percent of the peak hour reductions. This effect is due to several reasons:

- The HVAC and process heating (water and steam) end uses, both entirely in the industrial sector, make up 50 percent and 5 percent of total peak hour consumption, respectively. These end uses only account for a total of 22 percent of the peak hour reduction (17 percent for HVAC and 5 percent for process heating).
- There were significantly less measures that passed the TRC test in the HVAC and process heating (water and steam) end uses, especially when compared with space heating.”

Question(s):

a) Please provide the numerical data that supports the statements by Posterity regarding the peak hour consumption and the peak hour reductions in the quoted text.

b) Did Posterity survey the industrial sector customers of Enbridge in the Panhandle Regional Expansion Market to obtain independent consumption information or did Enbridge provide posterity with the consumption information for the industrial sector?

Response:

The preamble appears to be referencing Exhibit C, Tab 1, Schedule 1, Attachment 2, Page 2 (not Exhibit C, Tab 1, Schedule 1, Page 2). Exhibit C, Tab 1, Schedule 1, Attachment 2 consists of Posterity’s 2022 analysis which was not updated within Enbridge Gas’s amended application filed in June 2023.

To be responsive, Enbridge Gas interprets the interrogatory to be regarding Posterity’s 2023 analysis (Exhibit C, Tab 1, Schedule 1, Attachment 3, which was an update within the Company’s amended application filed in June 2023), specifically the information at Page 3, which states:

“The industrial sector makes up 22% of the total peak hour consumption but only accounts for 9% of the peak hour reductions. This effect is due to the dominance of the few residential space heating measures mentioned above over all other measures:

- 84% of industrial peak hour reductions come from HVAC.”

a) The numerical data supporting Posterity’s observations are shown in Tables 1 to 3 below.

Table 1

2029 Peak Hour Consumption for Industrial (General Service)

	Industrial	Total
Absolute (m3/hr)	100,939	449,472
Proportion	22%	100%

Table 2

2029 Peak Hour Reduction for Industrial (General Service)

	Industrial	Total
Absolute (m3/hr)	6,576	71,899
Proportion	9%	100%

Table 3

2029 Peak Hour Reduction by End Use for Industrial (General Service)

Industrial	HVAC	Total
Absolute (m3/hr)	5,525	6,576
Proportion	84%	100%



- b) For clarity, Posterity's analysis did not include contract customers.<sup>1</sup> As per Exhibit B, Tab 1, Schedule 1, paragraph 20, customers who submitted an EOI form through the 2023 EOI/ROS process were asked to confirm that their EOI bid volumes were inclusive of all future natural gas conservation activities, including natural gas conservation activities within and outside of Enbridge Gas's Demand Side Management programs, and the use of non-natural gas alternative options. All customers confirmed that to be the case.

Enbridge Gas provided the consumption information for the general service industrial sector to Posterity.

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<sup>1</sup> Exhibit C, Tab 1, Schedule 1, Attachment 3, p. 1: "Only general service customers are included in this analysis; contract customers are not included."

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Energy Probe Research Foundation (EP)

INTERROGATORY

Reference:

Exhibit E, Tab 1, Schedule 1, Page 4, Paragraph 9, and Schedule 5.

Preamble:

“The Stage 1 DCF analysis for the Project can be found at Exhibit E, Tab 1, Schedule 5. This schedule indicates that the Project has a NPV of negative \$150 million and a PI of 0.48.”

Question(s):

- a) Why did Enbridge use a 40-year revenue horizon in its Stage 1 DCF analysis?
- b) What are the NPV and the PI if a 20-year horizon is used in the DCF analysis as is specified in EBO 188 for large volume customers?

Response:

- a) Enbridge Gas used a 40-year revenue horizon consistent with past E.B.O. 134 applications approved by the OEB.
- b) Using a revenue horizon of 20 years results in a Stage 1 NPV of negative \$174 million and a PI of 0.39.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Energy Probe Research Foundation (EP)

INTERROGATORY

Reference:

Exhibit E, Tab 1, Schedule 1, Pages 4 and 5, Paragraph 14

Preamble:

“A Stage 2 analysis was undertaken as the Stage 1 NPV is less than zero (negative \$150 million). The Stage 2 analysis considers the estimated energy cost savings that accrue directly to Enbridge Gas in-franchise customers as a result of using natural gas instead of another fuel to meet their energy requirements. The difference in fuel cost is derived as:

*[Weighted Average Alternative Fuel Cost - Cost of Natural Gas] × Energy Use”.*

Question(s):

- a) Who are the “in-franchise customers” referred to in the quoted sentence? Are they new customers added in the Panhandle Regional Expansion Market area? If they are not, please explain why not?
- b) Do the “weighted average alternative fuel cost” remain constant over the analysis periods of 20 and 40 years? If the answer is yes, please explain why. If the answer is no, please explain how the weighted average alternative fuel costs change over the 20 year and 40-year periods.
- c) What assumptions did Enbridge make in its Stage 2 analysis regarding the impact of Energy Transition initiatives over the 20 year and 40-year periods, such as
  - i. electrification and the percentage of residential customers converting their heating systems from gas to electricity;
  - ii. hydrogen and RNG volumes used by Enbridge in its system and the impact on the cost of gas; and
  - iii. costs of conversion of the Enbridge facilities in the Panhandle Market area to allow for distribution of hydrogen.

Response:

- a) The in-franchise customers referenced are new customers in the general service customer class.
- b) Yes. This is consistent with past E.B.O. 134 applications approved by the OEB and provides results reflecting actual best available energy prices in the absence of reliable 20 and 40 year energy price forecasts by fuel type.
- c)
  - i. There are no specific assumptions regarding electrification and the percentage of residential customers converting their heating systems from gas to electricity in the Stage 2 analysis, beyond what has been included in the customer forecast consistent with those described in EB-2022-0200.
  - ii. There are no assumptions regarding hydrogen and RNG volumes used by Enbridge Gas in its system and the impact on the cost of gas in the Stage 2 analysis.
  - iii. There are no assumptions regarding the costs of conversion of the Enbridge Gas facilities in the Panhandle Market area to allow for distribution of hydrogen in the Stage 2 analysis.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Energy Probe Research Foundation (EP)

INTERROGATORY

Reference:

Exhibit E, Tab 1, Schedule 1, Page 5

Preamble:

“The Stage 2 energy cost savings have only been calculated for the general service customer class. It is assumed that contract rate customers will not choose an alternative fuel if natural gas is not available to them. The non-availability of natural gas will cause contract rate customers to expand or move their operations to other jurisdictions, likely outside of Ontario, where their natural gas needs can be served.”

Question(s):

- a) Did Enbridge contact contract rate customers regarding their plans if natural gas was not available to them? If the answer is no, please explain why not. If the answer is yes, please indicate which customers would move to other jurisdictions?
- b) What assumptions did Enbridge make regarding potential use of hydrogen and RNG by contract rate customers?

Response:

- a) No, Enbridge Gas did not specifically ask contract customers what their plans would be if their natural gas requirements were not available.

Regarding existing natural gas requirements from existing customers, Enbridge Gas understands that customers operate with the understanding that their existing contract demands will continue to be met by the Company.

Regarding incremental natural gas requirements from existing and new customers, Enbridge Gas understands that customers who cannot access their natural gas needs would be required to explore alternative locations to expand their operations, where access to affordable energy exists. Please see a recent Globe and Mail article which includes commentary from the greenhouse industry:

- August 2023: “Southern Ontario’s greenhouse operators warn lack of infrastructure is slowing growth in booming sector” – <https://www.theglobeandmail.com/business/article-windsor-greenhouse-growers-infrastructure/>

b) Enbridge Gas did not make assumptions that any of the volumes on the proposed pipeline would be hydrogen or RNG.

Contract customers who are direct purchase may purchase RNG as part of their supply. As proposed in Phase 2 of Enbridge Gas’s Rebasing Application at Exhibit 4.2.7, the Company has proposed a new Low Carbon Voluntary Program to enable system supplied customers the ability to voluntarily elect that a portion of their supply be RNG, pending OEB approval, beginning in 2025.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Energy Probe Research Foundation (EP)

INTERROGATORY

Reference:

Exhibit E, Tab 1, Schedule 2, Page 1

Question(s):

- a) Please explain how the Indirect Overheads of \$68.8 million were estimated showing all calculations.
- b) Were any Indirect Overheads amounts applied to Outside Services? If the answer is yes, please explain why Outside Services costs, which are costs paid to outside construction contractors have Enbridge Indirect Costs applied to them.

Response:

Enbridge Gas is not seeking cost recovery of the Project as part of this application.<sup>1</sup> Indirect overheads have been shown at Exhibit E, Tab 1, Schedule 2 to provide continuity for a separate proceeding regarding cost recovery. Indirect overheads are not included in the Project economics.

- a) Please see Attachment 1 to this response (filed under EB-2022-0200, Exhibit J16.2, Attachment 1) for the derivation of the \$68.8 million figure.
- b) Indirect overheads are allocated to projects based on the amount of direct capital costs and the overhead rate applicable by year. Indirect overheads are not allocated to specific cost components, such as Outside Services.

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<sup>1</sup> Exhibit A, Tab 3, Schedule 1, para. 13.

Panhandle Regional Expansion Project  
Project Cost

Line No.	Cost Description (\$ millions)	NPS 36		Subtotal	Dawn	Total
		Mainline	Stations			
1	Materials	\$ 28.3	\$ 2.2	\$ 30.5	\$ 26.4	\$ 57.0
2	Labour	2.7	0.2	2.8	0.9	3.8
3	External Permitting and Land	17.4	-	17.4	-	17.4
4	Outside Services	130.8	5.4	136.2	42.0	178.1
5	Contingency	13.9	0.6	14.5	6.3	20.8
6	Interest During Construction	6.4	0.3	6.7	5.4	12.1
7	Total Direct Capital Cost	199.5	8.6	208.1	81.1	289.2
8	Indirect Overheads	48.0	2.1	50.1	18.7	68.8
9	Total Project Cost	\$ 247.5	\$ 10.7	\$ 258.2	\$ 99.8	\$ 358.0
Total Direct Capital Cost excluding IDC		193.1	8.3	201.4	75.7	277.1
Indirect Overhead Rate		<u>24.8%</u>	<u>24.8%</u>	<u>24.8%</u>	<u>24.8%</u>	<u>24.8%</u> - weighted average of each year's OH rate
Total Indirect Overheads		48.0	2.1	50.1	18.8	68.8



ENBRIDGE GAS INC.

Answer to Interrogatory from  
Federation of Rental-housing Providers of Ontario ("FRPO")

INTERROGATORY

Reference:

Exhibit B, Tab 1, Schedule 1, p. 2-3, 7, 11, 13 including Table 1 & Attachments 1 & 2

Preamble:

EGL evidence states: Enbridge Gas's current Design Day demand forecast, discussed in detail below, indicates that the Panhandle System demand will increase by 22 TJ/d to 694 TJ/d by Winter 2022/2023, and by an additional 50 TJ/d to 744 TJ/d in Winter 2023/2024.

....

Contract rate customer demand makes up approximately 98% of the capacity of the proposed Project. At the time of filing, approximately 80% of the contract rate customer demand is subject to a customer commitment. Enbridge Gas has secured approximately 159 TJ/d of binding commitments with customers, including approximately 62 TJ/d of executed firm distribution contracts. Moreover, 100% of the 2023/2024 forecasted incremental demand on Panhandle System is currently secured with binding customer commitments.

Question:

We would like to understand better the forecasted growth and the amount of growth for which EGL has a binding commitment.

Please expand Table 1 with the amount of demand for which EGL has received a binding commitment and the amount that is requesting a move from interruptible to firm demand.

- a) Further please describe any monetary contractual commitments associated with these commitments such as aid-to-construct, minimum annual volume, term, consequences associated with not ultimately contracting for the future demand, etc.

**Response**

All existing contract rate demand for the Panhandle System is currently under binding commitment.

Of the incremental contract rate demand in Table 1 at Exhibit B, Tab 1, Schedule 1, Page 11, 167 TJ/d is under binding commitment. 58.6 TJ/d of the 167 TJ/d is for interruptible to firm service conversion.

Distribution contracts on annual renewals are evergreen unless notice to terminate has been provided by either party.

a) Please see Table 1 below for the breakdown of incremental contract rate demand currently under binding commitment.

Table 1

	TJ/d	
	As at Jun 10, 2022 (LTC filing)	As at Sep 22, 2022 (IR Responses)
<b>PREP Capacity Commitments</b>		
Executed Distribution Contracts	62	63
Executed Letters of Indemnity / Commitment Letters	97	104
<b>Total PREP Capacity Commitments</b>	<b>159</b>	<b>167</b>

After a customer has executed a distribution contract, they are responsible for the contract parameters and charges per the applicable rate schedule for the term of their contract. If a customer requests to terminate a contract prior to the end of the contract term, they will still be responsible for the remaining financial commitments of the contract. If a customer executes a Letter of Indemnity (“LOI”), and does not proceed to execute a distribution contract (i.e., cancels their plans), the customer will be liable for costs incurred by Enbridge Gas up to the amount covered by the Indemnification agreement. There are no monetary penalties for termination of a Commitment Letter (“CL”). However, terminating a CL may result in a customer not having access to the natural gas service they requested, if/when they need it in the future.

For distribution contract, Letter of Indemnity and Commitment Letter templates please see the response to Exhibit I.PP.5, Attachment 1.

Each customer that requests incremental contract rate service may require an individual service line, main extension, station(s), and/or local distribution

reinforcement to bring sufficient natural gas from the Panhandle System to their site. These costs will be the responsibility of the customer and will be assessed in accordance with E.B.O. 188 guidelines, which may result in the need for the customer to pay a contribution in aid of construction.

Capacity will be allocated on a first-come, first-served basis. Customers can request and contract for future capacity requirements at any time subject to the availability of such capacity. Enbridge Gas will reserve the contracted capacity for future demands provided that the customer agrees to pay the Demand Charges per the applicable rate schedule.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Federation of Rental-housing Providers of Ontario ("FRPO")

INTERROGATORY

Reference:

Exhibit B, Tab 1, Schedule 1, p. 2-3, 7, 11, 13 including Table 1 & Attachments 1 & 2

Preamble:

EGL evidence states: Enbridge Gas's current Design Day demand forecast, discussed in detail below, indicates that the Panhandle System demand will increase by 22 TJ/d to 694 TJ/d by Winter 2022/2023, and by an additional 50 TJ/d to 744 TJ/d in Winter 2023/2024.

....

Contract rate customer demand makes up approximately 98% of the capacity of the proposed Project. At the time of filing, approximately 80% of the contract rate customer demand is subject to a customer commitment. Enbridge Gas has secured approximately 159 TJ/d of binding commitments with customers, including approximately 62 TJ/d of executed firm distribution contracts. Moreover, 100% of the 2023/2024 forecasted incremental demand on Panhandle System is currently secured with binding customer commitments.

Question:

Did EGL explore and discuss with customers what level of rate reduction that firm customers would need to move to interruptible?

a) If not, why not?

Response

No. Enbridge Gas did not specifically explore and discuss with existing customers in the Project area of study, what level of rate reduction would be required to incent customers currently contracted for firm service to move to interruptible service.

No such mechanism exists today to incent customers to convert existing firm service to interruptible service. The intent of the EOI process was to provide new and existing customers the opportunity to formally communicate their energy requirements to be met by natural gas under the current approved rates and services.

Most of the customers who submitted bids for new/incremental firm service, or to convert existing interruptible service to firm, are existing Enbridge Gas customers who are familiar with each type of service offering and the level of reliability/certainty of each service type. This was reflected in the bids received through the EOI process, with 99.7% of the total interest received being for new/incremental firm service or the conversion of existing interruptible service to firm. Please also see the response at Exhibit I.STAFF.4 part a) for the results of the EOI.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Federation of Rental-housing Providers of Ontario ("FRPO")

INTERROGATORY

Reference:

Exhibit B, Tab 1, Schedule 1, p. 2-3, 7, 11, 13 including Table 1 & Attachments 1 & 2

Preamble:

EGL evidence states: Natural gas is uniquely suited to the greenhouse sector. It is used to heat greenhouses and to supply the carbon dioxide requirements ("CO<sub>2</sub>") of the growing plants. A common practice within the greenhouse sector is to capture the CO<sub>2</sub> that would normally be emitted into the atmosphere upon combustion of natural gas and use it within the greenhouse where it is consumed by the growing plants, resulting in faster growth and increased production.

Question:

Has EGL considered a different rate for greenhouses that reflects the benefits to greenhouse owners as higher than customers who simply use natural gas for energy?

a) If not, why not?

**Response**

No, Enbridge Gas has not considered a rate design that is specific to any one industry, including the greenhouse sector.

a) Costs are allocated to rate classes based on the cost to serve customers in the rate class. The distribution cost to serve one unit of demand of a customer in the greenhouse sector is no different than the distribution cost to serve one unit of demand of a customer in another industry.

Eligible commercial greenhouse customers are provided specific relief from the Federal Carbon Charge under the Greenhouse Gas Pollution Pricing Act as a result of the nature of the greenhouse sector operations.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Federation of Rental-housing Providers of Ontario ("FRPO")

INTERROGATORY

Reference:

Exhibit B, Tab 1, Schedule 1, p. 2-3, 7, 11, 13 including Table 1 & Attachments 1 & 2

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Question:

For the schematic structure provided in Attachment 1, in tabular format, please provide the throughput and direction through:

- a) Dover Transmission to the NPS 16 & separately to the NPS 20
- b) Leamington North Gate (please add pressure also)
- c) Grand Marais Station
- d) Sandwich Station
- e) Ojibway Measurement (table shows demand of 30TJ – seeking clarification)
- f) Detroit River Crossing

**Response**

The Company is interpreting FRPO's reference to "Attachment 1" to be Exhibit B, Tab 2, Schedule 1, Attachment 1.

Please see Table 1 below for Winter 2024/2025 throughput and gas flow direction, without the proposed Project. In response to the clarification requested for item e), there are several distribution stations in the vicinity of Ojibway Measurement that were assigned to the Ojibway Measurement node within the schematics. Exhibit B, Tab 2,

Schedule 1, Attachment 1, shows that on design day there is 29,193 GJ/d of demand being served to customers from that general location. Thus the 60,138 GJ/d of Ojibway supply coming into the Panhandle System at the River Crossing passes through the Ojibway Measurement Station, serves the demand associated with the distribution stations near to the Ojibway Measurement Station, and the remaining 30,945 GJ/d flows easterly into the NPS 16 Panhandle System to serve other customer demands.

Table 1: Throughput and Direction at Existing Facilities Without the Project

<b>W24/25 Existing Facilities (without Proposed Project)</b>	<b>Throughput</b>	<b>Direction</b>	<b>Requested Pressure</b>
<b>Location</b>	<b>GJ/d</b>	<b>Flow</b>	<b>kPag</b>
Dawn Supply	742,043	Westerly	
Dover Transmission Station to NPS 16	175,554	Westerly	
Dover Transmission Station to NPS 20	457,657	Westerly	
Leamington North Gate Station	14,260	South	1580
Grand Marais Station	25,819	Westerly	
Sandwich Station	145,562	Westerly	
Ojibway Measurement to Windsor	60,138	North/South	
Detroit River Crossing (Ojibway Supply)	60,138	Easterly	



ENBRIDGE GAS INC.

Answer to Interrogatory from  
Federation of Rental-housing Providers of Ontario ("FRPO")

INTERROGATORY

Reference:

Exhibit B, Tab 1, Schedule 1, p. 2-3, 7, 11, 13 including Table 1 & Attachments 1 & 2

Preamble:

EGI evidence states: Natural gas is uniquely suited to the greenhouse sector. It is used to heat greenhouses and to supply the carbon dioxide requirements ("CO<sub>2</sub>") of the growing plants. A common practice within the greenhouse sector is to capture the CO<sub>2</sub> that would normally be emitted into the atmosphere upon combustion of natural gas and use it within the greenhouse where it is consumed by the growing plants, resulting in faster growth and increased production.

Question:

Please provide the information in Attachment 1, including the flows requested in IR#4 above, with the addition of:

- a) The proposed 19 km of NPS 36 with demands for:
  - i) Winter 2023/24
  - ii) Winter 2030/31 (using Table 1 demands)
- b) The proposed 12 km of NPS 16 with demands for:
  - i) Winter 2023/24
  - ii) Winter 2030/31 (using Table 1 demands)
- c) Both the proposed 19 km of NPS 36 and the 12km of NPS 16 with demands for:
  - i) Winter 2023/24
  - ii) Winter 2030/31 (using Table 1 demands)

## **Response**

The Company is interpreting FRPO's reference to "Attachment 1" to be Exhibit B, Tab 2, Schedule 1, Attachment 1. Please note that while Attachments 1-4 discussed below are marked as confidential in nature, that is solely for internal document control purposes and thus can be disregarded for the purposes of this response.

- a)
- i. Please see Attachment 1 to this response for the proposed 19 km of NPS 36 with demand for Winter 2023/2024.
  - ii. The proposed 19 km of NPS 36 with demand for Winter 2030/2031 cannot be provided as requested as the Company's hydraulic model returned an infeasible result due to extremely low system pressures, and the model would not balance. In this scenario, there is a growing shortfall from Winter 2023/2024 to Winter 2029/2030 of 244 TJ/day. When the 19 km of NPS 36 is added in Winter 2030/2031 as suggested, the shortfall drops to 150 TJ/d.
- b)
- i. Please see Attachment 2 to this response for the proposed 12 km of NPS 16 with demand for Winter 2023/2024.
  - ii. The proposed 12 km of NPS 16 with demands for Winter 2030/2031 cannot be provided as requested as the Company's hydraulic model returned an infeasible result due to extremely low system pressures, and the model would not balance. In this scenario, similar to a) ii. above, there is a growing shortfall from Winter 2023/2024 to Winter 2029/2030 of 244 TJ/day. When this 12 km of NPS 16 is added in Winter 2030/2031 as proposed, the shortfall drops to 226 TJ/d.
- c)
- i. Please see Attachment 3 to this response for the proposed 19 km of NPS 36 and the proposed 12 km of NPS 16 with demand for Winter 2023/2024.
  - ii. Please see Attachment 4 to this response for the proposed 19 km of NPS 36 and the proposed 12 km of NPS 16 with demands for Winter 2030/2031.

/U

**W2023/2024 Proposed 19 km of NPS 36 Schematic and Summary Table**

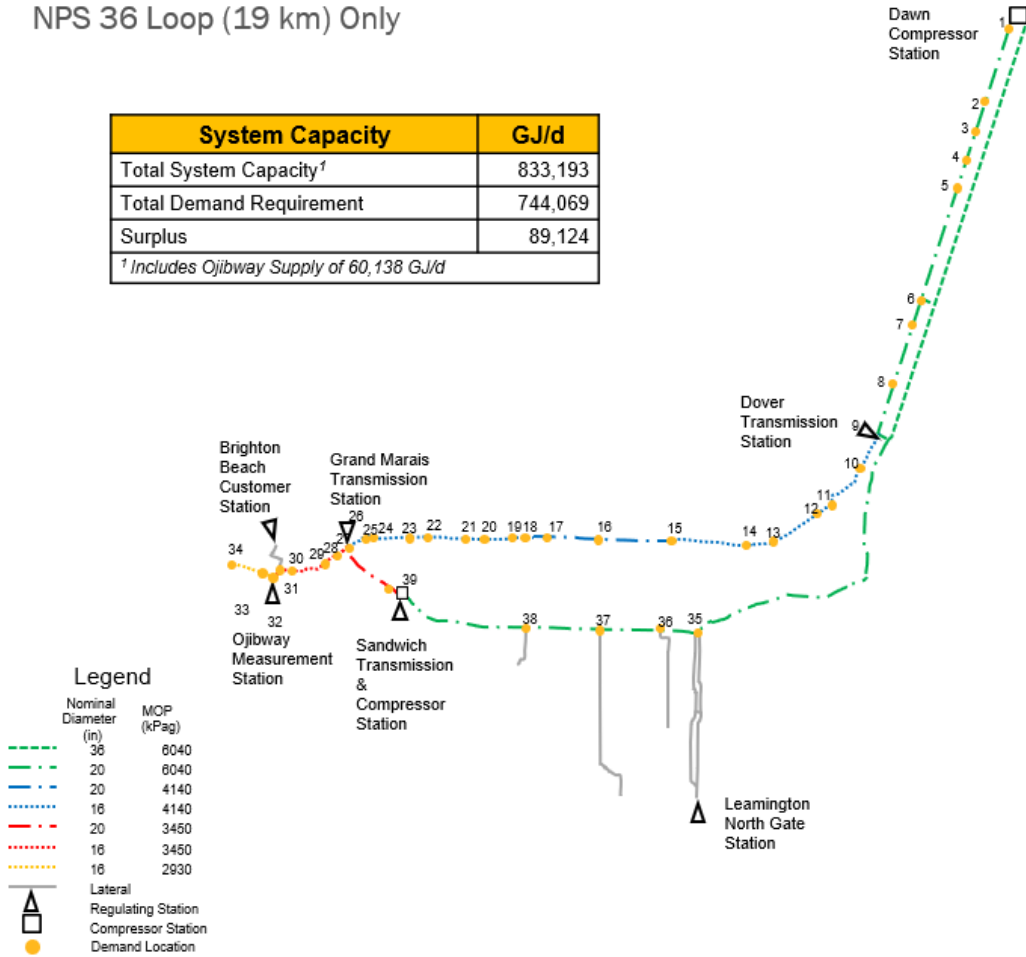
**Panhandle Transmission System**

Winter Design Day Schematic  
 Winter 2023/2024  
 NPS 36 Loop (19 km) Only



System Capacity	GJ/d
Total System Capacity <sup>1</sup>	833,193
Total Demand Requirement	744,069
Surplus	89,124

<sup>1</sup> Includes Ojibway Supply of 60,138 GJ/d



**Legend**

Nominal Diameter (in)	MOP (kPag)
36	6040
20	6040
20	4140
16	4140
20	3450
16	3450
16	2930

Lateral  
 Regulating Station  
 Compressor Station  
 Demand Location

W23/24	Station Name	Kilometre Post (km)	Demand (GJ/d)	Pressure (kPag)
	1 Dawn / Dawn West Lines	0	17742	5999
	2 Tolloch & Mandaumin	4.3	0	5980
	3 Chatham Gore Conc 4	10	0	5956
	4 Lindsay Tile Yard	12.9	37	5944
	5 Tupperville	15.2	3694	5935
	6 Dover Centre	27	83976	5877
	7 Cartier	29.4	0	5868
	8 Bechard	34.9	1927	5848
	9 Dover Transmission	40	0	5828
	10 Bradley	44.1	0	3918
	11 T. N. Lighthouse	48.9	187	3712
	12 Tilbury North TO	50.7	3995	3632
	13 Tilbury Conc 2	55.8	0	3384
	14 Stoney Point	58.7	1223	3238
	15 St Joachim	65.4	494	2892
	16 Belle River	72.6	3731	2764
	17 Puce	77.8	2336	2673
	18 Wallace	79.4	32	2640
	19 Patillo	80.9	5139	2614
	20 Elmstead	83	1537	2469
	21 Manning	85.2	7523	2313
	22 Lauzon TO	88.9	50000	2051
	23 Ford Marentette TO	90.7	3253	2012
	24 TransAlta / East Windsor TO	94.2	36242	1942
	25 Walker	94.9	36971	1939
	26 Grand Marais	97.1	26671	1937
	27 NPS 16/20 Interconnect	108.1	0	1940
	28 Bruce	109.4	3797	1930
	29 California	111.4	14812	1891
	30 Titcombe	114.9	13451	1850
	31 Brighton Beach and WWP	116.2	72314	1829
	32 Ojibway Measurement	116.6	30723	1842
	33 Ojibway Valve	117.9	0	1867
	34 River Crossing	118.6	0	1910
	35 Comber	71.2	181251	4980
	36 Mersea	75	43029	4909
	37 Kingville	80	78083	4840
	38 Essex	88.1	6014	4797
	39 Sandwich Transmission	101.1	13881	2013
<b>Total</b>			<b>744069</b>	

**CONFIDENTIAL**

<b>W23/24 NPS 36 Loop Only</b>	<b>Throughput</b>	<b>Direction</b>	<b>Requested Pressure</b>
<b>Location</b>	<b>GJ/d</b>	<b>Flow</b>	<b>kPag</b>
Dawn Supply	683931	Westerly	
Dover Transmission to NPS 16	172544	Westerly	
Dover Transmission to NPS 20	404010	Westerly	
Leamington North Gate Station	20372	South	3783
Grand Marais Station	19879	Westerly	
Sandwich Station	95632	Westerly	
Ojibway Measurement to Windsor	60138	North/South	
Detroit River Crossing (Ojibway Supply)	60138	Easterly	

### W2023/2024 Proposed 12 km of NPS 16 Schematic and Summary Table

## Panhandle Transmission System

Winter Design Day Schematic

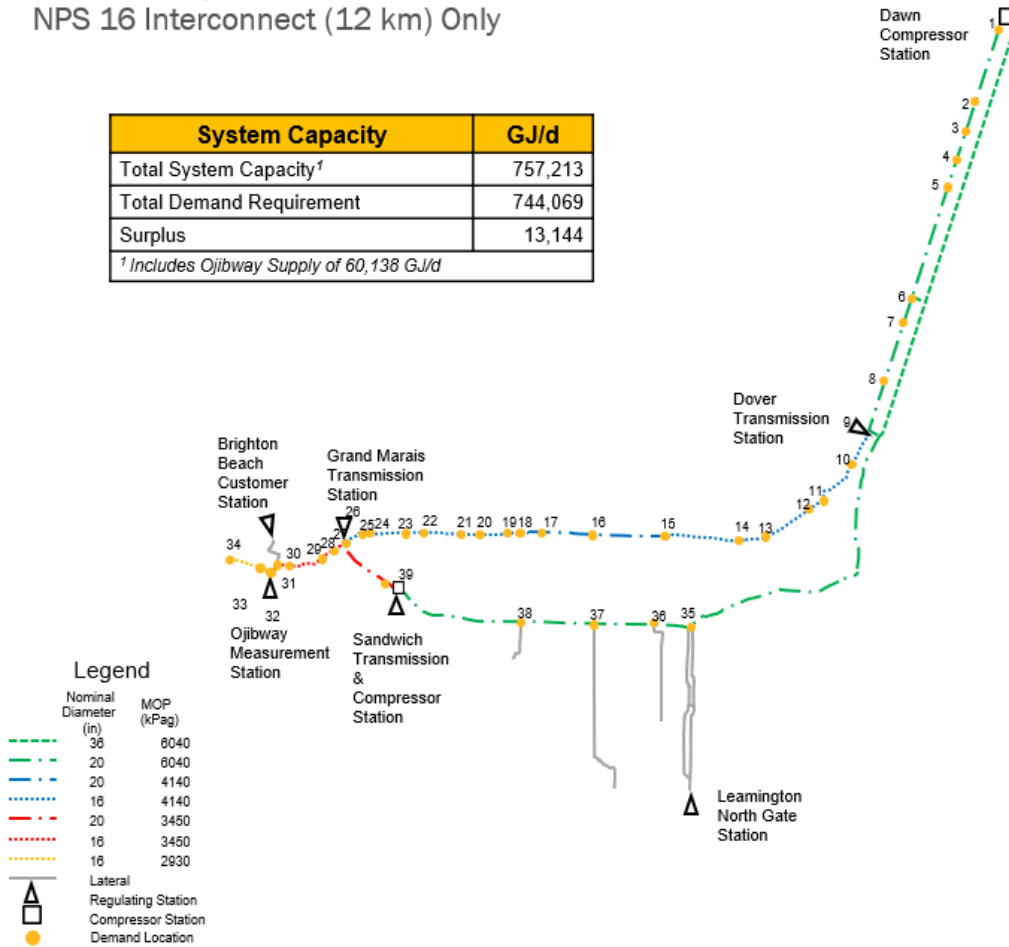
Winter 2023/2024

NPS 16 Interconnect (12 km) Only



System Capacity	GJ/d
Total System Capacity <sup>1</sup>	757,213
Total Demand Requirement	744,069
Surplus	13,144

<sup>1</sup> Includes Ojibway Supply of 60,138 GJ/d



#### Legend

Nominal Diameter (in)	MOP (kPag)
36	8040
20	8040
20	4140
16	4140
20	3450
16	3450
16	2930

Lateral  
 Regulating Station  
 Compressor Station  
 Demand Location

W23/24	Station Name	Kilometre Post (km)	Demand (GJ/d)	Pressure (kPag)
1	Dawn / Dawn West Lines	0	17742	5999
2	Tolloch & Mandaumin	4.3	0	5981
3	Chatham Gore Conc 4	10	0	5959
4	Lindsay Tile Yard	12.9	37	5947
5	Tupperville	15.2	3694	5939
6	Dover Centre	27	83976	5884
7	Cartier	29.4	0	5875
8	Bechard	34.9	1927	5856
9	Dover Transmission	40	0	5837
10	Bradley	44.1	0	3918
11	T. N. Lighthouse	48.9	187	3712
12	Tilbury North TO	50.7	3995	3632
13	Tilbury Conc 2	55.8	0	3385
14	Stoney Point	58.7	1223	3238
15	St Joachim	65.4	494	2892
16	Belle River	72.6	3731	2765
17	Puce	77.8	2336	2673
18	Wallace	79.4	32	2641
19	Patillo	80.9	5139	2615
20	Elmstead	83	1537	2470
21	Manning	85.2	7523	2314
22	Lauzon TO	88.9	50000	2052
23	Ford Marentette TO	90.7	3253	2013
24	TransAlta / East Windsor TO	94.2	36242	1943
25	Walker	94.9	36971	1940
26	Grand Marais	97.1	26671	1938
27	NPS 16/20 Interconnect	108.1	0	1940
28	Bruce	109.4	3797	1931
29	California	111.4	14812	1891
30	Titcombe	114.9	13451	1851
31	Brighton Beach and WWP	116.2	72314	1830
32	Ojibway Measurement	116.6	30723	1843
33	Ojibway Valve	117.9	0	1868
34	River Crossing	118.6	0	1910
35	Comber	71.2	181251	3578
36	Mersea	75	43029	3429
37	Kingsville	80	78083	3266
38	Essex	88.1	6014	3205
39	Sandwich Transmission	101.1	13881	2013
<b>Total</b>			<b>744069</b>	

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<b>W23/24 Interconnect Only</b>	<b>Throughput</b>	<b>Direction</b>	<b>Requested Pressure</b>
<b>Location</b>	<b>GJ/d</b>	<b>Flow</b>	<b>kPag</b>
Dawn Supply	683931	Westerly	
Dover Transmission to NPS 16	172544	Westerly	
Dover Transmission to NPS 20	404010	Westerly	
Leamington North Gate Station	20372	South	2624
Grand Marais Station	19879	Westerly	
Sandwich Station	95604	Westerly	
Ojibway Measurement to Windsor	60138	North/South	
Detroit River Crossing (Ojibway Supply)	60138	Easterly	

## W2023/2024 Proposed 19 km of NPS 36 and the 12km of NPS 16 Schematic and Summary Table

### Panhandle Transmission System

Winter Design Day Schematic

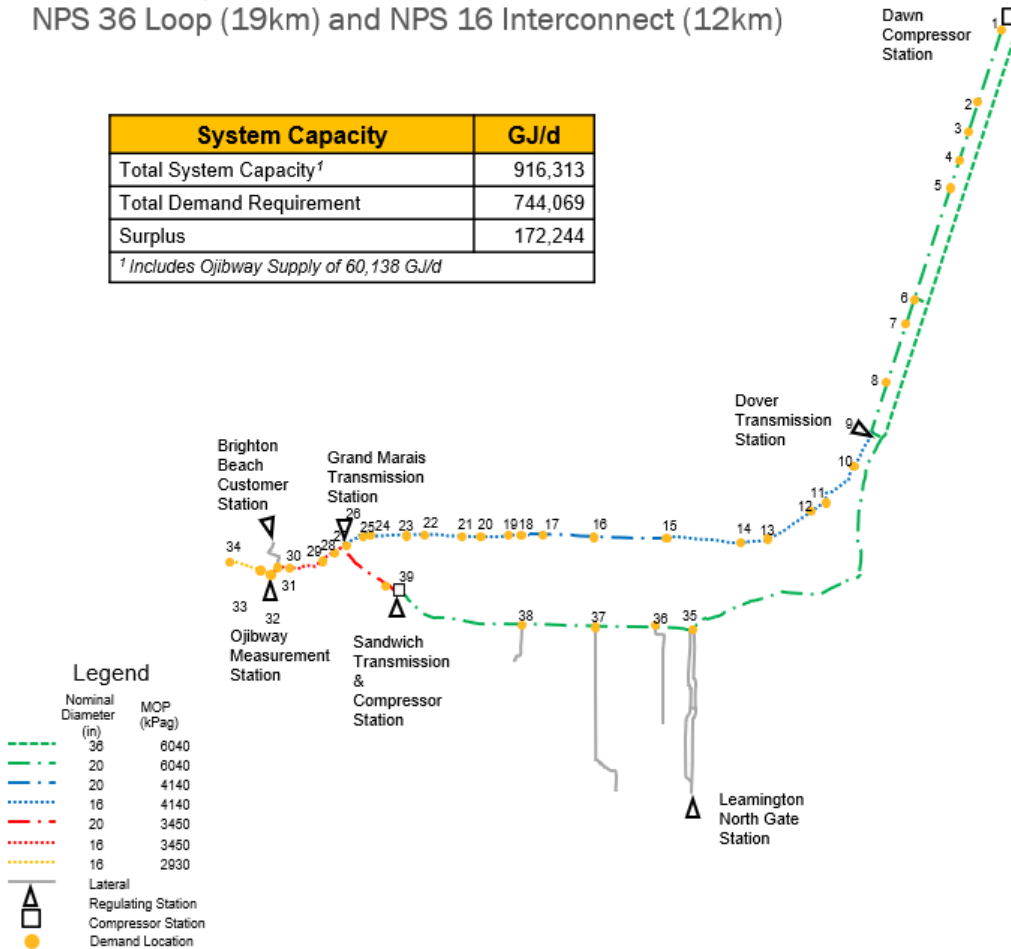
Winter 2023/2024

NPS 36 Loop (19km) and NPS 16 Interconnect (12km)



System Capacity	GJ/d
Total System Capacity <sup>1</sup>	916,313
Total Demand Requirement	744,069
Surplus	172,244

<sup>1</sup> Includes Ojibway Supply of 60,138 GJ/d



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W23/24	Station Name	Kilometre Post (km)	Demand (GJ/d)	Pressure (kPag)
1	Dawn / Dawn West Lines	0	17742	5999
2	Tolloch & Mandaumin	4.3	0	5980
3	Chatham Gore Conc 4	10	0	5956
4	Lindsay Tile Yard	12.9	37	5944
5	Tupperville	15.2	3694	5935
6	Dover Centre	27	83976	5877
7	Cartier	29.4	0	5868
8	Bechard	34.9	1927	5848
9	Dover Transmission	40	0	5828
10	Bradley	44.1	0	3918
11	T. N. Lighthouse	48.9	187	3712
12	Tilbury North TO	50.7	3995	3632
13	Tilbury Conc 2	55.8	0	3384
14	Stoney Point	58.7	1223	3238
15	St Joachim	65.4	494	2892
16	Belle River	72.6	3731	2764
17	Puce	77.8	2336	2673
18	Wallace	79.4	32	2640
19	Patillo	80.9	5139	2614
20	Elmstead	83	1537	2469
21	Manning	85.2	7523	2314
22	Lauzon TO	88.9	50000	2052
23	Ford Marentette TO	90.7	3253	2012
24	TransAlta / East Windsor TO	94.2	36242	1943
25	Walker	94.9	36971	1939
26	Grand Marais	97.1	26671	1938
27	NPS 16/20 Interconnect	108.1	0	1940
28	Bruce	109.4	3797	1930
29	California	111.4	14812	1891
30	Titcombe	114.9	13451	1850
31	Brighton Beach and WWP	116.2	72314	1829
32	Ojibway Measurement	116.6	30723	1842
33	Ojibway Valve	117.9	0	1867
34	River Crossing	118.6	0	1910
35	Comber	71.2	181251	4983
36	Mersea	75	43029	4874
37	Kingsville	80	78083	4757
38	Essex	88.1	6014	4713
39	Sandwich Transmission	101.1	13881	2013
<b>Total</b>			<b>74 4069</b>	

<b>W23/24 NPS 36 Panhandle Loop and Leamington Interconnect</b>	<b>Throughput</b>	<b>Direction</b>	<b>Requested Pressure</b>
<b>Location</b>	<b>GJ/d</b>	<b>Flow</b>	<b>kPag</b>
Dawn Supply	683931	Westerly	
Dover Transmission to NPS 16	172556	Westerly	
Dover Transmission to NPS 20 and 36	403999	Westerly	
Leamington North Gate Station	20376	South	4331
Grand Marais Station	19907	Westerly	
Sandwich Station	95632	Westerly	
Ojibway Measurement to Windsor	60138	North/South	
Detroit River Crossing (Ojibway Supply)	60138	Easterly	



## W2030/2031 Proposed 19 km of NPS 36 and the 12km of NPS 16 Schematic and Summary Table

### Panhandle Transmission System

Winter Design Day Schematic

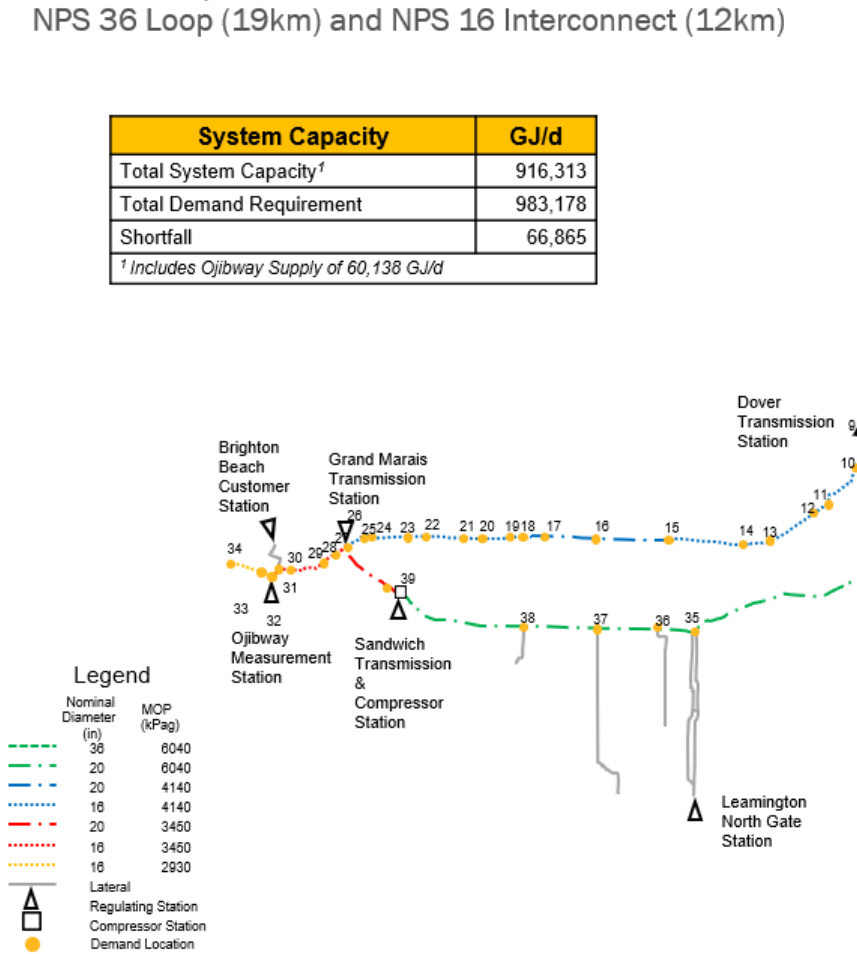
Winter 2030/2031

NPS 36 Loop (19km) and NPS 16 Interconnect (12km)



System Capacity	GJ/d
Total System Capacity <sup>1</sup>	916,313
Total Demand Requirement	983,178
Shortfall	66,865

<sup>1</sup> Includes Ojibway Supply of 60,138 GJ/d



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W30/31	Station Name	Kilometre Post (km)	Demand (GJ/d)	Pressure (kPag)
1	Dawn / Dawn West Lines	0	17854	5999
2	Tolloch & Mandaumin	4.3	0	5966
3	Chatham Gore Conc 4	10	0	5923
4	Lindsay Tile Yard	12.9	37	5901
5	Tupperville	15.2	3716	5886
6	Dover Centre	27	84228	5785
7	Cartier	29.4	0	5768
8	Bechard	34.9	1936	5730
9	Dover Transmission	40	0	5692
10	Bradley	44.1	0	3917
11	T. N. Lighthouse	48.9	194	3709
12	Tilbury North TO	50.7	4113	3628
13	Tilbury Conc 2	55.8	0	3378
14	Stoney Point	58.7	1263	3230
15	St Joachim	65.4	510	2880
16	Belle River	72.6	3854	2752
17	Puce	77.8	2413	2659
18	Wallace	79.4	33	2626
19	Patillo	80.9	5283	2599
20	Elmstead	83	1588	2450
21	Manning	85.2	7771	2290
22	Lauzon TO	88.9	51016	2017
23	Ford Marentette TO	90.7	3361	1974
24	TransAlta / East Windsor TO	94.2	36242	1898
25	Walker	94.9	37666	1894
26	Grand Marais	97.1	27506	1887
27	NPS 16/20 Interconnect	108.1	0	1889
28	Bruce	109.4	3909	1864
29	California	111.4	15259	1759
30	Titcombe	114.9	13789	1612
31	Brighton Beach and WWP	116.2	129996	1511
32	Ojibway Measurement	116.6	31364	1573
33	Ojibway Valve	117.9	0	1601
34	River Crossing	118.6	0	1651
35	Comber	71.2	290430	3422
36	Mersea	75	90681	3063
37	Kingsville	80	96710	2643
38	Essex	88.1	6139	2497
39	Sandwich Transmission	101.1	14318	2310
<b>Total</b>			<b>983178</b>	

<b>W30/31 NPS 36 Panhandle Loop and Leamington Interconnect</b>	<b>Throughput</b>	<b>Direction</b>	<b>Requested Pressure</b>
<b>Location</b>	<b>GJ/d</b>	<b>Flow</b>	<b>kPag</b>
Dawn Supply	923040	Westerly	
Dover Transmission to NPS 16	167465	Westerly	
Dover Transmission to NPS 20 and 36	647805	Westerly	
Leamington North Gate Station	20874	South	1496
Grand Marais Station	12158	Westerly	
Sandwich Station	163845	Westerly	
Ojibway Measurement to Windsor	60138	North/South	
Detroit River Crossing (Ojibway Supply)	60138	Easterly	

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Federation of Rental-housing Providers of Ontario ("FRPO")

INTERROGATORY

Reference:

Exhibit B, Tab 2, Schedule 1, p. 3, 5, 6, 7 and  
EB-2016-0186 including Exhibit K2.1 Union\_Further Correspondence\_20161122

Preamble:

EGI evidence states: Two NPS 12 pipelines ("Detroit River Crossing" or "the crossings") connect the NPS 16 Panhandle Line at Ojibway to the Panhandle Eastern Pipeline System ("Panhandle Eastern") at the International Border. This interconnection was established in 1947 and is commercially known as Ojibway. The Detroit River Crossing MOP is 2930 kPag.

We would like to understand more about EGI's review of the potential for increasing supply at Ojibway. During the last major Panhandle Reinforcement proceeding, EB-2016-0186, there was significant evidence regarding Energy Transfer's desire to increase deliveries to Dawn including the potential to obligate at Ojibway. We understand that EGI held discussions with Rover, of which Energy Transfer holds an ownership position, but we are interested in discussions with Energy Transfer who owns the Panhandle Eastern Pipeline.

Question:

Please summarize the contractual agreements that Union Gas/Enbridge Gas Inc. had/have with Energy Transfer as it relates to Panhandle Eastern deliveries to and through Ojibway to the EGI's Panhandle system:

- a) Prior to November 1, 2016
- b) After November 1, 2016, as the agreements relate to negotiations occurring during the proceeding.
- c) Currently

## **Response**

Enbridge Gas does not accept FRPO's interpretation of the Panhandle Reinforcement Project proceeding (EB-2016-0186) in the preamble, specifically the statement that "there was significant evidence regarding Energy Transfer Partners' desire to increase deliveries to Dawn including the potential to obligate at Ojibway". Energy Transfer did not express interest in increasing deliveries at Dawn as part of the Panhandle Reinforcement Project proceeding.<sup>1</sup> Rather, Rover LLC executed contracts for Ojibway to Dawn C1 service that were presented in that same proceeding and has not requested incremental capacity since.

- a) Table 1 below includes contracts held by Union Gas Limited with Energy Transfer for capacity on the Panhandle Eastern Pipeline to Ojibway prior to November 1, 2016. All contracts listed in Table 1 are for firm transportation capacity.

Table 1: Contracts held by Union Gas with Energy Transfer for capacity on the Panhandle Eastern Pipeline to Ojibway prior to November 1, 2016.

<b>Contract</b>	<b>Path</b>	<b>Volume (TJ/d)</b>	<b>Expiry</b>
19605	PEPL FZ to Ojibway	26	October 2017
43059	PEPL FZ to Ojibway	11	October 2017
36203	PEPL FZ to Ojibway	2	October 2017
21273 (Trunkline)	Gulf to Ojibway	21	October 2017

- b) and c)

Table 2 below includes contracts held by Union Gas Limited (now Enbridge Gas) with Energy Transfer for capacity on the Panhandle Eastern Pipeline to Ojibway after November 1, 2016. There have been no changes to the contracts since this time.

---

<sup>1</sup> EB-2016-0186, Technical Conference Transcript, Day 2, Page 30, MR. REDFORD: Well, again, so an obligated flow at Ojibway, somebody has to control that into Ojibway. And in our discussions with Rover, they're not willing to do that. In fact, they don't have title to the gas. So ultimately we would have to nominate -- or we would have to buy supply from one of the Rover shippers at Dawn, and then once that was -- that was done, then they would route that supply through Ojibway. They're not -- when you look at -- and we have confirmed this with Rover. Ojibway is not a delivery point on the Rover system. It's not included in their tariff which was filed, and it is confidentially filed with FERC. But they have told us that it is not -- it is not a primary delivery point and it's not -- they did not include it in their secondary delivery points.

Table 2: Contracts held by Union Gas (now Enbridge Gas) with Energy Transfer for capacity on the Panhandle Eastern Pipeline to Ojibway after November 1, 2016.

<b>Contract</b>	<b>Path</b>	<b>Volume (TJ/d)</b>	<b>Expiry</b>
43059	PEPL FZ to Ojibway	23	October 2027
19605	PEPL FZ to Ojibway	37	October 2025

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Federation of Rental-housing Providers of Ontario ("FRPO")

INTERROGATORY

Reference:

Exhibit B, Tab 2, Schedule 1, p. 3, 5, 6, 7 and  
EB-2016-0186 including Exhibit K2.1 Union\_Further Correspondence\_20161122

Preamble:

EGI evidence states: Two NPS 12 pipelines ("Detroit River Crossing" or "the crossings") connect the NPS 16 Panhandle Line at Ojibway to the Panhandle Eastern Pipeline System ("Panhandle Eastern")<sup>2</sup> at the International Border. This interconnection was established in 1947 and is commercially known as Ojibway. The Detroit River Crossing MOP is 2930 kPag.

<sup>2</sup> Panhandle Eastern Pipe Line Company, LP is owned by Energy Transfer Equity L.P.

We would like to understand more about EGI's review of the potential for increasing supply at Ojibway. During the last major Panhandle Reinforcement proceeding, EB-2016-0186, there was significant evidence regarding Energy Transfer's desire to increase deliveries to Dawn including the potential to obligate at Ojibway. We understand that EGI held discussions with Rover, of which Energy Transfer holds an ownership position, but we are interested in discussions with Energy Transfer who owns the Panhandle Eastern Pipeline.

Question:

Please file EB-2016-0186 Exhibit K2.1

- a) Please file all correspondence (letters, emails, other electronic communication, etc.) between Energy Transfer and Union Gas/Enbridge Gas Inc. since Dec. 1, 2016, that relates to capacity on Panhandle Eastern to and potentially through Ojibway to EGI's Panhandle system.
- b) Did EGI approach Energy Transfer regarding:
  - i) Obligating deliveries as contemplated in Exhibit K2.1?  
(1) If not, why not?
  - ii) Increasing capacity across the Detroit River?  
(1) If not, why not?

## **Response**

Enbridge Gas does not accept FRPO's interpretation of the Panhandle Reinforcement Project proceeding (EB-2016-0186) in the preamble, specifically the statement that "there was significant evidence regarding Energy Transfer Partners' desire to increase deliveries to Dawn including the potential to obligate at Ojibway". Energy Transfer did not express interest in increasing deliveries at Dawn as part of the Panhandle Reinforcement Project proceeding.<sup>1</sup> Rather, Rover LLC executed contracts for Ojibway to Dawn C1 service that were presented in that same proceeding and has not requested incremental capacity since.

For the reasons above, as undertaking responses from the Panhandle Reinforcement Project proceeding are already a matter of public record, and as it bears no relevance to and would not provide any value to the OEB in the current Project proceeding, Enbridge Gas respectfully declines to file the exhibit requested by FRPO.

a) Please see Attachment 1 to this response for correspondence between Enbridge Gas and Energy Transfer, regarding Energy Transfer's ability to participate in the Request for Proposal (RFP) for delivered service at Ojibway as a supply-side alternative for the proposed Project. Correspondence with Energy Transfer dealing with matters outside of the current Project are not relevant to the current proceeding.

b)

- i. Enbridge Gas has confirmed again that Energy Transfer is not able to obligate deliveries; consistent with previous discussions as contemplated in the Panhandle Reinforcement Project proceeding, as discussed above.

Enbridge Gas developed the RFP for the firm exchange service to be inclusive to ex-franchise shippers with capacity on the PEPL system, in addition to shippers holding firm C1 transportation capacity on the Enbridge Gas Ojibway to Dawn path of the Panhandle Transmission System.

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<sup>1</sup> EB-2016-0186, Technical Conference Transcript, Day 2, Page 30, MR. REDFORD: Well, again, so an obligated flow at Ojibway, somebody has to control that into Ojibway. And in our discussions with Rover, they're not willing to do that. In fact, they don't have title to the gas. So ultimately we would have to nominate -- or we would have to buy supply from one of the Rover shippers at Dawn, and then once that was -- that was done, then they would route that supply through Ojibway. They're not -- when you look at -- and we have confirmed this with Rover. Ojibway is not a delivery point on the Rover system. It's not included in their tariff which was filed, and it is confidentially filed with FERC. But they have told us that it is not -- it is not a primary delivery point and it's not -- they did not include it in their secondary delivery points.

Enbridge Gas launched its firm exchange service RFP on September 16, 2021. On September 19, 2021, Enbridge Gas held a virtual meeting with members of Energy Transfer to determine whether they were interested in participating in the RFP, which would provide firm deliveries at Ojibway. Energy Transfer indicated that as a transmission pipeline operator, they transport gas for others and therefore are unable to offer a firm exchange and would not bid on the RFP.

- ii. Please see the response to Exhibit I.FRPO.8 for explanation as to why increasing capacity via the Detroit River Crossings is not a cost-effective alternative.

As discussed in Enbridge Gas's most recent Asset Management Plan, Enbridge Gas is planning to replace the existing NPS 12 Detroit River crossings to provide equivalent capacity, and is currently in discussion with Energy Transfer on a joint project to that effect.



## Matt Thomas

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**Subject:** Enbridge RFP  
**Location:** WebEx

**Start:** Mon 9/20/2021 12:30 PM  
**End:** Mon 9/20/2021 1:30 PM

**Recurrence:** (none)

**Meeting Status:** Accepted

**Organizer:** Reid, John

-----Original Appointment-----

**From:** Reid, John <John.Reid@energytransfer.com>  
**Sent:** September 17, 2021 2:18 PM  
**To:** Reid, John; Hilary Thompson  
**Cc:** Hill, Bryan D.; Colton, Joey  
**Subject:** Enbridge RFP  
**When:** September 20, 2021 11:30 AM-12:30 PM (UTC-06:00) Central Time (US & Canada).  
**Where:** WebEx

**EXTERNAL: PLEASE PROCEED WITH CAUTION.**

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<b>Meeting Name</b> : EGI & ETP Call re: Ojibway RFP	<b>Meeting Date</b> : 2021-09-21
--	----------------------------------

<b>Location</b> : Remote via Webex	<b>Next Meeting Date</b> : N/A
<b>Time</b> : 12:30 – 1 pm Eastern	<b>Location</b> : Chatham
<b>Recorded By</b> : Matt Thomas	<b>Date Issued</b> : 2020-09-20

Attendees			
<input checked="" type="checkbox"/> Hilary Thompson	<input checked="" type="checkbox"/> Jeff Cadotte	<input checked="" type="checkbox"/> Paul Dhaen	<input checked="" type="checkbox"/> Matt Thomas
<input checked="" type="checkbox"/> John Reid	<input checked="" type="checkbox"/> Bryan Hill	<input checked="" type="checkbox"/> Joey Colton	<input type="checkbox"/>

Description of Item
<p><b>Purpose of Call: Respond to questions from Energy Transfer Partners re: RFP for Ojibway deliveries launched on Sept 16<sup>th</sup></b></p> <p>ETP inquired about the background of the Ojibway RFP and the capacities outlined in the RFP. EGI clarified that the RFP is being contemplated as an Integrated Resource Planning alternative to provide incremental Panhandle Transmission System capacity.</p> <p>EGI has customers providing gas at Dawn and the firm exchange between Ojibway &amp; Dawn, facilitated via capacity on Panhandle Eastern Pipeline may be as an alternative to constructing facilities between Dawn and Ojibway to provide the equivalent capacity and system benefits.</p> <p>EGI clarified the amounts included in the RFP includes the 37 TJ/d currently contracted by ETP and are not above and beyond the existing contracts consistent with Table 1. ETP indicated that as a transmission pipeline operator they transport gas for others and therefore are unable to offer a firm exchange and will not bid in the RFP.</p>

Table 1 – Ojibway Import Capability

<u>Capacity</u>	<u>Long Term (Annual) [TJ/d]</u>	<u>Short-Term (Winter-Only) [TJ/d]</u>
Total Ojibway Import Capability	115	140
Gas Supply (Included in Design Day)	60	60
C1 (Rover LLC)	37	37
Available for Exchange	18	43
RFP Offering	55	80

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Federation of Rental-housing Providers of Ontario ("FRPO")

INTERROGATORY

Reference:

Exhibit B, Tab 2, Schedule 1, p. 3, 5, 6, 7 and  
EB-2016-0186 including Exhibit K2.1 Union\_Further Correspondence\_20161122

Preamble:

EGI evidence states: Two NPS 12 pipelines ("Detroit River Crossing" or "the crossings") connect the NPS 16 Panhandle Line at Ojibway to the Panhandle Eastern Pipeline System ("Panhandle Eastern")<sup>2</sup> at the International Border. This interconnection was established in 1947 and is commercially known as Ojibway. The Detroit River Crossing MOP is 2930 kPag.

<sup>2</sup> Panhandle Eastern Pipe Line Company, LP is owned by Energy Transfer Equity L.P.

We would like to understand more about EGI's review of the potential for increasing supply at Ojibway. During the last major Panhandle Reinforcement proceeding, EB-2016-0186, there was significant evidence regarding Energy Transfer's desire to increase deliveries to Dawn including the potential to obligate at Ojibway. We understand that EGI held discussions with Rover, of which Energy Transfer holds an ownership position, but we are interested in discussions with Energy Transfer who owns the Panhandle Eastern Pipeline.

Question:

Please provide the most recent determination of cost estimate for increasing capacity across the Detroit River.

## **Response**

Enbridge Gas does not accept FRPO's interpretation of the Panhandle Reinforcement Project proceeding (EB-2016-0186) in the preamble, specifically the statement that "there was significant evidence regarding Energy Transfer Partners' desire to increase deliveries to Dawn including the potential to obligate at Ojibway". Energy Transfer did not express interest in increasing deliveries at Dawn as part of the Panhandle Reinforcement Project proceeding. Rather, Rover LLC executed contracts for Ojibway to Dawn C1 service that were presented in that same proceeding and has not requested incremental capacity since.

Please refer to Exhibit C, Tab 1, Schedule 1 for Enbridge Gas' assessment of incremental firm supply availability through the PEPL facilities at Ojibway.

Currently, the capacity of the Detroit River Crossings is 195 mmscfd (~217 TJ/d) based on the Presidential Permit. However, Enbridge Gas's ability to import this volume is limited by the Windsor Market and facilities available to transport the imported gas from Ojibway to Dawn throughout all months of the year. In the summer, additional facilities are required at the west end of the Panhandle system to transport gas incremental to the available market to Dawn. In the winter, facilities are still required from Dawn to meet peak day demands that cannot be entirely served from Ojibway. Also, the ability to import supply at Ojibway is limited by the Panhandle Eastern Pipeline's ("PEPL") ability to deliver gas to the Detroit River Crossing.<sup>1</sup>

Enbridge Gas is currently unable to import the 217 TJ/d, as the existing system is limited by the current Windsor Market and the current Sandwich Compressor (please see the response to Exhibit I.FRPO.10).

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<sup>1</sup> In the previous Panhandle Reinforcement project (EB-2016-0186) Enbridge Gas evaluated increased capacity across the Detroit River which included additional Enbridge Gas facilities, PEPL facilities in Michigan, and the cost for incremental firm Ojibway deliveries. As noted in EB-2016-0186, Exhibit B.IGUA.9 d), Enbridge Gas (formerly Union Gas) stated: "Union did contemplate increased capacity by replacing the existing NPS 12 Detroit River Crossing pipelines with a single NPS 20 pipeline. This alternative is complex requiring significant new facilities on the PEPL system upstream of the Detroit River Crossing to provide a minimum of 3,450 kPag (500 Psig) at Ojibway and new facilities on Union's Panhandle System between Ojibway and consuming markets. Without new upstream facilities, a new river crossing would still only be able to deliver 2,930 kPag (425 Psig), the MOP of the upstream PEPL pipeline facilities. Union explored this alternative with PEPL however the large amount of facilities required made this alternative cost prohibitive. PEPL would also require significant compressor and pipeline investment to increase the delivery pressure to Union. Even if the capital costs were reasonable for such an alternative, Union would be required to contract for long term upstream transportation (at least 10 years) from Panhandle Field Zone to Ojibway to support the additional facilities required on the PEPL system."

To be able to import the 217 TJ/d, additional facilities are required within the Panhandle System including: replacement of the Detroit River Crossings at a 3450 kPa MOP, an NPS 20 pipeline looping the current NPS 16 from the Detroit River Crossing to Sandwich Compressor Station, and two compressor units at Sandwich Compressor Station (one for incremental volumes, and a “loss of critical unit” compressor).

Table 1 below summarizes the cost of these facilities, but does not include the cost of any incremental firm Ojibway deliveries, or costs associated to PEPL facilities.<sup>1</sup>

With this additional infrastructure and incremental supply, 7.8 km of NPS 36 pipeline would still be required (in addition to Dawn Yard facilities) to provide the equivalent 168 TJ/d of system capacity provided by the proposed Project, which is also shown in Table 1. Therefore, the facility costs alone to increase the supply of gas from Ojibway is not a cost-effective alternative to the proposed Project.

Table 1

<b>Cost Summary</b>	<b>Estimated Cost (\$ millions)</b>
<b><i>Facility Requirements Only</i></b>	
Replace Detroit River Crossing (NPS 20) <sup>1</sup> and increase MOP <sup>2</sup>	\$30
17 km NPS 20 pipeline from Detroit River Crossing to Sandwich Compressor Station, and two compressor units at Sandwich Compressor	\$237
7.8 km of NPS 36 Panhandle looping pipeline, station facilities and Dawn Facilities	\$220
In-direct Overheads	\$135
Total Facility Cost including in-direct overheads (Excluding Non-facility Supply costs)	\$668

**NOTES:**

1 - Assumes 60% of total River Crossing Costs, based on current Enbridge Gas ownership.

2 - Assuming PEPL has upgraded facilities to provide up to 3,450 kPag (500 Psig)

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Federation of Rental-housing Providers of Ontario ("FRPO")

INTERROGATORY

Reference:

Exhibit B, Tab 2, Schedule 1, p. 3, 5, 6, 7 and  
EB-2016-0186 including Exhibit K2.1 Union\_Further Correspondence\_20161122

Preamble:

EGL evidence states: The Panhandle System's ability to accept supply at Ojibway is limited to 115 TJ/d in the summer and 140 TJ/d in the winter.

Question:

Please confirm that these values are exactly the same as those provided in the Panhandle Reinforcement Project.

- a) In an Excel spreadsheet, please provide the data from which the summer and winter values in this proceeding were derived (ideally with working formulae showing the resulting values).

**Response**

Confirmed.

Please note, the Ojibway to Dawn path capability is typically calculated when a new long-term firm transportation contract is requested, or during contract renewals. There have been no long-term firm transport requests on Ojibway to Dawn since the 2016 Panhandle Reinforcement Project, therefore Enbridge Gas has not re-calculated these capacities since then.

Upon receipt of FRPO's interrogatory request Enbridge Gas undertook to review these values using the most recent information from the previous 5 years. The results of that review indicate that the Panhandle System's ability to accept supply at Ojibway has declined to:

- Summer: 108 TJ/d,
- Winter: 126 TJ/d

Importantly, although the historical observed minimum market has declined, design day requirements have not.

For the Excel spreadsheet relied upon to complete this review please see Attachment 1 to this response. A summary is set out in Table 1 below:

Table 1

	<b>Winter (GJ/d)</b>	<b>Summer (GJ/d)</b>
Lowest Market [Month]	46,000 [November]	20,000 [August]
Compression	<u>80,000</u>	<u>88,000</u>
<b>Total:</b>	<b>126,000</b>	<b>108,000</b>



Sum of Integrated Average							
Year	Month	Day	Windsor Balance Flow Rate	Year	Month	Day	
2017	01-January	1	2,449	2017	1	1	
2017	01-January	2	2,464	2017	1	2	
2017	01-January	3	2,528	2017	1	3	
2017	01-January	4	3,397	2017	1	4	
2017	01-January	5	3,079	2017	1	5	
2017	01-January	6	1,714	2017	1	6	
2017	01-January	7	1,938	2017	1	7	
2017	01-January	8	1,699	2017	1	8	
2017	01-January	9	1,255	2017	1	9	
2017	01-January	10	773	2017	1	10	
2017	01-January	11	1,704	2017	1	11	
2017	01-January	12	2,001	2017	1	12	
2017	01-January	13	1,729	2017	1	13	
2017	01-January	14	1,668	2017	1	14	
2017	01-January	15	1,642	2017	1	15	
2017	01-January	16	1,508	2017	1	16	
2017	01-January	17	1,218	2017	1	17	
2017	01-January	18	1,313	2017	1	18	
2017	01-January	19	1,349	2017	1	19	
2017	01-January	20	1,190	2017	1	20	
2017	01-January	21	832	2017	1	21	
2017	01-January	22	983	2017	1	22	
2017	01-January	23	1,138	2017	1	23	
2017	01-January	24	1,240	2017	1	24	
2017	01-January	25	1,191	2017	1	25	
2017	01-January	26	1,391	2017	1	26	
2017	01-January	27	1,612	2017	1	27	
2017	01-January	28	1,588	2017	1	28	
2017	01-January	29	1,634	2017	1	29	
2017	01-January	30	1,697	2017	1	30	
2017	01-January	31	1,515	2017	1	31	
2017	02-February	1	1,448	2017	2	1	
2017	02-February	2	1,892	2017	2	2	
2017	02-February	3	1,953	2017	2	3	
2017	02-February	4	1,577	2017	2	4	
2017	02-February	5	1,488	2017	2	5	
2017	02-February	6	1,259	2017	2	6	
2017	02-February	7	1,179	2017	2	7	
2017	02-February	8	1,608	2017	2	8	
2017	02-February	9	1,982	2017	2	9	
2017	02-February	10	1,696	2017	2	10	
2017	02-February	11	1,221	2017	2	11	
2017	02-February	12	1,439	2017	2	12	
2017	02-February	13	1,292	2017	2	13	
2017	02-February	14	1,202	2017	2	14	
2017	02-February	15	1,700	2017	2	15	
2017	02-February	16	1,476	2017	2	16	
2017	02-February	17	1,107	2017	2	17	
2017	02-February	18	852	2017	2	18	
2017	02-February	19	814	2017	2	19	
2017	02-February	20	976	2017	2	20	
2017	02-February	21	871	2017	2	21	
2017	02-February	22	751	2017	2	22	
2017	02-February	23	734	2017	2	23	
2017	02-February	24	798	2017	2	24	
2017	02-February	25	1,445	2017	2	25	
2017	02-February	26	1,252	2017	2	26	
2017	02-February	27	1,014	2017	2	27	
2017	02-February	28	857	2017	2	28	
2017	03-March	1	1,229	2017	3	1	
2017	03-March	2	1,583	2017	3	2	
2017	03-March	3	1,951	2017	3	3	
2017	03-March	4	1,693	2017	3	4	
2017	03-March	5	1,363	2017	3	5	

Sum of Integrated Average

2017 03-March	6	929	2017	3	6
2017 03-March	7	1,025	2017	3	7
2017 03-March	8	1,087	2017	3	8
2017 03-March	9	1,090	2017	3	9
2017 03-March	10	1,530	2017	3	10
2017 03-March	11	1,466	2017	3	11
2017 03-March	12	1,384	2017	3	12
2017 03-March	13	1,956	2017	3	13
2017 03-March	14	1,969	2017	3	14
2017 03-March	15	1,811	2017	3	15
2017 03-March	16	1,585	2017	3	16
2017 03-March	17	1,515	2017	3	17
2017 03-March	18	1,299	2017	3	18
2017 03-March	19	1,262	2017	3	19
2017 03-March	20	1,259	2017	3	20
2017 03-March	21	1,319	2017	3	21
2017 03-March	22	1,663	2017	3	22
2017 03-March	23	1,348	2017	3	23
2017 03-March	24	666	2017	3	24
2017 03-March	25	1,070	2017	3	25
2017 03-March	26	880	2017	3	26
2017 03-March	27	831	2017	3	27
2017 03-March	28	1,080	2017	3	28
2017 03-March	29	1,018	2017	3	29
2017 03-March	30	1,365	2017	3	30
2017 03-March	31	1,287	2017	3	31
2017 04-April	1	877	2017	4	1
2017 04-April	2	844	2017	4	2
2017 04-April	3	857	2017	4	3
2017 04-April	4	966	2017	4	4
2017 04-April	5	1,104	2017	4	5
2017 04-April	6	1,443	2017	4	6
2017 04-April	7	1,115	2017	4	7
2017 04-April	8	767	2017	4	8
2017 04-April	9	503	2017	4	9
2017 04-April	10	480	2017	4	10
2017 04-April	11	601	2017	4	11
2017 04-April	12	727	2017	4	12
2017 04-April	13	883	2017	4	13
2017 04-April	14	658	2017	4	14
2017 04-April	15	637	2017	4	15
2017 04-April	16	687	2017	4	16
2017 04-April	17	721	2017	4	17
2017 04-April	18	558	2017	4	18
2017 04-April	19	529	2017	4	19
2017 04-April	20	592	2017	4	20
2017 04-April	21	831	2017	4	21
2017 04-April	22	693	2017	4	22
2017 04-April	23	618	2017	4	23
2017 04-April	24	587	2017	4	24
2017 04-April	25	526	2017	4	25
2017 04-April	26	442	2017	4	26
2017 04-April	27	514	2017	4	27
2017 04-April	28	531	2017	4	28
2017 04-April	29	798	2017	4	29
2017 04-April	30	650	2017	4	30
2017 05-May	1	651	2017	5	1
2017 05-May	2	873	2017	5	2
2017 05-May	3	648	2017	5	3
2017 05-May	4	985	2017	5	4
2017 05-May	5	1,020	2017	5	5
2017 05-May	6	736	2017	5	6
2017 05-May	7	779	2017	5	7
2017 05-May	8	739	2017	5	8
2017 05-May	9	633	2017	5	9
2017 05-May	10	570	2017	5	10
2017 05-May	11	589	2017	5	11

Sum of Integrated Average

2017 05-May	12	492	2017	5	12
2017 05-May	13	495	2017	5	13
2017 05-May	14	528	2017	5	14
2017 05-May	15	688	2017	5	15
2017 05-May	16	715	2017	5	16
2017 05-May	17	719	2017	5	17
2017 05-May	18	698	2017	5	18
2017 05-May	19	652	2017	5	19
2017 05-May	20	566	2017	5	20
2017 05-May	21	520	2017	5	21
2017 05-May	22	672	2017	5	22
2017 05-May	23	758	2017	5	23
2017 05-May	24	823	2017	5	24
2017 05-May	25	856	2017	5	25
2017 05-May	26	761	2017	5	26
2017 05-May	27	679	2017	5	27
2017 05-May	28	738	2017	5	28
2017 05-May	29	745	2017	5	29
2017 05-May	30	751	2017	5	30
2017 05-May	31	763	2017	5	31
2017 06-June	1	488	2017	6	1
2017 06-June	2	652	2017	6	2
2017 06-June	3	629	2017	6	3
2017 06-June	4	629	2017	6	4
2017 06-June	5	542	2017	6	5
2017 06-June	6	552	2017	6	6
2017 06-June	7	564	2017	6	7
2017 06-June	8	514	2017	6	8
2017 06-June	9	535	2017	6	9
2017 06-June	10	501	2017	6	10
2017 06-June	11	517	2017	6	11
2017 06-June	12	469	2017	6	12
2017 06-June	13	499	2017	6	13
2017 06-June	14	489	2017	6	14
2017 06-June	15	526	2017	6	15
2017 06-June	16	537	2017	6	16
2017 06-June	17	547	2017	6	17
2017 06-June	18	584	2017	6	18
2017 06-June	19	538	2017	6	19
2017 06-June	20	562	2017	6	20
2017 06-June	21	524	2017	6	21
2017 06-June	22	529	2017	6	22
2017 06-June	23	546	2017	6	23
2017 06-June	24	550	2017	6	24
2017 06-June	25	565	2017	6	25
2017 06-June	26	465	2017	6	26
2017 06-June	27	490	2017	6	27
2017 06-June	28	490	2017	6	28
2017 06-June	29	491	2017	6	29
2017 06-June	30	563	2017	6	30
2017 07-July	1	553	2017	7	1
2017 07-July	2	567	2017	7	2
2017 07-July	3	648	2017	7	3
2017 07-July	4	448	2017	7	4
2017 07-July	5	567	2017	7	5
2017 07-July	6	643	2017	7	6
2017 07-July	7	632	2017	7	7
2017 07-July	8	586	2017	7	8
2017 07-July	9	636	2017	7	9
2017 07-July	10	695	2017	7	10
2017 07-July	11	567	2017	7	11
2017 07-July	12	595	2017	7	12
2017 07-July	13	678	2017	7	13
2017 07-July	14	568	2017	7	14
2017 07-July	15	574	2017	7	15
2017 07-July	16	636	2017	7	16
2017 07-July	17	727	2017	7	17

Sum of Integrated Average					
2017 07-July	18	727	2017	7	18
2017 07-July	19	534	2017	7	19
2017 07-July	20	566	2017	7	20
2017 07-July	21	577	2017	7	21
2017 07-July	22	176	2017	7	22
2017 07-July	23	268	2017	7	23
2017 07-July	24	371	2017	7	24
2017 07-July	25	378	2017	7	25
2017 07-July	26	445	2017	7	26
2017 07-July	27	408	2017	7	27
2017 07-July	28	442	2017	7	28
2017 07-July	29	432	2017	7	29
2017 07-July	30	376	2017	7	30
2017 07-July	31	416	2017	7	31
2017 08-August	1	442	2017	8	1
2017 08-August	2	437	2017	8	2
2017 08-August	3	441	2017	8	3
2017 08-August	4	470	2017	8	4
2017 08-August	5	445	2017	8	5
2017 08-August	6	444	2017	8	6
2017 08-August	7	451	2017	8	7
2017 08-August	8	389	2017	8	8
2017 08-August	9	572	2017	8	9
2017 08-August	10	698	2017	8	10
2017 08-August	11	647	2017	8	11
2017 08-August	12	621	2017	8	12
2017 08-August	13	526	2017	8	13
2017 08-August	14	502	2017	8	14
2017 08-August	15	518	2017	8	15
2017 08-August	16	539	2017	8	16
2017 08-August	17	565	2017	8	17
2017 08-August	18	596	2017	8	18
2017 08-August	19	640	2017	8	19
2017 08-August	20	653	2017	8	20
2017 08-August	21	512	2017	8	21
2017 08-August	22	488	2017	8	22
2017 08-August	23	517	2017	8	23
2017 08-August	24	578	2017	8	24
2017 08-August	25	586	2017	8	25
2017 08-August	26	621	2017	8	26
2017 08-August	27	596	2017	8	27
2017 08-August	28	564	2017	8	28
2017 08-August	29	571	2017	8	29
2017 08-August	30	539	2017	8	30
2017 08-August	31	572	2017	8	31
2017 09-September	1	694	2017	9	1
2017 09-September	2	686	2017	9	2
2017 09-September	3	690	2017	9	3
2017 09-September	4	686	2017	9	4
2017 09-September	5	558	2017	9	5
2017 09-September	6	578	2017	9	6
2017 09-September	7	566	2017	9	7
2017 09-September	8	582	2017	9	8
2017 09-September	9	627	2017	9	9
2017 09-September	10	585	2017	9	10
2017 09-September	11	534	2017	9	11
2017 09-September	12	550	2017	9	12
2017 09-September	13	546	2017	9	13
2017 09-September	14	532	2017	9	14
2017 09-September	15	589	2017	9	15
2017 09-September	16	698	2017	9	16
2017 09-September	17	697	2017	9	17
2017 09-September	18	607	2017	9	18
2017 09-September	19	566	2017	9	19
2017 09-September	20	599	2017	9	20
2017 09-September	21	630	2017	9	21
2017 09-September	22	741	2017	9	22

Sum of Integrated Average						
2017 09-September	23	706	2017	9	23	
2017 09-September	24	696	2017	9	24	
2017 09-September	25	629	2017	9	25	
2017 09-September	26	513	2017	9	26	
2017 09-September	27	486	2017	9	27	
2017 09-September	28	552	2017	9	28	
2017 09-September	29	636	2017	9	29	
2017 09-September	30	750	2017	9	30	
2017 10-October	1	717	2017	10	1	
2017 10-October	2	601	2017	10	2	
2017 10-October	3	610	2017	10	3	
2017 10-October	4	565	2017	10	4	
2017 10-October	5	625	2017	10	5	
2017 10-October	6	663	2017	10	6	
2017 10-October	7	630	2017	10	7	
2017 10-October	8	622	2017	10	8	
2017 10-October	9	648	2017	10	9	
2017 10-October	10	-247	2017	10	10	
2017 10-October	11	682	2017	10	11	
2017 10-October	12	76	2017	10	12	
2017 10-October	13	651	2017	10	13	
2017 10-October	14	686	2017	10	14	
2017 10-October	15	726	2017	10	15	
2017 10-October	16	686	2017	10	16	
2017 10-October	17	643	2017	10	17	
2017 10-October	18	660	2017	10	18	
2017 10-October	19	673	2017	10	19	
2017 10-October	20	754	2017	10	20	
2017 10-October	21	766	2017	10	21	
2017 10-October	22	683	2017	10	22	
2017 10-October	23	628	2017	10	23	
2017 10-October	24	753	2017	10	24	
2017 10-October	25	864	2017	10	25	
2017 10-October	26	774	2017	10	26	
2017 10-October	27	828	2017	10	27	
2017 10-October	28	937	2017	10	28	
2017 10-October	29	968	2017	10	29	
2017 10-October	30	1,138	2017	10	30	
2017 10-October	31	1,184	2017	10	31	
2017 11-November	1	1,024	2017	11	1	
2017 11-November	2	780	2017	11	2	
2017 11-November	3	882	2017	11	3	
2017 11-November	4	741	2017	11	4	
2017 11-November	5	737	2017	11	5	
2017 11-November	6	955	2017	11	6	
2017 11-November	7	999	2017	11	7	
2017 11-November	8	1,023	2017	11	8	
2017 11-November	9	1,434	2017	11	9	
2017 11-November	10	1,615	2017	11	10	
2017 11-November	11	1,249	2017	11	11	
2017 11-November	12	1,190	2017	11	12	
2017 11-November	13	1,141	2017	11	13	
2017 11-November	14	1,074	2017	11	14	
2017 11-November	15	1,166	2017	11	15	
2017 11-November	16	1,239	2017	11	16	
2017 11-November	17	1,080	2017	11	17	
2017 11-November	18	1,103	2017	11	18	
2017 11-November	19	1,427	2017	11	19	
2017 11-November	20	1,181	2017	11	20	
2017 11-November	21	1,150	2017	11	21	
2017 11-November	22	1,406	2017	11	22	
2017 11-November	23	1,308	2017	11	23	
2017 11-November	24	930	2017	11	24	
2017 11-November	25	1,077	2017	11	25	
2017 11-November	26	1,146	2017	11	26	
2017 11-November	27	1,052	2017	11	27	
2017 11-November	28	845	2017	11	28	

Sum of Integrated Average						
2017 11-November	29	1,081	2017	11	29	
2017 11-November	30	1,169	2017	11	30	
2017 12-December	1	1,119	2017	12	1	
2017 12-December	2	1,083	2017	12	2	
2017 12-December	3	1,045	2017	12	3	
2017 12-December	4	941	2017	12	4	
2017 12-December	5	1,450	2017	12	5	
2017 12-December	6	1,461	2017	12	6	
2017 12-December	7	1,654	2017	12	7	
2017 12-December	8	1,462	2017	12	8	
2017 12-December	9	1,494	2017	12	9	
2017 12-December	10	1,559	2017	12	10	
2017 12-December	11	1,627	2017	12	11	
2017 12-December	12	2,074	2017	12	12	
2017 12-December	13	1,925	2017	12	13	
2017 12-December	14	1,904	2017	12	14	
2017 12-December	15	1,753	2017	12	15	
2017 12-December	16	1,578	2017	12	16	
2017 12-December	17	1,468	2017	12	17	
2017 12-December	18	1,337	2017	12	18	
2017 12-December	19	1,287	2017	12	19	
2017 12-December	20	1,502	2017	12	20	
2017 12-December	21	1,477	2017	12	21	
2017 12-December	22	1,336	2017	12	22	
2017 12-December	23	1,401	2017	12	23	
2017 12-December	24	1,624	2017	12	24	
2017 12-December	25	1,892	2017	12	25	
2017 12-December	26	2,138	2017	12	26	
2017 12-December	27	2,300	2017	12	27	
2017 12-December	28	2,149	2017	12	28	
2017 12-December	29	1,989	2017	12	29	
2017 12-December	30	2,173	2017	12	30	
2017 12-December	31	2,255	2017	12	31	
2018 01-January	1	2,302	2018	1	1	
2018 01-January	2	2,587	2018	1	2	
2018 01-January	3	2,187	2018	1	3	
2018 01-January	4	2,522	2018	1	4	
2018 01-January	5	2,486	2018	1	5	
2018 01-January	6	2,351	2018	1	6	
2018 01-January	7	2,030	2018	1	7	
2018 01-January	8	1,642	2018	1	8	
2018 01-January	9	1,542	2018	1	9	
2018 01-January	10	1,363	2018	1	10	
2018 01-January	11	974	2018	1	11	
2018 01-January	12	1,989	2018	1	12	
2018 01-January	13	2,232	2018	1	13	
2018 01-January	14	2,314	2018	1	14	
2018 01-January	15	2,088	2018	1	15	
2018 01-January	16	2,252	2018	1	16	
2018 01-January	17	2,231	2018	1	17	
2018 01-January	18	1,986	2018	1	18	
2018 01-January	19	1,560	2018	1	19	
2018 01-January	20	1,277	2018	1	20	
2018 01-January	21	1,298	2018	1	21	
2018 01-January	22	1,131	2018	1	22	
2018 01-January	23	1,612	2018	1	23	
2018 01-January	24	1,758	2018	1	24	
2018 01-January	25	1,661	2018	1	25	
2018 01-January	26	1,134	2018	1	26	
2018 01-January	27	1,242	2018	1	27	
2018 01-January	28	1,363	2018	1	28	
2018 01-January	29	2,020	2018	1	29	
2018 01-January	30	2,008	2018	1	30	
2018 01-January	31	1,476	2018	1	31	
2018 02-February	1	1,962	2018	2	1	
2018 02-February	2	2,242	2018	2	2	
2018 02-February	3	1,821	2018	2	3	

Sum of Integrated Average

2018 02-February	4	1,964	2018	2	4
2018 02-February	5	2,136	2018	2	5
2018 02-February	6	1,924	2018	2	6
2018 02-February	7	1,909	2018	2	7
2018 02-February	8	2,008	2018	2	8
2018 02-February	9	1,862	2018	2	9
2018 02-February	10	1,859	2018	2	10
2018 02-February	11	1,801	2018	2	11
2018 02-February	12	1,894	2018	2	12
2018 02-February	13	1,813	2018	2	13
2018 02-February	14	1,328	2018	2	14
2018 02-February	15	1,221	2018	2	15
2018 02-February	16	1,667	2018	2	16
2018 02-February	17	1,621	2018	2	17
2018 02-February	18	1,398	2018	2	18
2018 02-February	19	1,106	2018	2	19
2018 02-February	20	839	2018	2	20
2018 02-February	21	1,453	2018	2	21
2018 02-February	22	1,487	2018	2	22
2018 02-February	23	1,212	2018	2	23
2018 02-February	24	1,267	2018	2	24
2018 02-February	25	1,277	2018	2	25
2018 02-February	26	1,140	2018	2	26
2018 02-February	27	916	2018	2	27
2018 02-February	28	944	2018	2	28
2018 03-March	1	1,581	2018	3	1
2018 03-March	2	1,587	2018	3	2
2018 03-March	3	1,668	2018	3	3
2018 03-March	4	1,662	2018	3	4
2018 03-March	5	1,687	2018	3	5
2018 03-March	6	1,554	2018	3	6
2018 03-March	7	1,882	2018	3	7
2018 03-March	8	1,919	2018	3	8
2018 03-March	9	1,861	2018	3	9
2018 03-March	10	1,740	2018	3	10
2018 03-March	11	1,663	2018	3	11
2018 03-March	12	1,740	2018	3	12
2018 03-March	13	1,838	2018	3	13
2018 03-March	14	1,684	2018	3	14
2018 03-March	15	1,815	2018	3	15
2018 03-March	16	1,702	2018	3	16
2018 03-March	17	1,463	2018	3	17
2018 03-March	18	1,244	2018	3	18
2018 03-March	19	1,626	2018	3	19
2018 03-March	20	1,624	2018	3	20
2018 03-March	21	1,597	2018	3	21
2018 03-March	22	1,549	2018	3	22
2018 03-March	23	1,616	2018	3	23
2018 03-March	24	1,745	2018	3	24
2018 03-March	25	1,657	2018	3	25
2018 03-March	26	1,334	2018	3	26
2018 03-March	27	1,178	2018	3	27
2018 03-March	28	1,372	2018	3	28
2018 03-March	29	1,521	2018	3	29
2018 03-March	30	1,427	2018	3	30
2018 03-March	31	1,471	2018	3	31
2018 04-April	1	1,550	2018	4	1
2018 04-April	2	1,497	2018	4	2
2018 04-April	3	1,615	2018	4	3
2018 04-April	4	1,808	2018	4	4
2018 04-April	5	1,311	2018	4	5
2018 04-April	6	1,670	2018	4	6
2018 04-April	7	1,574	2018	4	7
2018 04-April	8	1,493	2018	4	8
2018 04-April	9	1,520	2018	4	9
2018 04-April	10	1,357	2018	4	10
2018 04-April	11	1,116	2018	4	11

Sum of Integrated Average						
2018 04-April	12	748	2018	4	12	
2018 04-April	13	867	2018	4	13	
2018 04-April	14	1,743	2018	4	14	
2018 04-April	15	1,528	2018	4	15	
2018 04-April	16	1,608	2018	4	16	
2018 04-April	17	1,630	2018	4	17	
2018 04-April	18	1,262	2018	4	18	
2018 04-April	19	1,219	2018	4	19	
2018 04-April	20	976	2018	4	20	
2018 04-April	21	938	2018	4	21	
2018 04-April	22	795	2018	4	22	
2018 04-April	23	770	2018	4	23	
2018 04-April	24	522	2018	4	24	
2018 04-April	25	923	2018	4	25	
2018 04-April	26	849	2018	4	26	
2018 04-April	27	863	2018	4	27	
2018 04-April	28	1,257	2018	4	28	
2018 04-April	29	949	2018	4	29	
2018 04-April	30	716	2018	4	30	
2018 05-May	1	731	2018	5	1	
2018 05-May	2	661	2018	5	2	
2018 05-May	3	663	2018	5	3	
2018 05-May	4	588	2018	5	4	
2018 05-May	5	572	2018	5	5	
2018 05-May	6	730	2018	5	6	
2018 05-May	7	734	2018	5	7	
2018 05-May	8	654	2018	5	8	
2018 05-May	9	637	2018	5	9	
2018 05-May	10	762	2018	5	10	
2018 05-May	11	1,129	2018	5	11	
2018 05-May	12	1,066	2018	5	12	
2018 05-May	13	813	2018	5	13	
2018 05-May	14	666	2018	5	14	
2018 05-May	15	715	2018	5	15	
2018 05-May	16	669	2018	5	16	
2018 05-May	17	698	2018	5	17	
2018 05-May	18	534	2018	5	18	
2018 05-May	19	487	2018	5	19	
2018 05-May	20	599	2018	5	20	
2018 05-May	21	682	2018	5	21	
2018 05-May	22	674	2018	5	22	
2018 05-May	23	570	2018	5	23	
2018 05-May	24	573	2018	5	24	
2018 05-May	25	524	2018	5	25	
2018 05-May	26	509	2018	5	26	
2018 05-May	27	527	2018	5	27	
2018 05-May	28	618	2018	5	28	
2018 05-May	29	552	2018	5	29	
2018 05-May	30	495	2018	5	30	
2018 05-May	31	787	2018	5	31	
2018 06-June	1	769	2018	6	1	
2018 06-June	2	747	2018	6	2	
2018 06-June	3	797	2018	6	3	
2018 06-June	4	800	2018	6	4	
2018 06-June	5	848	2018	6	5	
2018 06-June	6	831	2018	6	6	
2018 06-June	7	806	2018	6	7	
2018 06-June	8	659	2018	6	8	
2018 06-June	9	647	2018	6	9	
2018 06-June	10	754	2018	6	10	
2018 06-June	11	738	2018	6	11	
2018 06-June	12	692	2018	6	12	
2018 06-June	13	773	2018	6	13	
2018 06-June	14	737	2018	6	14	
2018 06-June	15	700	2018	6	15	
2018 06-June	16	782	2018	6	16	
2018 06-June	17	764	2018	6	17	



Sum of Integrated Average

2018 06-June	18	607	2018	6	18
2018 06-June	19	761	2018	6	19
2018 06-June	20	729	2018	6	20
2018 06-June	21	723	2018	6	21
2018 06-June	22	769	2018	6	22
2018 06-June	23	696	2018	6	23
2018 06-June	24	677	2018	6	24
2018 06-June	25	692	2018	6	25
2018 06-June	26	664	2018	6	26
2018 06-June	27	672	2018	6	27
2018 06-June	28	570	2018	6	28
2018 06-June	29	400	2018	6	29
2018 06-June	30	321	2018	6	30
2018 07-July	1	321	2018	7	1
2018 07-July	2	335	2018	7	2
2018 07-July	3	465	2018	7	3
2018 07-July	4	339	2018	7	4
2018 07-July	5	357	2018	7	5
2018 07-July	6	457	2018	7	6
2018 07-July	7	405	2018	7	7
2018 07-July	8	431	2018	7	8
2018 07-July	9	503	2018	7	9
2018 07-July	10	558	2018	7	10
2018 07-July	11	504	2018	7	11
2018 07-July	12	482	2018	7	12
2018 07-July	13	529	2018	7	13
2018 07-July	14	395	2018	7	14
2018 07-July	15	414	2018	7	15
2018 07-July	16	442	2018	7	16
2018 07-July	17	536	2018	7	17
2018 07-July	18	476	2018	7	18
2018 07-July	19	423	2018	7	19
2018 07-July	20	395	2018	7	20
2018 07-July	21	344	2018	7	21
2018 07-July	22	415	2018	7	22
2018 07-July	23	476	2018	7	23
2018 07-July	24	466	2018	7	24
2018 07-July	25	470	2018	7	25
2018 07-July	26	511	2018	7	26
2018 07-July	27	494	2018	7	27
2018 07-July	28	403	2018	7	28
2018 07-July	29	437	2018	7	29
2018 07-July	30	615	2018	7	30
2018 07-July	31	595	2018	7	31
2018 08-August	1	469	2018	8	1
2018 08-August	2	401	2018	8	2
2018 08-August	3	326	2018	8	3
2018 08-August	4	359	2018	8	4
2018 08-August	5	270	2018	8	5
2018 08-August	6	368	2018	8	6
2018 08-August	7	289	2018	8	7
2018 08-August	8	679	2018	8	8
2018 08-August	9	800	2018	8	9
2018 08-August	10	671	2018	8	10
2018 08-August	11	771	2018	8	11
2018 08-August	12	592	2018	8	12
2018 08-August	13	363	2018	8	13
2018 08-August	14	383	2018	8	14
2018 08-August	15	392	2018	8	15
2018 08-August	16	432	2018	8	16
2018 08-August	17	404	2018	8	17
2018 08-August	18	428	2018	8	18
2018 08-August	19	431	2018	8	19
2018 08-August	20	360	2018	8	20
2018 08-August	21	354	2018	8	21
2018 08-August	22	357	2018	8	22
2018 08-August	23	340	2018	8	23

Sum of Integrated Average

2018 08-August	24	345	2018	8	24
2018 08-August	25	397	2018	8	25
2018 08-August	26	384	2018	8	26
2018 08-August	27	331	2018	8	27
2018 08-August	28	87	2018	8	28
2018 08-August	29	429	2018	8	29
2018 08-August	30	479	2018	8	30
2018 08-August	31	455	2018	8	31
2018 09-September	1	402	2018	9	1
2018 09-September	2	146	2018	9	2
2018 09-September	3	302	2018	9	3
2018 09-September	4	279	2018	9	4
2018 09-September	5	-23	2018	9	5
2018 09-September	6	620	2018	9	6
2018 09-September	7	665	2018	9	7
2018 09-September	8	756	2018	9	8
2018 09-September	9	707	2018	9	9
2018 09-September	10	686	2018	9	10
2018 09-September	11	649	2018	9	11
2018 09-September	12	682	2018	9	12
2018 09-September	13	654	2018	9	13
2018 09-September	14	697	2018	9	14
2018 09-September	15	718	2018	9	15
2018 09-September	16	759	2018	9	16
2018 09-September	17	616	2018	9	17
2018 09-September	18	653	2018	9	18
2018 09-September	19	625	2018	9	19
2018 09-September	20	630	2018	9	20
2018 09-September	21	692	2018	9	21
2018 09-September	22	787	2018	9	22
2018 09-September	23	756	2018	9	23
2018 09-September	24	623	2018	9	24
2018 09-September	25	652	2018	9	25
2018 09-September	26	725	2018	9	26
2018 09-September	27	675	2018	9	27
2018 09-September	28	646	2018	9	28
2018 09-September	29	708	2018	9	29
2018 09-September	30	677	2018	9	30
2018 10-October	1	683	2018	10	1
2018 10-October	2	668	2018	10	2
2018 10-October	3	652	2018	10	3
2018 10-October	4	665	2018	10	4
2018 10-October	5	760	2018	10	5
2018 10-October	6	755	2018	10	6
2018 10-October	7	780	2018	10	7
2018 10-October	8	730	2018	10	8
2018 10-October	9	618	2018	10	9
2018 10-October	10	652	2018	10	10
2018 10-October	11	713	2018	10	11
2018 10-October	12	891	2018	10	12
2018 10-October	13	834	2018	10	13
2018 10-October	14	732	2018	10	14
2018 10-October	15	969	2018	10	15
2018 10-October	16	904	2018	10	16
2018 10-October	17	1,088	2018	10	17
2018 10-October	18	990	2018	10	18
2018 10-October	19	844	2018	10	19
2018 10-October	20	1,034	2018	10	20
2018 10-October	21	1,092	2018	10	21
2018 10-October	22	864	2018	10	22
2018 10-October	23	1,079	2018	10	23
2018 10-October	24	1,139	2018	10	24
2018 10-October	25	1,087	2018	10	25
2018 10-October	26	987	2018	10	26
2018 10-October	27	1,046	2018	10	27
2018 10-October	28	1,052	2018	10	28
2018 10-October	29	1,084	2018	10	29

Sum of Integrated Average						
2018 10-October	30	918	2018	10	30	
2018 10-October	31	893	2018	10	31	
2018 11-November	1	1,138	2018	11	1	
2018 11-November	2	1,097	2018	11	2	
2018 11-November	3	1,115	2018	11	3	
2018 11-November	4	963	2018	11	4	
2018 11-November	5	889	2018	11	5	
2018 11-November	6	1,082	2018	11	6	
2018 11-November	7	1,271	2018	11	7	
2018 11-November	8	1,340	2018	11	8	
2018 11-November	9	1,559	2018	11	9	
2018 11-November	10	1,429	2018	11	10	
2018 11-November	11	1,271	2018	11	11	
2018 11-November	12	1,249	2018	11	12	
2018 11-November	13	1,541	2018	11	13	
2018 11-November	14	1,516	2018	11	14	
2018 11-November	15	1,447	2018	11	15	
2018 11-November	16	1,372	2018	11	16	
2018 11-November	17	1,248	2018	11	17	
2018 11-November	18	1,350	2018	11	18	
2018 11-November	19	1,311	2018	11	19	
2018 11-November	20	1,364	2018	11	20	
2018 11-November	21	1,586	2018	11	21	
2018 11-November	22	1,640	2018	11	22	
2018 11-November	23	1,069	2018	11	23	
2018 11-November	24	961	2018	11	24	
2018 11-November	25	1,088	2018	11	25	
2018 11-November	26	1,504	2018	11	26	
2018 11-November	27	1,547	2018	11	27	
2018 11-November	28	1,600	2018	11	28	
2018 11-November	29	1,441	2018	11	29	
2018 11-November	30	1,252	2018	11	30	
2018 12-December	1	1,121	2018	12	1	
2018 12-December	2	956	2018	12	2	
2018 12-December	3	1,366	2018	12	3	
2018 12-December	4	1,458	2018	12	4	
2018 12-December	5	1,515	2018	12	5	
2018 12-December	6	1,517	2018	12	6	
2018 12-December	7	1,601	2018	12	7	
2018 12-December	8	1,582	2018	12	8	
2018 12-December	9	1,490	2018	12	9	
2018 12-December	10	1,692	2018	12	10	
2018 12-December	11	1,580	2018	12	11	
2018 12-December	12	1,337	2018	12	12	
2018 12-December	13	1,170	2018	12	13	
2018 12-December	14	1,008	2018	12	14	
2018 12-December	15	1,171	2018	12	15	
2018 12-December	16	1,095	2018	12	16	
2018 12-December	17	1,282	2018	12	17	
2018 12-December	18	1,276	2018	12	18	
2018 12-December	19	1,184	2018	12	19	
2018 12-December	20	1,108	2018	12	20	
2018 12-December	21	1,201	2018	12	21	
2018 12-December	22	1,283	2018	12	22	
2018 12-December	23	1,182	2018	12	23	
2018 12-December	24	1,220	2018	12	24	
2018 12-December	25	1,106	2018	12	25	
2018 12-December	26	1,008	2018	12	26	
2018 12-December	27	989	2018	12	27	
2018 12-December	28	995	2018	12	28	
2018 12-December	29	1,253	2018	12	29	
2018 12-December	30	1,188	2018	12	30	
2018 12-December	31	1,074	2018	12	31	
2019 01-January	1	1,345	2019	1	1	
2019 01-January	2	1,407	2019	1	2	
2019 01-January	3	1,323	2019	1	3	
2019 01-January	4	1,130	2019	1	4	

Sum of Integrated Average

2019 01-January	5	1,037	2019	1	5
2019 01-January	6	1,228	2019	1	6
2019 01-January	7	1,134	2019	1	7
2019 01-January	8	1,159	2019	1	8
2019 01-January	9	1,755	2019	1	9
2019 01-January	10	1,755	2019	1	10
2019 01-January	11	1,474	2019	1	11
2019 01-January	12	1,586	2019	1	12
2019 01-January	13	1,657	2019	1	13
2019 01-January	14	1,554	2019	1	14
2019 01-January	15	1,696	2019	1	15
2019 01-January	16	1,694	2019	1	16
2019 01-January	17	1,509	2019	1	17
2019 01-January	18	1,549	2019	1	18
2019 01-January	19	2,008	2019	1	19
2019 01-January	20	2,275	2019	1	20
2019 01-January	21	2,196	2019	1	21
2019 01-January	22	1,548	2019	1	22
2019 01-January	23	1,477	2019	1	23
2019 01-January	24	1,873	2019	1	24
2019 01-January	25	2,236	2019	1	25
2019 01-January	26	2,040	2019	1	26
2019 01-January	27	2,241	2019	1	27
2019 01-January	28	2,026	2019	1	28
2019 01-January	29	2,579	2019	1	29
2019 01-January	30	2,813	2019	1	30
2019 01-January	31	2,683	2019	1	31
2019 02-February	1	2,173	2019	2	1
2019 02-February	2	1,456	2019	2	2
2019 02-February	3	1,098	2019	2	3
2019 02-February	4	1,037	2019	2	4
2019 02-February	5	1,464	2019	2	5
2019 02-February	6	1,436	2019	2	6
2019 02-February	7	1,487	2019	2	7
2019 02-February	8	2,208	2019	2	8
2019 02-February	9	1,838	2019	2	9
2019 02-February	10	1,780	2019	2	10
2019 02-February	11	1,689	2019	2	11
2019 02-February	12	1,648	2019	2	12
2019 02-February	13	1,812	2019	2	13
2019 02-February	14	1,304	2019	2	14
2019 02-February	15	1,626	2019	2	15
2019 02-February	16	1,668	2019	2	16
2019 02-February	17	1,723	2019	2	17
2019 02-February	18	1,761	2019	2	18
2019 02-February	19	1,667	2019	2	19
2019 02-February	20	1,539	2019	2	20
2019 02-February	21	1,385	2019	2	21
2019 02-February	22	1,411	2019	2	22
2019 02-February	23	1,294	2019	2	23
2019 02-February	24	1,865	2019	2	24
2019 02-February	25	1,945	2019	2	25
2019 02-February	26	2,091	2019	2	26
2019 02-February	27	2,052	2019	2	27
2019 02-February	28	1,895	2019	2	28
2019 03-March	1	1,530	2019	3	1
2019 03-March	2	1,515	2019	3	2
2019 03-March	3	1,946	2019	3	3
2019 03-March	4	2,336	2019	3	4
2019 03-March	5	2,144	2019	3	5
2019 03-March	6	1,802	2019	3	6
2019 03-March	7	1,881	2019	3	7
2019 03-March	8	1,367	2019	3	8
2019 03-March	9	1,357	2019	3	9
2019 03-March	10	1,518	2019	3	10
2019 03-March	11	1,467	2019	3	11
2019 03-March	12	1,312	2019	3	12

Sum of Integrated Average						
2019 03-March	13	1,092	2019	3	13	
2019 03-March	14	1,025	2019	3	14	
2019 03-March	15	1,384	2019	3	15	
2019 03-March	16	1,476	2019	3	16	
2019 03-March	17	1,401	2019	3	17	
2019 03-March	18	1,350	2019	3	18	
2019 03-March	19	1,217	2019	3	19	
2019 03-March	20	1,183	2019	3	20	
2019 03-March	21	1,248	2019	3	21	
2019 03-March	22	1,392	2019	3	22	
2019 03-March	23	1,154	2019	3	23	
2019 03-March	24	1,193	2019	3	24	
2019 03-March	25	1,347	2019	3	25	
2019 03-March	26	1,206	2019	3	26	
2019 03-March	27	1,035	2019	3	27	
2019 03-March	28	885	2019	3	28	
2019 03-March	29	955	2019	3	29	
2019 03-March	30	1,326	2019	3	30	
2019 03-March	31	1,626	2019	3	31	
2019 04-April	1	1,312	2019	4	1	
2019 04-April	2	1,066	2019	4	2	
2019 04-April	3	1,032	2019	4	3	
2019 04-April	4	1,355	2019	4	4	
2019 04-April	5	916	2019	4	5	
2019 04-April	6	904	2019	4	6	
2019 04-April	7	843	2019	4	7	
2019 04-April	8	816	2019	4	8	
2019 04-April	9	820	2019	4	9	
2019 04-April	10	1,226	2019	4	10	
2019 04-April	11	1,108	2019	4	11	
2019 04-April	12	823	2019	4	12	
2019 04-April	13	917	2019	4	13	
2019 04-April	14	1,396	2019	4	14	
2019 04-April	15	1,093	2019	4	15	
2019 04-April	16	960	2019	4	16	
2019 04-April	17	846	2019	4	17	
2019 04-April	18	861	2019	4	18	
2019 04-April	19	1,180	2019	4	19	
2019 04-April	20	1,253	2019	4	20	
2019 04-April	21	961	2019	4	21	
2019 04-April	22	881	2019	4	22	
2019 04-April	23	864	2019	4	23	
2019 04-April	24	920	2019	4	24	
2019 04-April	25	993	2019	4	25	
2019 04-April	26	1,111	2019	4	26	
2019 04-April	27	1,107	2019	4	27	
2019 04-April	28	1,118	2019	4	28	
2019 04-April	29	1,380	2019	4	29	
2019 04-April	30	1,266	2019	4	30	
2019 05-May	1	909	2019	5	1	
2019 05-May	2	957	2019	5	2	
2019 05-May	3	1,120	2019	5	3	
2019 05-May	4	879	2019	5	4	
2019 05-May	5	745	2019	5	5	
2019 05-May	6	830	2019	5	6	
2019 05-May	7	1,208	2019	5	7	
2019 05-May	8	946	2019	5	8	
2019 05-May	9	735	2019	5	9	
2019 05-May	10	833	2019	5	10	
2019 05-May	11	876	2019	5	11	
2019 05-May	12	929	2019	5	12	
2019 05-May	13	1,039	2019	5	13	
2019 05-May	14	680	2019	5	14	
2019 05-May	15	632	2019	5	15	
2019 05-May	16	567	2019	5	16	
2019 05-May	17	616	2019	5	17	
2019 05-May	18	551	2019	5	18	

Sum of Integrated Average						
2019 05-May	19	581	2019	5	19	
2019 05-May	20	646	2019	5	20	
2019 05-May	21	655	2019	5	21	
2019 05-May	22	617	2019	5	22	
2019 05-May	23	714	2019	5	23	
2019 05-May	24	752	2019	5	24	
2019 05-May	25	720	2019	5	25	
2019 05-May	26	799	2019	5	26	
2019 05-May	27	751	2019	5	27	
2019 05-May	28	736	2019	5	28	
2019 05-May	29	777	2019	5	29	
2019 05-May	30	763	2019	5	30	
2019 05-May	31	666	2019	5	31	
2019 06-June	1	658	2019	6	1	
2019 06-June	2	756	2019	6	2	
2019 06-June	3	797	2019	6	3	
2019 06-June	4	755	2019	6	4	
2019 06-June	5	650	2019	6	5	
2019 06-June	6	619	2019	6	6	
2019 06-June	7	588	2019	6	7	
2019 06-June	8	615	2019	6	8	
2019 06-June	9	607	2019	6	9	
2019 06-June	10	574	2019	6	10	
2019 06-June	11	610	2019	6	11	
2019 06-June	12	617	2019	6	12	
2019 06-June	13	673	2019	6	13	
2019 06-June	14	744	2019	6	14	
2019 06-June	15	750	2019	6	15	
2019 06-June	16	774	2019	6	16	
2019 06-June	17	633	2019	6	17	
2019 06-June	18	667	2019	6	18	
2019 06-June	19	609	2019	6	19	
2019 06-June	20	597	2019	6	20	
2019 06-June	21	674	2019	6	21	
2019 06-June	22	731	2019	6	22	
2019 06-June	23	714	2019	6	23	
2019 06-June	24	631	2019	6	24	
2019 06-June	25	589	2019	6	25	
2019 06-June	26	767	2019	6	26	
2019 06-June	27	664	2019	6	27	
2019 06-June	28	651	2019	6	28	
2019 06-June	29	563	2019	6	29	
2019 06-June	30	566	2019	6	30	
2019 07-July	1	603	2019	7	1	
2019 07-July	2	646	2019	7	2	
2019 07-July	3	421	2019	7	3	
2019 07-July	4	391	2019	7	4	
2019 07-July	5	582	2019	7	5	
2019 07-July	6	629	2019	7	6	
2019 07-July	7	625	2019	7	7	
2019 07-July	8	406	2019	7	8	
2019 07-July	9	385	2019	7	9	
2019 07-July	10	382	2019	7	10	
2019 07-July	11	426	2019	7	11	
2019 07-July	12	458	2019	7	12	
2019 07-July	13	534	2019	7	13	
2019 07-July	14	658	2019	7	14	
2019 07-July	15	638	2019	7	15	
2019 07-July	16	528	2019	7	16	
2019 07-July	17	482	2019	7	17	
2019 07-July	18	458	2019	7	18	
2019 07-July	19	459	2019	7	19	
2019 07-July	20	415	2019	7	20	
2019 07-July	21	526	2019	7	21	
2019 07-July	22	691	2019	7	22	
2019 07-July	23	821	2019	7	23	
2019 07-July	24	802	2019	7	24	

Sum of Integrated Average						
2019 07-July	25	798	2019	7	25	
2019 07-July	26	702	2019	7	26	
2019 07-July	27	632	2019	7	27	
2019 07-July	28	722	2019	7	28	
2019 07-July	29	692	2019	7	29	
2019 07-July	30	636	2019	7	30	
2019 07-July	31	802	2019	7	31	
2019 08-August	1	800	2019	8	1	
2019 08-August	2	630	2019	8	2	
2019 08-August	3	674	2019	8	3	
2019 08-August	4	664	2019	8	4	
2019 08-August	5	701	2019	8	5	
2019 08-August	6	713	2019	8	6	
2019 08-August	7	760	2019	8	7	
2019 08-August	8	857	2019	8	8	
2019 08-August	9	839	2019	8	9	
2019 08-August	10	642	2019	8	10	
2019 08-August	11	559	2019	8	11	
2019 08-August	12	564	2019	8	12	
2019 08-August	13	546	2019	8	13	
2019 08-August	14	504	2019	8	14	
2019 08-August	15	485	2019	8	15	
2019 08-August	16	582	2019	8	16	
2019 08-August	17	651	2019	8	17	
2019 08-August	18	576	2019	8	18	
2019 08-August	19	572	2019	8	19	
2019 08-August	20	567	2019	8	20	
2019 08-August	21	586	2019	8	21	
2019 08-August	22	619	2019	8	22	
2019 08-August	23	619	2019	8	23	
2019 08-August	24	615	2019	8	24	
2019 08-August	25	607	2019	8	25	
2019 08-August	26	773	2019	8	26	
2019 08-August	27	790	2019	8	27	
2019 08-August	28	727	2019	8	28	
2019 08-August	29	717	2019	8	29	
2019 08-August	30	763	2019	8	30	
2019 08-August	31	718	2019	8	31	
2019 09-September	1	675	2019	9	1	
2019 09-September	2	571	2019	9	2	
2019 09-September	3	544	2019	9	3	
2019 09-September	4	613	2019	9	4	
2019 09-September	5	610	2019	9	5	
2019 09-September	6	675	2019	9	6	
2019 09-September	7	705	2019	9	7	
2019 09-September	8	780	2019	9	8	
2019 09-September	9	739	2019	9	9	
2019 09-September	10	662	2019	9	10	
2019 09-September	11	712	2019	9	11	
2019 09-September	12	700	2019	9	12	
2019 09-September	13	756	2019	9	13	
2019 09-September	14	811	2019	9	14	
2019 09-September	15	765	2019	9	15	
2019 09-September	16	767	2019	9	16	
2019 09-September	17	789	2019	9	17	
2019 09-September	18	707	2019	9	18	
2019 09-September	19	717	2019	9	19	
2019 09-September	20	688	2019	9	20	
2019 09-September	21	754	2019	9	21	
2019 09-September	22	795	2019	9	22	
2019 09-September	23	743	2019	9	23	
2019 09-September	24	701	2019	9	24	
2019 09-September	25	756	2019	9	25	
2019 09-September	26	786	2019	9	26	
2019 09-September	27	784	2019	9	27	
2019 09-September	28	757	2019	9	28	
2019 09-September	29	807	2019	9	29	

Sum of Integrated Average					
2019 09-September	30	762	2019	9	30
2019 10-October	1	690	2019	10	1
2019 10-October	2	784	2019	10	2
2019 10-October	3	780	2019	10	3
2019 10-October	4	788	2019	10	4
2019 10-October	5	839	2019	10	5
2019 10-October	6	775	2019	10	6
2019 10-October	7	751	2019	10	7
2019 10-October	8	810	2019	10	8
2019 10-October	9	750	2019	10	9
2019 10-October	10	780	2019	10	10
2019 10-October	11	813	2019	10	11
2019 10-October	12	931	2019	10	12
2019 10-October	13	772	2019	10	13
2019 10-October	14	786	2019	10	14
2019 10-October	15	707	2019	10	15
2019 10-October	16	987	2019	10	16
2019 10-October	17	896	2019	10	17
2019 10-October	18	882	2019	10	18
2019 10-October	19	818	2019	10	19
2019 10-October	20	774	2019	10	20
2019 10-October	21	756	2019	10	21
2019 10-October	22	861	2019	10	22
2019 10-October	23	786	2019	10	23
2019 10-October	24	820	2019	10	24
2019 10-October	25	1,051	2019	10	25
2019 10-October	26	974	2019	10	26
2019 10-October	27	927	2019	10	27
2019 10-October	28	790	2019	10	28
2019 10-October	29	816	2019	10	29
2019 10-October	30	1,020	2019	10	30
2019 10-October	31	1,192	2019	10	31
2019 11-November	1	1,179	2019	11	1
2019 11-November	2	1,116	2019	11	2
2019 11-November	3	1,040	2019	11	3
2019 11-November	4	1,021	2019	11	4
2019 11-November	5	1,220	2019	11	5
2019 11-November	6	1,326	2019	11	6
2019 11-November	7	1,538	2019	11	7
2019 11-November	8	1,409	2019	11	8
2019 11-November	9	1,322	2019	11	9
2019 11-November	10	1,218	2019	11	10
2019 11-November	11	1,547	2019	11	11
2019 11-November	12	1,791	2019	11	12
2019 11-November	13	1,805	2019	11	13
2019 11-November	14	1,639	2019	11	14
2019 11-November	15	1,636	2019	11	15
2019 11-November	16	1,638	2019	11	16
2019 11-November	17	1,414	2019	11	17
2019 11-November	18	1,291	2019	11	18
2019 11-November	19	1,349	2019	11	19
2019 11-November	20	1,319	2019	11	20
2019 11-November	21	1,191	2019	11	21
2019 11-November	22	1,465	2019	11	22
2019 11-November	23	1,363	2019	11	23
2019 11-November	24	1,210	2019	11	24
2019 11-November	25	1,153	2019	11	25
2019 11-November	26	1,026	2019	11	26
2019 11-November	27	1,311	2019	11	27
2019 11-November	28	1,365	2019	11	28
2019 11-November	29	1,386	2019	11	29
2019 11-November	30	1,368	2019	11	30
2019 12-December	1	1,279	2019	12	1
2019 12-December	2	1,535	2019	12	2
2019 12-December	3	1,522	2019	12	3
2019 12-December	4	1,530	2019	12	4
2019 12-December	5	1,393	2019	12	5



Sum of Integrated Average						
2019 12-December	6	1,512	2019	12	6	
2019 12-December	7	1,513	2019	12	7	
2019 12-December	8	1,258	2019	12	8	
2019 12-December	9	1,190	2019	12	9	
2019 12-December	10	1,769	2019	12	10	
2019 12-December	11	2,027	2019	12	11	
2019 12-December	12	1,736	2019	12	12	
2019 12-December	13	1,436	2019	12	13	
2019 12-December	14	1,416	2019	12	14	
2019 12-December	15	1,590	2019	12	15	
2019 12-December	16	1,546	2019	12	16	
2019 12-December	17	1,684	2019	12	17	
2019 12-December	18	2,041	2019	12	18	
2019 12-December	19	2,004	2019	12	19	
2019 12-December	20	1,798	2019	12	20	
2019 12-December	21	1,562	2019	12	21	
2019 12-December	22	1,490	2019	12	22	
2019 12-December	23	1,381	2019	12	23	
2019 12-December	24	1,398	2019	12	24	
2019 12-December	25	1,137	2019	12	25	
2019 12-December	26	1,019	2019	12	26	
2019 12-December	27	1,221	2019	12	27	
2019 12-December	28	1,279	2019	12	28	
2019 12-December	29	1,144	2019	12	29	
2019 12-December	30	1,512	2019	12	30	
2019 12-December	31	1,642	2019	12	31	
2020 01-January	1	1,472	2020	1	1	
2020 01-January	2	1,302	2020	1	2	
2020 01-January	3	1,334	2020	1	3	
2020 01-January	4	1,563	2020	1	4	
2020 01-January	5	1,625	2020	1	5	
2020 01-January	6	1,505	2020	1	6	
2020 01-January	7	1,609	2020	1	7	
2020 01-January	8	2,072	2020	1	8	
2020 01-January	9	1,574	2020	1	9	
2020 01-January	10	1,215	2020	1	10	
2020 01-January	11	1,531	2020	1	11	
2020 01-January	12	1,660	2020	1	12	
2020 01-January	13	1,588	2020	1	13	
2020 01-January	14	1,533	2020	1	14	
2020 01-January	15	1,503	2020	1	15	
2020 01-January	16	1,914	2020	1	16	
2020 01-January	17	1,857	2020	1	17	
2020 01-January	18	1,816	2020	1	18	
2020 01-January	19	2,098	2020	1	19	
2020 01-January	20	1,949	2020	1	20	
2020 01-January	21	1,882	2020	1	21	
2020 01-January	22	1,851	2020	1	22	
2020 01-January	23	1,678	2020	1	23	
2020 01-January	24	1,631	2020	1	24	
2020 01-January	25	1,678	2020	1	25	
2020 01-January	26	1,657	2020	1	26	
2020 01-January	27	1,577	2020	1	27	
2020 01-January	28	1,679	2020	1	28	
2020 01-January	29	1,784	2020	1	29	
2020 01-January	30	1,805	2020	1	30	
2020 01-January	31	1,762	2020	1	31	
2020 02-February	1	1,748	2020	2	1	
2020 02-February	2	1,443	2020	2	2	
2020 02-February	3	1,392	2020	2	3	
2020 02-February	4	1,764	2020	2	4	
2020 02-February	5	1,910	2020	2	5	
2020 02-February	6	1,950	2020	2	6	
2020 02-February	7	1,780	2020	2	7	
2020 02-February	8	1,776	2020	2	8	
2020 02-February	9	1,684	2020	2	9	
2020 02-February	10	1,663	2020	2	10	

Sum of Integrated Average						
2020 02-February	11	1,731	2020	2	11	
2020 02-February	12	1,751	2020	2	12	
2020 02-February	13	2,176	2020	2	13	
2020 02-February	14	2,009	2020	2	14	
2020 02-February	15	1,652	2020	2	15	
2020 02-February	16	1,559	2020	2	16	
2020 02-February	17	1,562	2020	2	17	
2020 02-February	18	1,671	2020	2	18	
2020 02-February	19	1,847	2020	2	19	
2020 02-February	20	1,948	2020	2	20	
2020 02-February	21	1,780	2020	2	21	
2020 02-February	22	1,531	2020	2	22	
2020 02-February	23	1,423	2020	2	23	
2020 02-February	24	1,407	2020	2	24	
2020 02-February	25	1,642	2020	2	25	
2020 02-February	26	1,875	2020	2	26	
2020 02-February	27	2,068	2020	2	27	
2020 02-February	28	1,939	2020	2	28	
2020 02-February	29	1,771	2020	3	29	
2020 03-March	1	1,508	2020	3	1	
2020 03-March	2	1,082	2020	3	2	
2020 03-March	3	1,160	2020	3	3	
2020 03-March	4	1,263	2020	3	4	
2020 03-March	5	1,247	2020	3	5	
2020 03-March	6	1,538	2020	3	6	
2020 03-March	7	1,111	2020	3	7	
2020 03-March	8	988	2020	3	8	
2020 03-March	9	1,053	2020	3	9	
2020 03-March	10	1,429	2020	3	10	
2020 03-March	11	1,451	2020	3	11	
2020 03-March	12	1,270	2020	3	12	
2020 03-March	13	1,437	2020	3	13	
2020 03-March	14	1,639	2020	3	14	
2020 03-March	15	1,558	2020	3	15	
2020 03-March	16	1,417	2020	3	16	
2020 03-March	17	1,386	2020	3	17	
2020 03-March	18	1,436	2020	3	18	
2020 03-March	19	1,195	2020	3	19	
2020 03-March	20	1,393	2020	3	20	
2020 03-March	21	1,627	2020	3	21	
2020 03-March	22	1,517	2020	3	22	
2020 03-March	23	1,478	2020	3	23	
2020 03-March	24	1,483	2020	3	24	
2020 03-March	25	1,163	2020	3	25	
2020 03-March	26	1,190	2020	3	26	
2020 03-March	27	1,333	2020	3	27	
2020 03-March	28	1,137	2020	3	28	
2020 03-March	29	1,149	2020	3	29	
2020 03-March	30	1,233	2020	3	30	
2020 03-March	31	1,328	2020	3	31	
2020 04-April	1	1,232	2020	4	1	
2020 04-April	2	1,078	2020	4	2	
2020 04-April	3	1,072	2020	4	3	
2020 04-April	4	1,023	2020	4	4	
2020 04-April	5	1,152	2020	4	5	
2020 04-April	6	944	2020	4	6	
2020 04-April	7	846	2020	4	7	
2020 04-April	8	850	2020	4	8	
2020 04-April	9	1,252	2020	4	9	
2020 04-April	10	1,226	2020	4	10	
2020 04-April	11	863	2020	4	11	
2020 04-April	12	894	2020	4	12	
2020 04-April	13	1,211	2020	4	13	
2020 04-April	14	1,362	2020	4	14	
2020 04-April	15	1,500	2020	4	15	
2020 04-April	16	1,346	2020	4	16	
2020 04-April	17	1,442	2020	4	17	

Sum of Integrated Average						
2020 04-April	18	1,099	2020	4	18	
2020 04-April	19	1,150	2020	4	19	
2020 04-April	20	1,064	2020	4	20	
2020 04-April	21	1,435	2020	4	21	
2020 04-April	22	1,459	2020	4	22	
2020 04-April	23	1,281	2020	4	23	
2020 04-April	24	979	2020	4	24	
2020 04-April	25	978	2020	4	25	
2020 04-April	26	987	2020	4	26	
2020 04-April	27	908	2020	4	27	
2020 04-April	28	880	2020	4	28	
2020 04-April	29	887	2020	4	29	
2020 04-April	30	951	2020	4	30	
2020 05-May	1	835	2020	5	1	
2020 05-May	2	764	2020	5	2	
2020 05-May	3	860	2020	5	3	
2020 05-May	4	952	2020	5	4	
2020 05-May	5	1,087	2020	5	5	
2020 05-May	6	942	2020	5	6	
2020 05-May	7	991	2020	5	7	
2020 05-May	8	1,160	2020	5	8	
2020 05-May	9	1,014	2020	5	9	
2020 05-May	10	1,065	2020	5	10	
2020 05-May	11	1,137	2020	5	11	
2020 05-May	12	996	2020	5	12	
2020 05-May	13	956	2020	5	13	
2020 05-May	14	910	2020	5	14	
2020 05-May	15	854	2020	5	15	
2020 05-May	16	841	2020	5	16	
2020 05-May	17	914	2020	5	17	
2020 05-May	18	939	2020	5	18	
2020 05-May	19	899	2020	5	19	
2020 05-May	20	839	2020	5	20	
2020 05-May	21	909	2020	5	21	
2020 05-May	22	866	2020	5	22	
2020 05-May	23	469	2020	5	23	
2020 05-May	24	597	2020	5	24	
2020 05-May	25	688	2020	5	25	
2020 05-May	26	643	2020	5	26	
2020 05-May	27	777	2020	5	27	
2020 05-May	28	731	2020	5	28	
2020 05-May	29	721	2020	5	29	
2020 05-May	30	793	2020	5	30	
2020 05-May	31	859	2020	5	31	
2020 06-June	1	804	2020	6	1	
2020 06-June	2	797	2020	6	2	
2020 06-June	3	734	2020	6	3	
2020 06-June	4	728	2020	6	4	
2020 06-June	5	214	2020	6	5	
2020 06-June	6	391	2020	6	6	
2020 06-June	7	803	2020	6	7	
2020 06-June	8	812	2020	6	8	
2020 06-June	9	816	2020	6	9	
2020 06-June	10	806	2020	6	10	
2020 06-June	11	586	2020	6	11	
2020 06-June	12	448	2020	6	12	
2020 06-June	13	417	2020	6	13	
2020 06-June	14	315	2020	6	14	
2020 06-June	15	277	2020	6	15	
2020 06-June	16	330	2020	6	16	
2020 06-June	17	439	2020	6	17	
2020 06-June	18	474	2020	6	18	
2020 06-June	19	428	2020	6	19	
2020 06-June	20	351	2020	6	20	
2020 06-June	21	425	2020	6	21	
2020 06-June	22	484	2020	6	22	
2020 06-June	23	526	2020	6	23	

Sum of Integrated Average						
2020 06-June	24	529	2020	6	24	
2020 06-June	25	508	2020	6	25	
2020 06-June	26	407	2020	6	26	
2020 06-June	27	366	2020	6	27	
2020 06-June	28	360	2020	6	28	
2020 06-June	29	405	2020	6	29	
2020 06-June	30	440	2020	6	30	
2020 07-July	1	399	2020	7	1	
2020 07-July	2	284	2020	7	2	
2020 07-July	3	308	2020	7	3	
2020 07-July	4	428	2020	7	4	
2020 07-July	5	665	2020	7	5	
2020 07-July	6	597	2020	7	6	
2020 07-July	7	542	2020	7	7	
2020 07-July	8	396	2020	7	8	
2020 07-July	9	505	2020	7	9	
2020 07-July	10	607	2020	7	10	
2020 07-July	11	652	2020	7	11	
2020 07-July	12	569	2020	7	12	
2020 07-July	13	530	2020	7	13	
2020 07-July	14	552	2020	7	14	
2020 07-July	15	518	2020	7	15	
2020 07-July	16	600	2020	7	16	
2020 07-July	17	486	2020	7	17	
2020 07-July	18	541	2020	7	18	
2020 07-July	19	568	2020	7	19	
2020 07-July	20	597	2020	7	20	
2020 07-July	21	589	2020	7	21	
2020 07-July	22	600	2020	7	22	
2020 07-July	23	593	2020	7	23	
2020 07-July	24	611	2020	7	24	
2020 07-July	25	513	2020	7	25	
2020 07-July	26	521	2020	7	26	
2020 07-July	27	534	2020	7	27	
2020 07-July	28	559	2020	7	28	
2020 07-July	29	568	2020	7	29	
2020 07-July	30	611	2020	7	30	
2020 07-July	31	617	2020	7	31	
2020 08-August	1	613	2020	8	1	
2020 08-August	2	631	2020	8	2	
2020 08-August	3	643	2020	8	3	
2020 08-August	4	687	2020	8	4	
2020 08-August	5	665	2020	8	5	
2020 08-August	6	666	2020	8	6	
2020 08-August	7	661	2020	8	7	
2020 08-August	8	603	2020	8	8	
2020 08-August	9	608	2020	8	9	
2020 08-August	10	604	2020	8	10	
2020 08-August	11	621	2020	8	11	
2020 08-August	12	586	2020	8	12	
2020 08-August	13	605	2020	8	13	
2020 08-August	14	621	2020	8	14	
2020 08-August	15	619	2020	8	15	
2020 08-August	16	611	2020	8	16	
2020 08-August	17	626	2020	8	17	
2020 08-August	18	645	2020	8	18	
2020 08-August	19	630	2020	8	19	
2020 08-August	20	577	2020	8	20	
2020 08-August	21	602	2020	8	21	
2020 08-August	22	523	2020	8	22	
2020 08-August	23	509	2020	8	23	
2020 08-August	24	448	2020	8	24	
2020 08-August	25	573	2020	8	25	
2020 08-August	26	442	2020	8	26	
2020 08-August	27	347	2020	8	27	
2020 08-August	28	390	2020	8	28	
2020 08-August	29	459	2020	8	29	

Sum of Integrated Average						
2020 08-August	30	494	2020	8	30	
2020 08-August	31	549	2020	8	31	
2020 09-September	1	493	2020	9	1	
2020 09-September	2	427	2020	9	2	
2020 09-September	3	407	2020	9	3	
2020 09-September	4	350	2020	9	4	
2020 09-September	5	292	2020	9	5	
2020 09-September	6	262	2020	9	6	
2020 09-September	7	165	2020	9	7	
2020 09-September	8	323	2020	9	8	
2020 09-September	9	354	2020	9	9	
2020 09-September	10	417	2020	9	10	
2020 09-September	11	354	2020	9	11	
2020 09-September	12	286	2020	9	12	
2020 09-September	13	340	2020	9	13	
2020 09-September	14	479	2020	9	14	
2020 09-September	15	525	2020	9	15	
2020 09-September	16	439	2020	9	16	
2020 09-September	17	516	2020	9	17	
2020 09-September	18	603	2020	9	18	
2020 09-September	19	531	2020	9	19	
2020 09-September	20	508	2020	9	20	
2020 09-September	21	511	2020	9	21	
2020 09-September	22	506	2020	9	22	
2020 09-September	23	462	2020	9	23	
2020 09-September	24	462	2020	9	24	
2020 09-September	25	436	2020	9	25	
2020 09-September	26	318	2020	9	26	
2020 09-September	27	290	2020	9	27	
2020 09-September	28	489	2020	9	28	
2020 09-September	29	472	2020	9	29	
2020 09-September	30	625	2020	9	30	
2020 10-October	1	808	2020	10	1	
2020 10-October	2	842	2020	10	2	
2020 10-October	3	774	2020	10	3	
2020 10-October	4	907	2020	10	4	
2020 10-October	5	838	2020	10	5	
2020 10-October	6	677	2020	10	6	
2020 10-October	7	716	2020	10	7	
2020 10-October	8	733	2020	10	8	
2020 10-October	9	600	2020	10	9	
2020 10-October	10	726	2020	10	10	
2020 10-October	11	798	2020	10	11	
2020 10-October	12	787	2020	10	12	
2020 10-October	13	861	2020	10	13	
2020 10-October	14	824	2020	10	14	
2020 10-October	15	1,061	2020	10	15	
2020 10-October	16	1,125	2020	10	16	
2020 10-October	17	963	2020	10	17	
2020 10-October	18	1,043	2020	10	18	
2020 10-October	19	1,249	2020	10	19	
2020 10-October	20	1,007	2020	10	20	
2020 10-October	21	1,017	2020	10	21	
2020 10-October	22	948	2020	10	22	
2020 10-October	23	903	2020	10	23	
2020 10-October	24	1,130	2020	10	24	
2020 10-October	25	1,261	2020	10	25	
2020 10-October	26	1,345	2020	10	26	
2020 10-October	27	1,404	2020	10	27	
2020 10-October	28	1,242	2020	10	28	
2020 10-October	29	1,361	2020	10	29	
2020 10-October	30	1,536	2020	10	30	
2020 10-October	31	1,319	2020	10	31	
2020 11-November	1	1,432	2020	11	1	
2020 11-November	2	1,297	2020	11	2	
2020 11-November	3	1,001	2020	11	3	
2020 11-November	4	979	2020	11	4	

Sum of Integrated Average

2020 11-November	5	1,058	2020	11	5
2020 11-November	6	1,014	2020	11	6
2020 11-November	7	989	2020	11	7
2020 11-November	8	919	2020	11	8
2020 11-November	9	891	2020	11	9
2020 11-November	10	830	2020	11	10
2020 11-November	11	1,195	2020	11	11
2020 11-November	12	1,297	2020	11	12
2020 11-November	13	1,483	2020	11	13
2020 11-November	14	1,415	2020	11	14
2020 11-November	15	1,437	2020	11	15
2020 11-November	16	1,405	2020	11	16
2020 11-November	17	1,656	2020	11	17
2020 11-November	18	1,452	2020	11	18
2020 11-November	19	1,192	2020	11	19
2020 11-November	20	1,102	2020	11	20
2020 11-November	21	1,420	2020	11	21
2020 11-November	22	1,580	2020	11	22
2020 11-November	23	1,568	2020	11	23
2020 11-November	24	1,478	2020	11	24
2020 11-November	25	1,202	2020	11	25
2020 11-November	26	1,298	2020	11	26
2020 11-November	27	1,485	2020	11	27
2020 11-November	28	1,507	2020	11	28
2020 11-November	29	1,398	2020	11	29
2020 11-November	30	1,678	2020	11	30
2020 12-December	1	1,744	2020	12	1
2020 12-December	2	1,581	2020	12	2
2020 12-December	3	1,487	2020	12	3
2020 12-December	4	1,361	2020	12	4
2020 12-December	5	1,668	2020	12	5
2020 12-December	6	1,679	2020	12	6
2020 12-December	7	1,356	2020	12	7
2020 12-December	8	1,228	2020	12	8
2020 12-December	9	1,223	2020	12	9
2020 12-December	10	1,120	2020	12	10
2020 12-December	11	1,139	2020	12	11
2020 12-December	12	1,234	2020	12	12
2020 12-December	13	1,271	2020	12	13
2020 12-December	14	1,485	2020	12	14
2020 12-December	15	1,666	2020	12	15
2020 12-December	16	1,687	2020	12	16
2020 12-December	17	1,485	2020	12	17
2020 12-December	18	1,434	2020	12	18
2020 12-December	19	1,582	2020	12	19
2020 12-December	20	1,630	2020	12	20
2020 12-December	21	1,578	2020	12	21
2020 12-December	22	1,586	2020	12	22
2020 12-December	23	1,332	2020	12	23
2020 12-December	24	1,759	2020	12	24
2020 12-December	25	1,941	2020	12	25
2020 12-December	26	1,778	2020	12	26
2020 12-December	27	1,528	2020	12	27
2020 12-December	28	1,738	2020	12	28
2020 12-December	29	1,633	2020	12	29
2020 12-December	30	1,672	2020	12	30
2020 12-December	31	1,755	2020	12	31
2021 01-January	1	1,670	2021	1	1
2021 01-January	2	1,684	2021	1	2
2021 01-January	3	1,721	2021	1	3
2021 01-January	4	1,740	2021	1	4
2021 01-January	5	1,682	2021	1	5
2021 01-January	6	1,676	2021	1	6
2021 01-January	7	1,767	2021	1	7
2021 01-January	8	1,876	2021	1	8
2021 01-January	9	1,735	2021	1	9
2021 01-January	10	1,735	2021	1	10

Sum of Integrated Average						
2021 01-January	11	1,931	2021	1	11	
2021 01-January	12	1,853	2021	1	12	
2021 01-January	13	1,548	2021	1	13	
2021 01-January	14	1,547	2021	1	14	
2021 01-January	15	1,774	2021	1	15	
2021 01-January	16	1,818	2021	1	16	
2021 01-January	17	1,767	2021	1	17	
2021 01-January	18	1,510	2021	1	18	
2021 01-January	19	1,575	2021	1	19	
2021 01-January	20	1,654	2021	1	20	
2021 01-January	21	1,345	2021	1	21	
2021 01-January	22	1,740	2021	1	22	
2021 01-January	23	1,525	2021	1	23	
2021 01-January	24	1,525	2021	1	24	
2021 01-January	25	1,514	2021	1	25	
2021 01-January	26	1,621	2021	1	26	
2021 01-January	27	1,734	2021	1	27	
2021 01-January	28	1,839	2021	1	28	
2021 01-January	29	1,676	2021	1	29	
2021 01-January	30	1,728	2021	1	30	
2021 01-January	31	1,745	2021	1	31	
2021 02-February	1	1,690	2021	2	1	
2021 02-February	2	1,670	2021	2	2	
2021 02-February	3	1,617	2021	2	3	
2021 02-February	4	1,709	2021	2	4	
2021 02-February	5	2,052	2021	2	5	
2021 02-February	6	1,952	2021	2	6	
2021 02-February	7	2,001	2021	2	7	
2021 02-February	8	1,908	2021	2	8	
2021 02-February	9	1,942	2021	2	9	
2021 02-February	10	1,961	2021	2	10	
2021 02-February	11	1,814	2021	2	11	
2021 02-February	12	1,865	2021	2	12	
2021 02-February	13	1,907	2021	2	13	
2021 02-February	14	1,801	2021	2	14	
2021 02-February	15	2,034	2021	2	15	
2021 02-February	16	2,005	2021	2	16	
2021 02-February	17	1,922	2021	2	17	
2021 02-February	18	1,868	2021	2	18	
2021 02-February	19	1,782	2021	2	19	
2021 02-February	20	1,777	2021	2	20	
2021 02-February	21	1,683	2021	2	21	
2021 02-February	22	1,646	2021	2	22	
2021 02-February	23	1,449	2021	2	23	
2021 02-February	24	1,420	2021	2	24	
2021 02-February	25	1,498	2021	2	25	
2021 02-February	26	1,415	2021	2	26	
2021 02-February	27	1,376	2021	2	27	
2021 02-February	28	1,327	2021	2	28	
2021 03-March	1	1,582	2021	3	1	
2021 03-March	2	1,385	2021	3	2	
2021 03-March	3	1,343	2021	3	3	
2021 03-March	4	1,619	2021	3	4	
2021 03-March	5	1,519	2021	3	5	
2021 03-March	6	1,491	2021	3	6	
2021 03-March	7	1,480	2021	3	7	
2021 03-March	8	1,229	2021	3	8	
2021 03-March	9	1,225	2021	3	9	
2021 03-March	10	996	2021	3	10	
2021 03-March	11	1,074	2021	3	11	
2021 03-March	12	1,301	2021	3	12	
2021 03-March	13	1,286	2021	3	13	
2021 03-March	14	1,472	2021	3	14	
2021 03-March	15	1,552	2021	3	15	
2021 03-March	16	1,232	2021	3	16	
2021 03-March	17	1,160	2021	3	17	
2021 03-March	18	1,565	2021	3	18	

Sum of Integrated Average							
2021 03-March	19	1,425	2021	3	19		
2021 03-March	20	1,223	2021	3	20		
2021 03-March	21	1,140	2021	3	21		
2021 03-March	22	943	2021	3	22		
2021 03-March	23	861	2021	3	23		
2021 03-March	24	779	2021	3	24		
2021 03-March	25	1,010	2021	3	25		
2021 03-March	26	1,102	2021	3	26		
2021 03-March	27	954	2021	3	27		
2021 03-March	28	1,401	2021	3	28		
2021 03-March	29	1,271	2021	3	29		
2021 03-March	30	899	2021	3	30		
2021 03-March	31	1,324	2021	3	31		
2021 04-April	1	1,526	2021	4	1		
2021 04-April	2	1,446	2021	4	2		
2021 04-April	3	1,228	2021	4	3		
2021 04-April	4	1,094	2021	4	4		
2021 04-April	5	1,106	2021	4	5		
2021 04-April	6	884	2021	4	6		
2021 04-April	7	889	2021	4	7		
2021 04-April	8	925	2021	4	8		
2021 04-April	9	868	2021	4	9		
2021 04-April	10	870	2021	4	10		
2021 04-April	11	1,064	2021	4	11		
2021 04-April	12	1,043	2021	4	12		
2021 04-April	13	1,057	2021	4	13		
2021 04-April	14	1,213	2021	4	14		
2021 04-April	15	1,368	2021	4	15		
2021 04-April	16	1,226	2021	4	16		
2021 04-April	17	1,126	2021	4	17		
2021 04-April	18	1,074	2021	4	18		
2021 04-April	19	1,183	2021	4	19		
2021 04-April	20	1,554	2021	4	20		
2021 04-April	21	1,533	2021	4	21		
2021 04-April	22	1,427	2021	4	22		
2021 04-April	23	1,067	2021	4	23		
2021 04-April	24	1,126	2021	4	24		
2021 04-April	25	1,223	2021	4	25		
2021 04-April	26	1,099	2021	4	26		
2021 04-April	27	875	2021	4	27		
2021 04-April	28	941	2021	4	28		
2021 04-April	29	1,090	2021	4	29		
2021 04-April	30	1,142	2021	4	30		
2021 05-May	1	1,035	2021	5	1		
2021 05-May	2	854	2021	5	2		
2021 05-May	3	866	2021	5	3		
2021 05-May	4	933	2021	5	4		
2021 05-May	5	1,037	2021	5	5		
2021 05-May	6	965	2021	5	6		
2021 05-May	7	1,042	2021	5	7		
2021 05-May	8	1,041	2021	5	8		
2021 05-May	9	1,174	2021	5	9		
2021 05-May	10	1,043	2021	5	10		
2021 05-May	11	1,036	2021	5	11		
2021 05-May	12	983	2021	5	12		
2021 05-May	13	957	2021	5	13		
2021 05-May	14	936	2021	5	14		
2021 05-May	15	902	2021	5	15		
2021 05-May	16	902	2021	5	16		
2021 05-May	17	862	2021	5	17		
2021 05-May	18	789	2021	5	18		
2021 05-May	19	786	2021	5	19		
2021 05-May	20	845	2021	5	20		
2021 05-May	21	735	2021	5	21		
2021 05-May	22	760	2021	5	22		
2021 05-May	23	790	2021	5	23		
2021 05-May	24	802	2021	5	24		



Sum of Integrated Average						
2021 05-May	25	773	2021	5	25	
2021 05-May	26	855	2021	5	26	
2021 05-May	27	943	2021	5	27	
2021 05-May	28	1,173	2021	5	28	
2021 05-May	29	1,045	2021	5	29	
2021 05-May	30	942	2021	5	30	
2021 05-May	31	824	2021	5	31	
2021 06-June	1	785	2021	6	1	
2021 06-June	2	877	2021	6	2	
2021 06-June	3	846	2021	6	3	
2021 06-June	4	857	2021	6	4	
2021 06-June	5	788	2021	6	5	
2021 06-June	6	643	2021	6	6	
2021 06-June	7	569	2021	6	7	
2021 06-June	8	653	2021	6	8	
2021 06-June	9	671	2021	6	9	
2021 06-June	10	815	2021	6	10	
2021 06-June	11	805	2021	6	11	
2021 06-June	12	778	2021	6	12	
2021 06-June	13	839	2021	6	13	
2021 06-June	14	882	2021	6	14	
2021 06-June	15	797	2021	6	15	
2021 06-June	16	904	2021	6	16	
2021 06-June	17	904	2021	6	17	
2021 06-June	18	827	2021	6	18	
2021 06-June	19	825	2021	6	19	
2021 06-June	20	809	2021	6	20	
2021 06-June	21	932	2021	6	21	
2021 06-June	22	956	2021	6	22	
2021 06-June	23	895	2021	6	23	
2021 06-June	24	824	2021	6	24	
2021 06-June	25	846	2021	6	25	
2021 06-June	26	799	2021	6	26	
2021 06-June	27	761	2021	6	27	
2021 06-June	28	556	2021	6	28	
2021 06-June	29	670	2021	6	29	
2021 06-June	30	806	2021	6	30	
2021 07-July	1	787	2021	7	1	
2021 07-July	2	732	2021	7	2	
2021 07-July	3	706	2021	7	3	
2021 07-July	4	762	2021	7	4	
2021 07-July	5	825	2021	7	5	
2021 07-July	6	781	2021	7	6	
2021 07-July	7	815	2021	7	7	
2021 07-July	8	856	2021	7	8	
2021 07-July	9	868	2021	7	9	
2021 07-July	10	846	2021	7	10	
2021 07-July	11	843	2021	7	11	
2021 07-July	12	877	2021	7	12	
2021 07-July	13	865	2021	7	13	
2021 07-July	14	831	2021	7	14	
2021 07-July	15	866	2021	7	15	
2021 07-July	16	768	2021	7	16	
2021 07-July	17	721	2021	7	17	
2021 07-July	18	789	2021	7	18	
2021 07-July	19	781	2021	7	19	
2021 07-July	20	839	2021	7	20	
2021 07-July	21	872	2021	7	21	
2021 07-July	22	816	2021	7	22	
2021 07-July	23	721	2021	7	23	
2021 07-July	24	684	2021	7	24	
2021 07-July	25	745	2021	7	25	
2021 07-July	26	833	2021	7	26	
2021 07-July	27	830	2021	7	27	
2021 07-July	28	794	2021	7	28	
2021 07-July	29	709	2021	7	29	
2021 07-July	30	785	2021	7	30	

Sum of Integrated Average					
2021 07-July	31	801	2021	7	31
2021 08-August	1	887	2021	8	1
2021 08-August	2	849	2021	8	2
2021 08-August	3	783	2021	8	3
2021 08-August	4	694	2021	8	4
2021 08-August	5	695	2021	8	5
2021 08-August	6	710	2021	8	6
2021 08-August	7	681	2021	8	7
2021 08-August	8	771	2021	8	8
2021 08-August	9	798	2021	8	9
2021 08-August	10	571	2021	8	10
2021 08-August	11	579	2021	8	11
2021 08-August	12	597	2021	8	12
2021 08-August	13	520	2021	8	13
2021 08-August	14	593	2021	8	14
2021 08-August	15	612	2021	8	15
2021 08-August	16	616	2021	8	16
2021 08-August	17	613	2021	8	17
2021 08-August	18	803	2021	8	18
2021 08-August	19	569	2021	8	19
2021 08-August	20	612	2021	8	20
2021 08-August	21	530	2021	8	21
2021 08-August	22	565	2021	8	22
2022 08-August	23	728	2021	8	23
2021 08-August	24	27	2021	8	24
2021 08-August	25	509	2021	8	25
2021 08-August	26	538	2021	8	26
2021 08-August	27	196	2021	8	27
2021 08-August	28	665	2021	8	28
2021 08-August	29	631	2021	8	29
2021 08-August	30	601	2021	8	30
2021 08-August	31	604	2021	8	31
2021 09-September	1	58	2021	9	1
2021 09-September	2	639	2021	9	2
2021 09-September	3	619	2021	9	3
2021 09-September	4	550	2021	9	4
2021 09-September	5	509	2021	9	5
2021 09-September	6	561	2021	9	6
2021 09-September	7	555	2021	9	7
2021 09-September	8	585	2021	9	8
2021 09-September	9	594	2021	9	9
2021 09-September	10	1,377	2021	9	10
2021 09-September	11	1,247	2021	9	11
2021 09-September	12	1,251	2021	9	12
2021 09-September	13	1,401	2021	9	13
2021 09-September	14	663	2021	9	14
2021 09-September	15	863	2021	9	15
2021 09-September	16	713	2021	9	16
2021 09-September	17	672	2021	9	17
2021 09-September	18	712	2021	9	18
2021 09-September	19	684	2021	9	19
2021 09-September	20	675	2021	9	20
2021 09-September	21	693	2021	9	21
2021 09-September	22	742	2021	9	22
2021 09-September	23	813	2021	9	23
2021 09-September	24	728	2021	9	24
2021 09-September	25	778	2021	9	25
2021 09-September	26	719	2021	9	26
2021 09-September	27	714	2021	9	27
2021 09-September	28	757	2021	9	28
2021 09-September	29	755	2021	9	29
2021 09-September	30	758	2021	9	30
2021 10-October	1	699	2021	10	1
2021 10-October	2	687	2021	10	2
2021 10-October	3	689	2021	10	3
2021 10-October	4	697	2021	10	4
2021 10-October	5	695	2021	10	5

Sum of Integrated Average						
2021 10-October	6	693	2021	10	6	
2021 10-October	7	696	2021	10	7	
2021 10-October	8	699	2021	10	8	
2021 10-October	9	682	2021	10	9	
2021 10-October	10	589	2021	10	10	
2021 10-October	11	407	2021	10	11	
2021 10-October	12	723	2021	10	12	
2021 10-October	13	676	2021	10	13	
2021 10-October	14	771	2021	10	14	
2021 10-October	15	745	2021	10	15	
2021 10-October	16	800	2021	10	16	
2021 10-October	17	836	2021	10	17	
2021 10-October	18	845	2021	10	18	
2021 10-October	19	739	2021	10	19	
2021 10-October	20	709	2021	10	20	
2021 10-October	21	927	2021	10	21	
2021 10-October	22	960	2021	10	22	
2021 10-October	23	1077	2021	10	23	
2021 10-October	24	1048	2021	10	24	
2021 10-October	25	1091	2021	10	25	
2021 10-October	26	1080	2021	10	26	
2021 10-October	27	175	2021	10	27	
2021 10-October	28	955	2021	10	28	
2021 10-October	29	966	2021	10	29	
2021 10-October	30	1046	2021	10	30	
2021 10-October	31	1158	2021	10	31	
2021 11-November	1	1326	2021	11	1	
2021 11-November	2	1512	2021	11	2	
2021 11-November	3	1477	2021	11	3	
2021 11-November	4	1564	2021	11	4	
2021 11-November	5	1455	2021	11	5	
2021 11-November	6	1266	2021	11	6	
2021 11-November	7	1144	2021	11	7	
2021 11-November	8	1005	2021	11	8	
2021 11-November	9	1114	2021	11	9	
2021 11-November	10	1103	2021	11	10	
2021 11-November	11	1042	2021	11	11	
2021 11-November	12	1295	2021	11	12	
2021 11-November	13	1496	2021	11	13	
2021 11-November	14	1597	2021	11	14	
2021 11-November	15	1446	2021	11	15	
2021 11-November	16	1396	2021	11	16	
2021 11-November	17	990	2021	11	17	
2021 11-November	18	1374	2021	11	18	
2021 11-November	19	1326	2021	11	19	
2021 11-November	20	1510	2021	11	20	
2021 11-November	21	1570	2021	11	21	
2021 11-November	22	1542	2021	11	22	
2021 11-November	23	1472	2021	11	23	
2021 11-November	24	1431	2021	11	24	
2021 11-November	25	1361	2021	11	25	
2021 11-November	26	1625	2021	11	26	
2021 11-November	27	1506	2021	11	27	
2021 11-November	28	1464	2021	11	28	
2021 11-November	29	1400	2021	11	29	
2021 11-November	30	1368	2021	11	30	
2021 12-December	1	1320	2021	12	1	
2021 12-December	2	1224	2021	12	2	
2021 12-December	3	1458	2021	12	3	
2021 12-December	4	1519	2021	12	4	
2021 12-December	5	1397	2021	12	5	
2021 12-December	6	1630	2021	12	6	
2021 12-December	7	1723	2021	12	7	
2021 12-December	8	1518	2021	12	8	
2021 12-December	9	1478	2021	12	9	
2021 12-December	10	1115	2021	12	10	
2021 12-December	11	1467	2021	12	11	

Sum of Integrated Average

2021 12-December	12	1491	2021	12	12
2021 12-December	13	1475	2021	12	13
2021 12-December	14	1305	2021	12	14
2021 12-December	15	1128	2021	12	15
2021 12-December	16	1290	2021	12	16
2021 12-December	17	1526	2021	12	17
2021 12-December	18	1794	2021	12	18
2021 12-December	19	1897	2021	12	19
2021 12-December	20	1693	2021	12	20
2021 12-December	21	1582	2021	12	21
2021 12-December	22	1645	2021	12	22
2021 12-December	23	1534	2021	12	23
2021 12-December	24	970	2021	12	24
2021 12-December	25	1090	2021	12	25
2021 12-December	26	1336	2021	12	26
2021 12-December	27	1335	2021	12	27
2021 12-December	28	1573	2021	12	28
2021 12-December	29	1498	2021	12	29
2021 12-December	30	1402	2021	12	30
2021 12-December	31	1154	2021	12	31







							Windsor	
							Month	5 Year Averages - Low 20
1,515	1,588	1,612	1,634	1,642	1,668	1,697	1	58,732
1,661	1,758	1,986	1,989	2,008	2,020	2,030	2	57,245
1,554	1,586	1,657	1,694	1,696	1,755	1,755	3	48,814
1,625	1,631	1,657	1,660	1,678	1,678	1,679	4	35,802
1,682	1,684	1,721	1,728	1,734	1,735	1,735	5	27,786
1,252	1,259	1,292	1,439	1,445	1,448	1,476	6	23,014
1,621	1,667	1,801	1,813	1,821	1,859	1,862	7	20,602
1,667	1,668	1,689	1,723	1,761	1,780	1,812	8	19,695
1,748	1,751	1,764	1,776	1,780	1,780	1,847	9	21,840
1,782	1,801	1,814	1,865	1,868	1,907	1,908	10	28,460
1,287	1,299	1,319	1,348	1,363	1,365	1,384	11	46,056
1,616	1,624	1,626	1,657	1,662	1,663	1,668	12	51,789
1,347	1,350	1,357	1,367	1,384	1,392	1,401		
1,328	1,333	1,386	1,393	1,417	1,429	1,436		
1,229	1,232	1,271	1,286	1,301	1,324	1,343		
650	658	687	693	721	727	767		
1,219	1,257	1,262	1,311	1,357	1,493	1,497		
961	993	1,032	1,066	1,093	1,107	1,108		
1,064	1,072	1,078	1,099	1,150	1,152	1,211		
1,094	1,099	1,106	1,126	1,126	1,142	1,183		
688	698	715	719	736	738	739		
637	654	661	663	666	669	674		
736	745	751	752	763	777	799		
859	860	866	899	909	910	914		
902	902	933	936	942	943	957		
529	535	537	538	542	546	547		
723	729	737	738	747	754	761		
633	650	651	658	664	667	673		
439	440	448	474	484	508	526		
806	809	815	824	825	827	839		
566	567	567	567	568	574	577		
437	442	457	465	466	470	476		
534	582	603	625	629	632	636		
542	552	559	568	568	569	589		
789	794	801	815	816	825	830		
526	539	539	564	565	571	572		
383	384	392	397	401	404	428		
619	630	642	651	664	674	701		
603	604	605	608	611	613	619		
604	612	612	613	616	631	665		
589	599	607	627	629	630	636		
653	654	665	675	677	682	686		
717	739	743	754	756	756	757		
427	436	439	462	462	472	479		
693	712	713	714	719	728	742		
663	673	682	683	686	686	717		
844	864	891	893	904	918	969		
788	790	810	813	816	818	820		
903	907	948	963	1,007	1,017	1,043		
709	723	739	745	771	800	836		
1,080	1,081	1,103	1,141	1,146	1,150	1,166		
1,271	1,311	1,340	1,350	1,364	1,372	1,429		
1,322	1,326	1,349	1,363	1,365	1,368	1,386		
1,297	1,298	1,398	1,405	1,415	1,420	1,432		
1,396	1,400	1,431	1,446	1,455	1,464	1,472		
1,494	1,502	1,559	1,578	1,624	1,627	1,654		
1,184	1,188	1,201	1,220	1,253	1,276	1,282		
1,490	1,512	1,512	1,513	1,522	1,530	1,535		
1,528	1,578	1,581	1,582	1,586	1,630	1,633		
1,458	1,467	1,475	1,478	1,491	1,498	1,518		
1,039	1,042	1,043	1,045	1,049	1,050	1,052		



## Windsor

### Lowest 20 Day Look

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Monthly (GJ)	59,000	57,000	49,000	36,000	28,000	23,000	21,000	20,000	22,000	28,000	46,000	52,000
Compression	80,000	80,000	80,000	88,000	88,000	88,000	88,000	88,000	88,000	88,000	80,000	80,000
Total	139,000	137,000	129,000	124,000	116,000	111,000	109,000	108,000	110,000	116,000	126,000	132,000

**Notes:**

- Data considered 2017 to 2021 calendar years
- Average of lowest 20 days of market were calculated for each month.

Windsor Month	5 Year Averages - Low 20	Rounded
1	58,732	59,000
2	57,245	57,000
3	48,814	49,000
4	35,802	36,000
5	27,786	28,000
6	23,014	23,000
7	20,602	21,000
8	19,695	20,000
9	21,840	22,000
10	28,460	28,000
11	46,056	46,000
12	51,789	52,000

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Federation of Rental-housing Providers of Ontario ("FRPO")

INTERROGATORY

Reference:

Exhibit B, Tab 2, Schedule 1, p. 3, 5, 6, 7 and  
EB-2016-0186 including Exhibit K2.1 Union\_Further Correspondence\_20161122

Preamble:

EGI evidence states: The minimum firm Panhandle Market is limited by the base load summer Windsor market demands and the capacity of Sandwich Compressor to compress gas from Windsor towards Dawn. The capacity of the Sandwich Compressor is 80 TJ/d and limited by the fixed amount of horsepower available.

Question:

Please provide the current function and operating range of the current Sandwich Compressor.

- i) Please describe the limitations of the compressor and what could be done to increase the amount of Windsor market available in the summer.
  - (1) How much could the market be increased and what is the cost estimate of improvements.
- ii) Please describe the limitations of the compressor and what could be done to increase the amount of gas that could be accepted at Ojibway in the winter including additional compression to push gas into the Leamington market.
  - (1) How much could the amount that could be accepted at Ojibway in the winter be increased and what is the cost estimate of improvements.

Response

The Sandwich Compressor unit is a Centaur T4502 turbine engine (4387 ISO HP) with a Solar C306 compressor.

When fully utilized this unit provides 88 TJ/d of import capacity in the summer and 80 TJ/d of import capacity in the winter. There are no options to modify the existing unit to provide further capability.

To increase import capability at Ojibway, pipeline reinforcement is required from the Detroit River Crossing to the Sandwich Compressor station. In addition, compressor units at the Sandwich Compressor Station would also be required. The cost estimate for these improvements can be found at Exhibit I.FRPO.8.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Federation of Rental-housing Providers of Ontario ("FRPO")

INTERROGATORY

Reference:

Exhibit B, Tab 2, Schedule 1, p. 3, 5, 6, 7 and  
EB-2016-0186 including Exhibit K2.1 Union\_Further Correspondence\_20161122

Preamble:

EGL evidence states: The Panhandle System currently has two minimum pressure constraints which must be maintained:

- The BBGS is located at the extreme western end of the Panhandle System just east of Ojibway. The pressure constraint for the entire Panhandle System is located at the outlet of the BBGS customer station, where the contracted minimum delivery pressure must be maintained at or above 1,724 kPag; and
- The Leamington North Gate Station is the endpoint of the Leamington North Line which is a lateral connected to the NPS 20 Panhandle Line. The system pressure at the Leamington North Gate Station must be maintained at or above of 2,275 kPag.

Question:

We would like to understand better the identified constraints and what may be done to overcome them.

Did EGL contact BBGS to determine if the customer would be willing to accept any form of interruptible contract, demand response reduction or payment to lower inlet pressure requirements (possibly to 1200 kPa or lower) to assist with reducing this constraint?

- a) If not, why not?
- b) If so, please describe all efforts and reasons why this approach would not assist in reducing the constraint.

**Response**

No, the customer requested incremental firm gas at the existing contracted delivery pressure, as part of their EOI bid, to serve their needs.

There is no capacity to be gained in the system by reducing the current pressure constraints on the system. Please see the response to Exhibit I.FRPO.13.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Federation of Rental-housing Providers of Ontario ("FRPO")

INTERROGATORY

Reference:

Exhibit B, Tab 2, Schedule 1, p. 3, 5, 6, 7 and  
EB-2016-0186 including Exhibit K2.1 Union\_Further Correspondence\_20161122

Preamble:

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- The Leamington North Gate Station is the endpoint of the Leamington North Line which is a lateral connected to the NPS 20 Panhandle Line. The system pressure at the Leamington North Gate Station must be maintained at or above of 2,275 kPag.

Question:

Please describe and provide a cost estimate for station enhancements (e.g., control valves, etc.) that could replace current regulating equipment at Leamington North Gate to maximize the throughput while minimizing the station pressure differential to reduce the pressure constraint significantly (1725 kPa or lower) while allowing forecasted 2023/24 flows (or higher).

Response

There is no capacity to be gained in the system by reducing the current pressure constraints on the system. Please see the response to Exhibit I.FRPO.13.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Federation of Rental-housing Providers of Ontario ("FRPO")

INTERROGATORY

Reference:

Exhibit B, Tab 2, Schedule 1, p. 3, 5, 6, 7 and  
EB-2016-0186 including Exhibit K2.1 Union\_Further Correspondence\_20161122

Preamble:

EGL evidence states: The Panhandle System currently has two minimum pressure constraints which must be maintained:

- The BBGS is located at the extreme western end of the Panhandle System just east of Ojibway. The pressure constraint for the entire Panhandle System is located at the outlet of the BBGS customer station, where the contracted minimum delivery pressure must be maintained at or above 1,724 kPag; and
- The Leamington North Gate Station is the endpoint of the Leamington North Line which is a lateral connected to the NPS 20 Panhandle Line. The system pressure at the Leamington North Gate Station must be maintained at or above of 2,275 kPag.

Question:

If the pressure constraint at BBGS were reduced to 1200 kPa or lower and the inlet to Leamington North Gate were reduced to 1725 kPa or lower, please identify what year further reinforcement would be required to accommodate forecasted need provided in Attachment 1.

- a) Please provide the results of the Winter 23/24 simulations with all pressures and the flows and pressures requested in IR#4.

## **Response**

- a) If the pressure constraint at either BBGS or Leamington North station were reduced to the numbers specified, a new pressure constraint would become the controlling pressure constraint for the system.

If the BBGS pressure constraint was to be reduced, the new pressure constraint would shift to West Windsor Power Generation ("WWPG"). WWPG is located immediately adjacent to BBGS with the same delivery pressure constraint of 1724 kPag. Many other distribution stations in the City of Windsor near BBGS have similar pressure constraints.

Likewise, reducing the inlet pressure of Leamington North Gate Station to 1725 kPag would shift the pressure constraint to the County Road 18 Station which operates with similar minimum inlet pressure conditions and is located close to Leamington North Gate Station. Furthermore, the downstream distribution system operates at 1900 kPag which is above the requested pressure. This situation is not feasible as the minimum inlet pressure required to service that market must be maintained above 1900 kPag to account for losses through the regulating station.

There is no capacity to be gained in the system by reducing the current pressure constraints on the system.



ENBRIDGE GAS INC.

Answer to Interrogatory from  
Federation of Rental-housing Providers of Ontario (FRPO)

INTERROGATORY

Reference:

Exhibit A, Tab 4, Sch. 1, p. 4 and Exhibit B, Tab 1, Sch. 1 and Attachments

Preamble:

EGL evidence states: Using the results of the additional EOI/ROS, an updated demand forecast to Winter 2030/2031 was developed which reflects decreases in customer demand, including:

- Winter 2023/2024 customer demands decreased by 14 TJ/d, from 744 TJ/d to 730 TJ/d.
- The 5-year demand forecast (i.e., the total forecast demand in Winter 2028/2029) decreased by 40 TJ/d, from 932 TJ/d to 892 TJ/d.<sup>1</sup>

....

<sup>1</sup> As described in Section C of this Exhibit, the existing capacity of the Panhandle System is 737 TJ/d.

Contract rate customer demand makes up approximately 94% of the capacity of the proposed Project. As of May 2023, approximately 34% of the contract rate customer demand is underpinned by a firm distribution contract. The commitment letters received in 2021 are no longer being relied upon by Enbridge Gas as they were applicable to the former 2021 EOI process only. Based on the timing of the 2023 EOI process and updated leave to construct application, Enbridge Gas will be executing firm distribution contracts with customers that are requesting service in 2024 and 2025 first, followed by securing customer demands for the future years.

We would like to understand better the forecasted growth and the amount of growth for which EGL has a binding commitment.

Question(s):

Please expand and update Table 1 with the amount of demand for which EGL has received a binding commitment.

- a) Further please describe any monetary contractual commitments associated with these commitments such as aid-to-construct, minimum annual volume, term, consequences associated with not ultimately contracting for the future demand, etc.
- b) Please provide the letter of indemnity that customers were offered.

Response:

Please see the response at Exhibit I.STAFF.24, part a).

- a) Enbridge Gas is currently negotiating the commercial agreements with customers. Generally, customers who will require customer specific distribution facilities will be using EBO 188 financial guidelines to determine if CIAC is required.

Please see the response at Exhibit I.ED.30, parts b) and d).

- b) Please see Exhibit I.PP.5, Attachment 1, pp. 59-60.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Federation of Rental-housing Providers of Ontario (FRPO)

INTERROGATORY

Reference:

Exhibit A, Tab 4, Sch. 1, p. 4 and Exhibit B, Tab 1, Sch. 1 and Attachments

Preamble:

EGL evidence states: To provide clarity and respond to any questions regarding the EOI and ROS process, Enbridge Gas account managers directly contacted each contract rate customer in the Panhandle Market. In addition to direct outreach, all existing contract customers were invited to attend an in-person meeting held on March 7, 2023, and/or a virtual meeting held on March 23, 2023. A meeting with local economic development officials was also held on March 2, 2023, to inform them of the process and timelines, and to answer any questions related to the forms.

Question(s):

Please summarize what account managers heard from customers on the potential negotiation of firm to interruptible.

- a) Please provide all of the feedback received on page 6 of Attachment 8
- b) Please provide any notes, minutes or “as we heard it” from the March 7, 2023 meeting.
- c) Please provide all emails from staff in the account management department that relate to the potential of the provision of interruptible service.
- d) Were customers provided with a potential range of reduction of interruptible rate as a means of comparison.
  - i) If not, why not.

Response:

For a summary of customer responses regarding whether customers would be more inclined to consider interruptible service over new firm service if the ability to negotiate lower than posted interruptible rates was available, please see Exhibit B, Tab 1, Schedule 1, Paragraph 29.

- a) Please see Attachment 1 to this response.
- b) Enbridge Gas does not have notes or minutes from the meeting on March 7, 2023.
- c) Enbridge Gas does not have email communications from the account management department to customers regarding the viability of interruptible service as an alternative to new firm service (including whether they would be more inclined to consider interruptible service over new firm service if the ability to negotiate lower than posted interruptible rates was available), or regarding whether EOI bid amounts are inclusive of all future expected natural gas conservation activities (including natural gas conservation activities within and outside of Enbridge Gas's Demand Side Management programs, and the use of non-natural gas alternatives). The information was requested by Enbridge Gas via the EOI/ROS forms (see Exhibit B, Tab 1, Schedule 1, Attachment 8, p. 6, and Exhibit B, Tab 1, Schedule 1, Attachment 9, pp. 1-2).
- d) No. Enbridge Gas did not limit customer responses by providing potential ranges. Any rate or reduction in rate could have been provided by the customer in response to the question.

Interruptible service as an alternative to new Firm service (Yes/No)	If no, please explain why	If yes, how would you ensure compliance with a service interruption	Would you be more inclined to consider interruptible service over new Firm service if the ability to negotiate lower than posted interruptible rates was available (Yes/No)	If no, please explain why	If yes, please indicate the interruptible distribution delivery rate that would be required for you to consider interruptible service as an alternative to new Firm service (\$/m3/day or percentage reduction in the distribution rate)	Has Enbridge Gas discussed energy conservation program offerings with you (Yes/No)	Natural gas conservation (attestation)
No	- disruption to operations, alt fuel cost/availability/emissions, potential loss of production/product	n/a	No	- disruption to operations, alt fuel cost/availability/emissions, potential loss of production/product	n/a	Yes	Yes
No	- disruption to operations, alt fuel cost/availability/emissions, potential loss of production/product	n/a	No	- disruption to operations, alt fuel cost/availability/emissions, potential loss of production/product	n/a	Yes	Yes
No	- disruption to operations, alt fuel cost/availability/emissions, potential loss of production/product	n/a	No	- disruption to operations, alt fuel cost/availability/emissions, potential loss of production/product	n/a	Yes	Yes
No	- disruption to operations, alt fuel cost/availability/emissions, potential loss of production/product	n/a	No	- disruption to operations, alt fuel cost/availability/emissions, potential loss of production/product	n/a	Yes	Yes
No	- bunker oil 3x more expansive than gas	n/a	No	- not set up to use bunker oil	n/a	Yes	Yes
No	- no response	n/a	No	- no response	n/a	Yes	Yes
No	- disrupts operations and risk of product damage	n/a	No	- incremental cost of alternate fuels not economic	n/a	Yes	Yes
No	- disrupts operations and risk of product damage	n/a	No	- incremental cost of alternate fuels not economic	n/a	Yes	Yes
No	- backup fuel system infrastructure too expensive	n/a	Yes	n/a	25% - 35% reduction	Yes	Yes
No	- operations do not allow for interruptible service due to potential crop loss	n/a	No	- operations do not allow for interruptible service due to potential crop loss	n/a	Yes	Yes
No	- operations cannot accommodate service interruption due to possible crop loss	n/a	No	- operations cannot accommodate service interruption due to possible crop loss	n/a	Yes	Yes
No	- disruption to operations, alt fuel cost/availability/emissions, potential loss of production/product	n/a	No	- disruption to operations, alt fuel cost/availability/emissions, potential loss of production/product	n/a	Yes	Yes
No	- loss of crop	n/a	No	- loss of crop	n/a	Yes	Yes
No	- operations cannot withstand interruption due to crop loss	n/a	No	- operations cannot withstand interruption due to crop loss	n/a	Yes	Yes
No	- operations disruption/crop loss	n/a	No	- operations disruption/crop loss	n/a	Yes	Yes
No	- operations disruption	n/a	No	- operations disruption	n/a	Yes	Yes
No	- not viable/potential crop loss	n/a	No	- not viable/potential crop loss	n/a	Yes	Yes
No	- disruption to operations, alt fuel cost/availability/emissions, potential loss of production/product	n/a	No	- disruption to operations, alt fuel cost/availability/emissions, potential loss of production/product	n/a	Yes	Yes
No	- heating is crucial to operations daily, alternate fuels too expensive to operate on	n/a	No response	- no response	n/a	Yes	Yes
No	- disruption of operations causing a loss to production to supply the Canadian food market	n/a	No	- disruption of operations causing a loss to production to supply the Canadian food market	n/a	Yes	Yes
No	- disruption to operations & cost of alternate fuel	n/a	No	no response	n/a	Yes	Yes
No	- no operations cannot accommodate interruption due to crop loss	n/a	No	- no operations cannot accommodate interruption due to crop loss	n/a	Yes	Yes

Interruptible service as an alternative to new Firm service (Yes/No)	If no, please explain why	If yes, how would you ensure compliance with a service interruption	Would you be more inclined to consider interruptible service over new Firm service if the ability to negotiate lower than posted interruptible rates was available (Yes/No)	If no, please explain why	If yes, please indicate the interruptible distribution delivery rate that would be required for you to consider interruptible service as an alternative to new Firm service (\$/m3/day or percentage reduction in the distribution rate)	Has Enbridge Gas discussed energy conservation program offerings with you (Yes/No)	Natural gas conservation (attestation)
No	- disruption to operations & cost of alternate fuel	n/a	No	- no response	n/a	Yes	Yes
No response	- no response	n/a	No response	- no response	No response	Yes	Yes
No	- production will be 365 days/yr and produce will not tolerate one or more days without heating. Loss of production	n/a	No	- interruptible service is not an option for our produce operation cycle (continuous production)	n/a	Yes	Yes
No	- healthcare	n/a	No	- no	n/a	Yes	Yes
No	- our crop is too valuable to risk losing in the event of an interruption	n/a	No	- our crop is too valuable to risk losing in the event of an interruption	n/a	Yes	Yes
No	- our crop is too valuable to risk losing in the event of an interruption	n/a	No	- our crop is too valuable to risk losing in the event of an interruption	n/a	Yes	Yes
No	- our crop is too valuable to risk losing in the event of an interruption	n/a	No	- our crop is too valuable to risk losing in the event of an interruption	n/a	Yes	Yes
No	- live vegetable crops + LT-1 program needs	n/a	No	- fees and penalties are too great on LT-1	n/a	Yes	Yes
No	- no response	n/a	Yes	n/a	20% lower	Yes	Yes
No	- no response	n/a	Yes	n/a	20% lower	Yes	Yes
No	- contractually obligated to provide power to the IESO when called upon, and cannot be interrupted.	n/a	No	- East Windsor Cogen is contractually obligated to provide power to the IESO when called upon, and cannot be interrupted.	n/a	Yes	Yes
No	- no response	n/a	No	- East Windsor Cogen is contractually obligated to provide power to the IESO when called upon, and cannot be interrupted.	n/a	Yes	Yes
No response	- no response	n/a	No response	- no response	No response	Yes	Yes
No response	- no response	n/a	No response	- no response	No response	Yes	Yes
No response	- no response	n/a	No response	- no response	No response	Yes	Yes
No response	- no response	n/a	No response	- no response	No response	Yes	Yes
No	- No, because there is risk to crop and large costs for alternate fuel	n/a	No	- No because the discount is not worth the risk	n/a	Yes	Yes
No	- Interruptible service is not a viable option as it requires firm gas services to support regional reliability in the Southwest Region and future expected growth from the greenhouse and industrial sectors.	n/a	No	- Interruptible service is not a viable option for BBGS operation as it requires firm gas services to support regional reliability in the Southwest Region and future expected growth from the greenhouse and industrial sectors.	n/a	Yes	Yes
Yes	n/a	- Alternate fuel source	Yes	n/a	25% - 35% reduction	Yes	Yes
Yes	n/a	- Alternate fuel source	Yes	n/a	25% - 35% reduction	Yes	Yes
No	- Product processing delays would result in loss of product; no alt fuel system currently installed	n/a	No	The loss in product is more substantial than the potential savings from lower rates.	n/a	Yes	Yes

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Federation of Rental-housing Providers of Ontario (FRPO)

INTERROGATORY

Reference:

Exhibit A, Tab 4, Sch. 1, p. 4 and Exhibit B, Tab 1, Sch. 1 and Attachments

Preamble:

EGL evidence states: Since the close of the EOI, Enbridge Gas has continued to engage customers that submitted bids to confirm their interest and negotiate contracts for incremental service. Enbridge Gas is requesting a minimum five-year contract from interested contract rate customers for capacity on the Panhandle System starting in November 2024. This practice is consistent with the methodology of contracting for incremental capacity that was used for the PRP and KTRP projects.

Question(s):

Please confirm that in the Leamington Expansion Project – EB-2012-0431 – Union required greenhouses to sign 10 year contracts with minimum annual volume requirements to support the project.

- a) If not confirmed, please explain commitments and terms associated with contracting for that project.
- b) Did EGL consider this approach for the Panhandle Regional Expansion?
  - i) If not, why not?

Response:

Not confirmed.

- a) and b)

The commitments and terms of the contracts varied with the number of acre equivalents the customer contracted for. The Leamington Expansion Project was a distribution pipeline where the distribution costs were allocated to the customer/contract, the applicable contract term and if required, the CIAC to achieve

a PI of 1.0 under the E.B.O 188 economic feasibility test for customer-specific distribution facilities.

Distribution facilities (beyond the scope of the Project) may be required to connect certain contract customers to the natural gas system. More specifically, customers who contract for contract rate distribution service in the area may need to install an individual service, main extension, station(s) and in some cases may require local distribution reinforcement to bring sufficient natural gas to their site – all of which are beyond the scope of the Project. These costs will be the responsibility of the customer. When negotiating a contract with each customer, a DCF analysis (per EBO 188) is completed for each individual contract for a term longer than 5 years and up to 20 years.



ENBRIDGE GAS INC.

Answer to Interrogatory from  
Federation of Rental-housing Providers of Ontario (FRPO)

INTERROGATORY

Reference:

Exhibit B, Tab 2, Schedule 1, Attachment 1 pg. 1

Question(s):

For the schematic structure provided in Attachment 1, in tabular format, please provide the throughput and direction through:

- a) Dover Transmission to the NPS 16 & separately to the NPS 20
- b) Leamington North Gate (please add pressure also)
- c) Grand Marais Station
- d) Sandwich Station
- e) Ojibway Measurement
- f) Detroit River Crossing

Response:

Please see the response at Exhibit I.FRPO.4 (updated October 3, 2023).

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Federation of Rental-housing Providers of Ontario (FRPO)

INTERROGATORY

Reference:

Exhibit B, Tab 2, Schedule 1, Attachment 1 pg. 1

Question(s):

Please provide the information in Attachment 1, including the flows requested in IR#4 above, with the addition of:

- a) The proposed 19 km of NPS 36 with demands for:
  - i) Winter 2024/25
  - ii) Winter 2033/34 (using Table 1 demands)

Response:

- a)
  - i) Please see Attachment 1 for the proposed 19 km of NPS 36 with demand for Winter 2024/2025.
  - ii) The proposed 19 km of NPS 36 with demand for Winter 2033/2034 cannot be provided since the modelled system pressures fall extremely low, resulting in model failure (i.e., the model run could not be completed). The scenario is not viable without additional facilities. Therefore, no schematic or flow table can be provided.

With the proposed 19 km of NPS 36 in service as of Winter 2024/2025, it is expected to provide enough capacity through Winter 2028/2029. By Winter 2033/2034, with the Project in place providing the incremental 168 TJ/d, the forecast shortfall is 59 TJ/d.

/u

W2024/2025 Proposed 19 km of NPS 36 Schematic and Summary Table

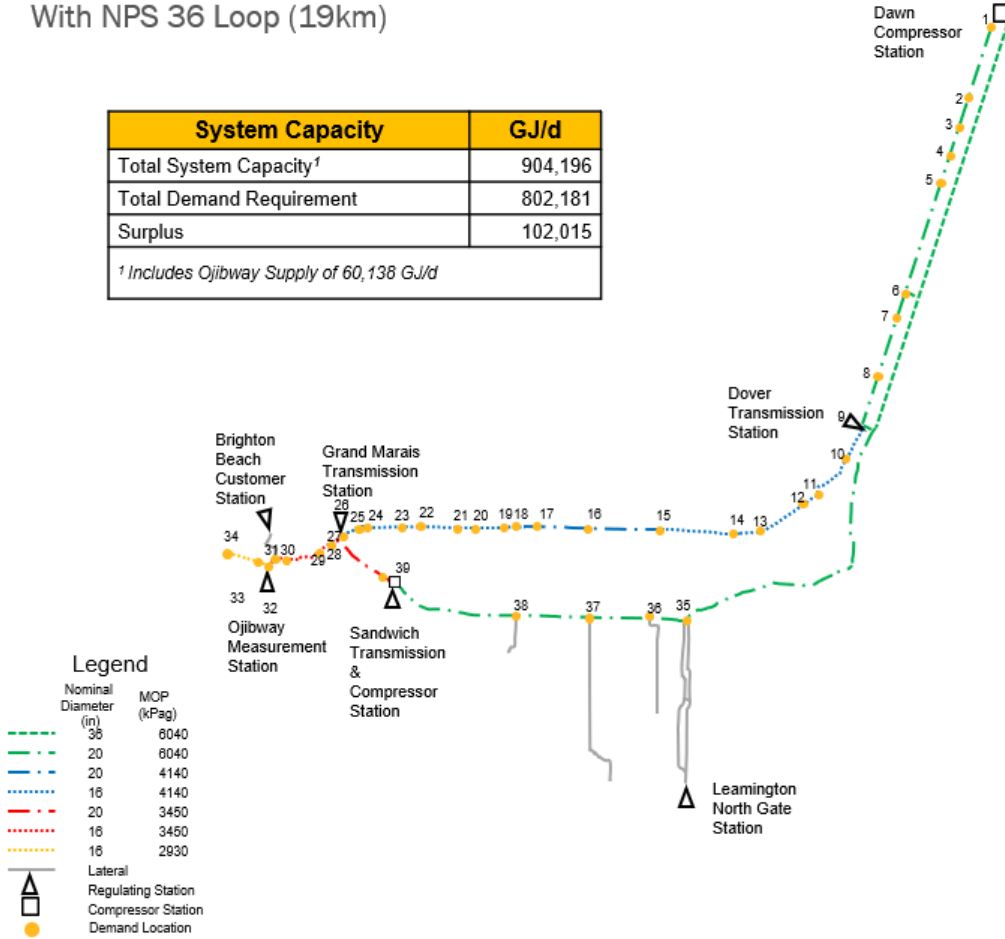
Panhandle Transmission System

Winter Design Day Schematic  
 Winter 2024/2025  
 With NPS 36 Loop (19km)



System Capacity	GJ/d
Total System Capacity <sup>1</sup>	904,196
Total Demand Requirement	802,181
Surplus	102,015

<sup>1</sup> Includes Ojibway Supply of 60,138 GJ/d



**Legend**

Nominal Diameter (in)	MOP (kPag)
36 (dashed green line)	8040
20 (dotted green line)	8040
20 (dotted blue line)	4140
18 (dotted blue line)	4140
20 (dotted red line)	3450
18 (dotted red line)	3450
16 (dotted yellow line)	2930

**Lateral**

- Regulating Station (triangle symbol)
- Compressor Station (square symbol)
- Demand Location (yellow dot)

Station Name	Kilometre Post (km)	Demand (GJ/d)	Pressure (kPag)
1 Dawn / Dawn West Lines	0	20251	5978
2 Tolloch & Mandaumin	4.3	0	5957
3 Chatham Gore Conc 4	10	0	5930
4 Lindsay Tile Yard	12.9	44	5916
5 Tuperville	15.2	3984	5906
6 Dover Centre	27	82442	5842
7 Cartier	29.4	0	5831
8 Bechard	34.9	2110	5808
9 Dover Transmission	40	0	5786
10 Bradley	44.1	0	3930
11 T. N. Lighthouse	48.9	200	3740
12 Tilbury North TO	50.7	2934	3667
13 Tilbury Conc 2	55.8	0	3439
14 Stoney Point	58.7	1282	3304
15 St Joachim	65.4	337	2990
16 Belle River	72.6	4280	2875
17 Puce	77.8	2302	2794
18 Wallace	79.4	131	2765
19 Patillo	80.9	5087	2743
20 Elmstead	83	1650	2616
21 Manning	85.2	7691	2482
22 Lauzon TO	88.9	45805	2259
23 Ford Marentette TO	90.7	2071	2221
24 TransAlta / East Windsor TO	94.2	37220	2177
25 Walker	94.9	38746	2147
26 Grand Marais	97.1	27633	2147
27 NPS 16/20 Interconnect	108.1	0	2143
28 Bruce	109.4	5774	2121
29 California	111.4	17518	2031
30 Titcombe	114.9	7583	1915
31 Brighton Beach and WWP	116.2	129371	1829
32 Ojibway Measurement	116.6	29193	1879
33 Ojibway Valve	117.9	0	1903
34 River Crossing	118.6	0	1919
35 Comber	71.2	170753	4726
36 Mersea	75	44534	4614
37 Kingsville	80	89822	4496
38 Essex	88.1	6986	4413
39 Sandwich Transmission	101.1	14448	4293
<b>Total</b>		<b>802181</b>	

<b>W24/25 Facilities (Existing with Proposed Project)</b>	<b>Throughput</b>	<b>Direction</b>	<b>Requested Pressure</b>
<b>Location</b>	<b>GJ/d</b>	<b>Flow</b>	<b>kPag</b>
Dawn Supply	742,044	Westerly	
Dover Transmission Station to NPS 16	169,371	Westerly	
Dover Transmisssion Station to NPS 20+NPS 36	463,841	Westerly	
Leamington North Gate Station	14,260	South	3630
Grand Marais Station	19,635	Westerly	
Sandwich Station	151,746	Westerly	
Ojibway Measurement to Windsor	60,138	North/South	
Detroit River Crossing (Ojibway Supply)	60,138	Easterly	

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Federation of Rental-housing Providers of Ontario (FRPO)

INTERROGATORY

Reference:

Exhibit B, Tab 2, Schedule 1, p. 3, 7 & 9 including Table 1 & Exhibit I.FRPO.7 & .8

Preamble:

EGL evidence states: Two NPS 12 pipelines (“Detroit River Crossing” or “the crossings”) connect the NPS 16 Panhandle Line at Ojibway to the Panhandle Eastern Pipeline System (“Panhandle Eastern”)2 at the International Border. This interconnection was established in 1947 and is commercially known as Ojibway. The Detroit River Crossing MOP is 2930 kPag.

2 Panhandle Eastern Pipe Line Company, LP is owned by Energy Transfer Equity L.P.

The response to the above interrogatory 7 states: As discussed in Enbridge Gas’s most recent Asset Management Plan, Enbridge Gas is planning to replace the existing NPS 12 Detroit River crossings to provide equivalent capacity, and is currently in discussion with Energy Transfer on a joint project to that effect.

We would like to understand more about EGL’s review of the potential for increasing supply at Ojibway

Question(s):

Please summarize the contractual agreements that Union Gas/Enbridge Gas Inc. had/have with Energy Transfer as it relates to Panhandle Eastern deliveries to and through Ojibway to the EGL’s Panhandle system.

Response:

For contracts held between Enbridge Gas and PEPL as part of the Company's Gas Supply Plan, please see the response to Exhibit I.FRPO.6.

Please see the information below for a summary of contracts held between Enbridge Gas and Rover.

<b>Customer Name</b>	<b>Agreement Name</b>	<b>Receipt Point</b>	<b>Delivery Point</b>	<b>Quantity (GJ)</b>	<b>Start Date</b>	<b>Expiry Date</b>
Rover Pipeline LLC	C10113	Ojibway	Dawn	36,927	Nov 1, 2017	Oct 31, 2025

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Federation of Rental-housing Providers of Ontario (FRPO)

INTERROGATORY

Reference:

Exhibit B, Tab 2, Schedule 1, p. 3, 7 & 9 including Table 1 & Exhibit I.FRPO.7 & .8

Preamble:

EGL evidence states: Two NPS 12 pipelines (“Detroit River Crossing” or “the crossings”) connect the NPS 16 Panhandle Line at Ojibway to the Panhandle Eastern Pipeline System (“Panhandle Eastern”)2 at the International Border. This interconnection was established in 1947 and is commercially known as Ojibway. The Detroit River Crossing MOP is 2930 kPag.

2 Panhandle Eastern Pipe Line Company, LP is owned by Energy Transfer Equity L.P.

The response to the above interrogatory 7 states: As discussed in Enbridge Gas’s most recent Asset Management Plan, Enbridge Gas is planning to replace the existing NPS 12 Detroit River crossings to provide equivalent capacity, and is currently in discussion with Energy Transfer on a joint project to that effect.

We would like to understand more about EGL’s review of the potential for increasing supply at Ojibway

Question(s):

Please provide updates from internal discussions on replacement of this crossing.

a) Please provide the most recent determination of cost estimate for replacing the pipeline across the Detroit River.

Response:

Enbridge Gas is continuing to evaluate the replacement of the two NPS 12 river crossing pipelines with a single pipeline that can provide the equivalent capacity.

a) Enbridge Gas estimates the total facility costs to replace the Detroit River Crossing to be approximately \$50 MM which would be shared with PEPL.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Federation of Rental-housing Providers of Ontario (FRPO)

INTERROGATORY

Reference:

Exhibit B, Tab 2, Schedule 1, p. 3, 7 & 9 including Table 1 & Exhibit I.FRPO.7 & .8

Preamble:

EGL evidence states: Two NPS 12 pipelines (“Detroit River Crossing” or “the crossings”) connect the NPS 16 Panhandle Line at Ojibway to the Panhandle Eastern Pipeline System (“Panhandle Eastern”)2 at the International Border. This interconnection was established in 1947 and is commercially known as Ojibway. The Detroit River Crossing MOP is 2930 kPag.

2 Panhandle Eastern Pipe Line Company, LP is owned by Energy Transfer Equity L.P.

The response to the above interrogatory 7 states: As discussed in Enbridge Gas’s most recent Asset Management Plan, Enbridge Gas is planning to replace the existing NPS 12 Detroit River crossings to provide equivalent capacity, and is currently in discussion with Energy Transfer on a joint project to that effect.

We would like to understand more about EGL’s review of the potential for increasing supply at Ojibway

Question(s):

Please provide copies of all communications with Energy Transfer on the crossing replacement or changes to the throughput capacity.

- a) Please provide any commitments to cost sharing to replace the river crossing.
- b) Please provide the most recent determination of cost estimate for increasing capacity across the Detroit River.



Response:

Enbridge Gas is currently engaged in discussions with Energy Transfer to establish the purpose, need and timing of a jointly owned replacement project which assumes that the current capacity provided through the Detroit River Crossing is a like-for-like replacement that does not add incremental capacity. Communications regarding a like-for-like replacement do not impact the Project.

- a) There are no firm commitments for cost sharing associated with the river crossing replacement. Currently the Asset Management Plan is based on Enbridge Gas owning 60% of the replacement facilities, based on estimated length within Canada.
- b) At this time there is no plan to increase the capacity of the Detroit River Crossing. As stated in Enbridge Gas's most recent Asset Management Plan, Enbridge Gas is planning to replace the existing two NPS 12 Detroit River Crossings to provide equivalent capacity.

Exhibit I.FRPO.8 requested that Enbridge Gas provided a scenario of the potential requirements to increase the capacity of the Detroit River Crossing. Please see Table 1 at the response to Exhibit I.FRPO.8 (updated October 3, 2023) for the most recent cost estimates for this scenario.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Federation of Rental-housing Providers of Ontario (FRPO)

INTERROGATORY

Reference:

Exhibit B, Tab 2, Schedule 1, p. 3, 7 & 9 including Table 1 & Exhibit I.FRPO.7 & .8

Preamble:

EGL evidence states: The Panhandle System's ability to accept supply at Ojibway on a firm basis is limited by the physical Panhandle System assets and the minimum Panhandle Market available to consume gas between Ojibway and Dawn. The minimum firm Panhandle Market is limited by the base load summer Windsor market demands and the capacity of Sandwich Compressor to compress gas from Windsor towards Dawn. The capacity of the Sandwich Compressor is 80 to 88 TJ/d and limited by the fixed amount of horsepower available. Due to the increased amount of heat load, the winter Windsor market is larger than the summer Windsor market. The Panhandle System's ability to accept supply at Ojibway is limited to 108 TJ/d in the summer and 126 TJ/d in the winter.<sup>6</sup>

Furthermore, incremental supply deliveries at Ojibway from Panhandle Eastern can only **efficiently serve demands** in the far west end of the Panhandle Market in Windsor between Ojibway, Grand Marais Station and Sandwich Compressor. **emphasis added**

Question(s):

Please confirm the bolded section is described in Exhibit C, Tab 1, Sch. 1, p. 11.

a) Please include what demands could be served inefficiently?

Response:

Confirmed. Serving the Leamington Kingsville market using Ojibway supply is not efficient as it requires more supply from Ojibway than can be delivered to the Leamington Kingsville market on design day. It is, therefore, inefficient to serve the Leamington Kingsville market with Ojibway supply.

a) Demands of the Panhandle Market east of Sandwich Compressor and east of Grand Marais Station would be served inefficiently.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Federation of Rental-housing Providers of Ontario (FRPO)

INTERROGATORY

Reference:

Exhibit B, Tab 2, Schedule 1, p. 3, 7 & 9 including Table 1 & Exhibit I.FRPO.7 & .8

Preamble:

EGL evidence states: The Panhandle System's ability to accept supply at Ojibway on a firm basis is limited by the physical Panhandle System assets and the minimum Panhandle Market available to consume gas between Ojibway and Dawn. The minimum firm Panhandle Market is limited by the base load summer Windsor market demands and the capacity of Sandwich Compressor to compress gas from Windsor towards Dawn. The capacity of the Sandwich Compressor is 80 to 88 TJ/d and limited by the fixed amount of horsepower available. Due to the increased amount of heat load, the winter Windsor market is larger than the summer Windsor market. The Panhandle System's ability to accept supply at Ojibway is limited to 108 TJ/d in the summer and 126 TJ/d in the winter.<sup>6</sup>

Furthermore, incremental supply deliveries at Ojibway from Panhandle Eastern can only efficiently serve demands in the far west end of the Panhandle Market in Windsor between Ojibway, Grand Marais Station and Sandwich Compressor. emphasis added

Question(s):

Please provide the cost estimate to modify the Sandwich compressor station to increase the Ojibway receipts to the current capacity of 217 TJ/d.

- a) Please identify any key thresholds of capacity that could be reached with limited cost to increase Sandwich above 88 TJ.
- b) Please explain why gas could not flow east past Grand Marais toward Dawn on the NPS 16.
  - i) Please provide an estimate for any changes that could be done at Grand Marais to substantially increase the market for Ojibway deliveries.
- c) How much summer and winter market will contracted demand at Stellantis and other customers in the boundaries identified by EGL (Ojibway, Grand Marais, Sandwich)

Response:

Please see the response at Exhibit I.FRPO.8 (updated October 3, 2023) for more information regarding the issue being explored by FRPO. The cost estimate to install two 3800 horsepower Compression Units at Sandwich Station is \$144M.

- a) The capacity of the compressor is limited by horsepower, and there is no additional capacity above 88 TJ/d that could be attained.
- b) The gas could not reliably flow east of Grand Marais Station because the section of pipe east of Grand Marais Station operates at a higher pressure (4140 kPa) than the pipe west of Grand Marais Station (3450 kPa).
  - i. There is no option to increase capacity at Grand Marias. In order to increase supply imports from Ojibway, Enbridge Gas would need to increase the capacity of the Detroit River Crossing, loop or upsize the Panhandle NPS 16 from Ojibway to Sandwich and add further compression at Sandwich station. For discussion regarding increasing Ojibway imports, please see the response to Exhibit.I.FRPO.8 (updated October 3, 2023). This does not address the facilities that are required on the PEPL system to deliver the necessary volume and pressure.
- c) The minimum firm Panhandle market in the Summer and Winter is calculated using historical information based on actual customer consumption. Therefore, Enbridge Gas is unable to calculate changes in the minimum firm market.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Federation of Rental-housing Providers of Ontario (FRPO)

INTERROGATORY

Reference:

Exhibit I.PP.16

Question(s):

Please update the above interrogatory with updated alternative assessments.

Response:

Please see the response at Exhibit I.PP.16 (updated October 3, 2023).

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Federation of Rental-housing Providers of Ontario (FRPO)

INTERROGATORY

Reference:

Exhibit C, Tab 1, Schedule 1, p. 8-9 and Table 3

Preamble:

EGI evidence states: While either an NPS 30 or NPS 36 to Richardson Sideroad would be sufficient to meet the 5-year growth forecast, the NPS 36 pipeline alternative was selected as it is the most cost-effective option with the lowest cost per unit of capacity (see Table 3 below).

Question(s):

Who does EGI propose pay for the upsizing cost for the NPS 36?

- a) Please justify this proposal including any recent Board approvals that support such an approach.
- b) Please provide the Overheads that are stipulated as not included in the footnotes to Table 3.
  - i) What decisions or rules preclude the inclusion of overheads in the assessment of Net Present Value?
  - ii) Please provide Table 3 including Overheads.

Response:

- a) Enbridge Gas is not seeking cost recovery of the Project as part of this application.<sup>1</sup>

As per Exhibit C, Tab 1, Schedule 1, Page 8, Paragraph 27: “the NPS 36 pipeline alternative was selected as it is the most cost-effective option with the lowest cost per unit of capacity”. The NPS 36 is the most appropriate alternative from a cost-effectiveness standpoint. Additional benefits regarding the NPS 36, which contribute to it being the most appropriate alternative, can be found at the response to Exhibit

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<sup>1</sup> Exhibit A, Tab 3, Schedule 1, para. 13.

I.EP.8. Additionally, Enbridge Gas forecasts that the incremental capacity provided by the Project to be utilized by Winter 2028/2029.

b) Indirect overheads for the “19 km Loop with NPS 36” is \$68.8 million as per Exhibit E, Tab 1, Schedule 2, Line 8. Indirect overheads for the “19 km Loop with NPS 30” is \$65.7 million.

- i) Please see the response to Exhibit I.STAFF.15, part a).
- ii) Please see the information below for the Net Present Value including indirect overheads.

Potential Alternative	Incremental Capacity (TJ/d)	Costs (\$ Million)	Net Present Value (\$ Million)	Cost per Unit of Capacity (\$/TJ/d)
Facility Alternative: Looping of NPS 20 Panhandle				
<b><u>Proposed Project</u></b>				
19 km Loop with NPS 36	168	\$358.0	\$(207.5)	\$2.13
19 km Loop with NPS 30	160	\$342.7 <sup>(1)</sup>	\$(196.2)	\$2.14

(1) The estimated cost of \$342.7 M for an NPS 30 alternative is based on a November 1, 2024 in-service date, for the purpose of displaying a direct comparator to the proposed Project. The actual installation of an NPS 30 alternative would result in a November 1, 2025 in-service date and as such the estimated cost would be higher due to inflationary impacts.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Federation of Rental-housing Providers of Ontario (FRPO)

INTERROGATORY

Reference:

Exhibit C, Tab 1, Schedule 1, p.11-13

Preamble:

EGL evidence states: There are no commercial services available to be contracted at Ojibway with third parties that can fully eliminate the forecasted 5-year Panhandle System shortfall. Of the total 108 TJ/d of capacity operationally available to be delivered to Ojibway on an annual basis, 60 TJ/d is already utilized by Enbridge Gas to serve firm design day demands. Of the remaining 48 TJ/d of capacity, 37 TJ/d is contracted by ROVER until October 31, 2025 with renewal rights. As outlined in Exhibit B, Tab 2, Schedule 1 and Exhibit B, Tab 3, Schedule 1, Enbridge Gas currently estimates that only 18 - 21 TJ/d of incremental firm annual capacity is available for deliveries to Ojibway into the Panhandle System.

Question(s):

What precludes working with Energy Transfer to provide an exchange service, even a seasonal winter service, between Ojibway and Dawn.

Response:

Please see Attachment 1 to the response at Exhibit I.FRPO.7 for correspondence between Enbridge Gas and Energy Transfer, regarding Energy Transfer's ability to participate in the Request for Proposal (RFP) for delivered service at Ojibway as a supply-side alternative for the proposed Project.

Enbridge Gas has confirmed that Energy Transfer is not able to obligate deliveries (consistent with previous discussions as contemplated in the Panhandle Reinforcement Project proceeding).

Enbridge Gas developed the RFP for the firm exchange service to be inclusive of ex-franchise shippers with capacity on the PEPL system, in addition to shippers holding firm C1 transportation capacity on the Enbridge Gas Ojibway to Dawn path of the Panhandle Transmission System.



ENBRIDGE GAS INC.

Answer to Interrogatory from  
Federation of Rental-housing Providers of Ontario (FRPO)

INTERROGATORY

Reference:

Exhibit C, Tab 1, Schedule 1, p.11-13

Preamble:

EGL evidence states: Ojibway supply does not flow directly into the Leamington-Kingsville market, which can only be served by Ojibway through displacement, i.e., additional Windsor volume served by Ojibway means less Windsor market volume served by the NPS 20 Panhandle Line.

Question(s):

Please describe what issues or concerns EGL would have by simply using displacement to “free-up” additional supply into the Leamington-Kingsville market.

Response:

Enbridge Gas considered incremental supply deliveries at Ojibway, and the displacement that would result, as a project alternative. This alternative requires additional facilities at a cost that exceeds that of the proposed Project. Please refer to Exhibit C, Tab 1, Schedule 1, Pages 11-14 and the response at Exhibit I.FRPO.22 for more details.

Enbridge Gas reviewed hybrid alternatives as part of the alternatives assessment and concluded that the hybrid scenarios are not economic relative to the proposed Project. Please refer to Exhibit C, Tab 1, Schedule 1, Page 16, Paragraphs 52-61 for more information regarding the hybrid alternatives.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Federation of Rental-housing Providers of Ontario (FRPO)

INTERROGATORY

Reference:

Exhibit C, Tab 1, Schedule 1, p.11-13

Preamble:

EGL evidence states: The Leamington-Kingsville market has a peak hour factor of 1.2, which means that the demand pattern throughout the day does not match the constant volumetric supply rate of Ojibway. In the absence of incremental facilities along the NPS 20 Panhandle Line, there is no mechanism to manage the intra-day peaks in the incremental demand in the Leamington-Kingsville market.

Question(s):

Please describe why linepack could not absorb these differences in supply and demand.

- a) Please provide transient simulation results that show that linepack could not provide the ability to absorb the swings.
  - i) Please ensure that the simulation is optimized to reduce pressures in the summer to maximize the chance of success.

Response:

Linepack is currently being used to serve the fluctuations in demand over the course of the design day. Linepack is used to serve the peak hour demand while reducing the facilities required to serve the average daily demand. Additional supply at Ojibway, equal to the incremental daily demand, does not increase the Panhandle System's linepack. This situation causes an imbalance when the supply arrives at a constant rate in comparison to the 1.2 peak hour in Leamington, as an example. To overcome this imbalance, the following would be required to serve the incremental demand; supplies greater than the incremental demand and/or additional facilities.

a), i)

The Panhandle System is modelled using transient analysis. Transient analysis utilizes the systems linepack to manage changes in demand throughout the day. Please refer to the response at Exhibit.I.FRPO.29 including schematics.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Federation of Rental-housing Providers of Ontario (FRPO)

INTERROGATORY

Reference:

Exhibit C, Tab 1, Schedule 1, p.11-13

Preamble:

EGI evidence states: The distribution systems that supply the Leamington-Kingsville market are fed from long (10 to 18 km) smaller diameter laterals that require an increase in upstream pressure (along the NPS 20 Panhandle Line) in order to provide the necessary incremental capacity to the market. An increase in Ojibway supply, corresponding to a decrease in the Windsor market demand being fed from the NSP 20 Panhandle Line, does not result in an increase in pressure along the NPS 20 Panhandle Line sufficient to service a corresponding increase in demand in the Leamington-Kingsville market.

Question(s):

Using output from a simulations for both summer and winter, please provide a schematic which shows this effect.

a) Please define the assumptions used to optimize the system.

Response:

Enbridge Gas used the scenario at Exhibit I.ED.6, part a) (i) to illustrate the effect that an increase in Ojibway supply does not result in an increase in pressure along the NPS 20 Panhandle Line that is sufficient to serve the corresponding increase in demand in the Leamington-Kingsville market.

See the schematics provided at Attachment 1 to this response ("Base Case: 60 TJ/d (typical import) at Ojibway Supply) and Attachment 2 to this response ("Scenario 1: 81 TJ/d (+21 TJ/d incremental import) at Ojibway Supply).

With the additional supply at Ojibway (+21 TJ/d), the Panhandle Transmission system can only serve an additional 9.2 TJ/d of demands within the Leamington-Kingsville market when compared to the base case.

In addition to the system assumptions for design day network analysis outlined in Exhibit B, Tab 2, Schedule 1, Page 5-6, Sandwich Transmission Station is used to optimize the Panhandle Transmission system pressure in Windsor relative to the system constraints. The Sandwich Transmission Station flows additional volumes from the NPS 20 Panhandle Line into the Windsor market as Ojibway supplies and the NPS 16 Panhandle Lines alone cannot serve the demands on design day.

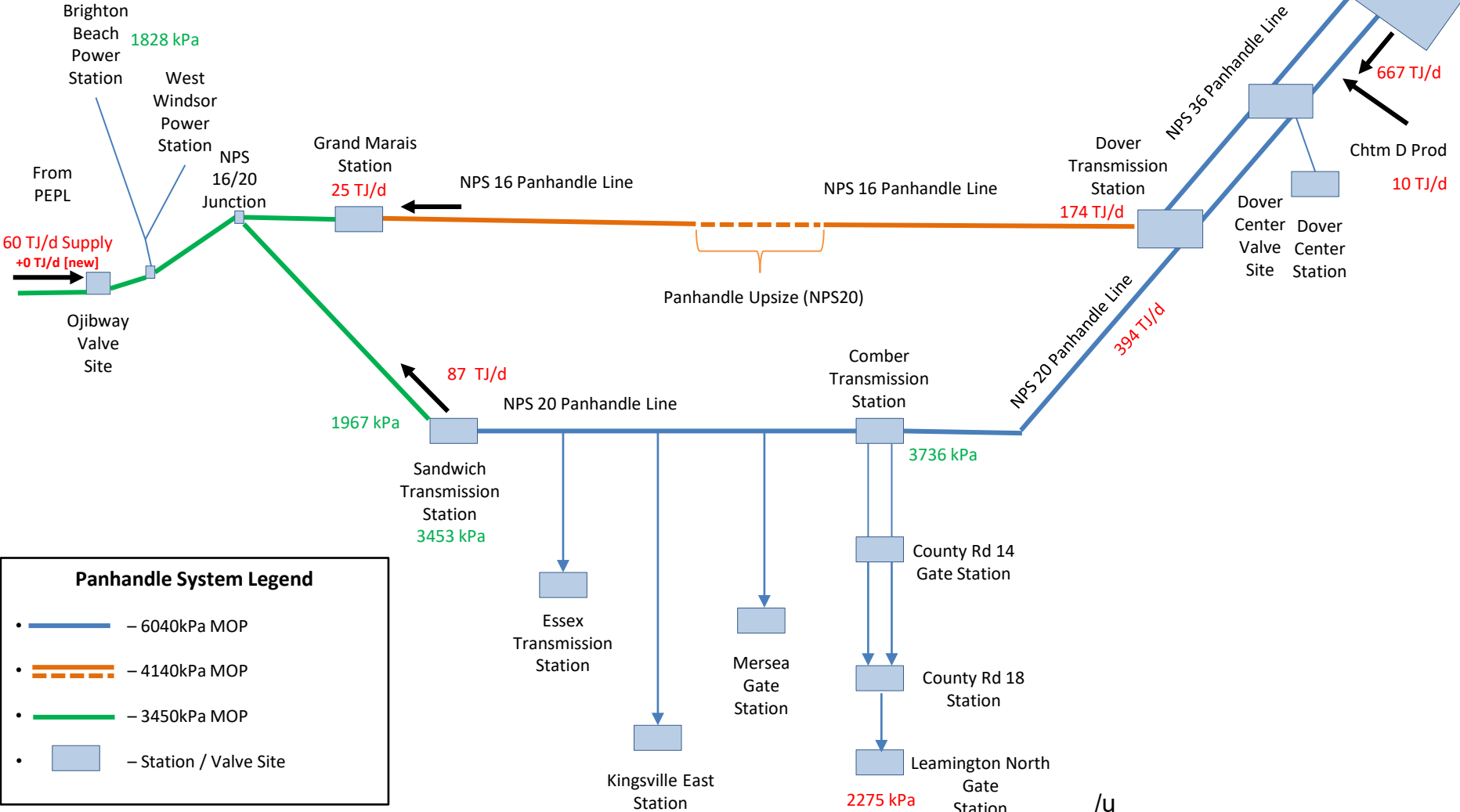
Comparing results shown in the Base Case (Attachment 1) and Scenario 1 (Attachment 2), by increasing the Ojibway supply by 21 TJ/d reduces the need for approximately 21 TJ/d to flow through Sandwich Transmission from the NPS 20 Panhandle Line. Under this scenario, with less volume required from the NPS 20 Panhandle Line the NPS 20 Panhandle has an additional 117 kPag available at Comber Transmission to serve the Leamington-Kingsville market. If all incremental demands are assumed to be served from the Leamington North Lines, the additional 117 kPag at Comber Transmission can only serve an incremental 9.2 TJ/d.

Therefore, an increase in Ojibway supply offsets the amount of volume required to serve the Windsor market from the NPS 20 Panhandle Line approximately one-to-one. However, this displacement of approximately 21 TJ/d does not result in a pressure increase along the NPS 20 Panhandle (117 kPag as stated above) that is sufficient to serve the corresponding increase in demand in the Leamington-Kingsville market as a result of longer, smaller diameter laterals that feed the area.

Summer is not relevant regarding the Panhandle design day analysis.

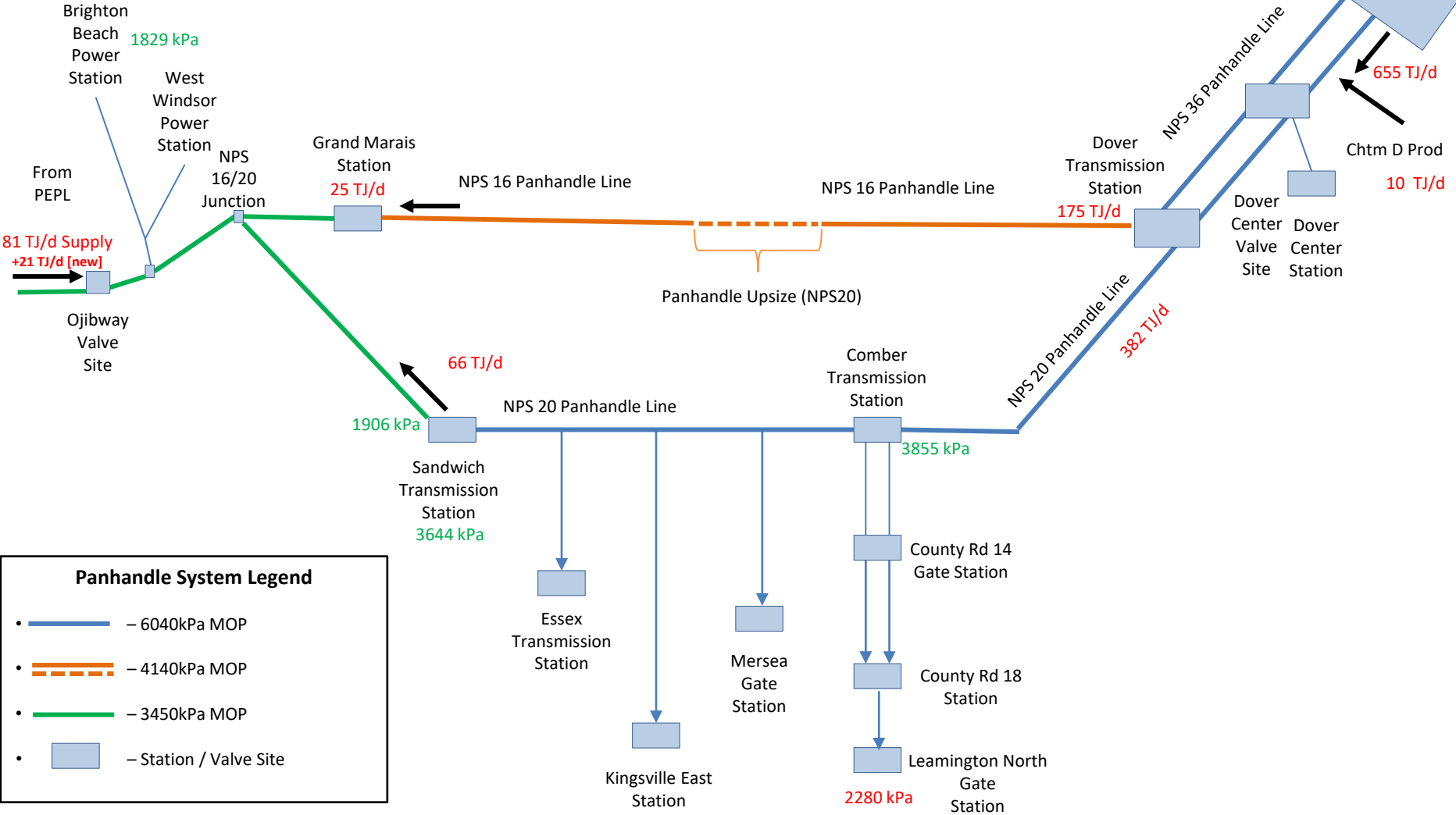
# Panhandle Regional Expansion Project

## Panhandle System Schematic - Supply Side Alternative Base Case: 60 TJ/d Import; No Other Facilities



# Panhandle Regional Expansion Project

## Panhandle System Schematic - Supply Side Alternative Scenario 1: 81 TJ/d Import [+21 TJ/d]; No Other Facilities



ENBRIDGE GAS INC.

Answer to Interrogatory from  
Federation of Rental-housing Providers of Ontario (FRPO)

INTERROGATORY

Reference:

Exhibit C, Tab 1, Schedule 1, p.11-13

Preamble:

EGL evidence states: It is not possible to address the 5-year system shortfall of 156 TJ/d with Ojibway deliveries alone because the volume required would greatly exceed the physical import capability at Ojibway.

Question(s):

Further to the answers provided above, with the system enhancements and pressure setting optimized, please indicated the amount of the 156 TJ/d that could be served from Ojibway.

- a) Please provide the resulting schematic showing the pressures.
- b) Please re-run the length of NPS 36 needed to serve the remaining 156 TJ/d assuming all of the ancillary station work is completed in conjunction.

Response:

a) and b)

Enbridge Gas evaluated similar scenarios as part of the Hybrid Alternatives (please see Exhibit C, Tab 1, Schedule 1, Pages 16-19). The first Hybrid Alternative used the 21 TJ/d of Ojibway supply and reduced the length of the NPS 36 loop to provide equivalent system capacity as the proposed Project (168 TJ/d). The second Hybrid Alternative explored ending the NPS 36 loop one road to the east of Richardson Sideroad, on Wheatley Sideroad (total loop length of 16.20 km for only 153 TJ/d of incremental capacity).

The results from the requested scenario to meet the 156 TJ/d of incremental 5-year shortfall is provided at Attachment 1 to this response.

The amount of the 156 TJ/d that could be served from Ojibway is 21 TJ/d. The length of NPS 36 needed to serve the remaining capacity is 16.8 km. The 16.8 km would end the loop in the middle of a field without road access.

The schematic of the updated hybrid scenario showing the pressures is provided at Attachment 1 to this response.



# Panhandle Transmission System

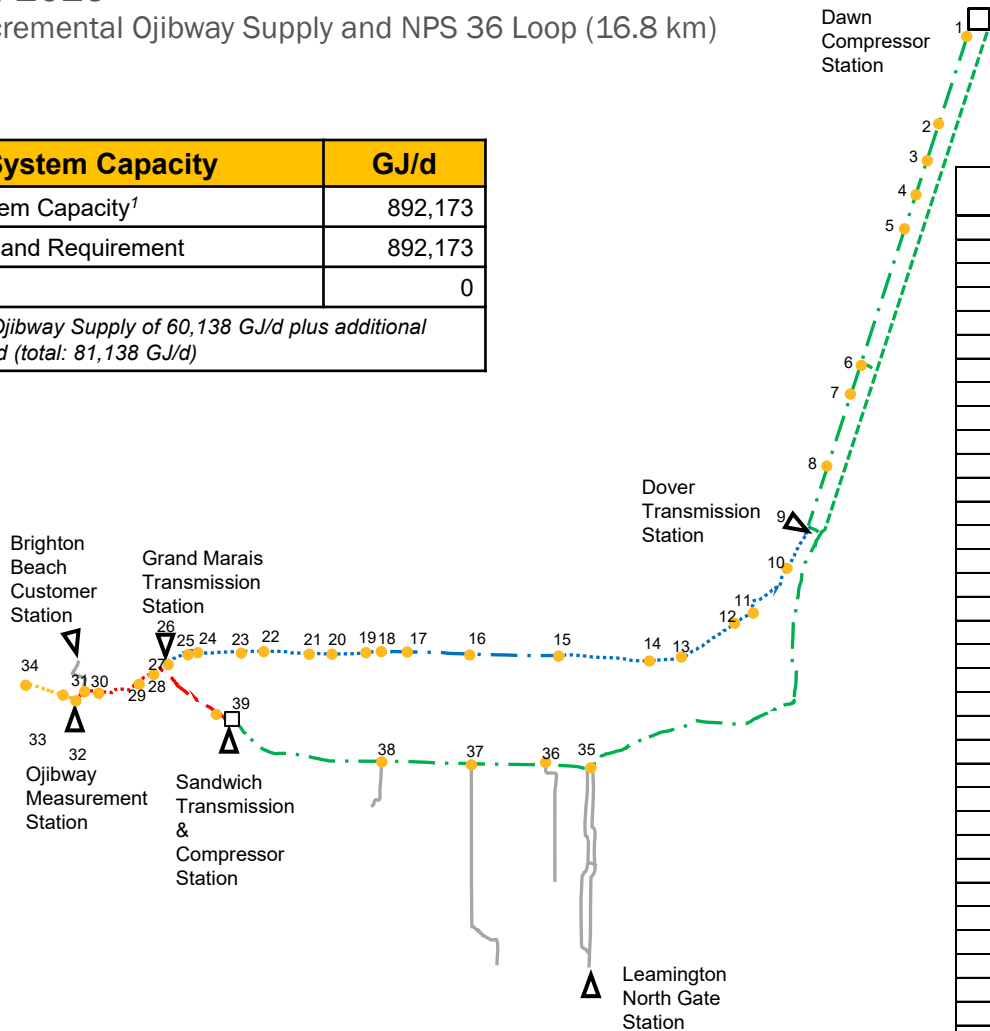
Winter Design Day Schematic

Winter 2028/2029

With 21 TJ/d Incremental Ojibway Supply and NPS 36 Loop (16.8 km)



System Capacity	GJ/d
Total System Capacity <sup>1</sup>	892,173
Total Demand Requirement	892,173
Surplus	0
<sup>1</sup> Includes Ojibway Supply of 60,138 GJ/d plus additional 21,000 GJ/d (total: 81,138 GJ/d)	



### Legend

Nominal Diameter (in)	MOP (kPag)
36	6040
20	6040
20	4140
16	4140
20	3450
16	3450
16	2930

	Lateral
	Regulating Station
	Compressor Station
	Demand Location

	Station Name	Kilometre Post (km)	Demand (GJ/d)	Pressure (kPag)
1	Dawn / Dawn West Lines	0	20547	6040
2	Tolloch & Mandaumin	4.3	0	6015
3	Chatham Gore Conc 4	10	0	5984
4	Lindsay Tile Yard	12.9	44	5967
5	Tupperville	15.2	4239	5955
6	Dover Centre	27	83489	5880
7	Cartier	29.4	0	5868
8	Bechard	34.9	2117	5840
9	Dover Transmission	40	0	5813
10	Bradley	44.1	0	3926
11	T. N. Lighthouse	48.9	205	3731
12	Tilbury North TO	50.7	3001	3656
13	Tilbury Conc 2	55.8	0	3420
14	Stoney Point	58.7	1316	3281
15	St Joachim	65.4	346	2955
16	Belle River	72.6	4394	2835
17	Puce	77.8	2364	2751
18	Wallace	79.4	135	2721
19	Patillo	80.9	5202	2697
20	Elmstead	83	1694	2565
21	Manning	85.2	7897	2424
22	Lauzon TO	88.9	46596	2191
23	Ford Marentette TO	90.7	2126	2150
24	TransAlta / East Windsor TO	94.2	61521	2101
25	Walker	94.9	39367	2076
26	Grand Marais	97.1	28337	2077
27	NPS 16/20 Interconnect	108.1	0	2106
28	Bruce	109.4	10801	2086
29	California	111.4	17951	2009
30	Titcombe	114.9	7681	1916
31	Brighton Beach and WWP	116.2	137123	1831
32	Ojibway Measurement	116.6	29661	1889
33	Ojibway Valve	117.9	0	1930
34	River Crossing	118.6	0	1957
35	Comber*	71.2	194282	4147
36	Mersea	75	67615	3988
37	Kingsville	80	90207	3822
38	Essex	88.1	7101	3703
39	Sandwich Transmission	101.1	14813	3526
<b>Total</b>			<b>892173</b>	

\*Comber is upstream of the Leamington North Gate Station. The modelled minimum inlet pressure to the Leamington North Gate Station is 2280 kPag which is just above the minimum inlet pressure constraint of 2275 kPa.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Federation of Rental-housing Providers of Ontario (FRPO)

INTERROGATORY

Reference:

Exhibit C, Tab 1, Schedule 1, p.17-18

Preamble:

We understand that EGI uses a 40 year term to equate the term of the exchange to the presumed economic life of the pipe, however, this approach minimizes the potential for reductions in demand in the term.

Question(s):

Notwithstanding EGI's approach, please run economics that use the exchange for 10 years reducing the length of reinforcement required with the assumption that there is a 15 TJ reduction in expected demand thus precluding any additional pipe and elimination of the exchange service in year 10.

Response:

FRPO's request appears to rely on the assumption that 15 TJ/d of demand will not be needed after year 10 of the Project. This assumption appears to be arbitrary (both in terms of the amount of the demand reduction and the timing of the demand reduction) and is not supported by Enbridge Gas's demand forecast.

In an effort to be responsive, please see the requested information below.

Potential Alternative	Costs (\$ Million)	NPV (\$ Million)
<u>Hybrid Alternative:</u> 17.86 km NPS 36 and 21 TJ/d Ojibway to Dawn Exchange	<u>Facility</u> \$351.0	\$(173.7)
	<u>O&amp;M</u> \$4.2 Annually \$(32.0) NPV over a 10-year term	
<u>Hybrid Alternative:</u> 16.20 km (i.e., Wheatley Road end- point) NPS 36 and 21 TJ/d Ojibway to Dawn Exchange	<u>Facility</u> \$330.5	\$(165.6)
	<u>O&amp;M</u> \$4.2 Annually \$(32.0) NPV over a 10-year term	

(1) The estimated O&M costs are based on the bid received in the RFP. The bid stated pricing is subject to refresh based on the market conditions at the timing of contracting.

The proposed Project has an NPV of \$(153.5). The scenarios request by FRPO result in NPVs of \$(173.7) and \$(165.6) and are therefore less economic than the proposed Project.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Federation of Rental-housing Providers of Ontario (FRPO)

INTERROGATORY

Reference:

Exhibit C, Tab 1, Schedule 1, p. 20

Preamble:

EGL evidence states: In 2021, Enbridge Gas engaged Posterity Group (“Posterity”) to evaluate whether an ETEE IRPA could viably meet the identified system need or reduce the scope of the facilities that would otherwise be required. This alternative examined the extent to which the proposed Project, could be eliminated or reduced through investment in ETEE. Due to the timing of the identified system need, this alternative would require a supply-side solution to bridge the gap between the year that the system is constrained and the year that the full ETEE reductions would be realized. However, as noted below, the ETEE alternative cannot meet the required peak demand reduction.

Question(s):

The above reference assumes a supply side solution is necessary. Please provide EGL’s views on a scenario where the Board requires the implementation of directive to provide interruptible service for incremental demands until sufficient demand reduction is implemented to allow interruptible customers to move to firm unless the customer wants to pay for the costs to make their service firm.

Response:

As per Exhibit B, Tab 1, Schedule 1, Paragraphs 28 – 29 and 31, customers were provided the opportunity to convert firm service to interruptible service, and invited to indicate whether they would be more inclined to consider interruptible service over new firm service if the ability to negotiate lower than posted interruptible rates was available. Customers continue to seek firm service and express concern regarding interruptible service for their needs (please see Attachment 1 at Exhibit I.FRPO.15 for customer responses regarding the matter).

Implementation of an interruptible service directive (and effectively restricting customers from contracting firm service) would limit customer choice related to their needs and, for this Project specifically, would likely mean that customers would be required to choose

between taking on financial and operational risk beyond their risk tolerance threshold, not expanding their business, or moving their business to another jurisdiction.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Federation of Rental-housing Providers of Ontario (FRPO)

INTERROGATORY

Reference:

Exhibit D, Tab 1, Schedule 1, p. 1

Preamble:

EGL evidence states: Enbridge Gas will also construct ancillary measurement, pressure regulation and station facilities within the Township of Dawn Euphemia and in the Municipality of Chatham-Kent.

We would like to understand more about the work referred to in the above sentence.

Question(s):

For each station that EGL proposes to be modified, please provide:

- a) A description of the work
- b) Current design parameters
  - i) Inlet pressure: maximum and minimum
  - ii) Outlet pressure: maximum and minimum
  - iii) Design day flow (with current peak day demands)
  - iv) Maximum Flow available: Minimum Pressure in and Maximum Pressure out
- c) Design parameters after proposed work is completed
  - i) Inlet pressure: maximum and minimum
  - ii) Outlet pressure: maximum and minimum
  - iii) Design day flow (with current peak day demands)
  - iv) Maximum Flow available: Minimum Pressure in and Maximum Pressure out

Response:

There are two stations being modified and one station being added. Each station is listed below and described at Exhibit D, Tab 1, Schedule 1 Page 3 - 4.

- Dawn Compressor Station – Modified
- Dover Transmission Station – Modified
- Richardson Station – New

**Dawn Compressor Station**

*Location: Township of Dawn-Euphemia*

a) Description of Work:

- Tie proposed NPS 42 header into existing NPS 42 Trafalgar header in the Dawn South Yard to feed into Panhandle Pipelines (NPS 20 and NPS 36).
- Install new NPS 10 and NPS 20 pressure control runs on new NPS 42 header that is heading toward Dawn Metering & Odorization to feed into Panhandle pipelines (NPS 20 and NPS 36).
- Install approximately 1400 meters of NPS 42 header across the Dawn South Yard to take feed from NPS 42 Trafalgar header and flow into Panhandle pipelines (NPS 20 and NPS 36).
- New NPS 30 (for high flow) and NPS 8 (for low flow) Ultrasonic Flow Meters on Panhandle NPS 36 pipeline
- New NPS 20 (for high flow) and NPS 6 (for low flow) Ultrasonic Flow Meters on Panhandle NPS 20 pipeline
- New Odourant Building to odorize gas in Panhandle NPS 36 and 20 pipelines
- New Gas Chromatograph Building
- Over pressure protection system on NPS 42 header that is coming from Dawn South Yard

b) Current Design Parameters:

Item No.	Parameter Description	Minimum	Maximum
i	Inlet Pressure [kPag]	4895	6040
ii	Outlet Pressure [kPag]	4827	6040
iii	W22/23 Design Day Flows [TJ/d] <sup>1</sup>	n/a	628
iv	Station Flow Capacity [TJ/d]	n/a	747

c) Design Parameters after proposed work is completed:

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<sup>1</sup> Design Day Flows out of Dawn Yard only (does not include other system supplies)

Item No.	Parameter Description	Minimum	Maximum
i	Inlet Pressure [kPag]	6109	9308
ii	Outlet Pressure [kPag]	4827	6040
iii	W22/23 Design Day Flows [TJ/d] <sup>2</sup>	n/a	628
iv	Station Flow Capacity [TJ/d]	n/a	1168

### Dover Transmission Station

*Location: Municipality of Chatham-Kent*

a) Description of work:

- Install NPS 12 Ultrasonic Flow Meter to measure flows to the NPS 16 Panhandle Line
- Relocate the NPS 36 x 42 launcher/receiver to the new Richardson Sideroad station and tie-in the proposed NPS 36 Panhandle pipeline in same location.
- Install a NPS 16 valve for Over Pressure protection on NPS 16 pipeline.
- Install temporary station bypass on the NPS 16 pipeline to maintain flow to downstream customers during construction.

b) and c) Station Design Parameters (no change after proposed work is complete)

Item No.	Parameter Description	Minimum	Maximum
i	Inlet Pressure [kPag]	4435	6040
ii	Outlet Pressure [kPag]	2826	4140
iii	W22/23 Design Day Flows [TJ/d] <sup>3</sup>	n/a	164
iv	Station Flow Capacity [TJ/d]	n/a	177

### Richardson Station

*Location: Municipality of Chatham-Kent*

a) Description of work:

- Relocate the NPS 36 Launcher/Receiver from Dover Transmission station and reinstall in this location with filter separator and drain tank.
- Install two NPS 20 crossovers to tie-in the proposed NPS 36 pipeline with the existing NPS 20.
- Install Remote Telemetry Unit building and a standby generator.

b) Not applicable as this is a new station.

<sup>2</sup> Design Day Flows out of Dawn Yard only (does not include other system supplies)

<sup>3</sup> Flow through Dover Transmission to the NPS 16



c) Design Parameters after proposed work is completed:<sup>4</sup>

<b>Item No.</b>	<b>Parameter Description</b>	<b>Minimum</b>	<b>Maximum</b>
<b>i</b>	<b>Inlet Pressure [kPag]</b>	4435	6040
<b>ii</b>	<b>Outlet Pressure [kPag]</b>	4435	6040
<b>iii</b>	<b>W22/23 Design Day Flows [TJ/d]</b>	n/a	n/a
<b>iv</b>	<b>Station Flow Capacity [TJ/d]</b>	n/a	n/a

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<sup>4</sup> For clarity, Richardson Station is a valve-site station, not a pressure regulating station.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Industrial Gas Users Association (IGUA)

INTERROGATORY

Reference:

Exhibit A, Tab 3, Schedule 1, page 5, paragraph 12.  
The revised estimated cost for PREP is \$358.0 million.

Question(s):

(a) Please provide the forecast rate base for the Panhandle system as of the proposed in-service date for PREP and before addition of the PREP costs.

(b) Please explain the current basis for allocation of Panhandle costs to customers (confirming that such costs are allocated in aggregate with the costs of the St. Clair system and indicating the allocator(s) used).

(c) Please provide the forecast rate base for the St. Clair system as of the proposed in-service date for PREP.

Response:

Enbridge Gas is not seeking cost recovery of the Project as part of this application.<sup>1</sup>

- a) The forecast net book value that would be included in the determination of rate base for the Panhandle system prior to the PREP in-service date of November 1, 2024 is \$422.2M.
- b) Union's 2013 OEB-approved cost allocation study classifies the demand-related costs for the combined Panhandle System and St. Clair System as Ojibway/St. Clair demand.

The OEB-approved cost allocation methodology of Ojibway/St. Clair demand costs is based on the maximum design capacity of the combined system which is determined as the Panhandle System capacity from Dawn to Ojibway (Dawn send out) plus the maximum firm import capacity at the St. Clair Pipeline and Bluewater

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<sup>1</sup> Exhibit A, Tab 3, Schedule 1, para. 13.

Pipeline river crossings. The allocation of the maximum design capacity to ex-franchise Rate C1 and Rate M16 is based on firm contracted demands. The remaining capacity is allocated to Union South in-franchise rate classes in proportion to the combined Panhandle System and St. Clair System firm design day demands.

- c) The forecast net book value that would be included in the determination of rate base for the St. Clair system prior to the PREP in-service date of November 1, 2024 is \$3.7M.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Industrial Gas Users Association (IGUA)

INTERROGATORY

Reference:

Exhibit A, Tab 3, Schedule 1, page 5, paragraph 13.

Enbridge Gas expects that, as part of its 2024 rebasing application, the recovery of costs associated with this project will be addressed. Enbridge Gas will allocate Project costs to rate classes according to the cost allocation methodology approved as part of that proceeding, or as otherwise approved by the OEB.

EB-2022-0200, Exhibit J13.2, part b).

The ratemaking implications of the largest projects to be implemented in 2023 and 2024 (Dawn to Corunna and PREP) will be determined by a subsequent regulatory process, Phase 2 for Dawn to Corunna and the LTC for PREP.

Question(s):

Based on the current approved cost allocation methodology for the Panhandle system, please provide the forecast PREP costs that would be allocated to each EGI rate class and the rate impact ( $\phi/m^3$  and % impact) of such allocation.

Response:

Please see Attachment 1 to this response. Page 1 provides the cost allocation and unit rates for the Project using a levelized revenue requirement as proposed in Enbridge Gas's 2024 Rebasing application.<sup>1</sup> The cost allocation factor is based on Union's current approved cost allocation methodology for Ojibway/St. Clair demand costs updated for the 2024 forecast included in Enbridge Gas's 2024 Rebasing application. Page 2 provides rate impacts in the form of annual bill impacts for typical small and large customers as a percentage of the customer's delivery bill.

Enbridge Gas is not seeking cost recovery of the Project as part of this application.<sup>2</sup>

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<sup>1</sup> EB-2022-0200.

<sup>2</sup> Exhibit A, Tab 3, Schedule 1, para. 13.

Cost Allocation and Unit Rates of Panhandle Regional Expansion Project  
based on Current OEB-approved Cost Allocation Methodology

Line No.	Particulars	Current Approved Cost Allocation Methodology		2024 Forecast Usage (4)	Billing Units (d)	Unit Rate (cents/m <sup>3</sup> ) (e) = (b / c x 100)
		Allocator (1) (a)	Allocation (\$000s) (2) (b)			
<u>EGD Rate Zone</u>						
1	Rate 1	-	-	5,011,588	10 <sup>3</sup> m <sup>3</sup>	-
2	Rate 6	-	-	4,799,240	10 <sup>3</sup> m <sup>3</sup>	-
3	Rate 100	-	-	4,503	10 <sup>3</sup> m <sup>3</sup> /d	-
4	Rate 110	-	-	75,654	10 <sup>3</sup> m <sup>3</sup> /d	-
5	Rate 115	-	-	14,481	10 <sup>3</sup> m <sup>3</sup> /d	-
6	Rate 125	-	-	111,124	10 <sup>3</sup> m <sup>3</sup> /d	-
7	Rate 135	-	-	52,646	10 <sup>3</sup> m <sup>3</sup>	-
8	Rate 145	-	-	6,138	10 <sup>3</sup> m <sup>3</sup> /d	-
9	Rate 170	-	-	30,928	10 <sup>3</sup> m <sup>3</sup> /d	-
10	Rate 200	-	-	15,025	10 <sup>3</sup> m <sup>3</sup> /d	-
11	Rate 300	-	-	-	10 <sup>3</sup> m <sup>3</sup> /d	-
12	Total EGD Rate Zone	-	-	10,121,328		
<u>Union North Rate Zone</u>						
13	Rate 01	-	-	990,646	10 <sup>3</sup> m <sup>3</sup>	-
14	Rate 10	-	-	328,117	10 <sup>3</sup> m <sup>3</sup>	-
15	Rate 20	-	-	91,732	10 <sup>3</sup> m <sup>3</sup> /d	-
16	Rate 25	-	-	126,831	10 <sup>3</sup> m <sup>3</sup>	-
17	Rate 100	-	-	42,050	10 <sup>3</sup> m <sup>3</sup> /d	-
18	Total Union North Rate Zone	-	-	1,579,376		
<u>Union South Rate Zone</u>						
19	Rate M1	4,838	1,306	3,260,773	10 <sup>3</sup> m <sup>3</sup>	0.0400
20	Rate M2	1,909	515	1,320,841	10 <sup>3</sup> m <sup>3</sup>	0.0390
21	Rate M4 (F)	1,576	425	46,836	10 <sup>3</sup> m <sup>3</sup> /d	0.9080
22	Rate M4 (I)	-	-	238	10 <sup>3</sup> m <sup>3</sup>	-
23	Rate M5 (F)	20	5	432	10 <sup>3</sup> m <sup>3</sup> /d	1.2722
24	Rate M5 (I)	-	-	55,087	10 <sup>3</sup> m <sup>3</sup>	-
25	Rate M7 (F)	3,420	923	71,858	10 <sup>3</sup> m <sup>3</sup> /d	1.2846
26	Rate M7 (I)	-	-	75,999	10 <sup>3</sup> m <sup>3</sup>	-
27	Rate M9	-	-	6,040	10 <sup>3</sup> m <sup>3</sup> /d	-
28	Rate T1 (F)	579	156	26,540	10 <sup>3</sup> m <sup>3</sup> /d	0.5893
29	Rate T1 (I)	-	-	37,536	10 <sup>3</sup> m <sup>3</sup>	-
30	Rate T2 (F)	13,553	3,658	308,713	10 <sup>3</sup> m <sup>3</sup> /d	1.1850
31	Rate T2 (I)	-	-	41,762	10 <sup>3</sup> m <sup>3</sup>	-
32	Rate T3	-	-	28,200	10 <sup>3</sup> m <sup>3</sup> /d	-
33	Total Union South Rate Zone	25,895	6,989	5,280,856		
<u>Ex-Franchise</u>						
34	Rate 331	-	-			
35	Rate 332	-	-			
36	Rate 401	-	-			
37	Rate M12	-	-			
38	Rate M13	-	-			
39	Rate M16	188	51			
40	Rate M17	-	-			
41	Rate C1 (F)	945	255			
42	Rate C1 (I)	-	-			
43	Total Ex-Franchise	1,133	306			
44	Total	27,027	7,295 (3)			

Notes:

- (1) Ojibway/St. Clair demand allocation factor based on 2024 forecast maximum design capacity. Direct assignment to ex-franchise rates based on contracted capacity with remaining maximum design capacity allocated to Union South rate classes in proportion to Panhan System and St. Clair System design day demands.
- (2) Allocated using column (a).
- (3) EB-2022-0200, Exhibit 2, Tab 5, Schedule 4, Attachment 2, page 1, line 15, column (f).
- (4) EB-2022-0200, Exhibit 8, Tab 2, Schedule 8, Attachment 2, column (a). General service volumes updated for Settlement Agreement.

Bill Impacts for Typical Small and Large Customers of Panhandle Regional Expansion Project  
based on Current OEB-approved Cost Allocation Methodology

Line No.	Particulars	Unit Rate (1) (a)	Billing Units (2) (b)	Bill Impact (\$) (c)	EB-2022-0133 Current Approved Delivery Bill (3) (d)	Delivery Bill Impact (%) (e)
<u>Union South Rate Zone</u>						
1	Rate M1 - Residential	0.0400	2,200 m <sup>3</sup>	0.88	433	0.2%
2	Rate M2	0.0390	73,000 m <sup>3</sup>	28.48	5,972	0.5%
3	Rate M4 (F) - Small	0.9080	4,800 m <sup>3</sup> /d	523	57,891	0.9%
4	Rate M4 (F) - Large	0.9080	50,000 m <sup>3</sup> /d	5,448	468,572	1.2%
5	Rate M5 (I) - Small	-	825,000 m <sup>3</sup>	-	38,793	0.0%
6	Rate M5 (I) - Large	-	6,500,000 m <sup>3</sup>	-	227,250	0.0%
7	Rate M7 (F) - Small	1.2846	165,000 m <sup>3</sup> /d	25,434	842,327	3.0%
8	Rate M7 (F) - Large	1.2846	720,000 m <sup>3</sup> /d	110,986	3,183,889	3.5%
9	Rate M9 - Small	-	56,439 m <sup>3</sup> /d	-	206,517	0.0%
10	Rate M9 - Large	-	168,100 m <sup>3</sup> /d	-	613,438	0.0%
11	Rate T1 (F) - Small	0.5893	25,750 m <sup>3</sup> /d	1,821	175,282	1.0%
12	Rate T1 (F) - Average	0.5893	48,750 m <sup>3</sup> /d	3,447	272,638	1.3%
13	Rate T1 (F) - Large	0.5893	133,000 m <sup>3</sup> /d	9,405	614,548	1.5%
14	Rate T2 (F) - Small	1.1850	190,000 m <sup>3</sup> /d	27,018	777,629	3.5%
15	Rate T2 (F) - Average	1.1850	669,000 m <sup>3</sup> /d	95,130	1,901,634	5.0%
16	Rate T2 (F) - Large	1.1850	1,200,000 m <sup>3</sup> /d	170,637	3,156,032	5.4%
17	Rate T3	-	2,350,000 m <sup>3</sup> /d	-	6,375,944	0.0%

Notes:

- (1) Page 1, column (e).
- (2) Billing units for typical small and large customers.
- (3) Delivery charges per EB-2022-0200, Exhibit 8, Tab 2, Schedule 8, Attachment 10, pages 7-9, column (a).

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Industrial Gas Users Association (IGUA)

INTERROGATORY

Reference:

Exhibit A, Tab 3, Schedule 1, page 6, paragraph 17

In summary, it is critical that Enbridge Gas provide additional capacity on the Panhandle System to meet the forecasted firm demand of customers in the Panhandle Market. The proposed Project will cost-effectively provide the required incremental capacity within the necessary timeframe. In doing so the Project will provide a continuing source of affordable energy for residential customers while offering a competitive advantage to commercial and industrial customers, thereby helping to ensure economic growth not only in the Panhandle Market, but across the Southwestern Ontario region.

Question(s):

(a) Please provide a map of the referenced Southwestern Ontario region, indicating thereon the referenced Panhandle Market.

(b) Please confirm that the phrase “helping to ensure economic growth...across the Southwestern Ontario region” is a reference to the same benefits from the Project articulated at paragraph 23 of the same exhibit, and paragraphs 44 and 45 (page 14) of Exhibit B/T1/S1. If not confirmed, please explain what additional benefits the Project will provide outside of the Panhandle Market.

Response:

a) Please see the response at Exhibit I.PP.1, part a) for a map of the Panhandle Transmission System. As per the response at Exhibit I.STAFF.25, part c) the proposed Project partially alleviates the largest Panhandle System bottleneck (see Exhibit B, Tab 2, Schedule 1, pp. 13 - 14). Partial alleviation of the bottleneck improves the reliability of natural gas service for existing customers, and will allow for growth among both existing and new customers on the Panhandle System. All customers benefit from alleviation of Panhandle System bottlenecks.

The benefits from the Project, however, extend beyond the hydraulic benefits described above. From a broader economic perspective, as outlined at Exhibit E, Tab 1, Schedule 1, Paragraph 19, the transmission Project will also provide direct and indirect economic benefits to Ontario estimated at approximately \$257 million.

This figure does not include the similar direct and indirect economic benefits to Ontario when both existing and new natural gas customers invest and grow their operations. Within EOI bid responses, customers indicated that total direct capital investments into their business operations in Southern Ontario related to their incremental natural gas needs would exceed \$4.5 billion.

- b) Enbridge Gas interprets paragraph 23 referenced within the interrogatory as paragraph 23 at Exhibit A, Tab 4, Schedule 1.

The benefits mentioned at the three references provided in the interrogatory are all related in that they are in regards to broader benefits related to the Project and access to natural gas; however, the benefits within each of those references also differ in some instances as described at the references themselves. Please see the response at Exhibit I.STAFF.25, part c) for more information regarding Project benefits.



ENBRIDGE GAS INC.

Answer to Interrogatory from  
Industrial Gas Users Association (IGUA)

INTERROGATORY

Reference:

EB-2020-0094 (November 5, 2020 Decision and Order on Application by EGI for approval of a System Expansion Surcharge, a Temporary Connection Surcharge and an Hourly Allocation Factor), page 13, 3rd paragraph.

The Area of Benefit is determined by hydraulically modelling the pipeline network in the region around the proposed Development Project to determine the geographic extent of the area that will benefit from the incremental capacity of the project. Exhibit B, Tab 1, Schedule 1, page 3, paragraph 12 and page 4 Figure 1, describing the Area of Benefit for the Project.

Question(s):

Please confirm that the Area of Benefit for PREP complies with the definition of “Area of Benefit” as set out in the referenced excerpt from the OEB’s 2020 Decision approving the Hourly Allocation Factor (HAF) mechanism.

If not confirmed, please explain the difference in the two uses of the term.

Response:

Not confirmed. The Area of Benefit shown in Exhibit B, Tab 1, Schedule 1, Figure 1 was developed for the EOI. The purpose of the EOI was to collect information regarding customer interest in natural gas in the area downstream of the existing NPS 20 Panhandle Line bottleneck (see Exhibit B, Tab 2, Schedule 1, pp. 13-14 for more information regarding Panhandle System bottlenecks). Please note that all capacity along the Panhandle Transmission System can be used to serve any customer from Dawn to the Ojibway valve site in Windsor, and that Project benefits extend beyond EOI-identified customers (please see the response to Exhibit I.STAFF.25, part c)).

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Industrial Gas Users Association (IGUA)

INTERROGATORY

Reference:

Exhibit B, Tab 1, Schedule 1, page 7, paragraph 26.

The evidence indicates that;

a. In response to the 2023 Expression of Interest Process (EOI) EGI received 42 bids for capacity for the Project from 39 entities totalling 197 TJ/day of interest.

b. This 197 TJ/day is incremental to capacity already contracted by customers via the 2021 EOI and in the normal course of business since the close of that process.

Question(s):

(a) Please indicate how many of the 39 entities who responded to the 2023 EOI are customers whose forecast hourly gas consumption demand is equal to or greater than 50 m<sup>3</sup>/hour, and the percentage of PREP's capacity represented by these customers.

(b) Please indicate the capacity already contracted via the 2021 EOI and in the normal course of business since the close of that process by customers whose forecast hourly gas consumption demand is equal to or greater than 50 m<sup>3</sup>/hour, the number of such customers and the percentage of PREP's capacity represented by these customers.

(c) Please indicate additional capacity demand not included in parts (a) and (b) of this interrogatory forecasted for the 10 year period commencing with the proposed PREP in service date for customers whose forecast hourly gas consumption demand is equal to or greater than 50 m<sup>3</sup>/hour, the number of such forecast customers and the percentage of PREP's capacity represented by those forecast customers.

(d) Please provide the percentage of forecast peak hourly demand represented by the customers included in the responses to each of parts (a), (b) and (c) of this interrogatory.

(e) Based on the information provided in response to earlier parts of this interrogatory, please calculate the HAF that would be applicable to PREP were the HAF framework to be applied to PREP, and show the calculations.

(f) Based on the calculations provided in response to part (e) of this interrogatory, please indicate the total CIACs that would be applicable to PREP.

Response:

a) All 39 entities that provided EOI bids require greater than 50 m<sup>3</sup>/hr.

Enbridge Gas is in the process of executing contracts with the entities that require incremental capacity starting in 2024 and 2025 (please see the response at Exhibit I.STAFF.24, part a) for details regarding contract status including the percentage of the total incremental capacity created by the Project). Going forward, Enbridge Gas will continue to engage and negotiate with EOI bidders as well as new requests from entities that were not EOI bidders, which could result in customers attaching to the Panhandle System due to the incremental capacity provided by the Project that are less than 50 m<sup>3</sup>/hr.

b) There is one customer who participated in the 2021 EOI with a firm distribution contract related to the Project's incremental capacity with a forecast hourly consumption demand equal to or greater than 50 m<sup>3</sup>/hour. This contract represents 34% of the total incremental capacity created by the Project.

c) The capacity demand not included in parts a) and b) above is provided in part d) below ("remaining capacity for future customers"). Future customers may or may not have hourly demands greater than or equal to 50 m<sup>3</sup>/hour.

The proposed Project provides 168 TJ/d and would serve 5 years of the current demand forecast. Another solution will be required to serve the remainder of the 10-year demand forecast and the remaining demand will be confirmed through another EOI closer to that time.

d) Please see the information below.

	Demand (TJ/day)	Project Capacity (TJ/day)	Percent
Contracts Under Negotiations	74	168	44%
2021 EOI customers executed	57	168	34%
Remaining capacity for future customers	37	168	22%

e) Please see the response at Exhibit I.STAFF.26, part a).

f) Please see the response at Exhibit I.ED.29, part c).

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Industrial Gas Users Association (IGUA)

INTERROGATORY

Reference:

EB-2020-0094 (November 5, 2020 Decision and Order on Application by EGI for approval of a System Expansion Surcharge, and Temporary Connection Surcharge and an Hourly Allocation Factor), page 20, last paragraph.

The OEB recognizes the concern of some parties about the use of HAF in transmission projects and finds Enbridge Gas's commitment to continue to explore alternatives to be acceptable. The OEB approves the use of HAF for projects that are primarily distribution and if there is a minor component of transmission then the OEB would still accept the use of HAF. For exclusively transmission projects, the OEB has not agreed to the application of HAF.

Question(s):

(a) Please discuss alternatives for application of the HAF to transmission projects explored by EGI in accord with its commitment as acknowledged by the OEB in the EB-2020-0094 excerpt referenced.

(b) If the Commission were to direct application of the HAF to PREP, please confirm that the HAF could be applied on the basis of the information included in EGI's Application. If not confirmed please particularize any impediments to doing so.

Response:

a) For clarity, Enbridge Gas's Reply Argument within EB-2020-0094 stated the following:

*"In the case of the Chatham-Kent Rural project,<sup>1</sup> although it involved transmission facilities, the HAF was appropriate due to the modest cost and the fact that customers were able to mitigate their costs and avoid a CIAC through reasonable contract terms and conditions, as recognized by OGVG. Enbridge Gas is continuing*

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<sup>1</sup> EB-2018-0188.

*to explore alternatives to applying EBO 134 or EBO 188 in an exclusive manner and how to reconcile the two sets of guidelines in an appropriate case.*

The statement was made in the context of the use of HAF for distribution projects which may have a minor transmission component, and where the use of HAF could be appropriate due to its modest cost. The proposed Project is entirely a transmission project (i.e., not a distribution project, and not a “dual-function” pipeline) and HAF is not appropriate.

Enbridge Gas will continue to evaluate opportunities where HAF may apply in an appropriate case involving “dual-function” facilities, however there are no such opportunities identified at this time.

b) Not confirmed. Please see the response at Exhibit I.STAFF.26, part a).

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Ontario Greenhouse Vegetable Growers ("OGVG")

INTERROGATORY

References:

EB-2022-0133, Exhibit A, Tab 2, Schedule 1, page 2, paragraph 4  
EB-2022-0157, Exhibit A, Tab 3, Schedule 1, page 5, paragraph 13

Preamble:

In its 2023 Rates Application filed June 30, 2022 (EB-2022-0133), EGI makes the following assertion with respect to the applicability of the Ontario Energy Board's Incremental Capital Module ("ICM") in 2023:

This 2023 Rate Application is the final annual rate adjustment application under the IRM approved in the MAADs Decision. Enbridge Gas will not be proposing an ICM request for 2023 Rates. As such, there will not be a Phase 2 of the 2023 Rates application. Enbridge Gas will be filing a rebasing application for rates in 2024 prepared under a cost of service. (emphasis added)<sup>1</sup>

By contrast, in the Leave to Construct Application, most recently updated on June 23, 2022, EGI makes the following, apparently inconsistent assertion:

As outlined in Exhibit E, Tab 1, Schedule 1, Enbridge Gas is not seeking cost recovery of the Project as part of this application. The OEB approved the use of the Incremental Capital Module ("ICM") for Enbridge Gas as a mechanism to fund incremental capital investments during the current deferred rebasing period. If the Project meets the criteria for rate recovery through the ICM mechanism, then an ICM request for the costs of the Project may form part of the Company's 2023 Rates (Phase 2) application. (emphasis added)<sup>2</sup>

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1 EB-2022-0133, Exhibit A, Tab 2, Schedule 1, page 2, paragraph 4.

2 EB-2022-0157, Exhibit A, Tab 3, Schedule 1, page 5, paragraph 13.

Question:

- a) Please confirm that EGI will not be seeking ICM relief for any part of the Panhandle Regional Expansion Project.
- b) Assuming that a) is confirmed, please confirm that, accordingly, spending on the Panhandle Regional Expansion Project will not impact EGI's rates until that project spending is considered by the OEB in EGI's next rebasing application for, under EGI's current plans, approval of rates effective January 1, 2024.
- c) Assuming that a) and b) are confirmed, please confirm that, as a result of a) and b), the appropriate allocation of costs and rate design implications of the Panhandle Regional Expansion Project will be considered in the context of EGI's next rebasing application.

**Response**

- a) Confirmed.
- b) Confirmed.
- c) Confirmed.



ENBRIDGE GAS INC.

Answer to Interrogatory from  
Ontario Greenhouse Vegetable Growers ("OGVG")

INTERROGATORY

References:

Exhibit B Tab 1 Schedule 1 Page 8

Preamble:

Each customer that requests incremental contract rate service may require an individual service line, main extension, station(s), and/or local distribution reinforcement to bring sufficient natural gas from the Panhandle System to their site. These costs will be the responsibility of the customer and will be assessed in accordance with E.B.O. 188 guidelines, which may result in the need for the customer to pay a contribution in aid of construction.

Question:

- a) Does EGI anticipate utilizing the "hourly allocation factor" when determining each customers' responsibility for a potential contribution in aid of construction for any new distribution assets required to connect customers to the incremental capacity provided by the Panhandle Regional Expansion Project?
- b) Does EGI anticipate that the Profitability Index for any distribution projects related to the incremental capacity provided by the Panhandle Regional Expansion Project will be at least 1.0 because of the use of the "hourly allocation factor", and that the actual Profitability Index for any such distribution projects will likely be more than 1.0?

**Response**

- a) Enbridge Gas will evaluate the need for any new distribution assets required and assess whether they meet the OEB approved guidelines to use the hourly allocation factor ("HAF").<sup>1</sup> At this time, Enbridge Gas anticipates one of the facility expansions may use HAF (this facility expansion does not require Leave to Construct). At this time, there are no distribution assets for which Leave to Construct is required.

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<sup>1</sup> For reference, see Page 26 of the OEB Natural Gas Facilities Handbook dated March 31, 2022

- b) Enbridge Gas cannot comment on what the PI for distribution assets will be at this time, as the facilities have not yet been designed or constructed.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Ontario Greenhouse Vegetable Growers ("OGVG")

INTERROGATORY

References:

Exhibit B Tab 1 Schedule 1 Page 11

Preamble:

Table 1 shows a 9 TJ/day decline in General Service demand in the 2020/2021 winter.

Question:

- a) Please explain the driver of the decline in General Service demand in the 2020/2021 winter.

**Response**

The decline is attributed to a combination of lower customer usage than previously predicted, and to customers switching rate classes (from existing M1 or M2 rate class into contract rate M4).

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Ontario Greenhouse Vegetable Growers ("OGVG")

INTERROGATORY

References:

EB-2022-0157 Exhibit B Tab 1 Schedule 1 Page 18

Preamble:

Enbridge Gas has also identified the potential need for a second phase of transmission expansion to meet the demands that are forecasted over the next 20 years. This second phase has been identified within the Enbridge Gas 2021-2025 AMP with a forecasted 2029 in-service date as shown below.

Question:

- a) Please discuss the potential for Integrated Resource Planning to defer, mitigate or obviate the need for a second phase of transmission expansion in 2029.

**Response**

- a) Please see the response at Exhibit I.STAFF.10 part b).

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Ontario Greenhouse Vegetable Growers (OGVG)

INTERROGATORY

Reference:

EB-2022-0157 Exhibit E Tab 1 Schedule 2 Page 1 of 1  
EB-2022-0157 Exhibit E Tab 1 Schedule 3 Page 1 of 1  
EB-2022-0157 Exhibit E Tab 1 Schedule 4 Page 1 of 1  
Exhibit E Tab 1 Schedule 5

Preamble:

EGL provides an estimate of the costs for the proposed Panhandle Regional Expansion Project (the "Project") and the transmission related revenue stream in relation to the new capacity provided by the proposed Project to provide a stage 1 discounted cash flow analysis for the Project. OGVG is interested in whether, as a part of the stage 2 and/or 3 analyses of the impacts of the project, there is a net benefit of the Project from any net incremental storage and transmission revenue resulting from the Project.

Question(s):

- a) Please provide, on a best-efforts basis, the incremental storage related costs, if any, made necessary because of the new load associated with the new capacity created by the proposed Project.
- b) Please provide, on a best-efforts basis, the incremental distribution related costs made necessary because of the need to connect the new load associated with the new capacity created by the Project.
- c) Please provide a calculation of the incremental storage revenue associated with the new capacity created by the Project in the same format as the transmission revenue calculated in Exhibit E Tab 1 Schedule 4 Page 1 of 1.
- d) Please provide a calculation of the incremental distribution revenue associated with the new capacity created by the Project in the same format as the transmission revenue calculated in Exhibit E Tab 1 Schedule 4 Page 1 of 1.
- e) Please provide a discounted cash flow analysis for the Project in the format provided in Exhibit E Tab 1 Schedule 5 that includes the storage and distribution related costs and revenues provided in answers a) to d). In providing the analysis please:

- i) provide the contract customer revenue and general service revenue on separate lines, and
- ii) provide the analysis in excel format.

Response:

- a) Since the customers associated with the Project are all located in Union South, the Union rate zone Gas Supply Plan will incur no additional storage service costs resulting from the load associated with the Project.
- b) Enbridge Gas is not able to provide incremental distribution facilities costs as distribution facilities have not yet been designed or constructed for the Project.
- c) Please see Attachment 1 to this response.
- d) Please see Attachment 2 to this response.
- e) Enbridge Gas is unable to provide the requested analysis as the information required to complete the analysis (i.e., distribution facilities costs) is not available. Please see part b) above.

**Calculation of Revenue (Storage Margins)**

**PREP - Panhandle Regional Expansion Project**

**InService Date: Nov-01-2024**

Line	Project Year	(\$000's)	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>
Storage costs are recovered from Contract rate classes based on Firm Contract Demand (CD) The deemed incremental revenue is based on the capacity created by the Project												
<b>Contract Methodology: Total CD * 12 * Storage Margin</b>												
1	Storage Margin \$/M3 / month	0.039654										
2	Contract Demand 10^3m^3/month		1,623	2,762	3,087	3,412	3,737	4,003	4,003	4,003	4,003	4,003
3	Storage Margin		\$772	\$1,314	\$1,469	\$1,624	\$1,778	\$1,905	\$1,905	\$1,905	\$1,905	\$1,905
<b>General Service Storage Margin = Volumes * Storage Margin</b>												
4	Storage Margin \$ / M3 consumed	0.008285										
5	Volume 10 ^3 M^3		2,218	6,610	10,912	15,092	19,120	23,000	24,906	24,906	24,906	24,906
6	Storage Margin		\$18	\$55	\$90	\$125	\$158	\$191	\$206	\$206	\$206	\$206
7	Total Storage Margin		\$790	\$1,369	\$1,559	\$1,749	\$1,936	\$2,096	\$2,111	\$2,111	\$2,111	\$2,111

The Storage margins are Jan 2023 rates

**Calculation of Revenue (Distribution Margins)**

**PREP - Panhandle Regional Expansion Project**

**InService Date: Nov-01-2024**

Line	Project Year	(\$000's)	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>
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Distribution costs are recovered from Contract rate classes based on Firm Contract Demand (CD)  
 The deemed incremental revenue is based on the capacity created by the Project

**Contract Methodology: Total CD \* 12 \* Distribution Margin**

1	Distribution Margin \$/M3 / month	0.097333										
2	Contract Demand 10 <sup>3</sup> m <sup>3</sup> /month		1,623	2,762	3,087	3,412	3,737	4,003	4,003	4,003	4,003	4,003
3	Distribution Margin		\$1,895	\$3,227	\$3,606	\$3,985	\$4,364	\$4,676	\$4,676	\$4,676	\$4,676	\$4,676

**General Service Distribution Margin = Volumes \* Distribution Margin**

4	Distribution Margin \$ / M3 consumed	0.118892										
5	Volume 10 <sup>3</sup> M <sup>3</sup>		2,218	6,610	10,912	15,092	19,120	23,000	24,906	24,906	24,906	24,906
6	Distribution Margin		\$264	\$786	\$1,297	\$1,794	\$2,273	\$2,735	\$2,961	\$2,961	\$2,961	\$2,961
7	Total Distribution Margin		\$2,159	\$4,012	\$4,903	\$5,779	\$6,638	\$7,410	\$7,637	\$7,637	\$7,637	\$7,637

The Distributions margins are Jan 2023 rates



ENBRIDGE GAS INC.

Answer to Interrogatory from  
Ontario Greenhouse Vegetable Growers (OGVG)

INTERROGATORY

Reference:

EB-2022-0157 Exhibit E Tab 1 Schedule 7 Pages 5 to 7.

Preamble:

EGI provides an analysis showing that the net present value of the economic benefits associated with the \$289.2M capital spending associated with the Project is \$257M and 1,093 jobs created.

EGI provides evidence that similar economic benefits will be created as a result of the approximately \$4.5 Billion in capital spending that will be enabled as a result of the Project, including the creation of approximately 6,900 jobs, but does not attempt to quantify the present value of the benefit.

Question(s):

a) Please comment on the magnitude of the economic benefits to Ontario that are likely to be realized because of the \$4.5 Billion in capital spending expected to be enabled by the Project, relative to the \$257M in forecast economic benefits associated with the relatively smaller Project cost of \$289.2M. For example, does EGI believe it is reasonable to expect that the economic benefits of the \$4.5 Billion in capital spending enabled by the Project will be at least equal to if not exceed the \$257M in economic benefits resulting from the Project spending?

b) Please confirm that it is EGI's evidence that, in the absence of the Project, the projected capital spending of \$4.5 Billion and forecast creation of 6,900 jobs will not occur.

c) To what extent does EGI believe that the 25% of customers that did not provide relevant information in response to the updated 2023 EOI nevertheless represent demand for new capacity.

Response:

- a) Yes, Enbridge Gas believes it is reasonable to expect that the economic benefits of the \$4.5 billion in capital spending enabled by the Project will be at least equal to if not greater than the \$257 million in economic benefits resulting from the construction of the Project.
- b) Confirmed.
- c) All customers who responded to the 2023 EOI, including those that did not provide economic development information related to their incremental natural gas needs, were included in the assessment of incremental natural gas demand requirements underpinning the need for the Project.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Ontario Greenhouse Vegetable Growers (OGVG)

INTERROGATORY

Reference:

EB-2022-0157 Exhibit B Tab 1 Schedule 1 Page 10 of 22  
EB-2022-0157 Exhibit B Tab 1 Schedule 1 Page 13 of 22

Preamble:

The contract rate (Rate M/BT4, Rate M/BT5, Rate M/BT7, Rate T-1 and Rate T-2) demand represents approximately 56% of firm demand served by the Panhandle System as of Winter 2022/2023.

It appears to OGVG that EGI's forecast for the winter 2030/31 season shows that by 2031 contract rate customers will represent 65% of the firm demand served by the Panhandle System.

Question(s):

a) To what extent does EGI believe that, assuming the Project is approved, the demand for capacity on the Panhandle System by contract customers will continue to grow such that in 2031 and beyond EGI will have to build further incremental capacity?

Response:

a) Enbridge Gas anticipates that natural gas demand will continue to increase such that another capacity solution will be required before 2031. More specifically, if the Project is approved and constructed it will provide a total system capacity of 904 TJ/d.<sup>1</sup> Enbridge Gas's demand forecast shows that demand requirements will surpass this amount by Winter 2029/2030 (906 TJ/d).<sup>2</sup> Furthermore, Enbridge Gas's demand forecast shows that natural gas demand will continue to increase to 921 TJ/d by Winter 2030/2031.

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<sup>1</sup> Exhibit A, Tab 4, Schedule 1, Page 7, Table 1.

<sup>2</sup> Exhibit B, Tab 1, Schedule 1, Page 13, Table 2.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Pollution Probe (“PP”)

INTERROGATORY

Reference:

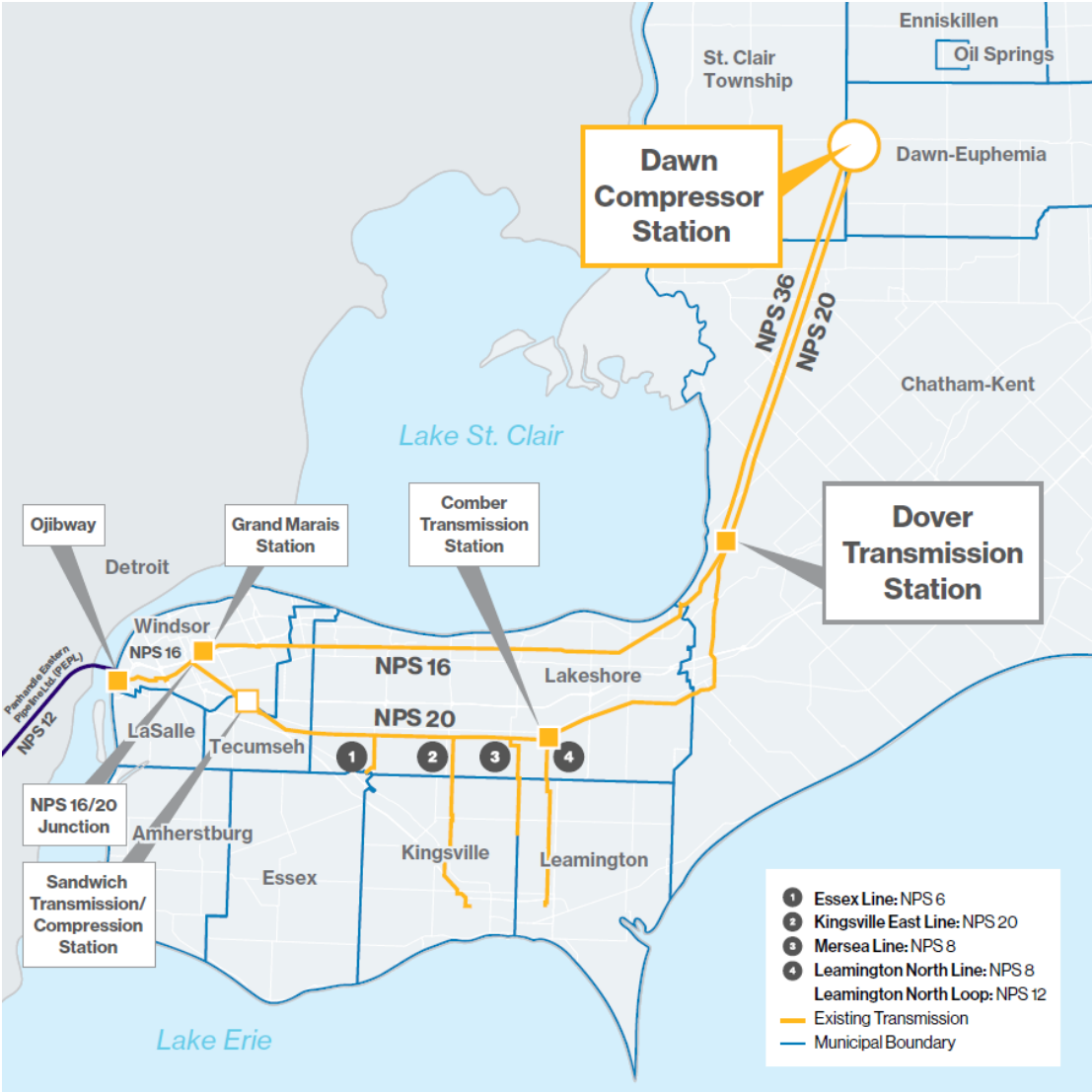
“The Panhandle System is critical to providing safe, reliable, and affordable natural gas to Enbridge Gas’s in-franchise residential, commercial, and industrial customers in the Panhandle Market.” [B/2/1 Pg.1]

Question:

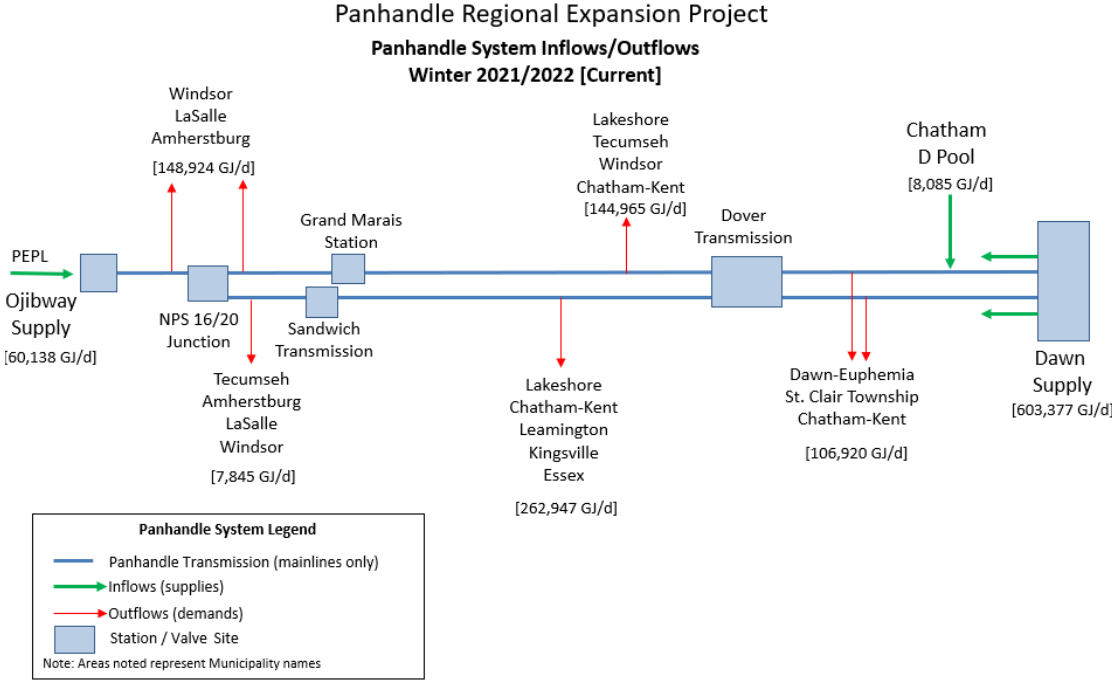
- a) Please provide a map showing the area of customers served by natural gas that travels through the Panhandle System.
- b) Please provide a diagram showing the peak inflows (GJ and/or cubic meter) and peak outflows (GJ and/or cubic meter) for the Panhandle System and which systems feed or receive the inflows/outflow.

Response

- a) Please refer to the map below, displaying the municipalities served by the Panhandle System.



b) Please refer to the line diagram below of the Panhandle System, displaying both inflows and outflows, shown in GJ/d as of Winter 2021/2022 (representing the current customer demands).



ENBRIDGE GAS INC.

Answer to Interrogatory from  
Pollution Probe (“PP”)

INTERROGATORY

Reference:

“The facilities, collectively referred to as the Panhandle Regional Expansion Project (“Project”), are required to expand Enbridge Gas’s Panhandle Transmission System (“Panhandle System”), which transports natural gas between Enbridge Gas’s Dawn Compressor Station, ...”. [A/2/1 Page 2]

Question:

- a) Please explain the full scope of system analysis conducted on the broader Enbridge Ontario transmission and distribution system with and without the proposed project (e.g. was this included in the Dawn/Storage assessment)
- b) When was the proposed project first identified in the Enbridge Asset Management Plan (AMP)?
- c) Please provide the page references from Enbridge’s most current Asset Management Plan that explains the basis for the project and where it ranks against all other projects in the AMP.

Response

- a) The Panhandle System is independent and serves a discreet area of the Southern Ontario market. The Panhandle System expansion has no impact on other transmission systems throughout the province. The facilities required at Dawn to support the proposed Project are identified in Exhibit D, Tab 1, Schedule 1, Page 3, Table 1.
- b) Additional facilities required for reinforcement of the Panhandle System was first identified in the Union Gas Limited Asset Management Plan 2018-2027 (EB-2017-0306/EB-2017-0307).
- c) The Project was identified as a growth-driven investment under EBO 134. Growth-driven investments under EBO 134 have fixed timing based on when the incremental

facilities are required and have not been directly ranked against other projects in the asset management plan.

The excerpts and references to the Panhandle Regional Expansion Project in Enbridge Gas' most current AMP are included below:

1. EB-2021-0148, Exhibit B, Tab 2, Schedule 3, Page 8

**“Panhandle Regional Expansion Project (PREP) Strategy Development**

The Panhandle Regional Expansion Project (PREP) is required to provide reliable, secure, economic natural gas supply to meet the growing design day demand of the EGI Panhandle Transmission System which serves in-franchise markets (including residential, commercial and industrial customers). As a result of a non-binding Expression of Interest (EOI) conducted in February 2021, EGI is forecasting firm transportation growth driven by general service growth, greenhouse market demand in Leamington / Kingsville / Chatham-Kent and industrial demand in Windsor requiring incremental facilities as early as winter 2023-24. Alternatives are being evaluated at varying levels of detail depending upon project feasibility including engineering, cost, construction feasibility, capacity and reliability. Through this process, EGI will identify the most efficient project to provide the Panhandle Transmission System with reliable supply and adequate capacity for both design day conditions and operational conditions. As part of the project plan, EGI will complete a supply-side IRP assessment in addition to a binding reverse open season. In this way, EGI will minimize the facilities required to serve incremental demand while optimizing any unwanted existing capacity.”

2. EB-2021-0148, Exhibit B, Tab 2, Schedule 3, Page 14

“+\$63.0M – Inclusion of PREP: Panhandle Expansion Project based on current growth model projections”

3. EB-2021-0148, Exhibit B, Tab 2, Schedule 3, Page 18

“Increase in large projects including Panhandle Expansion Project and Dawn to Cuthbert NPS 42 Replacement (ICM-eligible)””



ENBRIDGE GAS INC.

Answer to Interrogatory from  
Pollution Probe (“PP”)

INTERROGATORY

Reference:

“Growth is forecast to occur across the entire Panhandle System with concentration in the Leamington-Kingsville and Windsor areas.

Question:

Please provide a copy of all documents and specific information sources outlining the growth assumptions that would affect the Panhandle system as noted above.

**Response**

The growth forecast is provided in Exhibit B, Tab 1, Schedule 1. The growth forecast is informed by the EOI bids, in which customers provided their volume, location and approximate timing of demand. Please see the response at Exhibit I.STAFF.4

/U

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Pollution Probe (“PP”)

INTERROGATORY

Reference:

“Enbridge Gas’s current Panhandle System Design Day demand forecast is developed from the contract demand and customer attachment forecasts.” [A/3/1, Pg. 2]

Question:

- a) Please provide a summary of customer numbers by type (e.g. residential, industrial, commercial) currently served by the Panhandle system on a peak day.
- b) Please provide a copy of the Enbridge customer attachment forecast by year from 2023 to 2028 and indicate what portion of the forecast will be served by the Panhandle system.
- c) Does Enbridge have a customer forecast to cover the next 40 years (e.g. amortization period for the proposed pipeline) related to customers that would be served by the Panhandle system? If yes, please provide a copy.

Response

- a) The number of customers served by the Panhandle System is approximately 178,200 residential and 14,400 commercial/industrial customers.
- b) Enbridge Gas respectfully declines to respond on the basis of relevance. The Company’s customer attachment forecast for the entirety of Enbridge Gas’s service area is not relevant to the approvals sought for leave to construct in the current proceeding. Enbridge Gas has prepared a customer attachment forecast for the relevant Project area for the years 2021-2028 which is discussed within the responses at Exhibit I.ED.2, parts a) – b).
- c) No, Enbridge Gas does not produce a 40-year customer forecast.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Pollution Probe ("PP")

INTERROGATORY

Reference:

"The Project as proposed is designed to reliably serve increased demands for firm service in the Panhandle Market, including, in particular, incremental demands from the greenhouse, automotive, and power generation sectors." [A/2/1 Page 2]

Question:

- a) What is the current peak demand (GJ) for the Panhandle system and what will be the peak demand capacity if the project is approved and completed.
- b) Please provide a copy of all firm contracts and firm commitments from greenhouse, automotive, and power generation sectors customers that drive the incremental peak demand identified.
- c) Please provide a table showing each customer incremental natural gas peak demand that would be supplied by the proposed pipeline and include columns indicating the start and end date for each firm contractual commitment related to those peak demand commitments.
- d) Please identify any additional peak demand capacity that the proposed project would provide in excess of the contracted demand identified.
- e) Please confirm that the Panhandle system has the capacity to provide for ex-franchise delivery (e.g. export) and what the capacity is available for ex-franchise deliver.

Response

- a) The current (W22/23) Panhandle System peak day demand is 698,025 GJ/d and the system capacity is 736,512 GJ/day. The system capacity will be 904,196 GJ/day once the Project is placed into service. Please see Exhibit I.STAFF.6, Table 1.
- b) Please see the contract and commitment templates set out in Attachment 1 of this response, which are representative of all executed commitments from customers. Please see the response to part c) below for customer-specific bid details.

/U

c) – d)  
Please see Exhibit I.STAFF.24, part a).

/U

e) Confirmed.

Enbridge Gas's Panhandle System connects with the Panhandle Eastern Pipeline Company ("PEPL") system at Ojibway. The capacity for ex-franchise delivery is limited by the ability for PEPL system capacity to accept gas, which isn't known by Enbridge Gas at this time. There are currently no customers of Enbridge Gas with C1 service from Dawn to Ojibway and no requests have been received for this service by Enbridge Gas.

Contract ID	
Contract Name	

**M4 Contract**

This GAS DISTRIBUTION CONTRACT (“**Contract**”), made as of the [REDACTED] day of [REDACTED], 20[REDACTED].

BETWEEN:

Enbridge Gas Inc.

hereinafter called "**the Company**"

- and -

Customer Name

hereinafter called "**Customer**"

**WHEREAS**, the Company has built, or proposes to build, certain facilities for the Panhandle Regional Expansion Project (the “**Project**”) to increase the capacity of its natural gas pipeline system. In connection with the Project, the Company will be required to construct distribution facilities (the “**Expansion Facilities**”) to serve the Customer’s facilities at [REDACTED] (the “**Site**”);

**AND WHEREAS**, Customer has requested from the Company and the Company has agreed to provide Customer with Services as specified in Schedule 1 (the “**Services**”);

**AND WHEREAS**, if Customer has elected direct purchase services, Customer will be responsible for supplying Gas to the Company under a separate Contract called the Southern Bundled T;

**AND WHEREAS**, the Company will distribute Gas to Customer’s Point(s) of Consumption under this Contract identified in Schedule 1;

**IN CONSIDERATION** of the mutual covenants contained herein, and other good and valuable consideration, the receipt of and sufficiency of which is hereby acknowledged, the parties agree as follows:

**1. INCORPORATIONS**

The following are hereby incorporated in and form part of this Contract:

- a) Contract Parameters as contained in Schedule 1 as amended from time to time; and
- b) The latest posted version of the Company’s general terms and conditions applicable to Union Rate Zones (“**General Terms and Conditions**”) subject to Section 12.18 of the General Terms and Conditions; and
- c) Rate M4 Schedule as amended from time to time and as approved by the Ontario Energy Board.

## 2. CONDITIONS PRECEDENT

2.01 The obligations of the Company to provide Services hereunder are subject to the following conditions precedent that are for the sole benefit of the Company and which may be waived or extended, in whole or in part:

- a) The Company shall have obtained, in form and substance satisfactory to the Company, and all conditions shall have been satisfied under all governmental, regulatory and other third party approvals, consents, orders and authorizations in relation to the Project and Expansion Facilities that are required to:
  - i. provide the Services; and
  - ii. construct the Project and Expansion Facilities; and
- b) The Company shall have obtained all internal approvals that are necessary or appropriate to:
  - i. provide the Services; and
  - ii. construct the Project and Expansion Facilities; and
- c) The Company shall have completed and placed into Service the Project and Expansion Facilities; and
- d) Financial assurances acceptable to the Company shall be supplied and maintained in accordance with the General Terms and Conditions and Section 10 of this Agreement; and
- e) The Company shall have received a contribution in aid of construction to the Company of \$0.00 (the “**Aid Amount**”) from Customer pursuant to Customer’s obligations herein; and
- f) If Customer has elected direct purchase services, Customer and the Company shall have executed and maintained in good standing a Southern Bundled T.

The Company shall use commercially reasonable efforts to satisfy and fulfill the conditions precedent specified in Sections a), c), d), e), and f). The Company shall notify Customer forthwith in writing of the Company’s satisfaction or waiver of each condition precedent. If the Company concludes that it will not be able to satisfy a condition precedent, the Company may, upon written Notice to Customer, terminate this Contract and upon giving such Notice, this Contract shall be of no further force and effect and each of the parties shall be released from all further obligations hereunder, subject to Customer’s obligations pursuant to Section 11 herein.

2.02 The obligations of the Customer hereunder are subject to the following condition precedent that is for the sole benefit of the Customer and which may be waived by Customer:

- a) Customer shall have received all required financing necessary, on or before November 1, 2022, to ensure the Customer’s ability to construct new facilities at the Site and honour the provisions of this Contract.

Customer shall use commercially reasonable efforts to satisfy and fulfill the condition precedent specified in Section 2.02 a). Customer shall notify the Company forthwith in writing of the Customer's satisfaction or waiver of such condition precedent. If Customer concludes that it will not be able to satisfy or waive such condition precedent on or before the date specified, it may, upon written Notice to the Company no later than November 1, 2022, terminate this Contract and upon giving such Notice, this Contract shall be of no further force and effect and each of the parties shall be released from all further obligations hereunder.

2.03 Should this Contract be terminated by virtue of this Section 2, Customer and the Company shall remain bound by any pre-existing Gas Distribution Contract(s) between Customer and the Company.

### 3. CONTRACT TERM

This Contract shall be effective from the date hereof. However, the Services and the Company's obligation to provide the Services under Section 4 shall commence on the later of (such later date being the "Day of First Delivery") (a) [Date], and (b) the date that the last condition precedent as set out in Section 2 is satisfied or waived by the Company. Subject to the provisions hereof, this Contract shall continue in full force and effect for a period of xx Contract Years (the "Initial Term") and continuing thereafter on a year to year basis unless written Notice to terminate is provided by one party to the other at least three (3) Months prior to the end of the then-current term.

"Contract Year" means a period of twelve (12) consecutive Months, beginning on [redacted] of any year and ending on the subsequent [redacted], except for the first Contract Year which shall begin on the Day of First Delivery and end on the subsequent [redacted].

### 4. SERVICES PROVIDED

The Company agrees to provide Services as specified in Schedule 1 and Customer agrees to pay for such Services pursuant to the terms and conditions as set out in this Contract and the referenced attachments and the rate(s) referenced in Schedule 1.

To be eligible for services under the Rate M4 Rate Schedule, Customer must have an annual natural gas consumption of at least 350,400 m<sup>3</sup> and Daily Contracted Demand between 2,400 m<sup>3</sup> and 60,000 m<sup>3</sup>. If the Customer does not maintain this level of consumption during the current Contract Year or is not expected to maintain this level of consumption then, notwithstanding any other remedy available to the Company under this Contract or any other term of this Contract, effective the following Contract Year, the Customer may no longer qualify for service under the Rate M4 Rate Schedule and may be placed on an alternate service by the Company. If the Customer's Daily Contracted Demand exceeds 60,000 m<sup>3</sup> then the Customer no longer qualifies for services under the Rate M4 Rate Schedule.

If Customer has elected direct purchase services, and if the Company does not receive Gas from Customer under the Southern Bundled T, then the Company's obligations to provide Services under this Contract may, at the Company's option, be suspended by the Company. This suspension

will be effective as of the date specified in the Company's Notice to Customer, notwithstanding the General Terms and Conditions.

## 5. FIRM DAILY CONTRACT DEMAND

The Firm Contract Demand ("CD") is as specified in Schedule 1.

### 5.01 CD INCREASES DURING CONTRACT YEAR

The first day in each Contract Year that the Customer overruns its CD ("**First Occurrence**") shall be recorded. "**Overrun**" shall have the meaning given that term in the M4 Rate Schedule. The second day in each Contract Year that the customer overruns its CD ("**Second Occurrence**"), shall result in an increase in the Customer's CD to the higher quantity used on the First Occurrence or the Second Occurrence effective as of the 1<sup>st</sup> day of the month of this Second Occurrence, at the Company's sole discretion. Customer charges will reflect the increased CD.

### 5.02 SUBSEQUENT CD INCREASES DURING CONTRACT YEAR

After the CD has been increased and anytime thereafter that it has been increased pursuant to Section 5.01, the next day that Customer overruns the increased CD within the Contract Year shall be deemed to be a new First Occurrence for the purposes of Section 5.01, and the next time thereafter that Customer overruns the CD within the Contract Term shall be deemed to be a new Second Occurrence for the purposes of Section 5.01, resulting in another increase in the CD as per the procedure set out in Section 5.01. For greater clarity, every time the CD is increased in a Contract Year, the occurrence number is set back to zero and thereafter if two more occurrences happen, the CD will be raised again, and so on for the remainder of the Contract Year. At the beginning of each Contract Year any outstanding First Occurrences will be set back to zero.

## 6. MINIMUM ANNUAL VOLUME

### 6.01 FIRM MINIMUM ANNUAL VOLUME

In each Contract Year, the Customer shall consume or, in any event, pay for the Adjusted Firm Minimum Annual Volume ("**AFMAV**") as determined in the formula below. This AFMAV will not be less than the minimum quantity required to qualify for firm service in the M4 Rate Schedule.

The firm quantity not consumed in any Contract Year (the "**Firm Deficiency Volume**" or "**FDV**") shall be as determined in the formula below.

$$\text{AFMAV} = \text{FMAV} \times [(U - D_F) / U]$$

$$\text{FDV} = \text{AFMAV} - (\text{FV} - \text{F})$$

Where:

**FMAV** = Firm Minimum Annual Volume (as identified in Schedule 1)

**U** = number of days in the Contract Year

**D<sub>F</sub>** = number of days of Force Majeure in the Contract Year

**FV** = total firm volume taken in the Contract Year



**F** = volumes delivered to the Points of Consumption during Force Majeure

The payment required for the FDV shall be calculated by multiplying FDV by the MAV Delivery charge specified in the Rate M4 Rate Schedule as of the last day of the Contract Year. This payment would only apply if the FDV was greater than zero.

**6.02 INTERRUPTIBLE MINIMUM ANNUAL VOLUME**

In each Contract Year, the Customer shall consume or, in any event, pay for the Adjusted Interruptible Minimum Annual Volume (“**AIMAV**”) as determined in the formula below. This AIMAV will not be less than the minimum quantity required to qualify for interruptible service in the Rate M4 Rate Schedule.

The interruptible quantity not consumed in any Contract Year (the "**Interruptible Deficiency Volume**") (“**IDV**”) shall be determined in the formula below.

$$\text{AIMAV} = \text{IMAV} - (\text{CD}_i \times \text{D}_i)$$

$$\text{IDV} = \text{AIMAV} - (\text{IV} - \text{I})$$

Where:

- IMAV** = Interruptible Minimum Annual Volume (as identified in Schedule 1)
- CD<sub>i</sub>** = Interruptible Contract Demand
- D<sub>i</sub>** = number of days of interruption in the Contract Year
- IV** = total interruptible volume taken in the Contract Year
- I** = volumes delivered to the Points of Consumption during an interruption

The payment required for the IDV shall be calculated by multiplying the IDV by the MAV Delivery charge specified in the Rate M4 Rate Schedule as of the last day of the Contract Year. This payment would only apply if the IDV was greater than zero.

**7. EXPANSION FACILITIES**

The Company will use commercially reasonable efforts to construct the Project and Expansion Facilities to serve the Site. The target date for completion of these facilities is [Date]. The Company will provide written Notice to Customer when such facilities are complete and placed into service.

The Company and Customer agree that the Company shall not be obligated to construct any portion of the Expansion Facilities between December 15 of any year and March 31 of the subsequent calendar year.

**8. AID AMOUNT PAYMENT SCHEDULE**

Customer will be required to pay to the Company the Aid Amount of \$ [redacted] by [Date].

Any applicable taxes will be applied to all amounts paid under this Section. Customer warrants and represents that no payment to be made by Customer under this Contract is subject to any withholding tax.

**[NTD:If there are multiple years, then a payment table should be used:]**

Year	Payment	Due Date

**9. LATE PAYMENT CHARGES**

Any amounts due and payable by Customer to the Company arising under Section 8 and 11 of this Contract shall, if not paid by the due date thereof, be subject to late payment charges equal to 1.5% per month (for a nominal rate of 18% per annum compounded monthly) on any unpaid balance including previous arrears.

**10. CREDIT REQUIREMENTS DURING INITIAL TERM**

In addition to the terms of Section 5.04 of the General Terms and Conditions, the Company may, at any time during the Initial Term, request financial assurances to cover the potential financial exposure to the Company to the end of the Initial Term. Such financial assurances shall be determined by the Company in a commercially reasonable manner and may include, without limitation, expected return on capital invested. Failure to provide such financial assurances shall be treated in a manner provided for in Section 5.04 of the General Terms and Conditions. Customer shall provide financial assurances acceptable to the Company by no later than November 1, 2022.

**11. TERMINATION PRIOR TO COMPLETION OF EXPANSION FACILITIES**

The Company shall have the right to terminate this Contract at any time prior to the Day of First Delivery, pursuant to Section 2, by giving written notice hereof, subject to the terms hereof.

If this Contract is terminated by the Company as outlined above, then:

- (a) Upon such termination, this Contract shall be of no further force and effect and each of the parties shall be released from all further obligations hereunder, provided that any rights or remedies that a party may have for breaches of this Contract prior to such termination and any liability that a party may have incurred prior to such termination, and the parties’ obligations under this Section 11, shall not thereby be released;
- (b) Customer shall reimburse the Company for all Project Costs; and
- (c) Customer shall reimburse the Company for all cancellation costs, fees or other amounts paid under contracts entered into by the Company to support the satisfaction of the conditions precedent set out in Section 2 (“**Cancellation Costs**”).

The Company may invoice amounts under this Section from time to time, with the expectation that there will be an invoice rendered within 30 days of termination, and subsequent invoices as

additional amounts payable hereunder are incurred from time to time. After delivery of such Notice of termination by the Company, the Company will use commercially reasonable efforts to cease incurring Project Costs and to mitigate Cancellation Costs upon such termination. In no event shall the Company invoice Customer for any Cancellation Costs or Project Costs not previously invoiced by the Company after 12 months from the termination date. Without limiting the foregoing, Customer shall have the right to audit at Customer's expense the costs claimed for reimbursement by the Company for a period of six (6) months after each invoice is issued.

**"Project Costs"** means any and all reasonable costs (including litigation costs, cancellation costs, carrying costs, and third party claims) expenses, losses, demands, damages, obligations, or other liabilities (whether of a capital or operating nature, and whether incurred or suffered before or after the date of this Contract) of the Company (including amounts paid to affiliates in accordance with the Affiliate Relationship Code as established by the Ontario Energy Board) in connection with or in respect of development and construction of the Expansion Facilities (including without limitation the construction and placing into service of the Expansion Facilities, the obtaining of all governmental, regulatory, and other third party approvals, and the obtaining of rights of way) except for costs that have arisen from the gross negligence, fraud, or willful misconduct of the Company.

## 12. CONTRACT SUCCESSION

This Contract, unless terminated pursuant to Section 2 hereof, replaces all previous Gas Distribution Contracts between the parties, subject to settlement of any surviving obligations.

IN WITNESS WHEREOF this Contract has been duly executed by the parties hereto as of the date first written above. If an Agent on behalf of Customer executes this Contract then, if requested by the Company, Agent or Customer shall at any time provide a copy of such authorization to the Company.

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Authorized Signatory  
**Customer**

---

Authorized Signatory  
**Enbridge Gas Inc.**

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Please Print Name

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Please Print Name

Contract ID	
Contract Name	

**M4 Contract**

This GAS DISTRIBUTION CONTRACT (“**Contract**”), made as of the [REDACTED] day of [REDACTED], 20[REDACTED].

BETWEEN:

Enbridge Gas Inc.

hereinafter called "**the Company**"

- and -

Customer Name

hereinafter called "**Customer**"

**WHEREAS**, the Company has built, or proposes to build, certain facilities for the Panhandle Regional Expansion Project (the “**Project**”) to increase the capacity of its natural gas pipeline system. In connection with the Project, the Company will be required to construct distribution facilities (the “**Expansion Facilities**”) to serve the Customer’s facilities at [REDACTED] (the “**Site**”);

**AND WHEREAS**, Customer has requested from the Company and the Company has agreed to provide Customer with Services as specified in Schedule 1 (the “**Services**”);

**AND WHEREAS**, if Customer has elected direct purchase services, Customer will be responsible for supplying Gas to the Company under a separate Contract called the Southern Bundled T;

**AND WHEREAS**, the Company will distribute Gas to Customer’s Point(s) of Consumption under this Contract identified in Schedule 1;

**IN CONSIDERATION** of the mutual covenants contained herein, and other good and valuable consideration, the receipt of and sufficiency of which is hereby acknowledged, the parties agree as follows:

**1. INCORPORATIONS**

The following are hereby incorporated in and form part of this Contract:

- a) Contract Parameters as contained in Schedule 1 as amended from time to time; and
- b) The latest posted version of the Company’s general terms and conditions applicable to Union Rate Zones (“**General Terms and Conditions**”) subject to Section 12.18 of the General Terms and Conditions; and
- c) Rate M4 Schedule as amended from time to time and as approved by the Ontario Energy Board.

## 2. CONDITIONS PRECEDENT

2.01 The obligations of the Company to provide Services hereunder are subject to the following conditions precedent that are for the sole benefit of the Company and which may be waived or extended, in whole or in part, in the manner provided in this Contract:

- a) The Company shall have obtained, in form and substance satisfactory to the Company, and all conditions shall have been satisfied under all governmental, regulatory and other third party approvals, consents, orders and authorizations, that are required to:
  - i. provide the Services; and
  - ii. construct the Project and Expansion Facilities; and
- b) The Company shall have obtained all internal approvals that are necessary or appropriate to:
  - i. provide the Services; and
  - ii. construct the Project and Expansion Facilities; and
- c) The Company shall have completed and placed into Service the Project and Expansion Facilities; and
- d) The Company shall have received a contribution in aid of construction to the Company of \$0.00 (the “**Aid Amount**”) from Customer pursuant to Customer’s obligations herein; and
- e) If Customer has elected direct purchase services, Customer and the Company shall have executed and maintained in good standing a Southern Bundled T.

The Company shall use commercially reasonable efforts to satisfy and fulfill the conditions precedent specified in Sections 2.01 a), c), d) and e). The Company shall notify Customer forthwith in writing of the Company’s satisfaction or waiver of each condition precedent for the Company’s benefit. If Company concludes that it will not be able to satisfy or waive a condition precedent, it may, upon written Notice, terminate this Contract and upon giving such Notice, this Contract shall be of no further force and effect and each of the parties shall be released from all further obligations hereunder.

2.02 The obligations of the Customer hereunder are subject to the following condition precedent that is for the sole benefit of the Customer and which may be waived by Customer:

- a) Customer shall have received all required financing necessary, on or before November 1, 2022, to ensure the Customer’s ability to construct new facilities at the Site and honour the provisions of this Contract.

Customer shall use commercially reasonable efforts to satisfy and fulfill the condition precedent specified in Section 2.02 a). Customer shall notify the Company forthwith in writing of the Customer’s satisfaction or waiver of such condition precedent. If Customer concludes that it will not be able to satisfy or waive such condition precedent on or before the date specified, it may, upon written Notice to the Company no later than November 1, 2022, terminate this Contract and

upon giving such Notice, this Contract shall be of no further force and effect and each of the parties shall be released from all further obligations hereunder.

2.03 Should this Contract be terminated by virtue of this Section 2, Customer and the Company shall remain bound by any pre-existing Gas Distribution Contract(s) between Customer and the Company.

### 3. CONTRACT TERM

This Contract shall be effective from the date hereof. However, the Services and the Company's obligation to provide the Services under Section 4 shall commence on the later of (such later date being the "**Day of First Delivery**") (a) [Date], and (b) the date that the last condition precedent as set out in Section 2 is satisfied or waived by the Company. Subject to the provisions hereof, this Contract shall continue in full force and effect for a period of xx Contract Years (the "**Initial Term**") and continuing thereafter on a year to year basis unless written Notice to terminate is provided by one party to the other at least three (3) Months prior to the end of the then-current term.

"**Contract Year**" means a period of twelve (12) consecutive Months, beginning on [redacted] of any year and ending on the subsequent [redacted], except for the first Contract Year which shall begin on the Day of First Delivery and end on the subsequent [redacted].

### 4. SERVICES PROVIDED

The Company agrees to provide Services as specified in Schedule 1 and Customer agrees to pay for such Services pursuant to the terms and conditions as set out in this Contract and the referenced attachments and the rate(s) referenced in Schedule 1.

To be eligible for services under the Rate M4 Rate Schedule, Customer must have an annual natural gas consumption of at least 350,400 m<sup>3</sup> and Daily Contracted Demand between 2,400 m<sup>3</sup> and 60,000 m<sup>3</sup>. If the Customer does not maintain this level of consumption during the current Contract Year or is not expected to maintain this level of consumption then, notwithstanding any other remedy available to the Company under this Contract or any other term of this Contract, effective the following Contract Year, the Customer may no longer qualify for service under the Rate M4 Rate Schedule and may be placed on an alternate service by the Company. If the Customer's Daily Contracted Demand exceeds 60,000 m<sup>3</sup> then the Customer no longer qualifies for services under the Rate M4 Rate Schedule.

If Customer has elected direct purchase services, and if the Company does not receive Gas from Customer under the Southern Bundled T, then the Company's obligations to provide Services under this Contract may, at the Company's option, be suspended by the Company. This suspension will be effective as of the date specified in the Company's Notice to Customer, notwithstanding the General Terms and Conditions.

### 5. FIRM DAILY CONTRACT DEMAND

The Firm Contract Demand ("**CD**") is as specified in Schedule 1.

**5.01 CD INCREASES DURING CONTRACT YEAR**

The first day in each Contract Year that the Customer overruns its CD (“**First Occurrence**”) shall be recorded. “**Overrun**” shall have the meaning given that term in the M4 Rate Schedule. The second day in each Contract Year that the customer overruns its CD (“**Second Occurrence**”), shall result in an increase in the Customer’s CD to the higher quantity used on the First Occurrence or the Second Occurrence effective as of the 1<sup>st</sup> day of the month of this Second Occurrence, at the Company’s sole discretion. Customer charges will reflect the increased CD.

**5.02 SUBSEQUENT CD INCREASES DURING CONTRACT YEAR**

After the CD has been increased and anytime thereafter that it has been increased pursuant to Section 5.01, the next day that Customer overruns the increased CD within the Contract Year shall be deemed to be a new First Occurrence for the purposes of Section 5.01, and the next time thereafter that Customer overruns the CD within the Contract Term shall be deemed to be a new Second Occurrence for the purposes of Section 5.01, resulting in another increase in the CD as per the procedure set out in Section 5.01. For greater clarity, every time the CD is increased in a Contract Year, the occurrence number is set back to zero and thereafter if two more occurrences happen, the CD will be raised again, and so on for the remainder of the Contract Year. At the beginning of each Contract Year any outstanding First Occurrences will be set back to zero.

**6. MINIMUM ANNUAL VOLUME**

**6.01 FIRM MINIMUM ANNUAL VOLUME**

In each Contract Year, the Customer shall consume or, in any event, pay for the Adjusted Firm Minimum Annual Volume (“**AFMAV**”) as determined in the formula below. This AFMAV will not be less than the minimum quantity required to qualify for firm service in the M4 Rate Schedule.

The firm quantity not consumed in any Contract Year (the "**Firm Deficiency Volume**" or "**FDV**") shall be as determined in the formula below.

$$AFMAV = FMAV \times [(U - D_F) / U]$$

$$FDV = AFMAV - (FV - F)$$

Where:

- FMAV** = Firm Minimum Annual Volume (as identified in Schedule 1)
- U** = number of days in the Contract Year
- D<sub>F</sub>** = number of days of Force Majeure in the Contract Year
- FV** = total firm volume taken in the Contract Year
- F** = volumes delivered to the Points of Consumption during Force Majeure

The payment required for the FDV shall be calculated by multiplying FDV by the MAV Delivery charge specified in the Rate M4 Rate Schedule as of the last day of the Contract Year. This payment would only apply if the FDV was greater than zero.

**6.02 INTERRUPTIBLE MINIMUM ANNUAL VOLUME**

In each Contract Year, the Customer shall consume or, in any event, pay for the Adjusted Interruptible Minimum Annual Volume (“AIMAV”) as determined in the formula below. This AIMAV will not be less than the minimum quantity required to qualify for interruptible service in the Rate M4 Rate Schedule.

The interruptible quantity not consumed in any Contract Year (the "**Interruptible Deficiency Volume**") (“IDV”) shall be determined in the formula below.

$$AIMAV = IMAV - (CD_i \times D_i)$$

$$IDV = AIMAV - (IV - I)$$

Where:

- IMAV**            Interruptible Minimum Annual Volume (as identified in Schedule 1)
- CD<sub>i</sub>**            = Interruptible Contract Demand
- D<sub>i</sub>**              = number of days of interruption in the Contract Year
- IV**              = total interruptible volume taken in the Contract Year
- I**                 = volumes delivered to the Points of Consumption during an interruption

The payment required for the IDV shall be calculated by multiplying the IDV by the MAV Delivery charge specified in the Rate M4 Rate Schedule as of the last day of the Contract Year. This payment would only apply if the IDV was greater than zero.

**7. EXPANSION FACILITIES**

The Company will use commercially reasonable efforts to construct the Project and Expansion Facilities to serve the Site. The target date for completion of these facilities is [Date]. The Company will provide written Notice to Customer when such facilities are complete and placed into service.

The Company and Customer agree that the Company shall not be obligated to construct any portion of the Expansion Facilities between December 15 of any year and March 31 of the subsequent calendar year.

**8. AID AMOUNT PAYMENT SCHEDULE**

Customer will be required to pay to the Company the Aid Amount of \$ [redacted] by [Date].

Any applicable taxes will be applied to all amounts paid under this Section. Customer warrants and represents that no payment to be made by Customer under this Contract is subject to any withholding tax.

[NTD:If there are multiple years, then a payment table should be used:]

Year	Payment	Due Date
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**9. LATE PAYMENT CHARGES**

Any amounts due and payable by Customer to the Company arising under Section 8 of this Contract shall, if not paid by the due date thereof, be subject to late payment charges equal to 1.5% per month (for a nominal rate of 18% per annum compounded monthly) on any unpaid balance including previous arrears.

**10. CREDIT REQUIREMENTS DURING INITIAL TERM**

In accordance with Section 5.04 of the General Terms and Conditions, the Company may, at any time during the Initial Term, request financial assurances to cover the potential financial exposure to the Company to the end of the Initial Term. Such financial assurances shall be determined by the Company in a commercially reasonable manner. Failure to provide such financial assurances shall be treated in a manner provided for in Section 5.04 of the General Terms and Conditions.

Customer shall provide financial assurances acceptable to the Company by no later than June 1, 2023.

**11. CONTRACT SUCCESSION**

This Contract, unless terminated pursuant to Section 2 hereof, replaces all previous Gas Distribution Contracts between the parties, subject to settlement of any surviving obligations.

IN WITNESS WHEREOF this Contract has been duly executed by the parties hereto as of the date first written above. If an Agent on behalf of Customer executes this Contract then, if requested by the Company, Agent or Customer shall at any time provide a copy of such authorization to the Company.

\_\_\_\_\_  
 Authorized Signatory  
**Customer**

\_\_\_\_\_  
 Authorized Signatory  
**Enbridge Gas Inc.**

\_\_\_\_\_  
 Please Print Name

\_\_\_\_\_  
 Please Print Name

Contract ID	
Contract Name	

**M4 Contract**

This GAS DISTRIBUTION CONTRACT (“**Contract**”), made as of the [REDACTED] day of [REDACTED], 20[REDACTED].

BETWEEN:

Enbridge Gas Inc.

hereinafter called "**the Company**"

- and -

Customer Name

hereinafter called "**Customer**"

**WHEREAS**, the Company has built, or proposes to build, certain facilities for the Panhandle Regional Expansion Project (the “**Project**”) to increase the capacity of its natural gas pipeline system to serve the Customer’s facilities at [REDACTED] (the “**Site**”);

**AND WHEREAS**, Customer has requested from the Company and the Company has agreed to provide Customer with Services as specified in Schedule 1 (the “**Services**”);

**AND WHEREAS**, if Customer has elected direct purchase services, Customer will be responsible for supplying Gas to the Company under a separate Contract called the Southern Bundled T;

**AND WHEREAS**, the Company will distribute Gas to Customer’s Point(s) of Consumption under this Contract identified in Schedule 1;

**IN CONSIDERATION** of the mutual covenants contained herein, and other good and valuable consideration, the receipt of and sufficiency of which is hereby acknowledged, the parties agree as follows:

**1. INCORPORATIONS**

The following are hereby incorporated in and form part of this Contract:

- a) Contract Parameters as contained in Schedule 1 as amended from time to time; and
- b) The latest posted version of the Company’s general terms and conditions applicable to Union Rate Zones (“**General Terms and Conditions**”) subject to Section 12.18 of the General Terms and Conditions; and
- c) Rate M4 Schedule as amended from time to time and as approved by the Ontario Energy Board.

## 2. CONDITIONS PRECEDENT

2.01 The obligations of the Company to provide Services hereunder are subject to the following conditions precedent that are for the sole benefit of the Company and which may be waived or extended, in whole or in part, in the manner provided in this Contract:

- a) The Company shall have obtained, in form and substance satisfactory to the Company, and all conditions shall have been satisfied under all governmental, regulatory and other third party approvals, consents, orders and authorizations, that are required to:
  - i. provide the Services; and
  - ii. construct the Project; and
- b) The Company shall have obtained all internal approvals that are necessary or appropriate to:
  - i. provide the Services; and
  - ii. construct the Project; and
- c) The Company shall have completed and placed into Service the Project; and
- d) If Customer has elected direct purchase services, Customer and the Company shall have executed and maintained in good standing a Southern Bundled T.

The Company shall use commercially reasonable efforts to satisfy and fulfill the conditions precedent specified in Sections 2.01 a), c) and d). The Company shall notify Customer forthwith in writing of the Company's satisfaction or waiver of each condition precedent for the Company's benefit. If Company concludes that it will not be able to satisfy or waive a condition precedent, it may, upon written Notice, terminate this Contract and upon giving such Notice, this Contract shall be of no further force and effect and each of the parties shall be released from all further obligations hereunder.

2.02 The obligations of the Customer hereunder are subject to the following condition precedent that is for the sole benefit of the Customer and which may be waived by Customer:

- a) Customer shall have received all required financing necessary, on or before November 1, 2022, to ensure the Customer's ability to construct new facilities at the Site and honour the provisions of this Contract.

Customer shall use commercially reasonable efforts to satisfy and fulfill the condition precedent specified in Section 2.02 a). Customer shall notify the Company forthwith in writing of the Customer's satisfaction or waiver of such condition precedent. If Customer concludes that it will not be able to satisfy or waive such condition precedent on or before the date specified, it may, upon written Notice to the Company no later than November 1, 2022, terminate this Contract and upon giving such Notice, this Contract shall be of no further force and effect and each of the parties shall be released from all further obligations hereunder.

2.03 Should this Contract be terminated by virtue of this Section 2, Customer and the Company shall remain bound by any pre-existing Gas Distribution Contract(s) between Customer and the Company.

### 3. CONTRACT TERM

This Contract shall be effective from the date hereof. However, the Services and the Company's obligation to provide the Services under Section 4 shall commence on the later of (such later date being the "**Day of First Delivery**") (a) [Date], and (b) the date that the last condition precedent as set out in Section 2 is satisfied or waived by the Company. Subject to the provisions hereof, this Contract shall continue in full force and effect for a period of **five (5)** Contract Years (the "**Initial Term**") and continuing thereafter on a year to year basis unless written Notice to terminate is provided by one party to the other at least three (3) Months prior to the end of the then-current term.

"**Contract Year**" means a period of twelve (12) consecutive Months, beginning on [redacted] of any year and ending on the subsequent [redacted], except for the first Contract Year which shall begin on the Day of First Delivery and end on the subsequent [redacted].

### 4. SERVICES PROVIDED

The Company agrees to provide Services as specified in Schedule 1 and Customer agrees to pay for such Services pursuant to the terms and conditions as set out in this Contract and the referenced attachments and the rate(s) referenced in Schedule 1.

To be eligible for services under the Rate M4 Rate Schedule, Customer must have an annual natural gas consumption of at least 350,400 m<sup>3</sup> and Daily Contracted Demand between 2,400 m<sup>3</sup> and 60,000 m<sup>3</sup>. If the Customer does not maintain this level of consumption during the current Contract Year or is not expected to maintain this level of consumption then, notwithstanding any other remedy available to the Company under this Contract or any other term of this Contract, effective the following Contract Year, the Customer may no longer qualify for service under the Rate M4 Rate Schedule and may be placed on an alternate service by the Company. If the Customer's Daily Contracted Demand exceeds 60,000 m<sup>3</sup> then the Customer no longer qualifies for services under the Rate M4 Rate Schedule.

If Customer has elected direct purchase services, and if the Company does not receive Gas from Customer under the Southern Bundled T, then the Company's obligations to provide Services under this Contract may, at the Company's option, be suspended by the Company. This suspension will be effective as of the date specified in the Company's Notice to Customer, notwithstanding the General Terms and Conditions.

### 5. FIRM DAILY CONTRACT DEMAND

The Firm Contract Demand ("**CD**") is as specified in Schedule 1.

#### 5.01 CD INCREASES DURING CONTRACT YEAR

The first day in each Contract Year that the Customer overruns its CD ("**First Occurrence**") shall be recorded. "**Overrun**" shall have the meaning given that term in the M4 Rate Schedule. The

second day in each Contract Year that the customer overruns its CD (“**Second Occurrence**”), shall result in an increase in the Customer’s CD to the higher quantity used on the First Occurrence or the Second Occurrence effective as of the 1<sup>st</sup> day of the month of this Second Occurrence, at the Company’s sole discretion. Customer charges will reflect the increased CD.

**5.02 SUBSEQUENT CD INCREASES DURING CONTRACT YEAR**

After the CD has been increased and anytime thereafter that it has been increased pursuant to Section 5.01, the next day that Customer overruns the increased CD within the Contract Year shall be deemed to be a new First Occurrence for the purposes of Section 5.01, and the next time thereafter that Customer overruns the CD within the Contract Term shall be deemed to be a new Second Occurrence for the purposes of Section 5.01, resulting in another increase in the CD as per the procedure set out in Section 5.01. For greater clarity, every time the CD is increased in a Contract Year, the occurrence number is set back to zero and thereafter if two more occurrences happen, the CD will be raised again, and so on for the remainder of the Contract Year. At the beginning of each Contract Year any outstanding First Occurrences will be set back to zero.

**6. MINIMUM ANNUAL VOLUME**

**6.01 FIRM MINIMUM ANNUAL VOLUME**

In each Contract Year, the Customer shall consume or, in any event, pay for the Adjusted Firm Minimum Annual Volume (“**AFMAV**”) as determined in the formula below. This AFMAV will not be less than the minimum quantity required to qualify for firm service in the M4 Rate Schedule.

The firm quantity not consumed in any Contract Year (the "**Firm Deficiency Volume**" or “**FDV**”) shall be as determined in the formula below.

$$AFMAV = FMAV \times [(U - D_F) / U]$$

$$FDV = AFMAV - (FV - F)$$

Where:

- FMAV** = Firm Minimum Annual Volume (as identified in Schedule 1)
- U** = number of days in the Contract Year
- D<sub>F</sub>** = number of days of Force Majeure in the Contract Year
- FV** = total firm volume taken in the Contract Year
- F** = volumes delivered to the Points of Consumption during Force Majeure

The payment required for the FDV shall be calculated by multiplying FDV by the MAV Delivery charge specified in the Rate M4 Rate Schedule as of the last day of the Contract Year. This payment would only apply if the FDV was greater than zero.

**6.02 INTERRUPTIBLE MINIMUM ANNUAL VOLUME**

In each Contract Year, the Customer shall consume or, in any event, pay for the Adjusted Interruptible Minimum Annual Volume (“**AIMAV**”) as determined in the formula below. This

AIMAV will not be less than the minimum quantity required to qualify for interruptible service in the Rate M4 Rate Schedule.

The interruptible quantity not consumed in any Contract Year (the "**Interruptible Deficiency Volume**") ("**IDV**") shall be determined in the formula below.

$$\text{AIMAV} = \text{IMAV} - (\text{CD}_i \times \text{D}_i)$$

$$\text{IDV} = \text{AIMAV} - (\text{IV} - \text{I})$$

Where:

<b>IMAV</b>	=	Interruptible Minimum Annual Volume (as identified in Schedule 1)
<b>CD<sub>i</sub></b>	=	Interruptible Contract Demand
<b>D<sub>i</sub></b>	=	number of days of interruption in the Contract Year
<b>IV</b>	=	total interruptible volume taken in the Contract Year
<b>I</b>	=	volumes delivered to the Points of Consumption during an interruption

The payment required for the IDV shall be calculated by multiplying the IDV by the MAV Delivery charge specified in the Rate M4 Rate Schedule as of the last day of the Contract Year. This payment would only apply if the IDV was greater than zero.

## 7. EXPANSION FACILITIES

The Company will use commercially reasonable efforts to construct the Project to serve the Site. The target date for completion of these facilities is [Date]. The Company will provide written Notice to Customer when such facilities are complete and placed into service.

The Company and Customer agree that the Company shall not be obligated to construct any portion of the Project between December 15 of any year and March 31 of the subsequent calendar year.

## 8. AID AMOUNT PAYMENT SCHEDULE

Customer will be required to pay to the Company the Aid Amount of \$0.00.

Any applicable taxes will be applied to all amounts paid under this Section. Customer warrants and represents that no payment to be made by Customer under this Contract is subject to any withholding tax.

## 9. CREDIT REQUIREMENTS DURING INITIAL TERM

In accordance with Section 5.04 of the General Terms and Conditions, the Company may, at any time during the Initial Term, request financial assurances to cover the potential financial exposure to the Company to the end of the Initial Term. Such financial assurances shall be determined by the Company in a commercially reasonable manner. Failure to provide such financial assurances shall be treated in a manner provided for in Section 5.04 of the General Terms and Conditions.

Customer shall provide financial assurances acceptable to the Company by no later than June 1, 2023.

**10. CONTRACT SUCCESSION**

This Contract, unless terminated pursuant to Section 2 hereof, replaces all previous Gas Distribution Contracts between the parties, subject to settlement of any surviving obligations.

IN WITNESS WHEREOF this Contract has been duly executed by the parties hereto as of the date first written above. If an Agent on behalf of Customer executes this Contract then, if requested by the Company, Agent or Customer shall at any time provide a copy of such authorization to the Company.

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Authorized Signatory  
**Customer**

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Authorized Signatory  
**Enbridge Gas Inc.**

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Please Print Name

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Please Print Name

Contract ID	
Contract Name	

**M7 Contract**

This GAS DISTRIBUTION CONTRACT (“**Contract**”), made as of the [REDACTED] day of [REDACTED], 20[REDACTED].

BETWEEN:

Enbridge Gas Inc.

hereinafter called "**the Company**"

- and -

Customer Name

hereinafter called "**Customer**"

**WHEREAS**, the Company has built, or proposes to build, certain facilities for the Panhandle Regional Expansion Project (the “**Project**”) to increase the capacity of its natural gas pipeline system. In connection with the Project, the Company will be required to construct distribution facilities (the “**Expansion Facilities**”) to serve the Customer’s facilities at [REDACTED] (the “**Site**”);

**AND WHEREAS**, Customer has requested from the Company and the Company has agreed to provide Customer with Services as specified in Schedule 1 (the “**Services**”);

**AND WHEREAS**, if Customer has elected direct purchase services, Customer will be responsible for supplying Gas to the Company under a separate Contract called the Southern Bundled T;

**AND WHEREAS**, the Company will distribute Gas to Customer’s Point(s) of Consumption under this Contract identified in Schedule 1;

**IN CONSIDERATION** of the mutual covenants contained herein, and other good and valuable consideration, the receipt of and sufficiency of which is hereby acknowledged, the parties agree as follows:

**1. INCORPORATIONS**

The following are hereby incorporated in and form part of this Contract:

- a) Contract Parameters as contained in Schedule 1 as amended from time to time; and
- b) The latest posted version of the Company’s general terms and conditions applicable to Union Rate Zones (“**General Terms and Conditions**”) subject to Section 12.18 of the General Terms and Conditions; and
- c) Rate M7 Schedule as amended from time to time and as approved by the Ontario Energy Board.



## 2. CONDITIONS PRECEDENT

2.01 The obligations of the Company to provide Services hereunder are subject to the following conditions precedent that are for the sole benefit of the Company and which may be waived or extended, in whole or in part:

- a) The Company shall have obtained, in form and substance satisfactory to the Company, and all conditions shall have been satisfied under all governmental, regulatory and other third party approvals, consents, orders and authorizations in relation to the Project and Expansion Facilities that are required to:
  - i. provide the Services; and
  - ii. construct the Project and Expansion Facilities; and
- b) The Company shall have obtained all internal approvals that are necessary or appropriate to:
  - i. provide the Services; and
  - ii. construct the Project and Expansion Facilities; and
- c) The Company shall have completed and placed into Service the Project and Expansion Facilities; and
- d) Financial assurances acceptable to the Company shall be supplied and maintained in accordance with the General Terms and Conditions and Section 10 of this Agreement; and
- e) The Company shall have received a contribution in aid of construction to the Company of \$0.00 (the “**Aid Amount**”) from Customer pursuant to Customer’s obligations herein; and
- f) If Customer has elected direct purchase services, Customer and the Company shall have executed and maintained in good standing a Southern Bundled T.

The Company shall use commercially reasonable efforts to satisfy and fulfill the conditions precedent specified in Sections a), c), d), e), and f). The Company shall notify Customer forthwith in writing of the Company’s satisfaction or waiver of each condition precedent. If the Company concludes that it will not be able to satisfy a condition precedent, the Company may, upon written Notice to Customer, terminate this Contract and upon giving such Notice, this Contract shall be of no further force and effect and each of the parties shall be released from all further obligations hereunder, subject to Customer’s obligations pursuant to Section 11 herein.

2.02 The obligations of the Customer hereunder are subject to the following condition precedent that is for the sole benefit of the Customer and which may be waived by Customer:

- a) Customer shall have received all required financing necessary, on or before November 1, 2022, to ensure the Customer’s ability to construct new facilities at the Site and honour the provisions of this Contract.

Customer shall use commercially reasonable efforts to satisfy and fulfill the condition precedent specified in Section 2.02 a). Customer shall notify the Company forthwith in writing of the Customer's satisfaction or waiver of such condition precedent. If Customer concludes that it will not be able to satisfy or waive such condition precedent on or before the date specified, it may, upon written Notice to the Company no later than November 1, 2022, terminate this Contract and upon giving such Notice, this Contract shall be of no further force and effect and each of the parties shall be released from all further obligations hereunder.

2.03 Should this Contract be terminated by virtue of this Section 2, Customer and the Company shall remain bound by any pre-existing Gas Distribution Contract(s) between Customer and the Company.

### 3. CONTRACT TERM

This Contract shall be effective from the date hereof. However, the Services and the Company's obligation to provide the Services under Section 4 shall commence on the later of (such later date being the "Day of First Delivery") (a) [Date], and (b) the date that the last condition precedent as set out in Section 2 is satisfied or waived by the Company. Subject to the provisions hereof, this Contract shall continue in full force and effect for a period of xx Contract Years (the "Initial Term") and continuing thereafter on a year to year basis unless written Notice to terminate is provided by one party to the other at least three (3) Months prior to the end of the then-current term.

"Contract Year" means a period of twelve (12) consecutive Months, beginning on [redacted] of any year and ending on the subsequent [redacted], except for the first Contract Year which shall begin on the Day of First Delivery and end on the subsequent [redacted].

### 4. SERVICES PROVIDED

The Company agrees to provide Services as specified in Schedule 1 and Customer agrees to pay for such Services pursuant to these Contract terms and conditions as set out in this Contract, the referenced attachments, and the rate(s) referenced in Schedule 1.

To be eligible for services under the Rate M7 Rate Schedule, Customer must have a combined Firm, Interruptible and Seasonal Daily Contracted Demand greater than sixty thousand (60,000) m<sup>3</sup>. If the Customer does not maintain this level of consumption during the current Contract Year or is not expected to maintain this level of consumption then, notwithstanding any other remedy available to the Company under this Contract or any other term of this Contract, effective the following Contract Year, the Customer may no longer qualify for service under the Rate M7 Rate Schedule and may be placed on an alternate service by the Company.

If a Customer has elected direct purchase services, and if the Company does not receive Gas from Customer under the Southern Bundled T, then the Company's obligations to provide Services under this Contract may, at the Company's option, be suspended or terminated by the Company. This suspension or termination will be effective as of the date specified in the Company's Notice to Customer, notwithstanding the General Terms and Conditions.

**5. FIRM DAILY CONTRACT DEMAND**

The Firm Contract Demand (“CD”) is as specified in Schedule 1.

**5.01 CD INCREASES DURING CONTRACT YEAR**

The first day in each Contract Year that the Customer overruns its CD (“**First Occurrence**”) shall be recorded. “**Overrun**” shall have the meaning given that term in the M7 Rate Schedule. The second day in each Contract Year that the customer overruns its CD (“**Second Occurrence**”), shall result in an increase in the Customer’s CD to the higher quantity used on the First Occurrence or the Second Occurrence effective as of the 1<sup>st</sup> day of the month of this Second Occurrence, at the Company’s sole discretion. Customer charges will reflect the increased CD.

**5.02 SUBSEQUENT CD INCREASES DURING CONTRACT YEAR**

After the CD has been increased and anytime thereafter that it has been increased pursuant to Section 5.01, the next day that Customer overruns the increased CD within the Contract Year shall be deemed to be a new First Occurrence for the purposes of Section 5.01, and the next time thereafter that Customer overruns the CD within the Contract Term shall be deemed to be a new Second Occurrence for the purposes of Section 5.01, resulting in another increase in the CD as per the procedure set out in Section 5.01. For greater clarity, every time the CD is increased in a Contract Year, the occurrence number is set back to zero and thereafter if two more occurrences happen, the CD will be raised again, and so on for the remainder of the Contract Year. At the beginning of each Contract Year any outstanding First Occurrences will be set back to zero.

**6. MINIMUM ANNUAL VOLUME**

**6.01 FIRM MINIMUM ANNUAL VOLUME**

In each Contract Year, the Customer shall consume or, in any event, pay for the Adjusted Firm Minimum Annual Volume (“AFMAV”) as determined in the formula below.

The firm quantity not consumed in any Contract Year (the “**Firm Deficiency Volume**” or “FDV”) shall be as determined in the formula below.

$$AFMAV = FMAV \times [(U - D_F) / U]$$

$$FDV = AFMAV - (FV - F)$$

Where:

**FMAV** = Firm Minimum Annual Volume (as identified in Schedule 1)

**U** = number of days in the Contract Year

**D<sub>F</sub>** = number of days of Force Majeure in the Contract Year

**FV** = total firm volume taken in the Contract Year

**F** = volumes delivered to the Points of Consumption during Force Majeure

The payment required for the FDV shall be calculated by multiplying FDV by the Monthly Firm Delivery Commodity Charge specified in the Rate M7 Rate Schedule as of the last day of the Contract Year. This payment would only apply if the FDV was greater than zero.

## 6.02 INTERRUPTIBLE MINIMUM ANNUAL VOLUME

In each Contract Year, the Customer shall consume or, in any event, pay for the Adjusted Interruptible Minimum Annual Volume (“AIMAV”) as determined in the formula below.

The interruptible quantity not consumed in any Contract Year (the “Interruptible Deficiency Volume”) (“IDV”) shall be determined in the formula below.

$$\text{AIMAV} = \text{IMAV} \times [(U - D_i) / U]$$

$$\text{IDV} = \text{AIMAV} - (\text{IV} - \text{I})$$

Where:

<b>IMAV</b>	=	Interruptible Minimum Annual Volume (as identified in Schedule 1)
<b>U</b>	=	number of days in the Contract Year
<b>D<sub>i</sub></b>	=	number of days of interruption in the Contract Year
<b>IV</b>	=	total interruptible volume taken in the Contract Year
<b>I</b>	=	volume delivered to point of consumption during an interruption

The payment required for the IDV shall be calculated by multiplying IDV by the Monthly Interruptible Delivery Commodity Charge as of the last day of the Contract Year. This payment would only apply if the IDV was greater than zero.

## 7. EXPANSION FACILITIES

The Company will use commercially reasonable efforts to construct the Project and Expansion Facilities to serve the Site. The target date for completion of these facilities is [Date]. The Company will provide written Notice to Customer when such facilities are complete and placed into service.

The Company and Customer agree that the Company shall not be obligated to construct any portion of the Expansion Facilities between December 15 of any year and March 31 of the subsequent calendar year.

## 8. AID AMOUNT PAYMENT SCHEDULE

Customer will be required to pay to the Company the Aid Amount of \$ [ ] by [Date].

Any applicable taxes will be applied to all amounts paid under this Section. Customer warrants and represents that no payment to be made by Customer under this Contract is subject to any withholding tax.

**[NTD:If there are multiple years, then a payment table should be used:]**

Year	Payment	Due Date

**9. LATE PAYMENT CHARGES**

Any amounts due and payable by Customer to the Company arising under Section 8 and 11 of this Contract shall, if not paid by the due date thereof, be subject to late payment charges equal to 1.5% per month (for a nominal rate of 18% per annum compounded monthly) on any unpaid balance including previous arrears.

**10. CREDIT REQUIREMENTS DURING INITIAL TERM**

In addition to the terms of Section 5.04 of the General Terms and Conditions, the Company may, at any time during the Initial Term, request financial assurances to cover the potential financial exposure to the Company to the end of the Initial Term. Such financial assurances shall be determined by the Company in a commercially reasonable manner and may include, without limitation, expected return on capital invested. Failure to provide such financial assurances shall be treated in a manner provided for in Section 5.04 of the General Terms and Conditions. Customer shall provide financial assurances acceptable to the Company by no later than November 1, 2022.

**11. TERMINATION PRIOR TO COMPLETION OF EXPANSION FACILITIES**

The Company shall have the right to terminate this Contract at any time prior to the Day of First Delivery, pursuant to Section 2, by giving written notice hereof, subject to the terms hereof.

If this Contract is terminated by the Company as outlined above, then:

- (a) Upon such termination, this Contract shall be of no further force and effect and each of the parties shall be released from all further obligations hereunder, provided that any rights or remedies that a party may have for breaches of this Contract prior to such termination and any liability that a party may have incurred prior to such termination, and the parties’ obligations under this Section 11, shall not thereby be released;
- (b) Customer shall reimburse the Company for all Project Costs; and
- (c) Customer shall reimburse the Company for all cancellation costs, fees or other amounts paid under contracts entered into by the Company to support the satisfaction of the conditions precedent set out in Section 2 (“Cancellation Costs”).

The Company may invoice amounts under this Section from time to time, with the expectation that there will be an invoice rendered within 30 days of termination, and subsequent invoices as additional amounts payable hereunder are incurred from time to time. After delivery of such

Notice of termination by the Company, the Company will use commercially reasonable efforts to cease incurring Project Costs and to mitigate Cancellation Costs upon such termination. In no event shall the Company invoice Customer for any Cancellation Costs or Project Costs not previously invoiced by the Company after 12 months from the termination date. Without limiting the foregoing, Customer shall have the right to audit at Customer's expense the costs claimed for reimbursement by the Company for a period of six (6) months after each invoice is issued.

**"Project Costs"** means any and all reasonable costs (including litigation costs, cancellation costs, carrying costs, and third party claims) expenses, losses, demands, damages, obligations, or other liabilities (whether of a capital or operating nature, and whether incurred or suffered before or after the date of this Contract) of the Company (including amounts paid to affiliates in accordance with the Affiliate Relationship Code as established by the Ontario Energy Board) in connection with or in respect of development and construction of the Expansion Facilities (including without limitation the construction and placing into service of the Expansion Facilities, the obtaining of all governmental, regulatory, and other third party approvals, and the obtaining of rights of way) except for costs that have arisen from the gross negligence, fraud, or willful misconduct of the Company.

## 12. CONTRACT SUCCESSION

This Contract, unless terminated pursuant to Section 2 hereof, replaces all previous Gas Distribution Contracts between the parties, subject to settlement of any surviving obligations.

IN WITNESS WHEREOF this Contract has been duly executed by the parties hereto as of the date first written above. If an Agent on behalf of Customer executes this Contract then, if requested by the Company, Agent or Customer shall at any time provide a copy of such authorization to the Company.

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Authorized Signatory  
**Customer**

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Authorized Signatory  
**Enbridge Gas Inc.**

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Please Print Name

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Please Print Name

Contract ID	
Contract Name	

**M7 Contract**

This GAS DISTRIBUTION CONTRACT (“**Contract**”), made as of the [REDACTED] day of [REDACTED], 20[REDACTED].

BETWEEN:

Enbridge Gas Inc.

hereinafter called "**the Company**"

- and -

Customer Name

hereinafter called "**Customer**"

**WHEREAS**, the Company has built, or proposes to build, certain facilities for the Panhandle Regional Expansion Project (the “**Project**”) to increase the capacity of its natural gas pipeline system. In connection with the Project, the Company will be required to construct distribution facilities (the “**Expansion Facilities**”) to serve the Customer’s facilities at [REDACTED] (the “**Site**”);

**AND WHEREAS**, Customer has requested from the Company and the Company has agreed to provide Customer with Services as specified in Schedule 1 (the “**Services**”);

**AND WHEREAS**, if Customer has elected direct purchase services, Customer will be responsible for supplying Gas to the Company under a separate Contract called the Southern Bundled T;

**AND WHEREAS**, the Company will distribute Gas to Customer’s Point(s) of Consumption under this Contract identified in Schedule 1;

**IN CONSIDERATION** of the mutual covenants contained herein, and other good and valuable consideration, the receipt of and sufficiency of which is hereby acknowledged, the parties agree as follows:

**1. INCORPORATIONS**

The following are hereby incorporated in and form part of this Contract:

- a) Contract Parameters as contained in Schedule 1 as amended from time to time; and
- b) The latest posted version of the Company’s general terms and conditions applicable to Union Rate Zones (“**General Terms and Conditions**”) subject to Section 12.18 of the General Terms and Conditions; and
- c) Rate M7 Schedule as amended from time to time and as approved by the Ontario Energy Board.

## 2. CONDITIONS PRECEDENT

2.01 The obligations of the Company to provide Services hereunder are subject to the following conditions precedent that are for the sole benefit of the Company and which may be waived or extended, in whole or in part, in the manner provided in this Contract:

- a) The Company shall have obtained, in form and substance satisfactory to the Company, and all conditions shall have been satisfied under all governmental, regulatory and other third party approvals, consents, orders and authorizations, that are required to:
  - i. provide the Services; and
  - ii. construct the Project and Expansion Facilities; and
- b) The Company shall have obtained all internal approvals that are necessary or appropriate to:
  - i. provide the Services; and
  - ii. construct the Project and Expansion Facilities; and
- c) The Company shall have completed and placed into Service the Project and Expansion Facilities; and
- d) The Company shall have received a contribution in aid of construction to the Company of \$0.00 (the “**Aid Amount**”) from Customer pursuant to Customer’s obligations herein; and
- e) If Customer has elected direct purchase services, Customer and the Company shall have executed and maintained in good standing a Southern Bundled T.

The Company shall use commercially reasonable efforts to satisfy and fulfill the conditions precedent specified in Sections 2.01 a), c), d) and e). The Company shall notify Customer forthwith in writing of the Company’s satisfaction or waiver of each condition precedent for the Company’s benefit. If Company concludes that it will not be able to satisfy or waive a condition precedent, it may, upon written Notice, terminate this Contract and upon giving such Notice, this Contract shall be of no further force and effect and each of the parties shall be released from all further obligations hereunder.

2.02 The obligations of the Customer hereunder are subject to the following condition precedent that is for the sole benefit of the Customer and which may be waived by Customer:

- a) Customer shall have received all required financing necessary, on or before November 1, 2022, to ensure the Customer’s ability to construct new facilities at the Site and honour the provisions of this Contract.

Customer shall use commercially reasonable efforts to satisfy and fulfill the condition precedent specified in Section 2.02 a). Customer shall notify the Company forthwith in writing of the Customer’s satisfaction or waiver of such condition precedent. If Customer concludes that it will not be able to satisfy or waive such condition precedent on or before the date specified, it may, upon written Notice to the Company no later than November 1, 2022, terminate this Contract and



upon giving such Notice, this Contract shall be of no further force and effect and each of the parties shall be released from all further obligations hereunder.

2.03 Should this Contract be terminated by virtue of this Section 2, Customer and the Company shall remain bound by any pre-existing Gas Distribution Contract(s) between Customer and the Company.

### 3. CONTRACT TERM

This Contract shall be effective from the date hereof. However, the Services and the Company's obligation to provide the Services under Section 4 shall commence on the later of (such later date being the "**Day of First Delivery**") (a) [Date], and (b) the date that the last condition precedent as set out in Section 2 is satisfied or waived by the Company. Subject to the provisions hereof, this Contract shall continue in full force and effect for a period of xx Contract Years (the "**Initial Term**") and continuing thereafter on a year to year basis unless written Notice to terminate is provided by one party to the other at least three (3) Months prior to the end of the then-current term.

"**Contract Year**" means a period of twelve (12) consecutive Months, beginning on [redacted] of any year and ending on the subsequent [redacted], except for the first Contract Year which shall begin on the Day of First Delivery and end on the subsequent [redacted].

### 4. SERVICES PROVIDED

The Company agrees to provide Services as specified in Schedule 1 and Customer agrees to pay for such Services pursuant to these Contract terms and conditions as set out in this Contract, the referenced attachments, and the rate(s) referenced in Schedule 1.

To be eligible for services under the Rate M7 Rate Schedule, Customer must have a combined Firm, Interruptible and Seasonal Daily Contracted Demand greater than sixty thousand (60,000) m<sup>3</sup>. If the Customer does not maintain this level of consumption during the current Contract Year or is not expected to maintain this level of consumption then, notwithstanding any other remedy available to the Company under this Contract or any other term of this Contract, effective the following Contract Year, the Customer may no longer qualify for service under the Rate M7 Rate Schedule and may be placed on an alternate service by the Company.

If a Customer has elected direct purchase services, and if the Company does not receive Gas from Customer under the Southern Bundled T, then the Company's obligations to provide Services under this Contract may, at the Company's option, be suspended or terminated by the Company. This suspension or termination will be effective as of the date specified in the Company's Notice to Customer, notwithstanding the General Terms and Conditions.

### 5. FIRM DAILY CONTRACT DEMAND

The Firm Contract Demand ("CD") is as specified in Schedule 1.

#### 5.01 CD INCREASES DURING CONTRACT YEAR

The first day in each Contract Year that the Customer overruns its CD (“**First Occurrence**”) shall be recorded. “**Overrun**” shall have the meaning given that term in the M7 Rate Schedule. The second day in each Contract Year that the customer overruns its CD (“**Second Occurrence**”), shall result in an increase in the Customer’s CD to the higher quantity used on the First Occurrence or the Second Occurrence effective as of the 1<sup>st</sup> day of the month of this Second Occurrence, at the Company’s sole discretion. Customer charges will reflect the increased CD.

**5.02 SUBSEQUENT CD INCREASES DURING CONTRACT YEAR**

After the CD has been increased and anytime thereafter that it has been increased pursuant to Section 5.01, the next day that Customer overruns the increased CD within the Contract Year shall be deemed to be a new First Occurrence for the purposes of Section 5.01, and the next time thereafter that Customer overruns the CD within the Contract Term shall be deemed to be a new Second Occurrence for the purposes of Section 5.01, resulting in another increase in the CD as per the procedure set out in Section 5.01. For greater clarity, every time the CD is increased in a Contract Year, the occurrence number is set back to zero and thereafter if two more occurrences happen, the CD will be raised again, and so on for the remainder of the Contract Year. At the beginning of each Contract Year any outstanding First Occurrences will be set back to zero.

**6. MINIMUM ANNUAL VOLUME**

**6.01 FIRM MINIMUM ANNUAL VOLUME**

In each Contract Year, the Customer shall consume or, in any event, pay for the Adjusted Firm Minimum Annual Volume (“**AFMAV**”) as determined in the formula below.

The firm quantity not consumed in any Contract Year (the "**Firm Deficiency Volume**" or “**FDV**”) shall be as determined in the formula below.

$$AFMAV = FMAV \times [(U - D_F) / U]$$

$$FDV = AFMAV - (FV - F)$$

Where:

**FMAV** = Firm Minimum Annual Volume (as identified in Schedule 1)

**U** = number of days in the Contract Year

**D<sub>F</sub>** = number of days of Force Majeure in the Contract Year

**FV** = total firm volume taken in the Contract Year

**F** = volumes delivered to the Points of Consumption during Force Majeure

The payment required for the FDV shall be calculated by multiplying FDV by the Monthly Firm Delivery Commodity Charge specified in the Rate M7 Rate Schedule as of the last day of the Contract Year. This payment would only apply if the FDV was greater than zero.

## 6.02 INTERRUPTIBLE MINIMUM ANNUAL VOLUME

In each Contract Year, the Customer shall consume or, in any event, pay for the Adjusted Interruptible Minimum Annual Volume (“AIMAV”) as determined in the formula below.

The interruptible quantity not consumed in any Contract Year (the “Interruptible Deficiency Volume”) (“IDV”) shall be determined in the formula below.

$$\text{AIMAV} = \text{IMAV} \times [(U - D_i) / U]$$

$$\text{IDV} = \text{AIMAV} - (\text{IV} - \text{I})$$

Where:

<b>IMAV</b>	=	Interruptible Minimum Annual Volume (as identified in Schedule 1)
<b>U</b>	=	number of days in the Contract Year
<b>D<sub>i</sub></b>	=	number of days of interruption in the Contract Year
<b>IV</b>	=	total interruptible volume taken in the Contract Year
<b>I</b>	=	volume delivered to point of consumption during an interruption

The payment required for the IDV shall be calculated by multiplying IDV by the Monthly Interruptible Delivery Commodity Charge as of the last day of the Contract Year. This payment would only apply if the IDV was greater than zero.

## 7. EXPANSION FACILITIES

The Company will use commercially reasonable efforts to construct the Project and Expansion Facilities to serve the Site. The target date for completion of these facilities is [Date]. The Company will provide written Notice to Customer when such facilities are complete and placed into service.

The Company and Customer agree that the Company shall not be obligated to construct any portion of the Expansion Facilities between December 15 of any year and March 31 of the subsequent calendar year.

## 8. AID AMOUNT PAYMENT SCHEDULE

Customer will be required to pay to the Company the Aid Amount of \$ [redacted] by [Date].

Any applicable taxes will be applied to all amounts paid under this Section. Customer warrants and represents that no payment to be made by Customer under this Contract is subject to any withholding tax.

[NTD:If there are multiple years, then a payment table should be used:]

Year	Payment	Due Date

**9. LATE PAYMENT CHARGES**

Any amounts due and payable by Customer to the Company arising under Section 8 of this Contract shall, if not paid by the due date thereof, be subject to late payment charges equal to 1.5% per month (for a nominal rate of 18% per annum compounded monthly) on any unpaid balance including previous arrears.

**10. CREDIT REQUIREMENTS DURING INITIAL TERM**

In accordance with Section 5.04 of the General Terms and Conditions, the Company may, at any time during the Initial Term, request financial assurances to cover the potential financial exposure to the Company to the end of the Initial Term. Such financial assurances shall be determined by the Company in a commercially reasonable manner. Failure to provide such financial assurances shall be treated in a manner provided for in Section 5.04 of the General Terms and Conditions.

Customer shall provide financial assurances acceptable to the Company by no later than June 1, 2023.

**11. CONTRACT SUCCESSION**

This Contract, unless terminated pursuant to Section 2 hereof, replaces all previous Gas Distribution Contracts between the parties, subject to settlement of any surviving obligations.

IN WITNESS WHEREOF this Contract has been duly executed by the parties hereto as of the date first written above. If an Agent on behalf of Customer executes this Contract then, if requested by the Company, Agent or Customer shall at any time provide a copy of such authorization to the Company.

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Authorized Signatory  
**Customer**

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Authorized Signatory  
**Enbridge Gas Inc.**

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Please Print Name

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Please Print Name

Contract ID	
Contract Name	

**M7 Contract**

This GAS DISTRIBUTION CONTRACT (“**Contract**”), made as of the [REDACTED] day of [REDACTED], 20[REDACTED].

BETWEEN:

Enbridge Gas Inc.

hereinafter called "**the Company**"

- and -

Customer Name

hereinafter called "**Customer**"

**WHEREAS**, the Company has built, or proposes to build, certain facilities for the Panhandle Regional Expansion Project (the “**Project**”) to increase the capacity of its natural gas pipeline system to serve the Customer’s facilities at [REDACTED] (the “**Site**”);

**AND WHEREAS**, Customer has requested from the Company and the Company has agreed to provide Customer with Services as specified in Schedule 1 (the “**Services**”);

**AND WHEREAS**, if Customer has elected direct purchase services, Customer will be responsible for supplying Gas to the Company under a separate Contract called the Southern Bundled T;

**AND WHEREAS**, the Company will distribute Gas to Customer’s Point(s) of Consumption under this Contract identified in Schedule 1;

**IN CONSIDERATION** of the mutual covenants contained herein, and other good and valuable consideration, the receipt of and sufficiency of which is hereby acknowledged, the parties agree as follows:

**1. INCORPORATIONS**

The following are hereby incorporated in and form part of this Contract:

- a) Contract Parameters as contained in Schedule 1 as amended from time to time; and
- b) The latest posted version of the Company’s general terms and conditions applicable to Union Rate Zones (“**General Terms and Conditions**”) subject to Section 12.18 of the General Terms and Conditions; and
- c) Rate M7 Schedule as amended from time to time and as approved by the Ontario Energy Board.

## 2. CONDITIONS PRECEDENT

2.01 The obligations of the Company to provide Services hereunder are subject to the following conditions precedent that are for the sole benefit of the Company and which may be waived or extended, in whole or in part, in the manner provided in this Contract:

- a) The Company shall have obtained, in form and substance satisfactory to the Company, and all conditions shall have been satisfied under all governmental, regulatory and other third party approvals, consents, orders and authorizations, that are required to:
  - i. provide the Services; and
  - ii. construct the Project; and
- b) The Company shall have obtained all internal approvals that are necessary or appropriate to:
  - i. provide the Services; and
  - ii. construct the Project; and
- c) The Company shall have completed and placed into Service the Project; and
- d) If Customer has elected direct purchase services, Customer and the Company shall have executed and maintained in good standing a Southern Bundled T.

The Company shall use commercially reasonable efforts to satisfy and fulfill the conditions precedent specified in Sections 2.01 a), c) and d). The Company shall notify Customer forthwith in writing of the Company's satisfaction or waiver of each condition precedent for the Company's benefit. If Company concludes that it will not be able to satisfy or waive a condition precedent, it may, upon written Notice, terminate this Contract and upon giving such Notice, this Contract shall be of no further force and effect and each of the parties shall be released from all further obligations hereunder.

2.02 The obligations of the Customer hereunder are subject to the following condition precedent that is for the sole benefit of the Customer and which may be waived by Customer:

- a) Customer shall have received all required financing necessary, on or before November 1, 2022, to ensure the Customer's ability to construct new facilities at the Site and honour the provisions of this Contract.

Customer shall use commercially reasonable efforts to satisfy and fulfill the condition precedent specified in Section 2.02 a). Customer shall notify the Company forthwith in writing of the Customer's satisfaction or waiver of such condition precedent. If Customer concludes that it will not be able to satisfy or waive such condition precedent on or before the date specified, it may, upon written Notice to the Company no later than November 1, 2022, terminate this Contract and upon giving such Notice, this Contract shall be of no further force and effect and each of the parties shall be released from all further obligations hereunder.

2.03 Should this Contract be terminated by virtue of this Section 2, Customer and the Company shall remain bound by any pre-existing Gas Distribution Contract(s) between Customer and the Company.

### 3. CONTRACT TERM

This Contract shall be effective from the date hereof. However, the Services and the Company's obligation to provide the Services under Section 4 shall commence on the later of (such later date being the "**Day of First Delivery**") (a) [Date], and (b) the date that the last condition precedent as set out in Section 2 is satisfied or waived by the Company. Subject to the provisions hereof, this Contract shall continue in full force and effect for a period of **five (5)** Contract Years (the "**Initial Term**") and continuing thereafter on a year to year basis unless written Notice to terminate is provided by one party to the other at least three (3) Months prior to the end of the then-current term.

"**Contract Year**" means a period of twelve (12) consecutive Months, beginning on [redacted] of any year and ending on the subsequent [redacted], except for the first Contract Year which shall begin on the Day of First Delivery and end on the subsequent [redacted].

### 4. SERVICES PROVIDED

The Company agrees to provide Services as specified in Schedule 1 and Customer agrees to pay for such Services pursuant to these Contract terms and conditions as set out in this Contract, the referenced attachments, and the rate(s) referenced in Schedule 1.

To be eligible for services under the Rate M7 Rate Schedule, Customer must have a combined Firm, Interruptible and Seasonal Daily Contracted Demand greater than sixty thousand (60,000) m<sup>3</sup>. If the Customer does not maintain this level of consumption during the current Contract Year or is not expected to maintain this level of consumption then, notwithstanding any other remedy available to the Company under this Contract or any other term of this Contract, effective the following Contract Year, the Customer may no longer qualify for service under the Rate M7 Rate Schedule and may be placed on an alternate service by the Company.

If a Customer has elected direct purchase services, and if the Company does not receive Gas from Customer under the Southern Bundled T, then the Company's obligations to provide Services under this Contract may, at the Company's option, be suspended or terminated by the Company. This suspension or termination will be effective as of the date specified in the Company's Notice to Customer, notwithstanding the General Terms and Conditions.

### 5. FIRM DAILY CONTRACT DEMAND

The Firm Contract Demand ("**CD**") is as specified in Schedule 1.

#### 5.01 CD INCREASES DURING CONTRACT YEAR

The first day in each Contract Year that the Customer overruns its CD ("**First Occurrence**") shall be recorded. "**Overrun**" shall have the meaning given that term in the M7 Rate Schedule. The second day in each Contract Year that the customer overruns its CD ("**Second Occurrence**"), shall result in an increase in the Customer's CD to the higher quantity used on the First Occurrence or

the Second Occurrence effective as of the 1<sup>st</sup> day of the month of this Second Occurrence, at the Company's sole discretion. Customer charges will reflect the increased CD.

**5.02 SUBSEQUENT CD INCREASES DURING CONTRACT YEAR**

After the CD has been increased and anytime thereafter that it has been increased pursuant to Section 5.01, the next day that Customer overruns the increased CD within the Contract Year shall be deemed to be a new First Occurrence for the purposes of Section 5.01, and the next time thereafter that Customer overruns the CD within the Contract Term shall be deemed to be a new Second Occurrence for the purposes of Section 5.01, resulting in another increase in the CD as per the procedure set out in Section 5.01. For greater clarity, every time the CD is increased in a Contract Year, the occurrence number is set back to zero and thereafter if two more occurrences happen, the CD will be raised again, and so on for the remainder of the Contract Year. At the beginning of each Contract Year any outstanding First Occurrences will be set back to zero.

**6. MINIMUM ANNUAL VOLUME**

**6.01 FIRM MINIMUM ANNUAL VOLUME**

In each Contract Year, the Customer shall consume or, in any event, pay for the Adjusted Firm Minimum Annual Volume (“AFMAV”) as determined in the formula below.

The firm quantity not consumed in any Contract Year (the "**Firm Deficiency Volume**" or “FDV”) shall be as determined in the formula below.

$$AFMAV = FMAV \times [(U - D_F) / U]$$

$$FDV = AFMAV - (FV - F)$$

Where:

**FMAV** = Firm Minimum Annual Volume (as identified in Schedule 1)

**U** = number of days in the Contract Year

**D<sub>F</sub>** = number of days of Force Majeure in the Contract Year

**FV** = total firm volume taken in the Contract Year

**F** = volumes delivered to the Points of Consumption during Force Majeure

The payment required for the FDV shall be calculated by multiplying FDV by the Monthly Firm Delivery Commodity Charge specified in the Rate M7 Rate Schedule as of the last day of the Contract Year. This payment would only apply if the FDV was greater than zero.

**6.02 INTERRUPTIBLE MINIMUM ANNUAL VOLUME**

In each Contract Year, the Customer shall consume or, in any event, pay for the Adjusted Interruptible Minimum Annual Volume (“AIMAV”) as determined in the formula below.



The interruptible quantity not consumed in any Contract Year (the "**Interruptible Deficiency Volume**") ( "**IDV**") shall be determined in the formula below.

$$\text{AIMAV} = \text{IMAV} \times [(U - D_i) / U]$$

$$\text{IDV} = \text{AIMAV} - (\text{IV} - \text{I})$$

Where:

<b>IMAV</b>	=	Interruptible Minimum Annual Volume (as identified in Schedule 1)
<b>U</b>	=	number of days in the Contract Year
<b>D<sub>i</sub></b>	=	number of days of interruption in the Contract Year
<b>IV</b>	=	total interruptible volume taken in the Contract Year
<b>I</b>	=	volume delivered to point of consumption during an interruption

The payment required for the IDV shall be calculated by multiplying IDV by the Monthly Interruptible Delivery Commodity Charge as of the last day of the Contract Year. This payment would only apply if the IDV was greater than zero.

## **7. EXPANSION FACILITIES**

The Company will use commercially reasonable efforts to construct the Project to serve the Site. The target date for completion of these facilities is [Date]. The Company will provide written Notice to Customer when such facilities are complete and placed into service.

The Company and Customer agree that the Company shall not be obligated to construct any portion of the Project between December 15 of any year and March 31 of the subsequent calendar year.

## **8. AID AMOUNT PAYMENT SCHEDULE**

Customer will be required to pay to the Company the Aid Amount of \$0.00.

Any applicable taxes will be applied to all amounts paid under this Section. Customer warrants and represents that no payment to be made by Customer under this Contract is subject to any withholding tax.

## **9. CREDIT REQUIREMENTS DURING INITIAL TERM**

In accordance with Section 5.04 of the General Terms and Conditions, the Company may, at any time during the Initial Term, request financial assurances to cover the potential financial exposure to the Company to the end of the Initial Term. Such financial assurances shall be determined by the Company in a commercially reasonable manner. Failure to provide such financial assurances shall be treated in a manner provided for in Section 5.04 of the General Terms and Conditions.

Customer shall provide financial assurances acceptable to the Company by no later than June 1, 2023.

**10. CONTRACT SUCCESSION**

This Contract, unless terminated pursuant to Section 2 hereof, replaces all previous Gas Distribution Contracts between the parties, subject to settlement of any surviving obligations.

IN WITNESS WHEREOF this Contract has been duly executed by the parties hereto as of the date first written above. If an Agent on behalf of Customer executes this Contract then, if requested by the Company, Agent or Customer shall at any time provide a copy of such authorization to the Company.

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Authorized Signatory  
**Customer**

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Authorized Signatory  
**Enbridge Gas Inc.**

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Please Print Name

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Please Print Name

Contract ID	<Field1>
Contract Name	<Field2>

## T2 CONTRACT

This GAS STORAGE AND DISTRIBUTION CONTRACT (“Contract”), made as of the <Field4> day of <Field5>, <Field6>

BETWEEN:

Enbridge Gas Inc.

hereinafter called "the Company"

- and -

<Field7>

hereinafter called "Customer"

**WHEREAS**, the Company has built, or proposes to build, certain facilities for the Panhandle Regional Expansion Project (the “**Project**”) to increase the capacity of its natural gas pipeline system. In connection with the Project, the Company will be required to construct distribution facilities (the “**Expansion Facilities**”) to serve the Customer’s facilities at [REDACTED] (the “**Site**”);

**WHEREAS**, Customer has requested the Company and the Company has agreed to provide Customer Services;

**AND WHEREAS**, the Company will deliver Customer owned Gas to Customer’s Point(s) of Consumption or Storage under this Contract pursuant to the T2 Rate Schedule;

**IN CONSIDERATION** of the mutual covenants contained herein, and other good and valuable consideration, the receipt of and sufficiency of which is hereby acknowledged, the parties agree as follows:

### **1 INCORPORATIONS**

The following are hereby incorporated in and form part of this Contract:

- a) Contract Parameters contained in Schedule 1 – DCQ, Storage and Distribution Services Parameters, and Schedule 1a – Supplemental Services Parameters as amended from time to time; and
- b) The latest posted version of the T2 Contract Terms and Conditions contained in Schedule 2 subject to Section 12.18 of the Company’s general terms and conditions applicable to Union Rate Zones (“General Terms and Conditions”); and

- c) The latest posted version of the General Terms and Conditions subject to Section 12.18 of the General Terms and Conditions; and
- d) The applicable T2 Rate Schedule as amended from time to time and as approved by the Ontario Energy Board.

For the purposes of this Contract, “Point(s) of Receipt” shall mean those points identified in Schedule 1 where the Company may receive Gas from Customer.

## 2 CONDITIONS PRECEDENT

2.01 The obligations of the Company to provide Services hereunder are subject to the following conditions precedent that are for the sole benefit of the Company and which may be waived or extended, in whole or in part:

- a) The Company shall have obtained, in form and substance satisfactory to the Company, and all conditions shall have been satisfied under all governmental, regulatory and other third party approvals, consents, orders and authorizations in relation to the Project and Expansion Facilities that are required to:
  - i. provide the Services; and
  - ii. construct the Project and Expansion Facilities; and
- b) The Company shall have obtained all internal approvals that are necessary or appropriate to:
  - i. provide the Services; and
  - ii. construct the Project and Expansion Facilities; and
- c) The Company shall have completed and placed into Service the Project and Expansion Facilities; and
- d) Financial assurances acceptable to the Company shall be supplied and maintained in accordance with the General Terms and Conditions and Section 10 of this Agreement; and
- e) The Company shall have received a contribution in aid of construction to the Company of \$0.00 (the “**Aid Amount**”) from Customer pursuant to Customer’s obligations herein; and
- f) If Customer has elected direct purchase services, Customer and the Company shall have executed and maintained in good standing a Southern Bundled T.

The Company shall use commercially reasonable efforts to satisfy and fulfill the conditions precedent specified in Sections a), c), and f). The Company shall notify Customer forthwith in writing of the Company’s satisfaction or waiver of each condition precedent. If the Company concludes that it will not be able to satisfy a condition precedent, the Company may, upon written Notice to Customer, terminate this Contract and upon giving such Notice, this Contract shall be of no further force and effect and each of the parties shall be released from all further obligations hereunder, subject to Customer’s obligations pursuant to Section 11 herein.

2.02 The obligations of the Customer hereunder are subject to the following condition precedent that is for the sole benefit of the Customer and which may be waived by Customer:

a) Customer shall have received all required financing necessary, on or before November 1, 2022, to ensure the Customer's ability to construct new facilities at the Site and honour the provisions of this Contract.

Customer shall use commercially reasonable efforts to satisfy and fulfill the condition precedent specified in Section 2.02 a). Customer shall notify the Company forthwith in writing of the Customer's satisfaction or waiver of such condition precedent. If Customer concludes that it will not be able to satisfy or waive such condition precedent on or before the date specified, it may, upon written Notice to the Company no later than November 1, 2022, terminate this Contract and upon giving such Notice, this Contract shall be of no further force and effect and each of the parties shall be released from all further obligations hereunder.

2.03 Should this Contract be terminated by virtue of this Section 2, Customer and the Company shall remain bound by any pre-existing Gas Distribution Contract(s) between Customer and the Company.

### **3 CONTRACT TERM**

This Contract shall be effective from the date hereof. However, the Services and the Company's obligation to provide the Services under Section 4 shall commence on the later of (such later date being the "**Day of First Delivery**") (a) \_\_\_\_\_, and (b) the date that the last condition precedent as set out in Section 2.01 is satisfied or waived by the Company. Subject to the provisions hereof, this Contract shall continue in full force and effect for a period of XX Contract Years (the "**Initial Term**") and continuing thereafter on a year to year basis unless written Notice to terminate is provided by one party to the other at least three (3) Months prior to the end of the then-current term.

"**Contract Year**" means a period of twelve (12) consecutive Months, beginning on \_\_\_\_\_ of any year and ending on the subsequent \_\_\_\_\_, except for the first Contract Year which shall begin on the Day of First Delivery and end on the subsequent \_\_\_\_\_.

### **4 SERVICES PROVIDED**

The Company agrees to provide Storage Services and Distribution Services as specified in Schedule 1 and Schedule 1a.

## **5 FIRM DAILY CONTRACT DEMAND**

The Firm Contract Demand (“CD”) is as specified in Schedule 1.

### **5.01 CD INCREASES DURING CONTRACT YEAR**

The first day in each Contract Year that the Customer overruns its CD (“**First Occurrence**”) shall be recorded. “**Overrun**” shall have the meaning given that term in the T2 Rate Schedule. The second day in each Contract Year that the customer overruns its CD (“**Second Occurrence**”), shall result in an increase in the Customer’s CD to the higher quantity used on the First Occurrence or the Second Occurrence effective as of the 1<sup>st</sup> day of the month of this Second Occurrence, at the Company’s sole discretion. Customer charges will reflect the increased CD.

### **5.02 SUBSEQUENT CD INCREASES DURING CONTRACT YEAR**

After the CD has been increased and anytime thereafter that it has been increased pursuant to Section 5.01, the next day that Customer overruns the increased CD within the Contract Year shall be deemed to be a new First Occurrence for the purposes of Section 5.01, and the next time thereafter that Customer overruns the CD within the Contract Term shall be deemed to be a new Second Occurrence for the purposes of Section 5.01, resulting in another increase in the CD as per the procedure set out in Section 5.01. For greater clarity, every time the CD is increased in a Contract Year, the occurrence number is set back to zero and thereafter if two more occurrences happen, the CD will be raised again, and so on for the remainder of the Contract Year. At the beginning of each Contract Year any outstanding First Occurrences will be set back to zero.

## **6 RATES FOR SERVICE**

Customer agrees to pay for Services herein pursuant to the terms and conditions of the following:

- a) The T2 Rate Schedule as amended from time to time by the Ontario Energy Board; and
- b) This Contract and the incorporations hereto.

## **7. EXPANSION FACILITIES**

The Company will use commercially reasonable efforts to construct the Project and Expansion Facilities to serve the Site. The target date for completion of these facilities is [Date]. The Company will provide written Notice to Customer when such facilities are complete and placed into service.

The Company and Customer agree that the Company shall not be obligated to construct any portion of the Project and Expansion Facilities between December 15 of any year and March 31 of the subsequent calendar year.

## **8 AID AMOUNT PAYMENT SCHEDULE**

Customer will be required to pay to the Company the Aid Amount of \$0.00 by [DATE].

Any applicable taxes will be applied to all amounts paid under this Section. Customer warrants and represents that no payment to be made by Customer under this Contract is subject to any withholding tax.

**9 LATE PAYMENT CHARGES**

Any amounts due and payable by Customer to the Company arising under Sections 8 and 11 of this Contract shall, if not paid by the due date thereof, be subject to late payment charges equal to 1.5% per month (for a nominal rate of 18% per annum compounded monthly) on any unpaid balance including previous arrears.

**10 CREDIT REQUIREMENTS DURING INITIAL TERM**

In addition to the terms of Section 5.04 of the General Terms and Conditions, the Company may, at any time during the Initial Term, request financial assurances to cover the potential financial exposure to the Company to the end of the Initial Term. Such financial assurances shall be determined by the Company in a commercially reasonable manner and may include, without limitation, expected return on capital invested. Failure to provide such financial assurances shall be treated in a manner provided for in Section 5.04 of the General Terms and Conditions. Customer shall provide financial assurances acceptable to the Company by no later than November 1, 2022.

**11 TERMINATION PRIOR TO COMPLETION OF EXPANSION FACILITIES**

The Company shall have the right to terminate this Contract at any time prior to the Day of First Delivery, pursuant to Section 2, by giving written notice hereof, subject to the terms hereof.

If this Contract is terminated by the Company as outlined above, then:

(a) Upon such termination, this Contract shall be of no further force and effect and each of the parties shall be released from all further obligations hereunder, provided that any rights or remedies that a party may have for breaches of this Contract prior to such termination and any liability that a party may have incurred prior to such termination, and the parties' obligations under this Section 11, shall not thereby be released;

(b) Customer shall reimburse the Company for all Project Costs; and

(c) Customer shall reimburse the Company for all cancellation costs, fees or other amounts paid under contracts entered into by the Company to support the satisfaction of the conditions precedent set out in Section 2 ("**Cancellation Costs**").

The Company may invoice amounts under this Section from time to time, with the expectation that there will be an invoice rendered within 30 days of termination, and subsequent invoices as additional amounts payable hereunder are incurred from time to time. After delivery of such Notice of termination by the Company, the Company will use commercially reasonable efforts to cease incurring Project Costs and to mitigate Cancellation Costs upon such termination. In no event shall the Company invoice Customer for any Cancellation Costs or Project Costs not previously invoiced by the Company after 12 months from the termination date. Without limiting

the foregoing, Customer shall have the right to audit at Customer's expense the costs claimed for reimbursement by the Company for a period of six (6) months after each invoice is issued.

**"Project Costs"** means any and all reasonable costs (including litigation costs, cancellation costs, carrying costs, and third party claims) expenses, losses, demands, damages, obligations, or other liabilities (whether of a capital or operating nature, and whether incurred or suffered before or after the date of this Contract) of the Company (including amounts paid to affiliates in accordance with the Affiliate Relationship Code as established by the Ontario Energy Board) in connection with or in respect of development and construction of the Expansion Facilities (including without limitation the construction and placing into service of the Expansion Facilities, the obtaining of all governmental, regulatory, and other third party approvals, and the obtaining of rights of way) except for costs that have arisen from the gross negligence, fraud, or willful misconduct of the Company.

**12 AGENCY**

If an agent on behalf of the Customer executes this Contract then, if requested by the Company, the agent shall at any time provide a copy of such authorization to the Company.

Notwithstanding the provisions of Section 10, the agent shall be responsible for providing security arrangements acceptable to the Company in accordance with the General Terms and Conditions.

The agent and Customer acknowledge and agree that they are unconditionally and irrevocably jointly and severally liable for all Customer obligations under the Contract.

**13 CONTRACT SUCCESSION**

This Contract, unless terminated pursuant to Section 2 hereof, replaces all previous Gas Distribution Contracts between the parties, subject to settlement of any surviving obligations.

The undersigned execute this Contract as of the above date. If an Agent on behalf of Customer executes this Contract then, if requested by the Company, Agent or Customer shall at any time provide a copy of such authorization to the Company.

Enbridge Gas Inc.

\_\_\_\_\_  
Authorized Signatory

\_\_\_\_\_  
Please Print Name

CUSTOMER

\_\_\_\_\_  
Authorized Signatory

\_\_\_\_\_  
Please Print Name



Contract ID	<Field1>
Contract Name	<Field2>

## T2 CONTRACT

This GAS STORAGE AND DISTRIBUTION CONTRACT (“Contract”), made as of the <Field4> day of <Field5>, <Field6>

BETWEEN:

Enbridge Gas Inc.

hereinafter called "the Company"

- and -

<Field7>

hereinafter called "Customer"

**WHEREAS**, the Company has built, or proposes to build, certain facilities for the Panhandle Regional Expansion Project (the “**Project**”) to increase the capacity of its natural gas pipeline system. In connection with the Project, the Company will be required to construct distribution facilities (the “**Expansion Facilities**”) to serve the Customer’s facilities at [REDACTED] (the “**Site**”);

**WHEREAS**, Customer has requested the Company and the Company has agreed to provide Customer Services;

**AND WHEREAS**, the Company will deliver Customer owned Gas to Customer’s Point(s) of Consumption or Storage under this Contract pursuant to the T2 Rate Schedule;

**IN CONSIDERATION** of the mutual covenants contained herein, and other good and valuable consideration, the receipt of and sufficiency of which is hereby acknowledged, the parties agree as follows:

### **1 INCORPORATIONS**

The following are hereby incorporated in and form part of this Contract:

- a) Contract Parameters contained in Schedule 1 – DCQ, Storage and Distribution Services Parameters, and Schedule 1a – Supplemental Services Parameters as amended from time to time; and
- b) The latest posted version of the T2 Contract Terms and Conditions contained in Schedule 2 subject to Section 12.18 of the Company’s general terms and conditions applicable to Union Rate Zones (“General Terms and Conditions”); and

- c) The latest posted version of the General Terms and Conditions subject to Section 12.18 of the General Terms and Conditions; and
- d) The applicable T2 Rate Schedule as amended from time to time and as approved by the Ontario Energy Board.

For the purposes of this Contract, “Point(s) of Receipt” shall mean those points identified in Schedule 1 where the Company may receive Gas from Customer.

## 2 CONDITIONS PRECEDENT

2.01 The obligations of the Company to provide Services hereunder are subject to the following conditions precedent that are for the sole benefit of the Company and which may be waived or extended, in whole or in part, in the manner provided in this Contract:

- a) The Company shall have obtained, in form and substance satisfactory to the Company, and all conditions shall have been satisfied under all governmental, regulatory and other third party approvals, consents, orders and authorizations, that are required to:
  - i. provide the Services; and
  - ii. construct the Project and Expansion Facilities; and
- b) The Company shall have obtained all internal approvals that are necessary or appropriate to:
  - i. provide the Services; and
  - ii. construct the Project and Expansion Facilities; and
- c) The Company shall have completed and placed into Service the Project and Expansion Facilities; and
- d) The Company shall have received a contribution in aid of construction to the Company of \$0.00 (the “**Aid Amount**”) from Customer pursuant to Customer’s obligations herein; and
- e) If Customer has elected direct purchase services, Customer and the Company shall have executed and maintained in good standing a Southern Bundled T.

The Company shall use commercially reasonable efforts to satisfy and fulfill the conditions precedent specified in Sections 2.01 a), c), and e). The Company shall notify Customer forthwith in writing of the Company’s satisfaction or waiver of each condition precedent for the Company’s benefit. If Company concludes that it will not be able to satisfy or waive a condition precedent, it may, upon written Notice, terminate this Contract and upon giving such Notice, this Contract shall be of no further force and effect and each of the parties shall be released from all further obligations hereunder.

2.02 The obligations of the Customer hereunder are subject to the following condition precedent that is for the sole benefit of the Customer and which may be waived by Customer:

a) Customer shall have received all required financing necessary, on or before November 1, 2022, to ensure the Customer's ability to construct new facilities at the Site and honour the provisions of this Contract.

Customer shall use commercially reasonable efforts to satisfy and fulfill the condition precedent specified in Section 2.02 a). Customer shall notify the Company forthwith in writing of the Customer's satisfaction or waiver of such condition precedent. If Customer concludes that it will not be able to satisfy or waive such condition precedent on or before the date specified, it may, upon written Notice to the Company no later than November 1, 2022, terminate this Contract and upon giving such Notice, this Contract shall be of no further force and effect and each of the parties shall be released from all further obligations hereunder.

2.03 Should this Contract be terminated by virtue of this Section 2, Customer and the Company shall remain bound by any pre-existing Gas Distribution Contract(s) between Customer and the Company.

### **3 CONTRACT TERM**

This Contract shall be effective from the date hereof. However, the Services and the Company's obligation to provide the Services under Section 4 shall commence on the later of (such later date being the "**Day of First Delivery**") (a) \_\_\_\_\_, and (b) the date that the last condition precedent as set out in Section 2.01 is satisfied or waived by the Company. Subject to the provisions hereof, this Contract shall continue in full force and effect for a period of XX Contract Years (the "**Initial Term**") and continuing thereafter on a year to year basis unless written Notice to terminate is provided by one party to the other at least three (3) Months prior to the end of the then-current term.

"**Contract Year**" means a period of twelve (12) consecutive Months, beginning on \_\_\_\_\_ of any year and ending on the subsequent \_\_\_\_\_, except for the first Contract Year which shall begin on the Day of First Delivery and end on the subsequent \_\_\_\_\_.

### **4 SERVICES PROVIDED**

The Company agrees to provide Storage Services and Distribution Services as specified in Schedule 1 and Schedule 1a.

### **5 FIRM DAILY CONTRACT DEMAND**

The Firm Contract Demand ("**CD**") is as specified in Schedule 1.

#### **5.01 CD INCREASES DURING CONTRACT YEAR**

The first day in each Contract Year that the Customer overruns its CD ("**First Occurrence**") shall be recorded. "**Overrun**" shall have the meaning given that term in the T2 Rate Schedule. The second day in each Contract Year that the customer overruns its CD ("**Second**

**Occurrence**”), shall result in an increase in the Customer’s CD to the higher quantity used on the First Occurrence or the Second Occurrence effective as of the 1<sup>st</sup> day of the month of this Second Occurrence, at the Company’s sole discretion. Customer charges will reflect the increased CD.

## **5.02 SUBSEQUENT CD INCREASES DURING CONTRACT YEAR**

After the CD has been increased and anytime thereafter that it has been increased pursuant to Section 5.01, the next day that Customer overruns the increased CD within the Contract Year shall be deemed to be a new First Occurrence for the purposes of Section 5.01, and the next time thereafter that Customer overruns the CD within the Contract Term shall be deemed to be a new Second Occurrence for the purposes of Section 5.01, resulting in another increase in the CD as per the procedure set out in Section 5.01. For greater clarity, every time the CD is increased in a Contract Year, the occurrence number is set back to zero and thereafter if two more occurrences happen, the CD will be raised again, and so on for the remainder of the Contract Year. At the beginning of each Contract Year any outstanding First Occurrences will be set back to zero.

## **6 RATES FOR SERVICE**

Customer agrees to pay for Services herein pursuant to the terms and conditions of the following:

- a) The T2 Rate Schedule as amended from time to time by the Ontario Energy Board; and
- b) This Contract and the incorporations hereto.

## **7. EXPANSION FACILITIES**

The Company will use commercially reasonable efforts to construct the Project and Expansion Facilities to serve the Site. The target date for completion of these facilities is [Date]. The Company will provide written Notice to Customer when such facilities are complete and placed into service.

The Company and Customer agree that the Company shall not be obligated to construct any portion of the Project and Expansion Facilities between December 15 of any year and March 31 of the subsequent calendar year.

## **8 AID AMOUNT PAYMENT SCHEDULE**

Customer will be required to pay to the Company the Aid Amount of \$0.00 by [DATE].

Any applicable taxes will be applied to all amounts paid under this Section. Customer warrants and represents that no payment to be made by Customer under this Contract is subject to any withholding tax.

**9 LATE PAYMENT CHARGES**

Any amounts due and payable by Customer to the Company arising under Section 8 of this Contract shall, if not paid by the due date thereof, be subject to late payment charges equal to 1.5% per month (for a nominal rate of 18% per annum compounded monthly) on any unpaid balance including previous arrears.

**10 CREDIT REQUIREMENTS DURING INITIAL TERM**

In accordance with Section 5.04 of the General Terms and Conditions, the Company may, at any time during the Initial Term, request financial assurances to cover the potential financial exposure to the Company to the end of the Initial Term. Such financial assurances shall be determined by the Company in a commercially reasonable manner. Failure to provide such financial assurances shall be treated in a manner provided for in Section 5.04 of the General Terms and Conditions.

Customer shall provide financial assurances acceptable to the Company by no later than June 1, 2023.

**11 AGENCY**

If an agent on behalf of the Customer executes this Contract then, if requested by the Company, the agent shall at any time provide a copy of such authorization to the Company.

Notwithstanding the provisions of Section 10, the agent shall be responsible for providing security arrangements acceptable to the Company in accordance with the General Terms and Conditions.

The agent and Customer acknowledge and agree that they are unconditionally and irrevocably jointly and severally liable for all Customer obligations under the Contract.

**12 CONTRACT SUCCESSION**

This Contract, unless terminated pursuant to Section 2 hereof, replaces all previous Gas Distribution Contracts between the parties, subject to settlement of any surviving obligations.

The undersigned execute this Contract as of the above date. If an Agent on behalf of Customer executes this Contract then, if requested by the Company, Agent or Customer shall at any time provide a copy of such authorization to the Company.

Enbridge Gas Inc.

\_\_\_\_\_  
Authorized Signatory

\_\_\_\_\_  
Please Print Name

CUSTOMER

\_\_\_\_\_

Authorized Signatory

---

Please Print Name

DRAFT

Contract ID	<Field1>
Contract Name	<Field2>

## T2 CONTRACT

This GAS STORAGE AND DISTRIBUTION CONTRACT (“Contract”), made as of the <Field4> day of <Field5>, <Field6>

BETWEEN:

Enbridge Gas Inc.

hereinafter called "the Company"

- and -

<Field7>

hereinafter called "Customer"

**WHEREAS**, the Company has built, or proposes to build, certain facilities for the Panhandle Regional Expansion Project (the “**Project**”) to increase the capacity of its natural gas pipeline system to serve the Customer’s facilities at [REDACTED] (the “**Site**”);

**WHEREAS**, Customer has requested the Company and the Company has agreed to provide Customer Services;

**AND WHEREAS**, the Company will deliver Customer owned Gas to Customer’s Point(s) of Consumption or Storage under this Contract pursuant to the T2 Rate Schedule;

**IN CONSIDERATION** of the mutual covenants contained herein, and other good and valuable consideration, the receipt of and sufficiency of which is hereby acknowledged, the parties agree as follows:

### **1 INCORPORATIONS**

The following are hereby incorporated in and form part of this Contract:

- a) Contract Parameters contained in Schedule 1 – DCQ, Storage and Distribution Services Parameters, and Schedule 1a – Supplemental Services Parameters as amended from time to time; and
- b) The latest posted version of the T2 Contract Terms and Conditions contained in Schedule 2 subject to Section 12.18 of the Company’s general terms and conditions applicable to Union Rate Zones (“General Terms and Conditions”); and
- c) The latest posted version of the General Terms and Conditions subject to Section 12.18 of the General Terms and Conditions; and

- d) The applicable T2 Rate Schedule as amended from time to time and as approved by the Ontario Energy Board.

For the purposes of this Contract, “Point(s) of Receipt” shall mean those points identified in Schedule 1 where the Company may receive Gas from Customer.

## **2 CONDITIONS PRECEDENT**

2.01 The obligations of the Company to provide Services hereunder are subject to the following conditions precedent that are for the sole benefit of the Company and which may be waived or extended, in whole or in part, in the manner provided in this Contract:

- a) The Company shall have obtained, in form and substance satisfactory to the Company, and all conditions shall have been satisfied under all governmental, regulatory and other third party approvals, consents, orders and authorizations, that are required to:
  - i. provide the Services; and
  - ii. construct the Project; and
- b) The Company shall have obtained all internal approvals that are necessary or appropriate to:
  - i. provide the Services; and
  - ii. construct the Project; and
- c) The Company shall have completed and placed into Service the Project; and
- d) If Customer has elected direct purchase services, Customer and the Company shall have executed and maintained in good standing a Southern Bundled T.

The Company shall use commercially reasonable efforts to satisfy and fulfill the conditions precedent specified in Sections 2.01 a), c) and d). The Company shall notify Customer forthwith in writing of the Company’s satisfaction or waiver of each condition precedent for the Company’s benefit. If Company concludes that it will not be able to satisfy or waive a condition precedent, it may, upon written Notice, terminate this Contract and upon giving such Notice, this Contract shall be of no further force and effect and each of the parties shall be released from all further obligations hereunder.

2.02 The obligations of the Customer hereunder are subject to the following condition precedent that is for the sole benefit of the Customer and which may be waived by Customer:

- a) Customer shall have received all required financing necessary, on or before November 1, 2022, to ensure the Customer’s ability to construct new facilities at the Site and honour the provisions of this Contract.



Customer shall use commercially reasonable efforts to satisfy and fulfill the condition precedent specified in Section 2.02 a). Customer shall notify the Company forthwith in writing of the Customer's satisfaction or waiver of such condition precedent. If Customer concludes that it will not be able to satisfy or waive such condition precedent on or before the date specified, it may, upon written Notice to the Company no later than November 1, 2022, terminate this Contract and upon giving such Notice, this Contract shall be of no further force and effect and each of the parties shall be released from all further obligations hereunder.

2.03 Should this Contract be terminated by virtue of this Section 2, Customer and the Company shall remain bound by any pre-existing Gas Distribution Contract(s) between Customer and the Company.

### **3 CONTRACT TERM**

This Contract shall be effective from the date hereof. However, the Services and the Company's obligation to provide the Services under Section 4 shall commence on the later of (such later date being the "**Day of First Delivery**") (a) \_\_\_\_\_, and (b) the date that the last condition precedent as set out in Section 2.01 is satisfied or waived by the Company. Subject to the provisions hereof, this Contract shall continue in full force and effect for a period of five (5) Contract Years (the "**Initial Term**") and continuing thereafter on a year to year basis unless written Notice to terminate is provided by one party to the other at least three (3) Months prior to the end of the then-current term.

"**Contract Year**" means a period of twelve (12) consecutive Months, beginning on \_\_\_\_\_ of any year and ending on the subsequent \_\_\_\_\_, except for the first Contract Year which shall begin on the Day of First Delivery and end on the subsequent \_\_\_\_\_.

### **4 SERVICES PROVIDED**

The Company agrees to provide Storage Services and Distribution Services as specified in Schedule 1 and Schedule 1a.

### **5 FIRM DAILY CONTRACT DEMAND**

The Firm Contract Demand ("**CD**") is as specified in Schedule 1.

#### **5.01 CD INCREASES DURING CONTRACT YEAR**

The first day in each Contract Year that the Customer overruns its CD ("**First Occurrence**") shall be recorded. "**Overrun**" shall have the meaning given that term in the T2 Rate Schedule. The second day in each Contract Year that the customer overruns its CD ("**Second Occurrence**"), shall result in an increase in the Customer's CD to the higher quantity used on the First Occurrence or the Second Occurrence effective as of the 1<sup>st</sup> day of the month of this Second Occurrence, at the Company's sole discretion. Customer charges will reflect the increased CD.

## **5.02 SUBSEQUENT CD INCREASES DURING CONTRACT YEAR**

After the CD has been increased and anytime thereafter that it has been increased pursuant to Section 5.01, the next day that Customer overruns the increased CD within the Contract Year shall be deemed to be a new First Occurrence for the purposes of Section 5.01, and the next time thereafter that Customer overruns the CD within the Contract Term shall be deemed to be a new Second Occurrence for the purposes of Section 5.01, resulting in another increase in the CD as per the procedure set out in Section 5.01. For greater clarity, every time the CD is increased in a Contract Year, the occurrence number is set back to zero and thereafter if two more occurrences happen, the CD will be raised again, and so on for the remainder of the Contract Year. At the beginning of each Contract Year any outstanding First Occurrences will be set back to zero.

## **6 RATES FOR SERVICE**

Customer agrees to pay for Services herein pursuant to the terms and conditions of the following:

- a) The T2 Rate Schedule as amended from time to time by the Ontario Energy Board; and
- b) This Contract and the incorporations hereto.

## **7. EXPANSION FACILITIES**

The Company will use commercially reasonable efforts to construct the Project to serve the Site. The target date for completion of these facilities is [Date]. The Company will provide written Notice to Customer when such facilities are complete and placed into service.

The Company and Customer agree that the Company shall not be obligated to construct any portion of the Project between December 15 of any year and March 31 of the subsequent calendar year.

## **8 AID AMOUNT PAYMENT SCHEDULE**

Customer will be required to pay to the Company the Aid Amount of \$0.00 by [DATE].

Any applicable taxes will be applied to all amounts paid under this Section. Customer warrants and represents that no payment to be made by Customer under this Contract is subject to any withholding tax.

## **9 LATE PAYMENT CHARGES**

Any amounts due and payable by Customer to the Company arising under Section 8 of this Contract shall, if not paid by the due date thereof, be subject to late payment charges equal to 1.5% per month (for a nominal rate of 18% per annum compounded monthly) on any unpaid balance including previous arrears.

**10 CREDIT REQUIREMENTS DURING INITIAL TERM**

In accordance with Section 5.04 of the General Terms and Conditions, the Company may, at any time during the Initial Term, request financial assurances to cover the potential financial exposure to the Company to the end of the Initial Term. Such financial assurances shall be determined by the Company in a commercially reasonable manner. Failure to provide such financial assurances shall be treated in a manner provided for in Section 5.04 of the General Terms and Conditions.

Customer shall provide financial assurances acceptable to the Company by no later than June 1, 2023.

**11 AGENCY**

If an agent on behalf of the Customer executes this Contract then, if requested by the Company, the agent shall at any time provide a copy of such authorization to the Company.

Notwithstanding the provisions of Section 10, the agent shall be responsible for providing security arrangements acceptable to the Company in accordance with the General Terms and Conditions.

The agent and Customer acknowledge and agree that they are unconditionally and irrevocably jointly and severally liable for all Customer obligations under the Contract.

**12 CONTRACT SUCCESSION**

This Contract, unless terminated pursuant to Section 2 hereof, replaces all previous Gas Distribution Contracts between the parties, subject to settlement of any surviving obligations.

The undersigned execute this Contract as of the above date. If an Agent on behalf of Customer executes this Contract then, if requested by the Company, Agent or Customer shall at any time provide a copy of such authorization to the Company.

Enbridge Gas Inc.

\_\_\_\_\_  
Authorized Signatory

\_\_\_\_\_  
Please Print Name

CUSTOMER

\_\_\_\_\_  
Authorized Signatory

\_\_\_\_\_  
Please Print Name

<Letter Date>

<Customers Legal Name>

<Property Address>

<City>, Ontario

<Postal Code>

**Re: Commitment Letter (“CL”) for the Panhandle Regional Expansion Project (the “Project”)**

Enbridge Gas Inc. (“**Enbridge Gas**”) continues to experience strong growth in demand for natural gas service by new and existing customers in the municipalities of Chatham-Kent, Windsor, Lakeshore, Leamington, Kingsville, Essex, Amherstburg, LaSalle, and Tecumseh.

In order to meet this growing demand from our in-franchise customer markets (which include the residential, commercial, industrial and greenhouse sectors), Enbridge Gas is proposing to expand its Panhandle Transmission System and associated gas distribution facilities in the area. The proposed Project will help unlock access to abundant, affordable and clean natural gas supply.

Enbridge Gas is requesting that customers who are interested in securing natural gas service from the proposed Project demonstrate their commitment to it by executing this CL, confirming their intentions to proceed with a new or amended distribution contract.

1. <Customers Legal Name> and Enbridge Gas intend to formalize a contract for natural gas service (the “**Distribution Contract**”), which will be conditional upon, amongst other things, Enbridge Gas receiving all required internal approvals to proceed with the Project, and Enbridge Gas receiving Ontario Energy Board approval for the Project.
2. The Distribution Contract will be based on the following estimated contract parameters, conditions and understanding:
  - a. <Customers Legal Name> agrees to a minimum 5-year (maximum 20-year) distribution contract for natural gas service based on the conditions outlined in the applicable Enbridge Gas distribution contract and an in service date of the later of <Effective Date>, or the in-service date of the Project.
  - b. Natural gas service will be provided by Enbridge Gas to <Customers Legal Name> under the terms and conditions of the appropriate rate schedule(s), which are available here: <https://www.enbridgegas.com/business-industrial/commercial-industrial/large-volume-services-rates/union-south> (not including natural gas commodity related costs).

- c. Incremental firm hourly quantity of **<Incremental FHQ>** m<sup>3</sup>/hour, total firm hourly quantity of **<Total FHQ>** m<sup>3</sup>/hour, firm daily contract demand of **<Firm CD>** m<sup>3</sup>/day, and minimum annual volume of **<Total MAV>** m<sup>3</sup>.
  - d. Customer is expected to execute a new or amended distribution contract no later than **<1 year prior to requested in-service date>**.
  - e. If a new or amended distribution contract is not executed by **<1 year prior to requested in-service date>**, Customer will be required to execute a Letter of Indemnification until a new or amended distribution contract is executed.
  - f. Customer shall have received all required financing as well as any Municipal, Provincial or Federal permits necessary, on or before **<Specify Date>**, to ensure the Customer's ability to construct its expansion facilities at **<Customer Expansion Facilities Address>** and honour the provisions of this CL.
  - g. Enbridge Gas shall have received all required internal approvals.
  - h. Enbridge Gas shall have received all required regulatory approvals.
3. **<Customers Legal Name>** has reviewed, and accepts the terms and conditions of the Distribution Contract.
  4. Any additional financial contributions required from **<Customers Legal Name>** to provide natural gas service will be calculated and included in the new or amended distribution contract in the form of a contribution in aid of construction.
  5. This CL shall expire at the earlier of a) **<Expiry Date>** or b) when the CL is replaced with a signed Distribution Contract or indemnification agreement.
  6. **<Customers Legal Name>** hereby warrants that it has taken all appropriate and necessary corporate action to authorise the execution of this CL and the performance of the terms hereof represents a legally binding obligation on **<Customers Legal Name>** with the exception of paragraph 1 of this CL, which indicates the Parties' intentions.
  7. Enbridge Gas hereby warrants that it has taken all appropriate and necessary corporate action to authorise the execution of this CL and the performance of the terms hereof represents a legally binding obligation on Enbridge Gas, with the exception of paragraph 1 of this CL, which indicates the Parties' intentions.  
If you have any questions, please contact your account manager:

**<Account Manager>**

**<Phone>**

**<Email>**

If **<Customers Legal Name>** acknowledges and agrees with the foregoing, please execute below and return a copy to my attention by **<Date>**.

Yours truly,

\_\_\_\_\_  
**<Enbridge Gas Authorized Person>**

**<Title>**

Enbridge Gas Inc.

Acknowledged and accepted on behalf of **<Customers Legal Name>**

By: \_\_\_\_\_

Name: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

[Date]

[Name of Customer]

[Address]

Attention: [ ]

Dear [ ]

Re: Indemnity Letter for Enbridge Gas Inc. facilities at the [Location]

Enbridge Gas Inc. (“**the Company**”) and [Name of Customer] (“**Customer**”) have held discussions related to the provision of natural gas distribution and storage services (the “**Services**”) [NTD: text to describe the driver: for new facilities to be built by Customer / increased demand by the customer at the [Location] as of [date]]. Until a definitive natural gas distribution services agreement (“**Contract**”) is executed by the parties hereto, the Company requires a written covenant from Customer to indemnify and save harmless the Company for all of the Project Costs related to the development and construction of any new Enbridge Gas Inc. facilities (“**Expansion Facilities**”) needed to serve the new facilities.

In consideration of the Company undertaking certain development and construction activities related to the Expansion Facilities [NTD: optional clause for times when further details are needed: as further described in Appendix [ ]], and other good and valuable consideration the receipt and sufficiency of which is hereby acknowledged, Customer hereby irrevocably and unconditionally indemnifies and holds harmless the Company, and all of the Company’s affiliates, employees, officers, and directors (collectively, the “**Indemnitees**”) from all Project Costs which the Indemnitees or any of them may incur or suffer in respect of, or in connection with, or in any manner arising out of the development and construction of the Expansion Facilities. “**Project Costs**” means any and all costs, (including litigation costs, cancellation costs, carrying costs, and third party claims) expenses, losses, demands, damages, obligations, or other liabilities (whether of a capital or operating nature, and whether incurred or suffered before or after the date of this Indemnity Letter) by any of the Indemnitees (including amounts paid to affiliates for services rendered in accordance with the Affiliate Relationships Code as established by the Ontario Energy Board), in connection with or in respect of development and construction of the Expansion Facilities (including without limitation the construction and placing into service of the Expansion Facilities, the obtaining of all governmental, regulatory and other third party approvals, and the obtaining of rights of way,) whether resulting from any of the Indemnitees’ negligence or not, except for any costs that have arisen from the fraud or wilful misconduct of any of the Indemnitees.

Except to the extent of any Project Costs arising out of the Customer’s breach of contract, negligence, fraud, or wilful misconduct, Customer’s liability under this Indemnity Letter will not exceed \$ [Amount] CAD [including/excluding] taxes.

This Indemnity Letter will terminate on the earlier of (a) the date that the Contract is executed, or (b) [Expiry Date] unless extended in writing by mutual consent, provided, however, that if the termination occurs pursuant to item (b) of this Indemnity Letter, Customer shall pay to the Company for all Project Costs as herein defined. Such payment shall be within 30 days of the Company submitting an invoice for Project Costs to Customer. Interest on any amounts due hereunder will accrue at an effective monthly interest rate of 1.5%, compounded monthly, for a nominal annual interest rate of 18%. In the event of termination under item (b), the Company may invoice Customer for Project Costs, from time to time and at any time within 12 months of such termination.

This Indemnity Letter supersedes any prior agreements, understandings, negotiations, or discussions whether oral or written, between the Parties with respect to the subject matter hereof.

If Customer agrees to be bound by the foregoing, please execute below and return a copy to my attention.

Yours very truly,  
Enbridge Gas Inc.

\_\_\_\_\_  
Authorized Signatory

Customer agrees to be bound by the foregoing:  
[Name of Customer]

\_\_\_\_\_  
Authorized Signatory



ENBRIDGE GAS INC.

Answer to Interrogatory from  
Pollution Probe ("PP")

INTERROGATORY

Reference:

"In total, 44 bid forms from interested parties were received, indicating over 318 TJ/d of interest for incremental firm and interruptible demand over the 2023-2033 period."  
[B/1/1, Page 6]

Question:

- a) Please provide the breakdown of survey results by year from 2023-2033 with separate columns for incremental firm, incremental interruptible and incremental total.
- b) How many of the 44 survey respondents (by number and incremental PJ requirement) have entered into the 5 year contract commitments requested by Enbridge.

**Response**

- a) Please see the response to Exhibit I.STAFF.4 part a), Table 1.
- b) There are currently 4 executed distribution contracts that will be effective for a minimum initial term of 5 years (and continue thereafter on a year-to-year basis) for a total of 63.1 TJ/d as of the date of this filing. Enbridge Gas expects to continue executing additional contracts throughout the course of this proceeding with customers.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Pollution Probe (“PP”)

INTERROGATORY

Reference:

“Natural gas plays a critical role in meeting the energy needs of the EV, EV battery and EV battery component manufacturing sector ...’ [B/1/1 Pg. 16]

Question:

Please explain the how natural gas is used in the creation of an EV and EV battery.

**Response**

To Enbridge Gas’s knowledge, natural gas is primarily used in EV battery production in 3 ways:

- i) space heating and space conditioning of the facility;
- ii) process heating; and
- iii) to power emergency backup electricity generators.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Pollution Probe ("PP")

INTERROGATORY

Reference:

"203 TJ/d resulting from the Project will support the continued reliable and secure delivery of natural gas to the growing residential, commercial, and industrial customer segments within the Panhandle Market" [A/3/1 pg.3]

"Contract rate customer demand makes up approximately 98% of the capacity of the proposed Project." [B/1/1 Pg.7]

Question:

- a) Please explain how 98% of the project capacity is allocated to contract rate demand, and there can still be 203 TJ/d of additional unallocated future capacity left from the proposed project.
- b) Please explain how the 203 TJ/d of additional unallocated future capacity will be used until it is needed in the future to serve in-franchise customers. Also, if it is idle capacity not planned to be used, please indicate.

Response

- a) and b)  
For clarity, Enbridge Gas is forecasting that all 168 TJ/day of the additional capacity resulting from the Project will be needed to meet customer demand through Winter 2028/2029. Enbridge Gas is forecasting that contract rate customer demand will make up approximately 94% of the additional 168 TJ/day capacity created.

/U

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Pollution Probe (“PP”)

INTERROGATORY

Question:

Please provide all reports, presentations and related materials that support that Panhandle system demand will exceed capacity by 31 TJ/d beginning in Winter 2023/2024 and increasing to 192 TJ/d by Winter 2027/2028.

**Response**

The following represent the entirety of reports and related materials that the Company relied upon to determine that the Panhandle System demand would exceed capacity by 31 TJ/d in Winter 2023/2024:

- Attachment 1 to this response: Prior to the development of the Leave to Construct application, Enbridge Gas summarized Project capacity compared to demands and recommended facility timelines.
- Exhibit B, Tab 2, Schedule 1, Table 3: Displays the existing system capacity compared to forecast design day demands.
- The response to Exhibit I.PP.5 part c): Displays customer commitments and letters of indemnity.
- Exhibit B, Tab 2, Table 1: Displays the forecast design day demands.

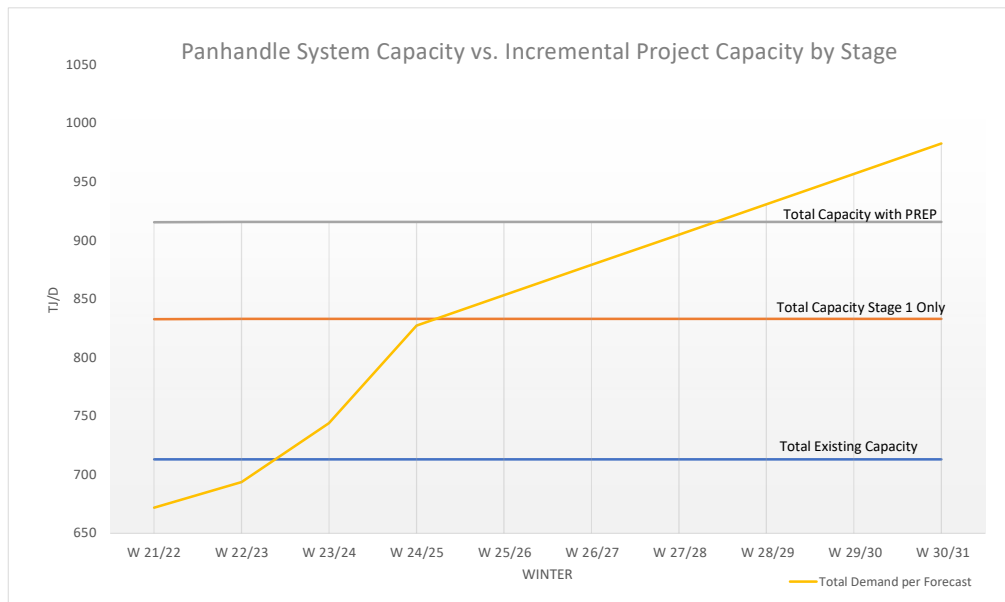
5/4/2022  
TJ/d

**PREP Timing and Staging Sensitivity**

**Impacts to Project Staging**

	W 21/22	W 22/23	W 23/24	W 24/25	W 25/26	W 26/27	W 27/28	W 28/29	W 29/30	W 30/31
<b>Total Capacity - No Build</b>	<b>713</b>	<b>713</b>	<b>713</b>	<b>713</b>	<b>713</b>	<b>713</b>	<b>713</b>	<b>713</b>	<b>713</b>	<b>713</b>
Total Demand per Forecast	672	694	744	828	854	880	906	932	958	983
Shortfall - No Build	41	19	(31)	(114)	(140)	(167)	(192)	(218)	(244)	(270)
<b>Total New Capacity Stage 1 Only</b>	<b>713</b>	<b>713</b>	<b>833</b>	<b>833</b>	<b>833</b>	<b>833</b>	<b>833</b>	<b>833</b>	<b>833</b>	<b>833</b>
Stage 1 - NPS 36 Loop Incremental Capacity	0	0	120	120	120	120	120	120	120	120
Shortfall - Stage 1 In-service Only	41	19	89	5	(21)	(47)	(73)	(98)	(124)	(150)
<b>Total New Capacity Stage 1 and 2</b>	<b>713</b>	<b>713</b>	<b>833</b>	<b>833</b>	<b>916</b>	<b>916</b>	<b>916</b>	<b>916</b>	<b>916</b>	<b>916</b>
Stage 2 - Incremental Capacity	0	0	0	0	83	83	83	83	83	83
Shortfall - Stage 1 and 2 In-service	41	19	89	5	62	36	10	(15)	(41)	(67)

Summary	
With demand presented per the forecast, the modelling shows we will need a build in 23/24. The amount of shortfall is estimated at 31 TJ/d.	
<b>Staging Impact:</b> The NPS 36 Loop would last through W24/25, Interconnect ISD W25/26 (however 5 TJ/d remaining is high risk in the event customer demands shift, recommendation is moving project forward one year to account for customer shifts). <i>PREP Phase 2 estimated for W2028 ISD</i>	



ENBRIDGE GAS INC.

Answer to Interrogatory from  
Pollution Probe ("PP")

INTERROGATORY

Question:

Please confirm that Enbridge did not conduct a 40 year demand forecast to validate the peak demand capacity that would be provided by the project options consider and the proposed project. If Enbridge did conduct that analysis, please provide a copy.

**Response**

Confirmed.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Pollution Probe (“PP”)

INTERROGATORY

Question:

Please provide a copy of the ICF market outlook report referenced in B/3/1 Page 6.

**Response**

The ICF Base Case is a commercially sensitive proprietary product with significant economic value. Consistent with past practice approved by the OEB, according to ICF, ICF is prepared to license the ICF Gas Market Outlook to any party that is willing to accept its commercial terms.

For these reasons, Enbridge Gas respectfully declines to provide the ICF Base Case as requested by Pollution Probe.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Pollution Probe ("PP")

INTERROGATORY

Reference:

"The Panhandle System Design Day weather condition is a 43.1 Heating Degree Day ("HDD"), which represents an average daily temperature of -25.1 degrees centigrade."  
[B/2/1 Pg. 4]

Question:

- a) Please indicate how many days in the past 10 years the Panhandle System Design Day weather condition of 43.1 Heating Degree Day ("HDD") occurred.
- b) For cases in the past 10 years where the Panhandle System Design Day weather condition of 43.1 Heating Degree Day ("HDD") was reached or exceeded, please indicate what additional measures were taken to ensure adequate natural gas supply.

**Response**

- a) In the past 10 years, the design day weather condition was exceeded on one instance on January 30, 2019. The system observed a 43.7 heating degree day which is higher than the 43.1 heating degree day standard used for the Panhandle System design.
- b) No additional measures were required on January 30, 2019 due to the following conditions:
  - Imports at Ojibway totaled 106 TJ/d. Of the total 106 TJ/d, 60 TJ/d was controlled by Enbridge Gas. The incremental 46 TJ/d was controlled by third parties.
  - The customer demand was less than design day estimates. Specifically, the power generators served by the Panhandle System used only 20% of their contracted capacity.



ENBRIDGE GAS INC.

Answer to Interrogatory from  
Pollution Probe (“PP”)

INTERROGATORY

Question:

Hydro One has also applied for a Leave to Construct (EB-2022-0157) to increase energy (natural gas) supply to south-western Ontario including many of the same customer needs. Please identify what coordination has been done to ensure that these independent projects are not duplicating energy supply to the same customers. If no coordination was done, please confirm.

Response

Enbridge Gas is aware of Hydro One’s Leave to Construct Application (EB-2022-0140) to construct transmission line facilities in the Chatham and Tilbury area. While both projects (Enbridge Gas and Hydro One) may supply the same customers, the need and purpose of each project are not duplicative. The need for Enbridge Gas’s proposed Project is underpinned by customer demands for natural gas specifically (as per the EOI process), which is used by agricultural customers for heating and carbon dioxide. Electricity is typically used for lighting and ventilation.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Pollution Probe (“PP”)

INTERROGATORY

Question:

- a) Please list all municipal/community energy plans (or equivalent such as energy & emission plans, etc.) were considered when planning for this project.
- b) Please provide a copy of all DSM related options and analysis conducted to serve current and incremental customers served by the Panhandle system.

Response

- a) Please see the response to Exhibit I.EP.2.
- b) The Company’s assessment of Enhanced Targeted Energy Efficiency (“ETEE”) IRP alternatives can be found at Exhibit C, Tab 1, Schedule 1, Pages 20 to 21. /U

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Pollution Probe (“PP”)

INTERROGATORY

Reference:

“Enbridge Gas identified several facility alternatives and IRPAs to meet the identified system need’. [C/1/1 Pg.5]

Question:

- a) Please provide a list of the stakeholders consulted during the facility alternative and IRPA identification and assessment.
- b) Please provide a copy of the input/comments provided by stakeholders during the facility alternative and IRPA identification and assessment. For each input/comment received, please explain how it was considered in the process.

**Response**

- a) and b)  
Facility and non-facility Project alternatives were determined to not be viable options early in the assessment process, and as a result they were not assessed further or communicated externally prior to submission of the current Project application and pre-filed evidence.

However, the Company did include general IRP information, as well as discussed Project route selection and alternative routes, during Virtual Open House sessions. No comments were received from participants from those sessions.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Pollution Probe (“PP”)

INTERROGATORY

Reference:

“Enbridge Gas has completed an alternatives assessment to determine the optimal solution to meet the identified system need” [C/1/1 Pg. 3]

Question:

Please provide a copy of all materials (e.g. reports, presentations, correspondence, etc. related to the alternatives assessment.

Response

The following represent the entirety of materials related to the Alternative Assessment:

- On September 16, 2021, Enbridge Gas completed a Request for Proposal (“RFP”) for a Firm Exchange Service. The RFP package is included at Exhibit C, Tab 1, Schedule 1. Attachment 1.
- On September 19, 2021, Enbridge Gas held a virtual meeting with members of Energy Transfer Partners to determine whether they were interested in participating in the Firm Exchange Service RFP. The meeting invitation and minutes are included in the response at Exhibit I.FRPO.7, Attachment 1.
- On October 7, 2021 Enbridge Gas received a non-binding bid for a Firm Exchange Service which is included at Attachment 1 to this response.
- As part of the alternatives assessment for non-facility alternatives Enbridge Gas engaged Posterity. Communications between Posterity are set out in the response at Exhibit I.ED.7, Attachment 6, and the Posterity IRP Analysis can be found at Exhibit C, Tab 1, Schedule 1, Attachment 2.
- On March 10, 2022, Enbridge Gas summarized Project alternatives to support a presentation made to the Company’s Capital Allocation Committee on April 4, 2022. The summary of Project alternatives can be found at Attachment 2 to this response, and the presentation made to the Capital Allocation Committee can be found at Attachment 3 to this response.

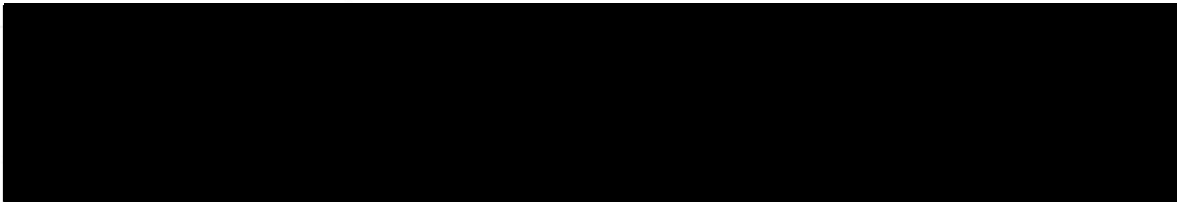
- Prior to the development of the current Leave to Construct application, Enbridge Gas refreshed the summary of Project alternatives to support decision making. That summary is set out at Attachment 4 to this response.
- The proposed Project received Enbridge Board of Director Approval in May 2022, based on the presentation materials set out at Attachment 5 to this response.
- On January 11, 2023, Enbridge Gas presented the incremental capital breakdown to the Capital Allocation Committee. The presentation can be found at Attachment 6 to this response.
- On April 12, 2023, Enbridge Gas presented the Projects updated scope and incremental capital request to the Investment Review Committee. The presentation can be found at Attachment 7 to this response.
- The proposed Project received Enbridge Board of Director Approval for incremental capital in April 2023, based on the presentation materials set out at Attachment 8 to this response.
- In June 2023, Enbridge Gas refreshed the summary of Project alternatives to support decision making. That summary is set out at Attachment 9 to this response.



**Request for Proposal Form**

**RFP - Ojibway To Dawn Firm Exchange Service With Call Option - 2023**

If you wish to participate in the Request for Proposal (RFP), please complete, sign and return this RFP Form on or before 12 p.m. ET / 11 a.m. CT on Oct. 7, 2021.



SERVICE PARAMETERS	
Please indicate if you are submitting an RFP for the "2023 Firm and Obligated Call Option Exchange Service"	WE ARE SUBMITTING A RESPONSE TO THE "OJIBWAY TO DAWN FIRM EXCHANGE SERVICE WITH CALL OPTION - 2023"
Receipt Point:	Ojibway (Enbridge Gas system)
Delivery Point:	Dawn (Facilities)
Start Date:	Nov.1, 2023
Exchange quantity:	up to 55,000 (GJ/day)
Term (years):	Minimum five (5) year initial term with four (4) year renewal right notice
Price	\$0.55 DEMAND (CAD/GJ/d)
• Total price	\$11,041,250 M PER YEAR Five (5) year term
Conditions Precedent: (If any)	PLEASE SEE ATTACHED

Enbridge Gas, at its sole discretion, reserves the right to reject any and all proposals received.

Any suggested conditions precedent proposed should be clearly articulated and attached to the RFP Form and will be considered during the RFP review. Successful bidders, if any, will be expected to enter into negotiations for a binding contract.



Instructions: Please return your completed RFP Form before the **deadline of 12 p.m. ET / 11 a.m. CT on Oct. 7, 2021** via email to:

- EnbridgeGas\_STSales@enbridge.com.

**RE: Conditions Precedent**

This proposal is for indicative purposes only and [REDACTED] reserves the right to amend, revise or cancel the proposal at any time.

In addition to the service parameters listed in the Request for Proposal Form, [REDACTED] proposal includes the following conditions:

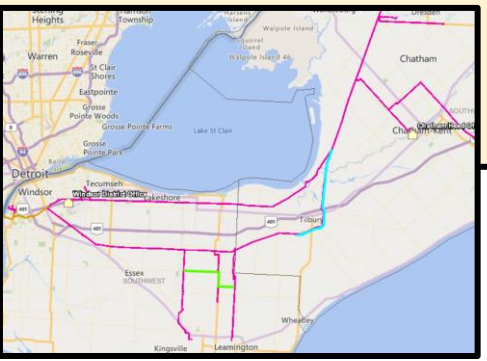
- Any service parameters including volume and pricing are subject to refresh
- This proposal is subject to [REDACTED] Management Committee approval and [REDACTED] Marketing Ventures Executive approval
- This proposal is subject to [REDACTED] Credit approval
- Exchange Quantity is subject to availability of capacity on Panhandle Eastern Pipeline Company, LP with delivery into Ojibway (currently estimated at 18,000 Dth/d)
- At any time within the term of the deal, the demand rate is subject to change due to potential toll increases on Panhandle Eastern Pipeline Company, LP
- Renewal rights to be negotiated between parties

Alternative	Pipe Size	Pipe Length	STP TJ/d	Project Timeframe	\$/TJ	Image (Expand to enlarge image)
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Filed: 2022-09-22, EB-2022-0157, Exhibit I.PP.16, Attachment 2, Page 1 of 1

**NPS 20 Loop from Dover Transmission To Richardson Sideroad  
NPS 16 Leamington Interconnect**

A <i>Recommended</i>	NPS 36	19 km	203	W2023 to W2028	1.25
B	NPS 30	19 km	195	W2023 to W2027	1.29



**Additional Alternatives under review include:**

- **Facility Options:**
  - NPS 20 Lift and Lay
  - NPS 16 Lift and Lay with tie-over to NPS 20
  
- **IRPA Options:**
  - LNG facility
  - CNG trucking deferral options, with and without reinforcement
  - Supply-side alternatives
  - ETEE studies
  - Project staging and deferral of the Leamington Interconnect



# Panhandle Regional Expansion Project

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**Capital Allocation Committee**

April 4, 2022



# Purpose of Update



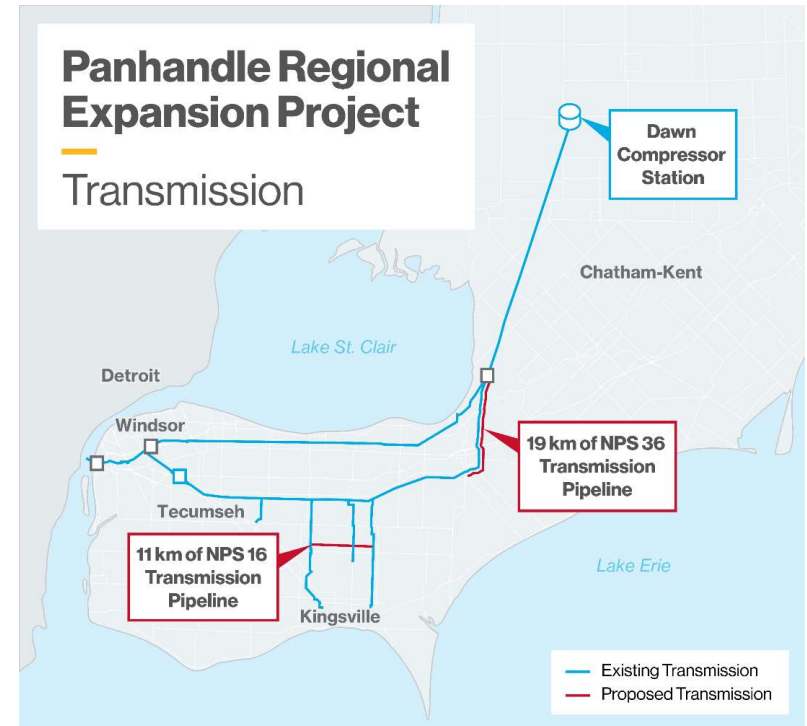
- Requesting Capital Allocation Committee approval to proceed to the IRC (Stage 3)
- Project is estimated to cost \$314 MM CAD, seeking Board of Directors approval for full funding in May 2022
- In January 2022, the Panhandle Regional Expansion Project received Capital Allocation Committee approval to proceed to capital allocation process Stage 2 and establish a full due diligence team with Corporate resources

# Background & Executive Summary



- The Panhandle Regional Expansion Project (PREP) supplies natural gas from the Dawn Hub to customers west of Dawn. The Project consists of constructing two transmission pipelines and measurement facilities at Dawn Compressor Station
  - The transmission facilities will increase the system capacity by 203 TJ/d
  - Target ISD is November 2023 and November 2024
- The project will provide Ontario greenhouse, power generator and residential customers with increased access to the diversified, reliable, and cost competitive supply at the Dawn Hub
  - Majority (97%) of the capacity created by the project will serve commercial customers
  - Similar to other regulated projects, a Leave to Construct (LTC) Application must be approved by the OEB, scheduled for February 2023
  - Customer commitment to the project is currently 67% of the total proposed project capacity and will continue to pursue additional customer commitments
- The project is estimated to cost \$314 MM with a commitment of \$68 MM for long lead materials required prior to LTC Approval
- The project is expected to receive a full cost-of-service regulated return
  - Costs will be recovered through rates from commercial agreements with contract customers and the remaining revenue requirement will be recovered from ratepayers

## Project Map

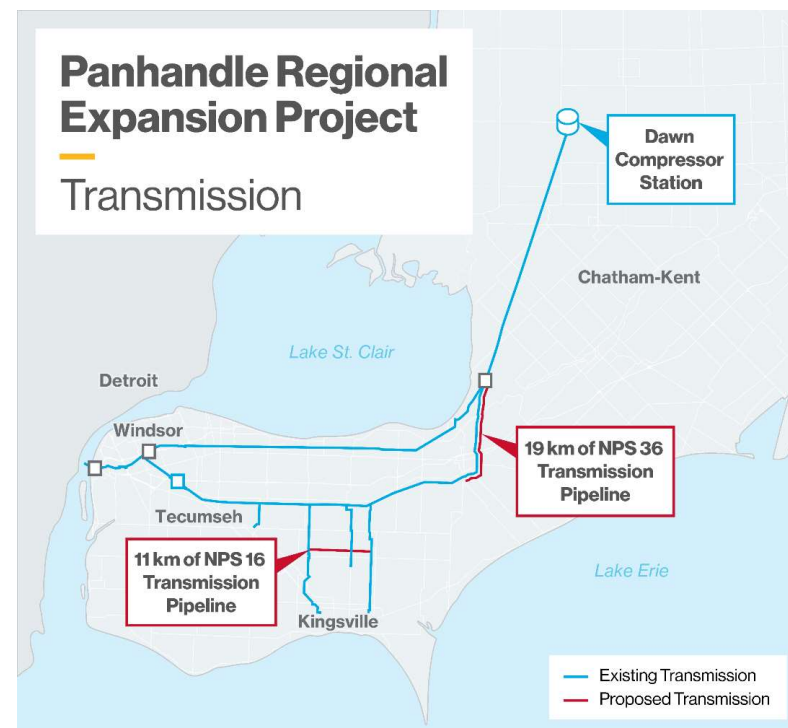


Regulated project that supports significant EGI customer growth



# Project Description

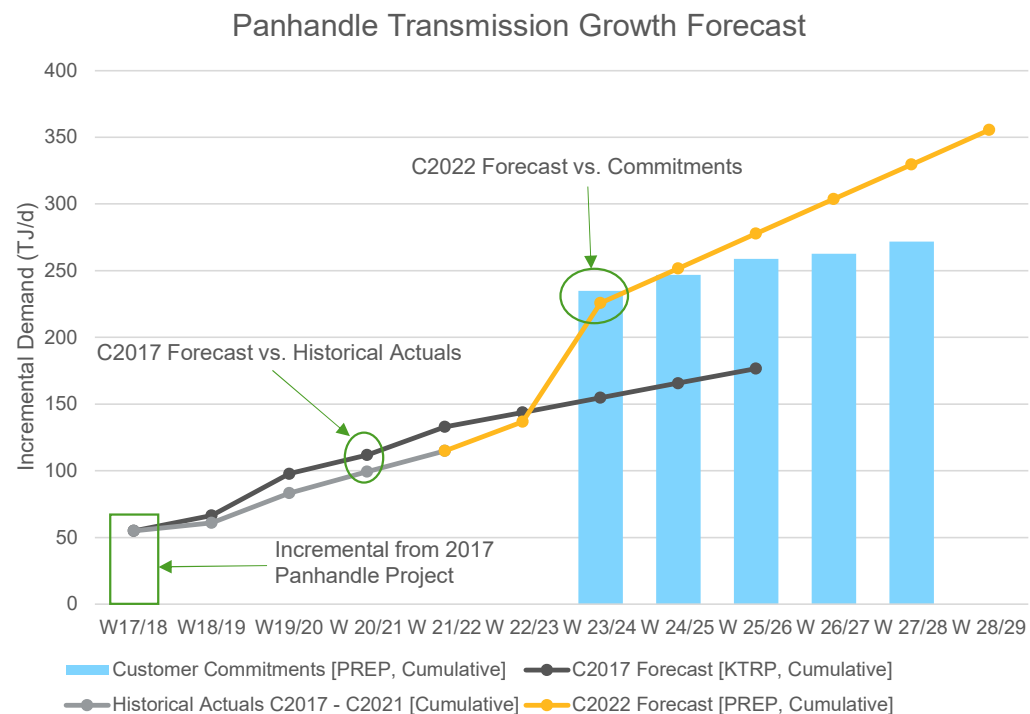
<b>Scope</b>	<ul style="list-style-type: none"> <li>• 36-inch pipeline ~19 km from Dover Station towards Comber Station</li> <li>• 16-inch pipeline ~11 km between Kingsville East Line and Leamington North Lines</li> <li>• Measurement facilities at Dawn Compressor Station</li> </ul>
<b>Capex</b>	<ul style="list-style-type: none"> <li>• \$314 MM CAD (\$260 MM direct capital including IDC plus \$54 MM in-direct overheads) (Class 3)                         <ul style="list-style-type: none"> <li>• 2023 ISD: \$246 MM (\$203 MM plus \$43 MM in-direct overheads)</li> <li>• 2024 ISD: \$68 MM (\$57 MM plus \$11 MM in-direct overheads)</li> </ul> </li> </ul>
<b>Commercial Terms</b>	<ul style="list-style-type: none"> <li>• Regulated Project – Incremental revenue resulting from increased demand and rate base to be included with 2024 Rate Rebasing and 2023 ICM</li> </ul>
<b>Key Dates</b>	<ul style="list-style-type: none"> <li>• Investment Review Committee – April 2022</li> <li>• ENB Board Request for Full Funding – May 2022</li> <li>• Ontario Energy Board (OEB) LTC Application – June 2022</li> <li>• Ontario Energy Board Approval Target – February 2023</li> <li>• In-Service Date – November 2023 (36-Inch Pipeline &amp; Measurement Facilities)</li> <li>• In-Service Date – November 2024 (16-Inch Pipeline)</li> </ul>
<b>Capacity</b>	203 TJ/d of Panhandle Transmission System Capacity
<b>Customers</b>	<p>Parties Contractually Involved</p> <ul style="list-style-type: none"> <li>• In-franchise contract customers (Greenhouse &amp; Power Generation markets) and residential demand growth</li> </ul>



# Market Fundamentals



- Demand for greenhouse grown vegetables has been continually growing over the past decade supported by consumer preference and favourable market conditions
- The Kingsville Transmission Reinforcement Project (KTRP) was placed in service in November 2019 creating 71 TJ/d of capacity. This incremental capacity was forecasted to be fully utilized by Winter 2025-26
- In February 2021, ENB held a non-binding expression of interest for customers seeking firm capacity on the Panhandle System. The results showed significant interest and informed the C2022 Forecast for PREP indicating that incremental capacity is required for Winter 2023-24
- 67% of the proposed PREP transmission capacity has been committed to by customers. This includes 58 TJ/d of contracted capacity and 78 TJ/d of executed commitment letters to support the Leave to Construct application



Incremental capacity is required for Winter 2023-24 supported by forecast and customer commitments



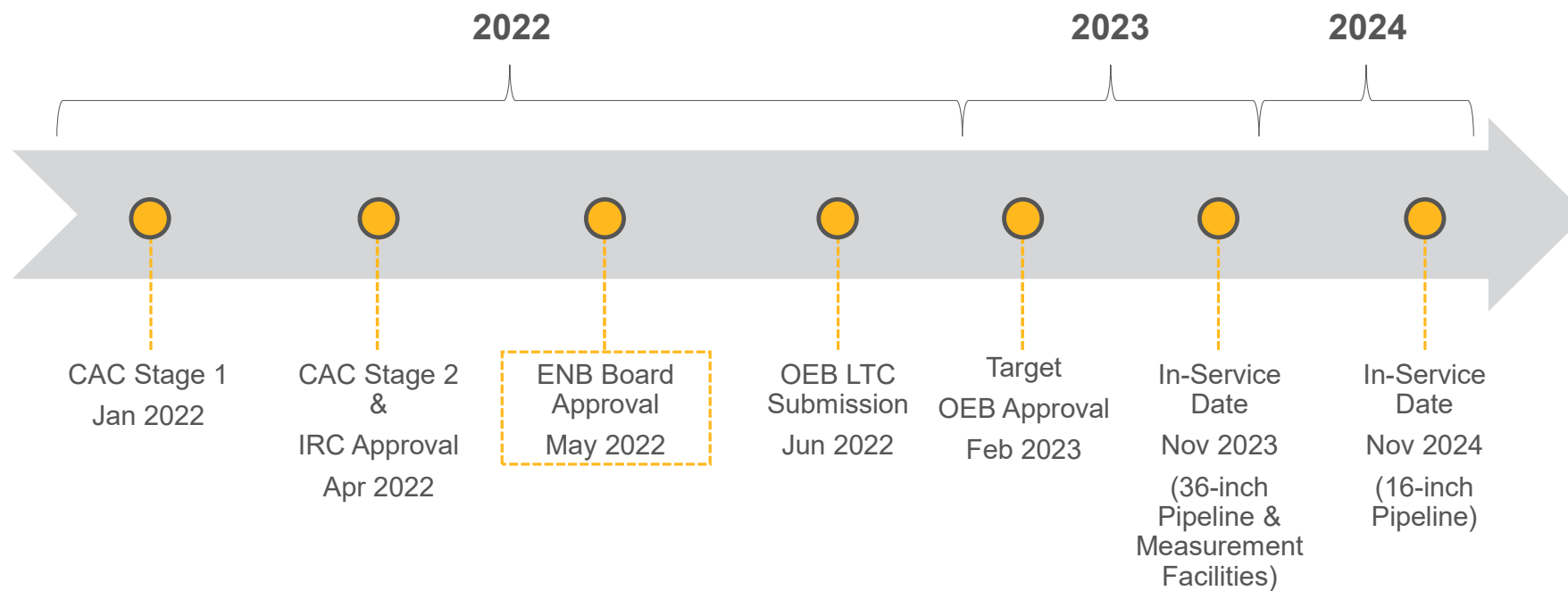
# Regulatory Approval Strategy

- Development of a thorough Regulatory Strategy for approval of the project was undertaken early in the project development given the large capital commitment (\$68 MM) required prior to the OEB LTC approval
- File comprehensive evidence with OEB to support project need and timing including:
  - Customer interest underpinning project scope
  - Importance to Ontario economy/industry
  - Lack of interest in turnback or interruptible service
  - Impact of project not moving forward
- OEB Application will include letters of support from key stakeholders (Municipalities) and agencies (Ontario Vegetable Growers Association)
- Majority (90%) of the \$68 MM capital spend before OEB Approval is in lands (\$6 MM) and pipeline assets (\$55 MM), in the event of unfavorable OEB decision the mitigations include:
  - Lands acquisition strategy to include options to reduce at risk capex prior to OEB Decision
  - Assess other Enbridge projects that can use long lead material in the event PREP is not approved by the OEB
  - Seek OEB approval for prudently incurred development costs

		Low	Medium	High
Approval Criteria	Rank	Considerations		
<b>Project Need</b>		<ul style="list-style-type: none"> <li>• Customer commitment to the project is currently 67% of the total proposed project capacity and are continuing to pursue additional customer commitments</li> <li>• Completed a binding reverse open season (turnback) and received no bids</li> </ul>		
<b>Alternatives Assessment</b>		<ul style="list-style-type: none"> <li>• Project provides best long term value to customers</li> <li>• Supply-side and enhanced targeted energy efficiency alternatives were evaluated and are not practical or economic</li> </ul>		
<b>Commercial Model</b>		<ul style="list-style-type: none"> <li>• OEB has approved previous projects in 2016 &amp; 2018 that support greenhouse markets in Ontario with the proposed commercial model</li> </ul>		
<b>OEB Economic Test</b>		<ul style="list-style-type: none"> <li>• Project is economic based on OEB 134 criteria and analysis that shows the project is in the Public Interest</li> </ul>		



# Project Execution



Project on track for scheduled in-service dates



# Strategic Rationale

- The project will provide Ontario greenhouse, power generator and residential customers with increased access to the diversified, reliable, and cost competitive supply at the Dawn Hub
- Project is underpinned by strong demand in the greenhouse and power generation markets. OEB has approved previous projects that support greenhouse markets in Ontario with proposed commercial model
  - Customer commitment to the project is currently 67% of the total proposed project capacity and continuing to pursue additional customer commitment
  - The 2017 & 2019 Panhandle Projects were expected to meet demand growth through 2021 and 2026. Actual demand growth has accelerated the need and timing for this project
- Expansion of Panhandle Transmission System and Dawn Compressor Station under cost of service revenue model supports EGI’s in-franchise growth with low-risk financial return
- Upon OEB approval, the project is expected to receive a full cost of service regulated return

## Project Scorecard



Key Attribute	Rank	Considerations
<b>Strategic Fit</b>		<ul style="list-style-type: none"> <li>• Core business growth project</li> </ul>
<b>Commercial Risk</b>		<ul style="list-style-type: none"> <li>• Regulated cost of service project</li> <li>• LTC application not approved as filed</li> </ul>
<b>Financial Reward</b>		<ul style="list-style-type: none"> <li>• Base case DCFROE 8.9%</li> </ul>
<b>Ability to Execute</b>		<ul style="list-style-type: none"> <li>• No expropriation included in schedule</li> <li>• Low complexity; rural terrain</li> </ul>
<b>ESG</b>		<ul style="list-style-type: none"> <li>• While the project will result in an emissions increase of ~5000 tCO2e annually (&lt;0.7%), it does not have a material impact on the total GDS emissions intensity</li> </ul>

Project aligned with core business model to drive growth in strategic greenhouse and power generation markets





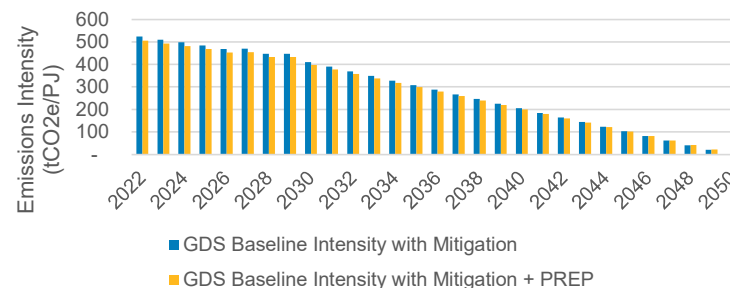
# GHG Reduction Strategy

- Strategy to achieve GHG emission reductions includes:
  - The emission reduction initiatives identified in the GDS GHG Reductions strategy, assuming these will be funded and approved for implementation by 2030
  - Emission reduction initiatives included as part of the broader Dawn GHG solution, including modernization initiatives at the Dawn Compressor Station and RNG compressor fuel switching, will also reduce emissions related to the Panhandle project by ~4,650 tCO<sub>2</sub>e (~93% of total project emissions) by 2030
- Residual emissions: At this time additional emission reduction opportunities would be required to reduce the remaining 7% of the total project emissions in order to achieve net-zero by 2050

## Notes:

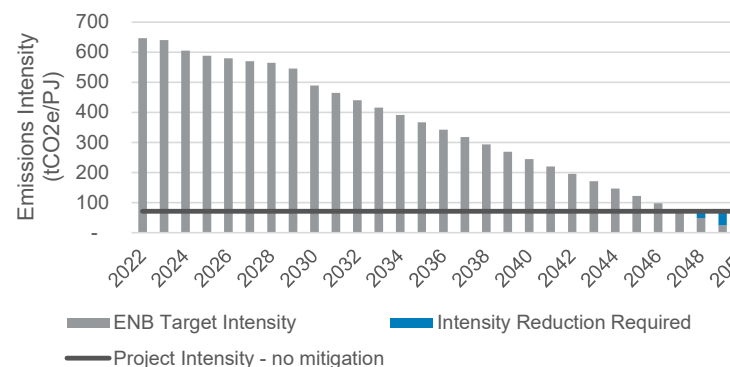
- The incremental emissions due to this project represent less than 0.7% of current baseline emissions and reduce overall carbon intensity for GDS
- A sensitivity with Day-One Net-Zero emission was also run and would decrease the project DCFROE by 0.3%

Emissions Intensity Comparison



Note: The GDS Emissions Intensity forecast above only goes out to 2030. A simplified approach with a linear decrease has been assumed for 2030 to 2050.

Emissions Intensity Reduction Required





# Financial Evaluation

## Project Description

- The revenue requirement for the total project is assumed as annual cost of service, with an allowed ROE of ~8.9% for 2023-2028 and ~8.8% for each subsequent period<sup>1</sup>
- Negative EBITDA and the growing EBITDA pattern is driven by tax credits in 2023 and expenses afterward
  - EBITDA increase required to offset higher than average increase in annual tax expense due to high tax depreciation rate. EBITDA stabilize starting in 2031 once majority of tax pool has been used
- Negative equity cash flow in 2024 is due to 2024 ISD spending and regulatory deferral account
  - EGI expects to propose to flow the 2023 revenue requirement credit through the ICM deferral account in 2024 (vs. a rate rider in 2023). This treatment is subject to OEB approval<sup>2</sup>
- High D/EBITDA and EV/EBITDA multiples are due to lower tax expense in early years resulting in lower EBITDA
- Evaluation parameters include:
  - 40 year evaluation horizon
  - 64:36 debt to equity ratio; 4.0% cost of debt
  - 26.5% Tax Rate

## Financial Outlook

in \$MM	2022-23	2024	2025	2026	2027	2028
Equity Cash Flow	(81.8)	(18.2)	10.6	12.0	11.7	11.5
EBITDA	(17.0)	12.3	21.3	22.3	22.8	23.2
Earnings	1.9	7.8	9.7	9.5	9.3	9.1
DCF	2.3	13.1	16.4	16.3	16.1	15.9
D/EBITDA		15.9x	9.1x	8.5x	8.1x	7.8x
Annual ROE		8.9%	8.9%	8.9%	8.9%	8.9%

<b>DCFROE</b>	<b>8.9%</b>
EV/EBITDA	14.8x
ROCE (5yr avg.)	5.4%

Investment realizes a strong return from low-risk cost of service investment

<sup>1</sup> Assumption reflects the current forecast of allowed ROE for 2024 and 2029 for EGI

<sup>2</sup> Rate rider methodology will have an unfavorable immaterial impact of 0.06% to the DCFROE when compared to the ICM deferral account treatment

# Risk Summary



High Medium Low

Base Case DCFROE 8.9%

Risk	Mitigation	Assessment	Sensitivity	ΔDCFROE
<p><b>Capital Cost</b></p> <p>Increase in cost as construction and material contracts finalized, Geotech confirmed, and route secured</p> <p>Pre-Spend Capex of \$68MM for long lead materials prior to LTC Approval expected in February 2023</p>	<ul style="list-style-type: none"> <li>11% contingency is included in the cost estimate</li> <li>Develop logistics plan with supply chain to optimize long lead material commitments without increasing risk to planned ISD</li> <li>Assess other Enbridge projects that can use long lead material in the event PREP is not approved by the OEB</li> <li>Continue to assess cost commitment risk</li> </ul>	●	N/A	N/A
<p><b>Regulatory Return</b></p> <p>OEB may approve lower than forecasted Allowed ROE in future re-basing period</p>	<ul style="list-style-type: none"> <li>A structured and documented rate application justifying the current ROE methodology supported by Enbridge's internal forecast of Canada long bond and Utility spreads</li> </ul>	●	~25bps reduction to allowed ROE	(0.3%)
<p><b>Regulatory Approval</b></p> <p>Project not obtaining Leave to Construct (LTC) approval</p>	<ul style="list-style-type: none"> <li>File comprehensive evidence to support project need and importance to Ontario economy/industry and impact of project not moving forward</li> <li>LTC Application will include the following evidence to prove strong need for the project:                             <ul style="list-style-type: none"> <li>A minimum of 50% capacity commitment as part of project need evidence to support a high probability of OEB approval</li> <li>Completed a binding reverse open season (turnback) and received no bids</li> <li>Customer commitment to the project is currently 67% of the total proposed project capacity and are continuing to pursue additional customer commitments</li> </ul> </li> </ul>	●	N/A	N/A
<p><b>Lands/Schedule/Expropriation</b></p> <p>No expropriation included in schedule; maximum historical duration is 13 months; Supply Chain shortages affecting procurement of materials assume 1 year in-service delay</p>	<ul style="list-style-type: none"> <li>Early engagement with landowners and municipal stakeholders to obtain access agreement for pipeline installation</li> <li>Successful negotiations with landowner groups (i.e. CAEPLA<sup>1</sup>)</li> <li>Develop logistics plan with supply chain to manage long lead material</li> <li>Impacts to rate recovery accruing to in-service delay will be managed through approved regulatory mechanisms</li> </ul>	●	Project ISD delayed by 12 months	(0.3%)

<sup>1</sup> Canadian Association of Energy and Pipeline Landowner Associations

# Next Steps



- Seeking Investment Review Committee approval on April 8, 2022
- Seeking Board of Directors Full Funding approval on May 3, 2022
- File Leave to Construct Application with Ontario Energy Board on June 10, 2022

# Risk Matrix Signoffs



Team/Area	Analysis Undertaken	Responsibilities	Signoff
Project Execution	<ul style="list-style-type: none"> <li>Risk: Global Supply Chain Shortages and Delays have been affecting the procurement of materials required for construction</li> <li>Mitigant: Advancing production of Early Order Bill of Materials to order long lead time items and general materials earlier to mitigate the effect of delays</li> <li>Risk: ISD could be delayed due to prolonged land negotiations, regulatory approval or permitting delays</li> <li>Mitigant: Early landowner engagement and agency outreach has been initiated to identify potential issues</li> </ul>	Andrew Harrington	
Integrity	<ul style="list-style-type: none"> <li>Design, manufacturing, and/or construction related hazards reducing reliability of new asset</li> <li>Design reviews, PQMP, construction inspection, pressure test, post-commissioning ILI</li> </ul>	Wes Armstrong	
Asset Utilization	<ul style="list-style-type: none"> <li>Customer demand forecast does not materialize</li> <li>The project is scoped to serve 5-6 years of system growth to minimize the forecast risk</li> </ul>	Tanya Mushynski & Jim Redford	
Operating Costs	<ul style="list-style-type: none"> <li>Greater than anticipated operating costs that are not recoverable in customer charges</li> <li>Incremental operating costs included in overall project economics</li> </ul>	Wes Armstrong & Jim Sanders	
Operations	<ul style="list-style-type: none"> <li>Injury or supply interruption due to improper operation as a result of incorrect project handoff</li> <li>EGI will follow proper procedures for documentation, handover and training</li> </ul>	Wes Armstrong & Jim Sanders	
Lands	<ul style="list-style-type: none"> <li>Landowners may not grant land rights within the timelines requested</li> <li>Identify preferred fee purchase locations early and engage landowners early in case new locations need to be chosen</li> </ul>	Vik Kohli	
Environmental	<ul style="list-style-type: none"> <li>Species at Risk permits and archaeological clearances are on the critical path</li> <li>Early access to lands will provide adequate time to complete all required archaeological surveys and receive clearance to meet the schedule</li> </ul>	Vik Kohli	
Stakeholder	<ul style="list-style-type: none"> <li>Indigenous and stakeholder opposition to the project on various grounds</li> <li>Detailed outreach planning, engagement, and advocacy</li> </ul>	Malini Giridhar & Mike Fernandez	
Regulatory	<ul style="list-style-type: none"> <li>OEB does not approve Leave to Construct</li> <li>Development of a clear and convincing application demonstrating need for the project and that the project is in the public interest</li> </ul>	Malini Giridhar	
Market Price Risk	<ul style="list-style-type: none"> <li>The project does not have any direct exposure to changes in market prices</li> <li>Financing and power costs are passed on to the customer through the OEB approved cost-of-service rate base</li> </ul>	Jonathon Gould	
Credit	<ul style="list-style-type: none"> <li>Risk of lost revenue, unrecovered capital investment or increased vendor costs</li> <li>Mitigated by anticipated approval for full cost of service recovery, as well as by established credit review processes</li> </ul>	Jonathon Gould	
Insurance	<ul style="list-style-type: none"> <li>Risk of insurance costs exceeding original estimates; financial impact of corporate deductibles</li> <li>Sensitivities are incorporated into analysis of the financial model</li> </ul>	Cathy Ward	
Taxation	<ul style="list-style-type: none"> <li>There are no significant tax risks</li> </ul>	Leslie O'Leary	
Accounting	<ul style="list-style-type: none"> <li>Inappropriate capitalization of project expenditures and inappropriate revenue recognition</li> <li>Follow enterprise revenue recognition and capitalization policies</li> </ul>	Chris Johnston	
Treasury	<ul style="list-style-type: none"> <li>Not earning a sufficient rate of return to justify the investment</li> <li>Treasury has reviewed the project and is comfortable with the regulated return for Enbridge Gas Inc.</li> </ul>	Jonathon Gould	
Investment Analysis	<ul style="list-style-type: none"> <li>Risk: Structural error in the model or incorrect assumption used in the model</li> <li>Mitigant: Financial model audit performed and assumption in the model were review and confirmed by appropriate SME's</li> </ul>	Falyne Chave	
GHG Emissions	<ul style="list-style-type: none"> <li>Greater than anticipated operating costs</li> <li>Mitigation assumes that the emission reduction initiatives identified in the 3+ year strategy will be funded and approved for implementation by 2030</li> </ul>	Wes Armstrong	

Panhandle Regional Expansion Project  
 Alternatives Assessment – Summary

Why are incremental facilities required in Winter 2023/24?

Demand Forecast	Winter 22/23	Winter 23/24	Winter 24/25	Winter 25/26
Total System Demand	694	744	828	854
Incremental per Year	22	50	84	26
System Capacity (No Project)	713	713	713	713
Shortfall (No Project)	+20	-31	-114	-140

Based on hydraulic modelling without the proposed project a minimum 42 TJ/d incremental delivery at Ojibway (102 TJ/d Total) is required in Winter 2023/24.

The required Ojibway delivery (42 TJ/d) is larger than the forecast Panhandle System shortfall (31 TJ/d) because increasing deliveries at Ojibway will not efficiently serve the Leamington-Kingsville market demands (i.e. the Ojibway deliveries to area demand ratio is not 1:1)

Enhanced Target Energy Efficiency (ETEE)

Posterity report estimates a maximum peak hour reduction potential of 6,900 m<sup>3</sup>/hour (5.43 TJ/d) from general service customers could be obtained by Winter 2029/2030 and would cost approximately \$50 million.

A reduction of 83 TJ/day of capacity is required to eliminate or reduce the scope of the Leamington lateral interconnect. Therefore, there is insufficient peak demand and ETEE is not a viable alternative.

Trucked CNG

A CNG analysis indicated that approximately 550 loads per day would be required to meet the shortfall capacity of 192 TJ/d. This alternative poses issues both in terms of logistics and in terms of security of supply. This alternative is not a viable solution and was not pursued further.

New LNG Plant

In the PRP proceeding, Enbridge Gas evaluated constructing and operating an LNG storage facility as an alternative. The estimated cost was \$287 million (approximately \$390 million in today's dollars) with about \$5 million in annual operating expenses to address 106 TJ/d of system growth. This would only provide half the capacity of the proposed Project. This Alternative is financially infeasible compared to the proposed project and was not pursued further.

Analysis of PEPL Available Capacity

Annual	Winter
PEPL website at time of RFP showed 21 TJ/d  19 TJ/d was noted in Tenaska RFP bid  Tenaska confirmed via follow-up that 21 TJ/d is available on a long term basis.	PEPL website does not show capacity for future years or winter  No bids were received for Winter Only Service in the Enbridge RFP

Panhandle Regional Expansion Project  
 Alternatives Assessment – Summary

Estimated Costs of Ojibway Deliveries

	Unit Cost (C/GJ/d)	Estimated Annual Costs (\$MM)	
		21 TJ/d Delivery	42 TJ/d Delivery**
RFP Bid	0.55	\$4.2	\$8.4
Gas Supply – 10 Year Landed Cost	0.76*	\$5.8	\$11.6
Gas Supply – 1-Year 2023/24	0.80*	\$6.1	\$12.3

\*Gas Supply landed cost reflects premium to Dawn based on current PEPL tolls and ICF Q1-2022

\*\*Assumes 42 TJ/d is available to be contracted at Unit Cost based on 365 days a \$0.55 C/GJ/d Annual price is the equivalent of a \$1.32 C/GJ/d Winter Only price ( $\$0.55 \times 365 / 151$ )

Why is a one-year deferral not a preferred Alternative?

Based on the results of the Expression of Interest and customer commitments to date – Enbridge Gas is expecting demands to continue, and Enbridge Gas has identified the potential need for a second phase of transmission expansion to meet all of the demands that are forecasted over the next 20 years. This second phase has also been identified within the Enbridge Gas 2021-2025 AMP with a forecasted 2028 in-service date.

Why is the NPS 36 in combination with NPS 16 the Preferred Alternative?

Loop and Interconnect Combinations (Equivalent Lengths)		Capacity (TJ/d)	Costs (\$ Million)	Cost per Unit of Capacity (\$/TJ/d)	NPV (\$ Million)
NPS 36	NPS 16	203	314.4	1.55	\$(66.9)
NPS 30	NPS 16	195	304.5	1.57	\$(56.2)
NPS 30	NPS 20	203	342.3	1.61	\$(85.7)
NPS 36	NPS 20	212	332.4	1.64	\$(74.9)

Hybrid Alternative	Capacity (TJ/d)	Facility Costs (\$ Million)	O&M Costs (\$ Million)*	Cost per Unit of Capacity (\$/TJ/d)	NPV (\$ Million)
21 TJ/d Supply-Side + 17.35 km NPS 36 Length	203	303.3	\$4.2 Annually 73.1 over a 40-year term	1.85	\$(129.7)

\*The estimated O&M costs are based on the bid received in the RFP. The bid stated pricing is subject to refresh based on the market conditions at the time of contracting.

- Optimized pipeline design considering combinations of pipeline diameters to provide best cost per capacity

Panhandle Regional Expansion Project  
Alternatives Assessment – Summary

- Proposed Project provides the lowest cost per capacity

Additional Benefits of NPS 36 Loop w/ NPS 16 Interconnect vs NPS 30 Loop w/ NPS 16 or 20 Interconnect

Extending the existing NPS 36 pipeline from Dawn through to Comber Transmission at the same diameter will reduce overall system costs for operations and maintenance. A common pipe size benefits a system from a maintenance perspective in the reduced costs associated with two separate pipeline inspection program and minimizes the number of overall facilities therefore minimizing impacts to Indigenous peoples, municipalities, and landowners, and environmental; and costs to build and operate.

The NPS 36 provides an additional 8 TJ/d compared to NPS 30 in the short term, and an incremental 46 TJ/d of capacity for the same pipe reinforcement path over the long-term plan as the NPS 36 loop is extended to Comber.

As the Loop is continued to Comber in the NPS 30 Loop and NPS 20 interconnect scenario the utilization of the NPS 20 will decrease and ultimately be oversized in comparison to the NPS 16 and therefore is not preferred compared to the proposed project.



# Panhandle Regional Expansion Project

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**Enbridge Gas Inc. Board of Directors**

April 26, 2022

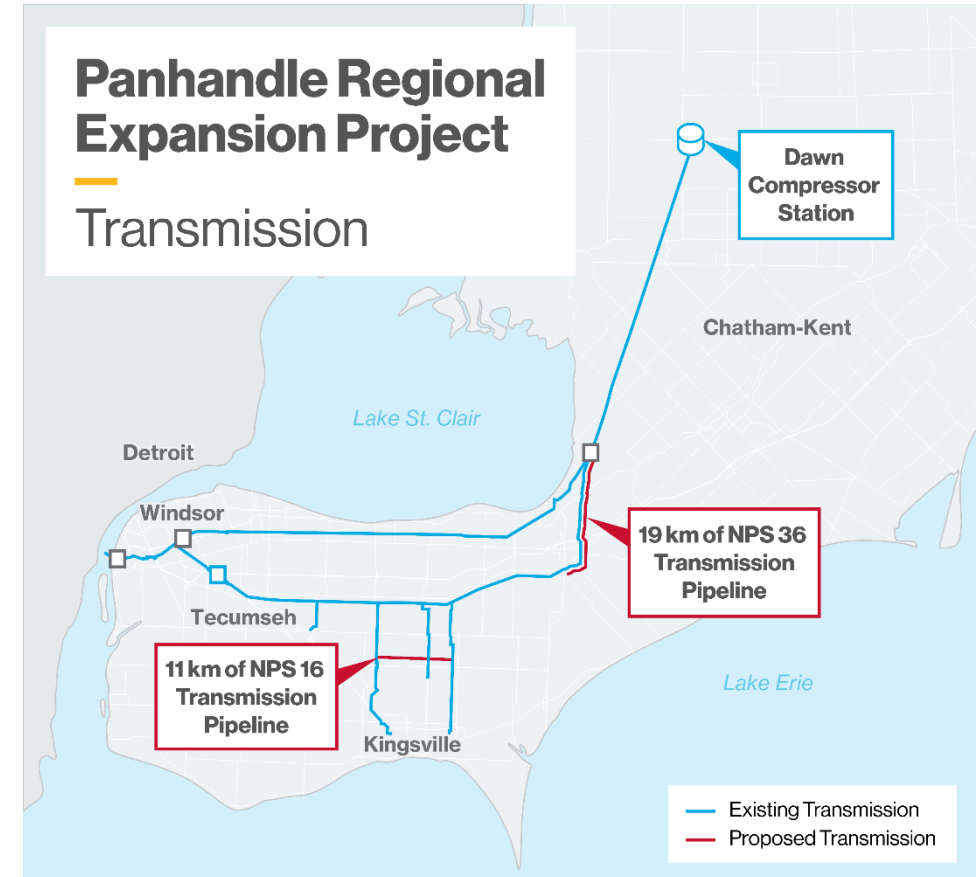




# Background & Executive Summary

- The Panhandle Regional Expansion Project (PREP) would transport natural gas from the Dawn Hub to customers west of Dawn. The project consists of constructing two transmission pipelines and measurement facilities at Dawn Compressor Station
  - The transmission facilities will increase the system capacity by 203 TJ/d (182 MMscf/d)
  - Target in-service date is November 2023 and November 2024
- The project provides Ontario greenhouse, power generator, industrial and residential customers with increased access to natural gas
  - Demand for greenhouse grown vegetables has been continually growing over the past decade due to consumer preference and favourable market conditions
  - 97% of the capacity will serve commercial customers
  - Strong customer commitment with project currently 67% subscribed and GDS will continue to pursue customer commitments with forecast to be fully subscribed before 2028
- The project is estimated at \$314 MM with a commitment of \$68 MM for long lead materials required prior to Leave To Construct (LTC) Approval from the Ontario Energy Board (OEB) in February 2023
- The project is expected to receive a full cost-of-service regulated return
  - Costs will be recovered through rates supported by commercial agreements with contract customers and the remaining revenue requirement will be recovered from ratepayers

## Project Map



Regulated project that supports significant Enbridge Gas Inc. customer growth

# Strategic Rationale



- PREP is underpinned by strong demand in the greenhouse and power generation markets. OEB has approved previous projects that support greenhouse markets in Ontario with proposed commercial model
- Expansion of Panhandle Transmission System and Dawn Compressor Station under cost of service revenue model supports EGI's in-franchise growth with low-risk financial return
- Since 2017, the Panhandle Transmission System has been expanded by 173 TJ/d (155 MMscf/d) with demand exceeding design capacity in 2023

## Project Scorecard



Key Attribute	Rank	Considerations
<b>Strategic Fit</b>		<ul style="list-style-type: none"> <li>• Core business growth project</li> </ul>
<b>Commercial Risk</b>		<ul style="list-style-type: none"> <li>• Regulated cost of service project</li> <li>• Project not obtaining Leave to Construct (LTC) approval</li> </ul>
<b>Financial Reward</b>		<ul style="list-style-type: none"> <li>• Base case DCFROE 8.8%</li> </ul>
<b>Ability to Execute</b>		<ul style="list-style-type: none"> <li>• Low complexity; rural terrain</li> <li>• No expropriation included in schedule or expected<sup>1</sup></li> </ul>
<b>ESG</b>		<ul style="list-style-type: none"> <li>• Carbon intensity of PREP is ~70 tCO<sub>2</sub>e/PJ with 5,000 tCO<sub>2</sub>e annual emissions</li> <li>• \$21 MM of carbon offset costs required to achieve 2050 net zero included in project economics</li> </ul>

Project aligned with core business model to drive growth in strategic greenhouse and power generation markets

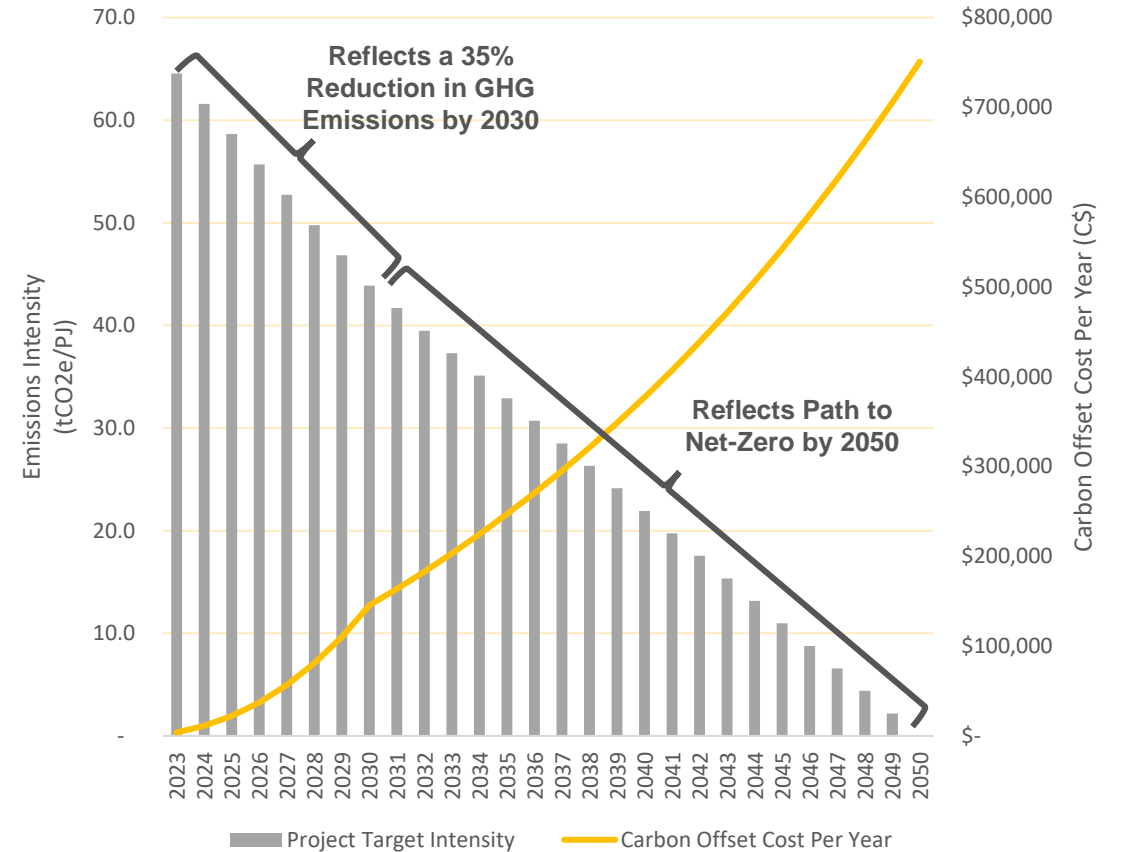
<sup>1</sup> Maximum historical expropriation duration is 13 months

# GHG Reduction Strategy



- Enbridge has aligned its capital allocation and investment criteria to meet its 2030 emissions reduction target and net zero by 2050
- The methodology consist of demonstrating a plan to achieve the targets, including purchasing carbon offsets if required
- PREP path to **2050 net-zero** includes:
  - The addition of \$21 MM to the original investment based on the purchase of Carbon Offsets from 2023-2063<sup>1</sup>
    - \$0.5 MM worth of carbon offset to reach the 35% GHG reduction target by 2030
    - \$20.5 MM worth of carbon offset from 2031 to 2063

## Path to 2050 Net-Zero



<sup>1</sup> Reflects a 40-year evaluation horizon, with an average of ~\$500k/year of carbon offset expense

# Financial Evaluation



## Project Description

- The revenue requirement for the total project is assumed as annual cost of service, with an allowed ROE of ~8.9% for 2023-2028 and ~8.8% for each subsequent period<sup>1</sup>
- Negative EBITDA in 2023 is driven by tax credits (utilization of a full year's worth of tax depreciation, while generating 2 months worth of revenue only)
- Negative equity cash flow in 2024 is due to 2024 ISD spending and regulatory deferral account
- High D/EBITDA and EV/EBITDA multiples are due to lower tax expense in the initial years resulting in lower EBITDA<sup>2</sup>
- Evaluation parameters include:
  - 40-year evaluation horizon
  - 64:36 debt to equity ratio; 4.0% cost of debt
  - 26.5% Tax Rate
  - Valuation includes cost of carbon to achieve 2050 net-zero
    - A sensitivity with **Day-One Net-Zero** emission would decrease the project DCFROE further by 0.2% (if not recovered within regulatory construct)

## Financial Outlook

in \$MM	2022-23	2024	2025	2026	2027	2028
Equity Cash Flow	(81.8)	(18.2)	10.6	11.9	11.7	11.5
EBITDA	(17.0)	12.2	21.3	22.3	22.8	23.1
Earnings	1.9	7.8	9.7	9.5	9.3	9.0
DCF	2.3	13.1	16.4	16.3	16.1	15.9
D/EBITDA		15.9x	9.1x	8.5x	8.1x	7.8x
Annual ROE		8.9%	8.9%	8.8%	8.8%	8.8%

**DCFROE (With Carbon Offset Costs) 8.8%**

DCFROE (Without Carbon Offset Costs) 9.0%

EV/EBITDA<sup>3</sup> 13.7x

ROCE (5yr avg.) 5.4%

Investment realizes a strong return from low-risk cost of service investment

<sup>1</sup> Assumption reflects the current forecast of allowed ROE for 2024 and 2029 for EGI

<sup>2</sup> The lower EBITDA in the initial years is mainly driven by station work of \$96 MM (inclusive of in-direct overheads) with a 20% CCA rate. As the Undepreciated Capital Cost (UCC) pool is utilized, the cash tax expense and the revenue requirement increases until the EBITDA stabilizes in 2031

<sup>3</sup> Reflects the average EBITDA of 2025 – 2035

# Risk Summary



High Medium Low

Base Case DCFROE 8.8%

Risk	Mitigation	Assessment	Sensitivity	ΔDCFROE
<p><b>Capital Cost</b>                      Increase in cost as construction and material contracts finalized, Geotech confirmed, and route secured</p>	<ul style="list-style-type: none"> <li>11% contingency is included in the cost estimate</li> <li>Develop logistics plan with supply chain to optimize long lead material commitments without increasing risk to planned ISD</li> </ul>		N/A	N/A
<p><b>Regulatory Return</b>                      OEB may approve lower than forecasted Allowed ROE in future re-basing period</p>	<ul style="list-style-type: none"> <li>A structured and documented rate application justifying the current ROE methodology supported by Enbridge's internal forecast of Canada long bond and Utility spreads</li> </ul>		~25bps reduction to allowed ROE	(0.3%)
<p><b>Regulatory Approval</b>                      Project not obtaining Leave to Construct (LTC) approval                       Pre-Spend Capex of \$68 MM for long lead materials prior to LTC Approval expected in February 2023</p>	<ul style="list-style-type: none"> <li>LTC Application will include comprehensive evidence to support project need and importance to Ontario economy/industry and impact of project not moving forward</li> <li>Assess other Enbridge projects that can use long lead material in the event PREP is not approved by the OEB</li> <li>Continue to assess cost commitment risk</li> </ul>		N/A	N/A
<p><b>Lands/Schedule/Expropriation</b>                      No expropriation included in schedule; maximum historical duration is 13 months; Supply Chain shortages affecting procurement of materials assume 1 year in-service delay</p>	<ul style="list-style-type: none"> <li>Early engagement with landowners and municipal stakeholders to obtain access agreement for pipeline installation</li> <li>Successful negotiations with landowner groups (i.e. CAEPLA<sup>1</sup>)</li> <li>Develop logistics plan with supply chain to manage long lead material</li> <li>Impacts to rate recovery accruing to in-service delay will be managed through approved regulatory mechanisms</li> </ul>		Project ISD delayed by 12 months	(0.3%)

<sup>1</sup> Canadian Association of Energy and Pipeline Landowner Associations

# Recommendation



**Management recommends that the Board of Directors of Enbridge Gas Inc. (the “Corporation”) approve the following (subject to any required approval of funding by the Board of Directors of Enbridge inc.):**

- Panhandle Regional Expansion Project, as revised (the “Project”), including the authority of the Corporation and the officers of the Corporation to take all such action, and to cause the subsidiaries of the Corporation to take all such action, necessary or advisable to effectuate the Project consistent with the project materials provided to the Board (the “Project Memo”);
- A major capital appropriation of up to \$314 million for the Project, including AIDC;
- A corresponding increase to the applicable budgets, to the extent necessary or appropriate, including an increase of \$21 million to the applicable operating budgets, consistent with the Project Memo; and
- Entry by the Corporation or its subsidiaries into such funding arrangements as may be required on terms as approved by the Vice President, Finance or Treasurer of the Corporation.

# Panhandle Regional Expansion Project Incremental Capital Seeking Stage 3

**Capital Allocation Committee**

January 11, 2023

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*Purpose: Requesting Capital Allocation Committee for approval to proceed to the IRC (Stage 3)*



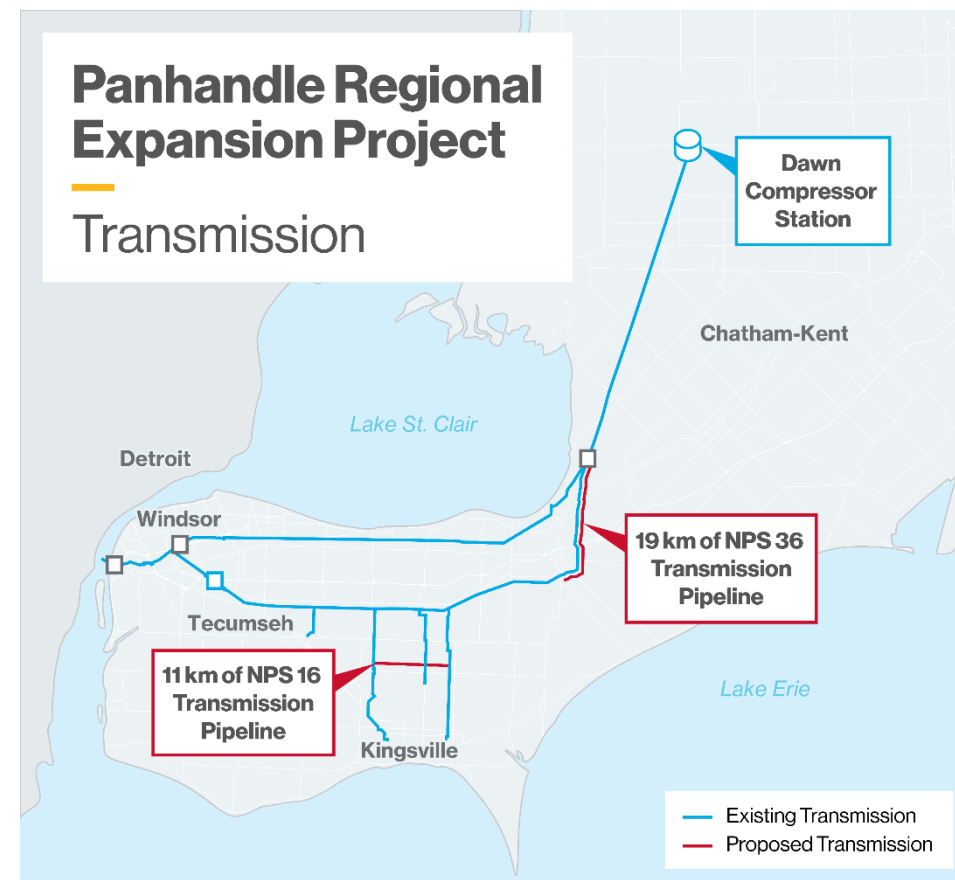




# Background

- Seeking C\$113 MM of incremental capital for the Panhandle Regional Expansion Project (PREP) that supplies natural gas from the Dawn Hub to customers west of Dawn. The Project consists of constructing two transmission pipelines and measurement facilities at Dawn Compressor Station
- The project received full funding approval on May 4, 2022 by EI Board of Directors for C\$314 MM including C\$54 MM of in-direct overheads at a Class 3 cost estimate with a DCFROE of 8.8%
- The project has since experienced increased costs of C\$113 MM (\$90 MM direct capital including IDC plus \$23 MM in-direct overheads) driven by prime contractor RFP estimates and internal labour/outside services increases
- The project is currently in a Leave to Construct (LTC) proceeding with the OEB and was placed into abeyance December 5, 2022 in order to update the evidentiary record of a material change of increased project cost
- The project is expected to receive a cost-of-service regulated return with an updated DCFROE of 8.1%
  - Incremental costs of C\$113 MM assumed to be included at next rebasing term starting in 2029

## Project Map



Regulated project that supports significant EGI customer growth

# Project Description with Incremental Capital



<b>Scope</b>	<ul style="list-style-type: none"> <li>• 36-inch pipeline ~19 km from Dover Station towards Comber Station</li> <li>• 16-inch pipeline ~11 km between Kingsville East Line and Leamington North Lines</li> <li>• Measurement facilities at Dawn Compressor Station</li> </ul>
<b>Approved Capex</b>	<ul style="list-style-type: none"> <li>• C\$314 MM (\$260 MM direct capital including IDC plus \$54 MM in-direct overheads) (Class 3)</li> </ul>
<b>Incremental Capex</b>	<ul style="list-style-type: none"> <li>• C\$113 MM (\$90 MM direct capital including IDC plus \$23 MM in-direct overheads)</li> </ul>
<b>Key Dates</b>	<ul style="list-style-type: none"> <li>• Investment Review Committee – Jan 2023</li> <li>• ENB Board Request for Incremental CAPEX approval – Feb 2023</li> <li>• Ontario Energy Board Approval Target – June 2023</li> <li>• In-Service Date – Nov 2023 (36-Inch Pipeline &amp; Measurement Facilities)<sup>1</sup></li> <li>• In-Service Date – Nov 2024 (16-Inch Pipeline)<sup>1</sup></li> </ul>
<b>Capacity</b>	203 TJ/d of Panhandle Transmission System Capacity
<b>Customers</b>	<ul style="list-style-type: none"> <li>• In-franchise contract customers (Greenhouse &amp; Power Generation markets) and residential demand growth</li> <li>• Customer commitment to the project is currently 80% of the total proposed project capacity</li> </ul>

## Project Scorecard



Key Attribute	Rank	Considerations
<b>Strategic</b>		<ul style="list-style-type: none"> <li>• Core business growth project</li> <li>• Most rapidly expanding transmission system</li> </ul>
<b>Commercial</b>		<ul style="list-style-type: none"> <li>• Regulated cost of service project</li> <li>• LTC application in abeyance</li> <li>• Seeking cost recovery for incremental CAPEX at earliest opportunity</li> </ul>
<b>Financial</b>		<ul style="list-style-type: none"> <li>• Base case DCFROE 8.1%</li> </ul>
<b>Ability to Execute</b>		<ul style="list-style-type: none"> <li>• No expropriation included in schedule</li> <li>• Low complexity; rural terrain</li> <li>• Full mainline can be completed with a June 2023 start date; ~5km NPS 36 required to meet winter 2023/2024 firm demand (year 1 growth forecast)</li> </ul>
<b>ESG</b>		<ul style="list-style-type: none"> <li>• While the project will result in an emissions increase of ~5000 tCO2e annually (&lt;0.7%), it does not have a material impact on the total GDS emissions intensity</li> </ul>

<sup>1</sup> No changes to ISD vs Original BOD memo



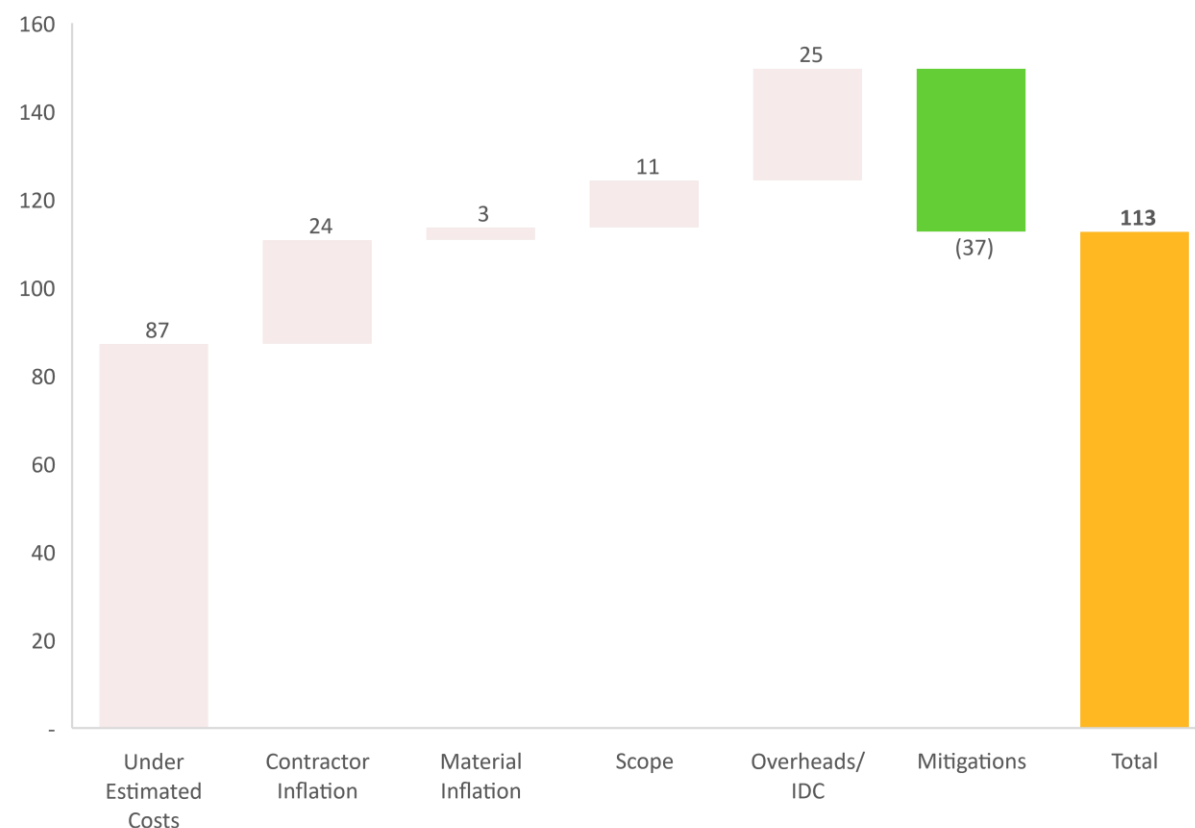
# Incremental Capital Breakdown

- **Underestimated Costs (+C\$87 MM)**
  - RFP estimates higher than Request for Information (RFI) responses
    - RFI estimate accuracy +/- 30%
    - RFI bids excluded Dawn NPS 42 header
  - Stations engineering consultant underestimated construction duration and labour hours
    - Estimated 78,000 labour-hours vs. current estimate of 306,000
- **Unforeseen Inflation (+C\$27 MM)**
  - Contractor pricing anticipates increases to rental equipment rates, fuel prices, and contract labour rates
  - Increased inspection hours and rates based on more detailed scope definition
- **Scope Clarification (+C\$11 MM)**
  - Scope additions added during detailed design
    - Increases in quantities of diameter-inch welding, cut & fill, large bore valves, actuators, and cabling
  - More trenchless crossings and added depth to open cuts
- **Overheads / IDC (+C\$25 MM)**
- **Mitigations (-C\$37 MM)**
  - Negotiate prime contractor terms of contract (\$19 MM)
  - Scope refinement for station design (\$18 MM)

## Summary of Incremental Capital Approvals (C\$ MM)

Original Board Approval – May 2022 (Class 3)	314
<b>Incremental Capital Appropriation Request</b>	<b>113</b>
Revised Total Capital	427

Cost Increase Breakdown (CAD \$MM)



Management has high confidence in achieving the mitigating savings and working to identify other potential costs reductions



# Regulatory Impacts

Key Considerations	Assessment	Commentary	Low	Medium	High
<b>OEB LTC Approval: Timeline</b>		<ul style="list-style-type: none"> <li>• EGI placed project in abeyance with OEB on Dec 5, 2022 due to discovery of a material change in project cost</li> <li>• ENB will file a comprehensive updated cost and evidence package at earliest opportunity</li> <li>• Seek streamlined continuation of the LTC proceeding and install facilities to meet 2023/2024 customer demand at a minimum</li> <li>• OEB approval timeline delayed up to 3 months (March to June) if full funding approval received in Feb 2023</li> </ul>			
<b>OEB LTC Approval: Project Need</b>		<ul style="list-style-type: none"> <li>• Project continues to be economic and in the public interest serving incremental demand for EGI's most rapidly expanding greenhouse sector, Ontario power generation customer &amp; Stellantis (NextStar)</li> <li>• Continuing to increase customer commitments for the project; significant support from municipal CAO's, regional Chambers of Commerce, Ministry of Economic Development</li> </ul>			
<b>Project Cost Recovery</b>		<ul style="list-style-type: none"> <li>• Project has committed costs of:                             <ul style="list-style-type: none"> <li>– C\$57 MM as of Dec 1, 2022</li> <li>– Total of C\$74 MM by ENB BoD meeting in Feb, 2023</li> <li>– Total of C\$130 MM by OEB LTC Approval in June 2023</li> </ul> </li> <li>• Customer costs will be recovered through rates from commercial agreements with contract customers</li> <li>• Remaining revenue requirement will be recovered from ratepayers                             <ul style="list-style-type: none"> <li>– Original BOD approved amount (C\$314 MM) to be included in 2024 Rebasing</li> <li>– Incremental Capex (C\$113 MM) to be included in 2029 Rebasing</li> </ul> </li> <li>• Project originally assumed seeking OEB approval using Incremental Capital Module (ICM) mechanism                             <ul style="list-style-type: none"> <li>– ICM threshold not met based on OEB approved 2023 proceeding<sup>1</sup></li> </ul> </li> </ul>			

The project continues to demonstrate a strong project need to serve customer growth and is still the most optimal solution

<sup>1</sup> Impact shown on the financial evaluation slide



# Financial Evaluation

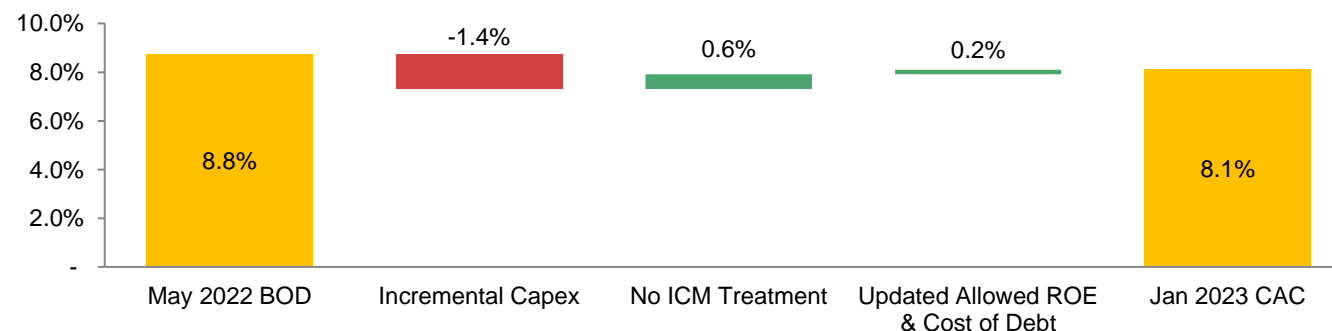
## Project Description

- **Incremental Capex:** To be included in Rate base starting in 2029
  - Losing the recovery on return on capital and return of capital for the 2024-2028 period
- **No ICM Treatment:** ENB to keep some CCA tax benefits<sup>1</sup>
  - ICM treatment was assumed in the original base case in 2022
- **Updated Allowed ROE & Cost of Debt:** The revenue requirement for the total project is assumed as annual cost of service, with an allowed ROE of 8.9% in 2023, 9.2% for 2024-2028 and 9.1% for each subsequent period<sup>2</sup>
- Evaluation parameters include:
  - C\$427 MM CAPEX (including IDC and overheads)
  - 40-year evaluation horizon
  - 64:36 debt to equity ratio, 4.7% cost of debt
  - 26.5% Tax Rate

## Financial Outlook

in \$MM	2022-23	2024	2025	2026	2027	2028	2029
Equity Cash Flow	(104.4)	(25.2)	8.5	10.4	10.0	9.7	15.6
EBITDA	(11.2)	13.4	23.3	24.4	24.8	25.1	33.9
Earnings	11.4	7.7	7.6	7.1	6.7	6.4	12.3
DCF	12.0	14.7	16.7	16.3	16.0	15.6	21.6
D/EBITDA		19.7x	11.3x	10.5x	10.1x	9.8x	7.1x
Annual ROE		5.8%	5.1%	4.9%	4.7%	4.6%	9.0%

<b>DCFROE</b>	<b>8.1%</b>
EV/ 2025 EBITDA	18.3x
EV/ 2029 EBITDA	12.6x



Investment realizes a strong return from low-risk cost of service investment

<sup>1</sup> ENB to keep CCA tax benefits related to capital subject to the half year rule, incremental CCA tax benefits related to the Accelerated Investment Incentive are not included

<sup>2</sup> Assumption reflects the latest forecast of allowed ROE for EGI

# Risk Matrix Signoffs



Team/Area	Responsibilities	Signoff
Project Execution	Heidi Bredenholler-Prasad	
Integrity	Jim Sanders	
Asset Utilization	Tanya Mushynski & Jim Redford	
Operations	Jim Sanders	
Insurance	Cathy Ward	
Tax	Leslie O'Leary	
Land	Vik Kohli	
Environmental	Vik Kohli	

Team/Area	Responsibilities	Signoff
Stakeholder	Keith Boulton & Mike Fernandez	
Regulatory	Malini Giridhar	
Credit	Jonathan Gould	
Accounting	Chris Johnston	
Treasury	Jonathan Gould	
Investment Review	Falyne Chave	
GHG	Malini Giridhar	
Market Price Risk	Jonathan Gould	

# Panhandle Regional Expansion Project Revised Scope

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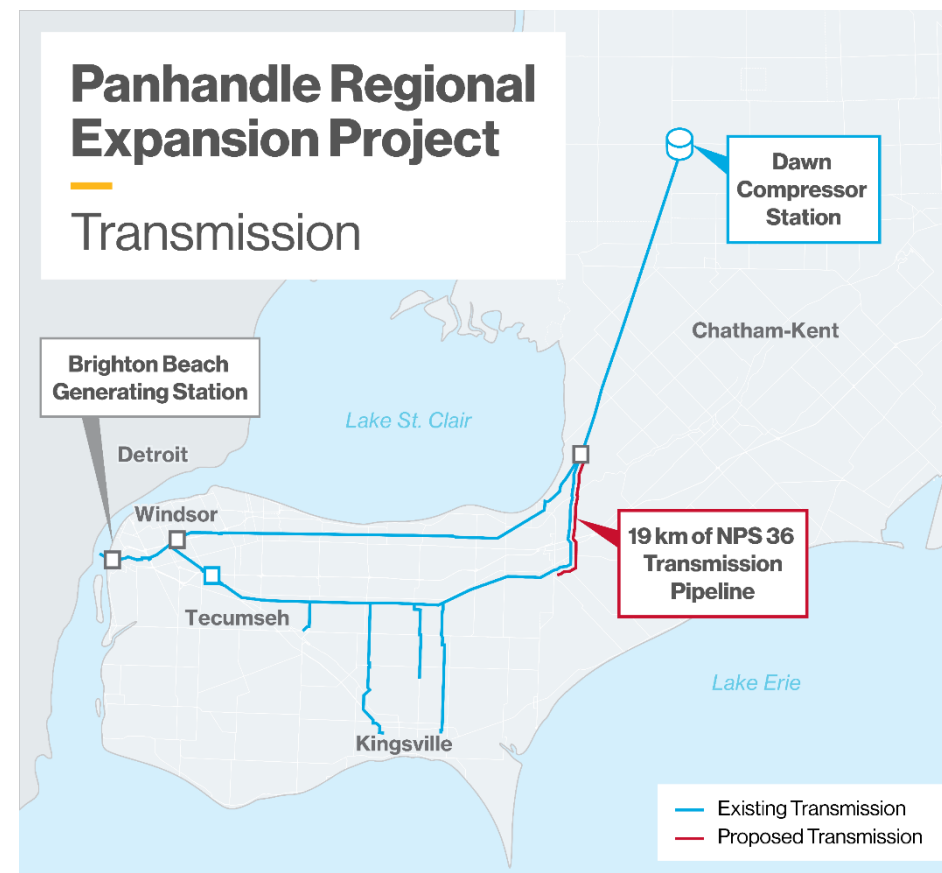
Investment Review Committee  
April 12, 2023



# Background

- The Panhandle Regional Expansion Project (PREP) supplies natural gas from the Dawn Hub to a growing customer base west of Dawn
- The original project scope included 19 km of NPS 36 pipe, measurement facilities at Dawn Compressor Station and 11 km of NPS 16 pipe. PREP received full funding approval in 2022 by EI Board of Directors for C\$314 MM with a DCFROE of 8.8%
- The project will require an incremental C\$45 MM due to:
  - Project cost increase of +C\$114 MM driven by inflationary pressures and identified gaps in the original cost basis
  - Offset by the scope removal of the NPS 16 pipeline of -C\$69 MM
- Updating the EGI Rebasing Application with a levelized cost recovery<sup>1</sup> mechanism for the 2024 project costs of C\$253 MM. The 2025 project costs of C\$106 MM will be recovered under the base capital included in EGI 2025 rates
  - EGI portfolio view DCFROE of 9.2%
  - Most likely scenario for PREP 2024 capital is to receive levelized cost recovery<sup>1</sup> treatment in 2024 due to it being a rebasing year and 2025 capital is accommodated in current capital plan. This will ensure a DCFROE at approved ROE of 9.2%. Should it not receive such treatment, worst case scenario is 2025 capital will be recovered in 2029 at next rebasing which leads to a DCFROE of 8.7%

## Project Map



Regulated project that supports significant EGI customer growth

<sup>1</sup> See Financial Evaluation slide for more details



# Project Description with Revised Scope



<b>Revised Scope</b>	<ul style="list-style-type: none"> <li>36-inch pipeline ~19 km from Dover Station towards Comber Station</li> <li>Measurement facilities at Dawn Compressor Station</li> </ul>
<b>Original Capex</b>	<ul style="list-style-type: none"> <li>C\$314 MM (\$260 MM direct capital including IDC plus \$54 MM indirect overheads)</li> </ul>
<b>Revised Scope Capex</b>	<ul style="list-style-type: none"> <li>C\$359 MM (\$289 MM direct capital including IDC plus \$70 MM indirect overheads)                             <ul style="list-style-type: none"> <li>2024 ISD: \$253 MM</li> <li>2025 ISD: \$106 MM</li> </ul> </li> </ul>
<b>Key Dates</b>	<ul style="list-style-type: none"> <li>[ENB Board Request for Incremental CAPEX approval – May 2023]</li> <li>Ontario Energy Board (OEB) LTC Application – June 2023</li> <li>OEB Approval Target – Jan 2024</li> <li>In-Service Date – Nov 2024 &amp; Nov 2025</li> </ul>
<b>Capacity</b>	<ul style="list-style-type: none"> <li>167 TJ/d of Panhandle Transmission System Capacity</li> </ul>
<b>Customers</b>	<ul style="list-style-type: none"> <li>In-franchise contract customers (Power Generation, Greenhouse and other Industrial markets) and residential growth</li> </ul>

## Original vs Revised Scope

	Capex \$ MM	Base System Capacity (TJ/d)	Incremental Project Capacity (TJ/d)	Total Market (TJ/d)	ISD
Original	314	713	203	916	2023 & 2024
Revised	359	737	167	904	2024 & 2025

## Project Scorecard



Key Attribute	Rank	Considerations
<b>Strategic</b>		<ul style="list-style-type: none"> <li>Core business growth project</li> <li>Most rapidly expanding transmission system</li> </ul>
<b>Commercial</b>		<ul style="list-style-type: none"> <li>Regulated cost of service project</li> <li>2025 project costs recovered in 2025 within existing base capital</li> </ul>
<b>Financial</b>		<ul style="list-style-type: none"> <li>EGI portfolio view DCFROE 9.2%</li> </ul>
<b>Ability to Execute</b>		<ul style="list-style-type: none"> <li>Delayed land acquisition for the NPS 36 pipeline ROW due to a single landowner (last 700m) may require shortened loop or land expropriation</li> </ul>
<b>ESG</b>		<ul style="list-style-type: none"> <li>While the project will result in an emissions increase of ~4100 tCO2e annually, it does not have a material impact on the total GDS emissions intensity (&lt;0.5%)</li> </ul>



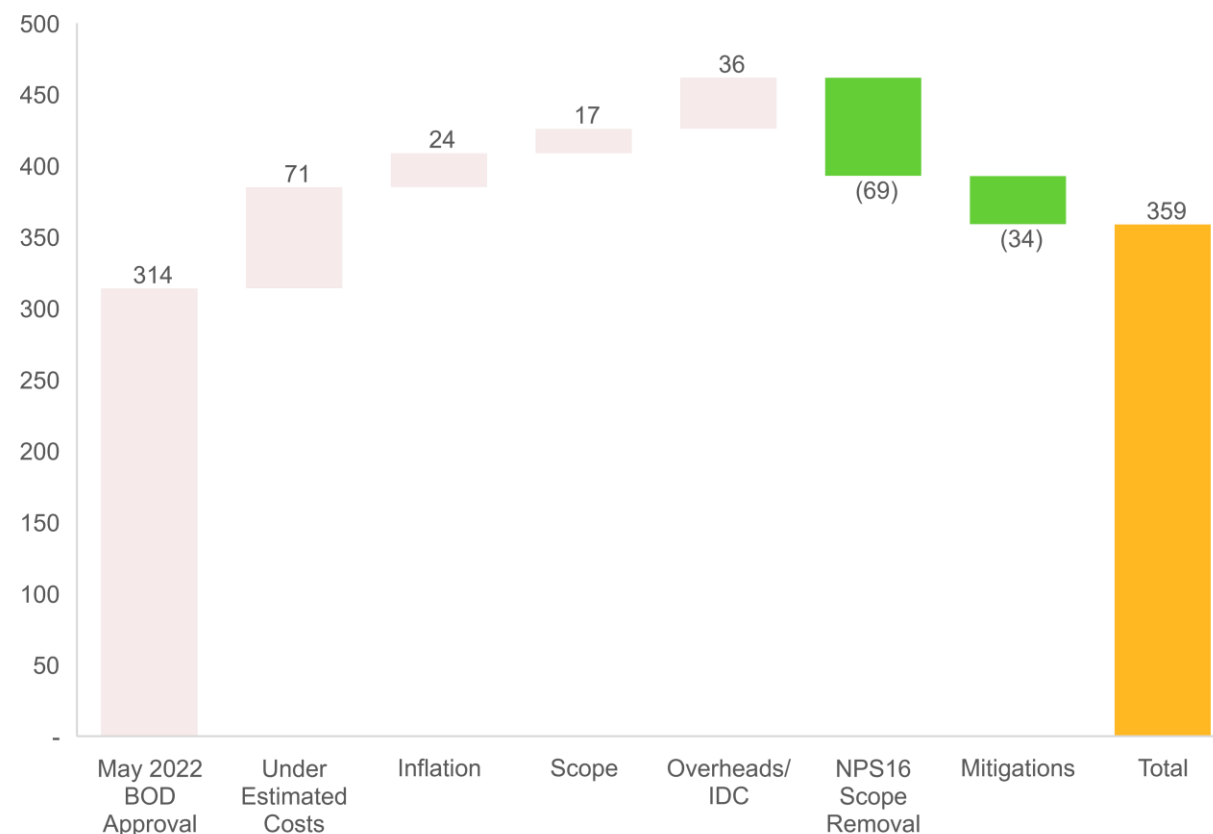
# Incremental Capital Breakdown

- **Underestimated Costs [Volume of Work] (+C\$71 MM)**
  - Contractor RFP estimates higher than Request for Information (RFI) responses (\$54 MM)
  - Engineering consultant & RFI Input underestimated station construction duration and labour hours (\$17 MM)
- **Incremental Cost Inflation (+C\$24 MM)**
  - Material cost increases (\$2 MM)
  - Contractor pricing anticipates increases to rental equipment rates, fuel prices, and contract labour rates (\$22 MM)
- **Scope Clarification [IFR30 to IFB\*] (+C\$17 MM)**
  - Scope clarifications added during detailed design (\$9 MM)
  - More trenchless crossings and added depth to open cuts (\$5 MM)
  - Increased inspection hours and rates based on more detailed scope definition (\$3 MM)
- **Overheads / IDC (+C\$36 MM) [OEB % of spend formula]**
- **NPS16 Lateral Scope Removed (-C\$69 MM)**
  - Scope deferred due to changing customer demand profile
- **Mitigations – current view (-C\$34 MM)**
  - Negotiate prime contractor terms and conditions (\$19 MM)
  - Streamlined design for station scope (\$15 MM)

## Summary of Incremental Capital Approvals (C\$ MM)

Original Board Approval – May 2022 (Class 3)	314
<b>Incremental Capital Appropriation Request</b>	<b>45</b>
<b>Revised Total Capital</b>	<b>359</b>

Cost Increase Breakdown (CAD \$MM)



\*IFR30 – Issued for Review at 30% Engineering; IFB – Issued for Bid (RFP)



# Regulatory Impacts

Key Considerations	Assessment	Commentary	<div style="display: flex; justify-content: space-between; width: 100%;"> <span style="background-color: red; color: white; padding: 2px;">Low</span> <span style="background-color: orange; color: white; padding: 2px;">Medium</span> <span style="background-color: green; color: white; padding: 2px;">High</span> </div>
<b>OEB LTC Approval: Timeline</b>		<ul style="list-style-type: none"> <li>• EGI placed project in abeyance with OEB on Dec 14, 2022 due to discovery of a material change in project cost</li> <li>• EGI will file a comprehensive update to evidence in June 2023 (including adjusted facility scope and costs) and will seek streamlined continuation of the LTC proceeding</li> </ul>	
<b>OEB LTC Approval: Project Need</b>		<ul style="list-style-type: none"> <li>• EGI completed an Expression of Interest in February – April of 2023 to confirm the demand forecast</li> <li>• Project continues to be economic and in the public interest serving incremental demand for EGI’s rapidly expanding greenhouse sector, power generation &amp; other industrial and residential growth</li> <li>• Continuing to increase customer commitments for the project; significant support from municipal CAO’s, regional Chambers of Commerce, Ministry of Economic Development</li> </ul>	
<b>Project Cost Recovery</b>		<ul style="list-style-type: none"> <li>• Project has committed costs of:                             <ul style="list-style-type: none"> <li>– Total of C\$72 MM by ENB BoD meeting in May 2023</li> <li>– Total of C\$77 MM by EGI Rebasing Application Approval in Q4-2023</li> <li>– Total of C\$193 MM by OEB LTC Approval in Jan 2024</li> </ul> </li> <li>• Costs will be recovered through rates from commercial agreements with contract customers</li> <li>• Remaining revenue requirement will be recovered from ratepayers                             <ul style="list-style-type: none"> <li>– Updating the EGI rebasing application with a levelized cost recovery mechanism proposal for the 2024 project costs with decision expected by Q4-2023</li> <li>– The 2025 project costs will be recovered under the base capital included in EGI 2025 rates</li> </ul> </li> </ul>	

The project continues to demonstrate a strong project need to serve customer growth and is still the most optimal solution

# Financial Evaluation



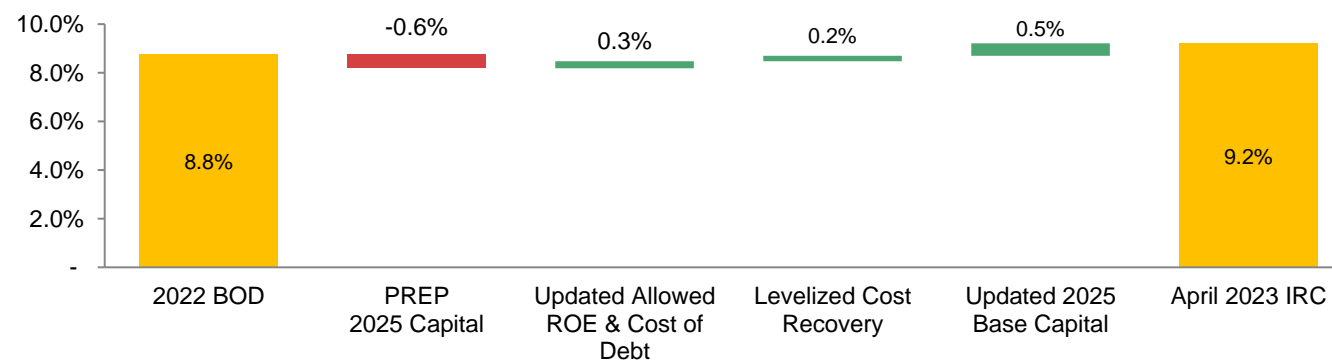
## Project Description

- **PREP 2025 Capital:** 2025 in-service capital was not included in 2024 EGI Rebasing Application
- **Updated Allowed ROE & Cost of Debt:** The revenue requirement for the total project is assumed as annual cost of service, with an allowed ROE of 8.9% in 2023, 9.2% for 2024-2028 and 9.1% for each subsequent period<sup>1</sup>
- **Levelized Cost Recovery:** The annual recovery of the 2024 ISD Revenue Requirement reflects the 5-year average of 2024-2028, recovering the same amount each year
- **Updated 2025 Base Capital:** Reflects the recovery of 2025 in-service capital of C\$106 MM under the base capital included in EGI 2025 rates
- Evaluation parameters include:
  - C\$359 MM CAPEX (including IDC and overheads)
  - 40-year evaluation horizon
  - Debt to equity ratio consistent with 2024 Cost of Service filing – ramps up to 58:42 in 2028, 4.65% cost of debt
  - 26.5% Tax Rate

## Financial Outlook

in \$MM	2022-23	2024	2025	2026	2027	2028	2029
Equity Cash Flow	2.8	(99.2)	(19.3)	7.9	8.8	9.4	15.7
EBITDA	-	7.2	4.8	21.4	23.1	24.5	29.3
Earnings	2.8	15.4	3.7	8.7	9.1	9.5	12.4
DCF	2.8	15.8	9.1	16.5	16.9	17.3	20.2
D/EBITDA		25.9x <sup>2</sup>	45.2x <sup>2</sup>	9.7x	8.6x	7.8x	6.4x
Annual ROE		130.5% <sup>3</sup>	3.6% <sup>3</sup>	6.2% <sup>3</sup>	6.5% <sup>3</sup>	6.8% <sup>3</sup>	9.1%

<b>DCFROE</b>	<b>9.2%</b>
EV/ 2026 EBITDA	16.8x
EV/ 2029 EBITDA	12.3x



Investment realizes a strong return from low-risk cost of service investment

<sup>1</sup> Assumption reflects the latest forecast of allowed ROE for EGI

<sup>2</sup> High D/EBITDA multiples in 2024 & 2025 due to the utilization of a full year's worth of tax depreciation, while generating 2 months worth of revenue from the 2024 and 2025 in-service capital

<sup>3</sup> Annual ROE is lower than the allowed ROE of 9.2% in years 2025-2028 due to the effects of levelized cost recovery. 2024 will be earning above the allowed ROE

# Risk Matrix Signoffs



Team/Area	Responsibilities	Signoff
Project Execution	Rob Watson	
Integrity	Jim Sanders	
Asset Utilization	Philippe Teijeira & Jim Redford	
Operations	Jim Sanders	
Insurance	Cathy Ward	
Tax	Leslie O'Leary	
Land	Vik Kohli	
Environmental	Vik Kohli	

Team/Area	Responsibilities	Signoff
Stakeholder	Keith Boulton & Mike Fernandez	
Regulatory	Malini Giridhar	
Credit	Jonathan Gould	
Accounting	Chris Johnston	
Treasury	Jonathan Gould	
Investment Review	Falyne Chave	
GHG	Malini Giridhar	
Market Price Risk	Jonathan Gould	

# Panhandle Regional Expansion Project Revised Scope

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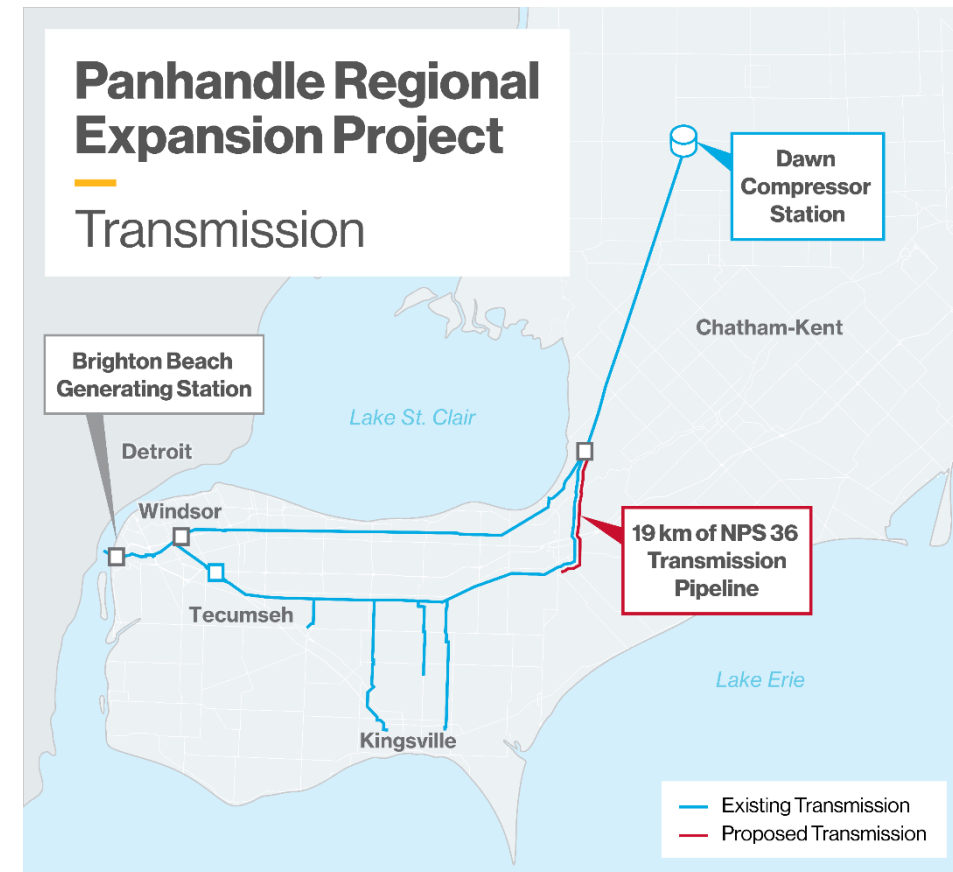
**Board of Directors**  
**April 25, 2023**



# Background

- The Panhandle Regional Expansion Project (PREP) supplies natural gas from the Dawn Hub to a growing customer base west of Dawn
- The original project scope included 19 km of NPS 36 pipe, measurement facilities at Dawn Compressor Station and 11 km of NPS 16 pipe. PREP received full funding approval in 2022 by EI Board of Directors for C\$314 MM with a DCFROE of 8.8%
- The project will require an incremental C\$45 MM due to:
  - Project cost increase of +C\$114 MM driven by inflationary pressures and identified gaps in the original cost estimate
  - Offset by the scope removal of the NPS 16 pipeline of -C\$69 MM
  - Project will be phased into service with the NPS 36 pipe in 2024 and the Dawn Facilities in 2025 based on demand forecast
- Updating the EGI Rebasing Application with a levelized cost recovery<sup>1</sup> mechanism for the 2024 project costs of C\$253 MM. The 2025 project costs of C\$106 MM will be recovered under the base capital included in EGI 2025 rates
  - EGI portfolio view DCFROE of 9.2%
  - Most likely regulatory scenario for PREP 2024 capital is to receive levelized cost recovery<sup>1</sup> treatment in 2024 due to it being a rebasing year. 2025 capital is accommodated in current capital plan
  - Worst case regulatory scenario is 2025 capital will be recovered in 2029 at next rebasing which leads to a revised project DCFROE of 8.7%

## Project Map



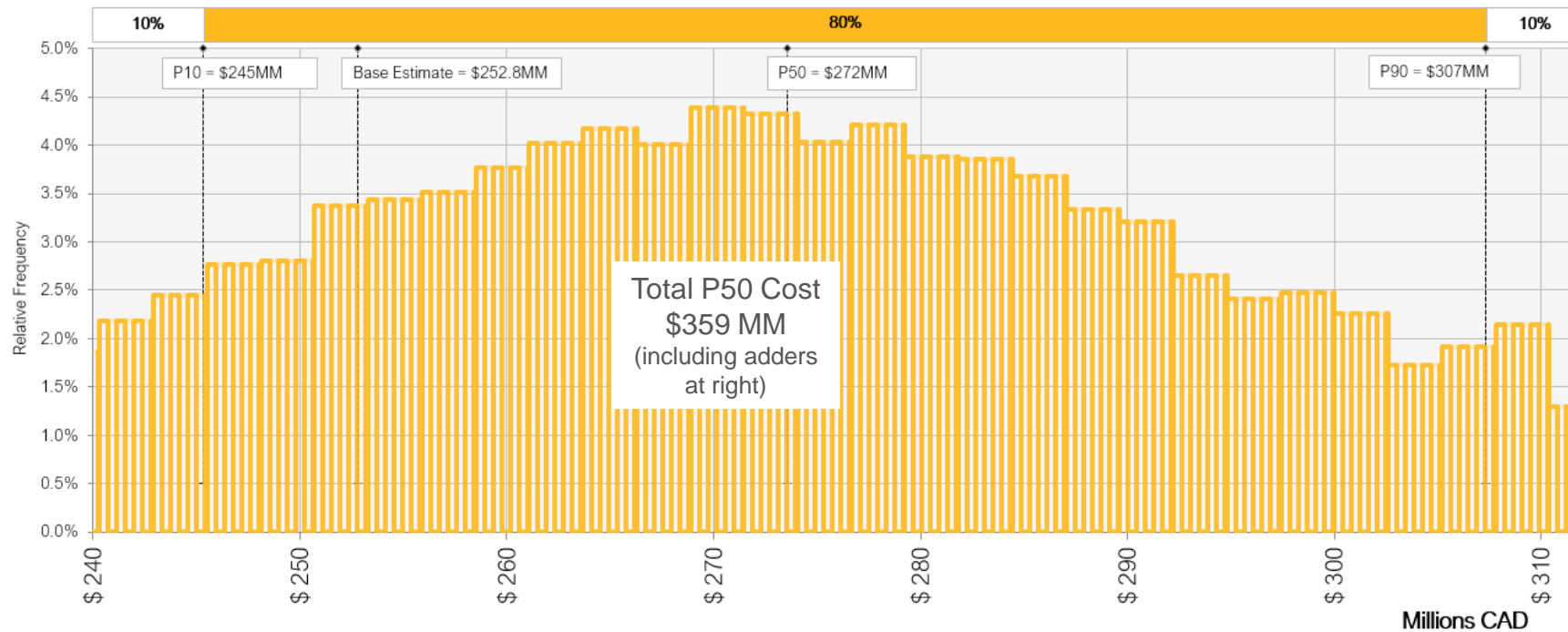
Regulated project that supports significant EGI customer growth

<sup>1</sup> See Financial Evaluation slide for more details



# GDS: Panhandle Regional Expansion Project

## CAPEX Monte Carlo – Range of Cost Outcomes



	Estimate (\$MM)
<b>Total Project Estimate</b>	<b>\$359</b>
P50 Estimate (with contingency)	\$272
Adders (scale with P50 estimate)	
Escalation, Interest During Construction (IDC), GDS Overheads	\$87
<b>Calculated Accuracy Range</b> (P90 / P10 – In Relation to P50 value)	
+12% / -10%	

### Top project specific risks:

- Delayed land acquisition for the NPS 36 pipeline ROW
- OEB Leave to Construct approval is delayed beyond January 2024

High level of certainty (tight accuracy band) driven by advanced project definition





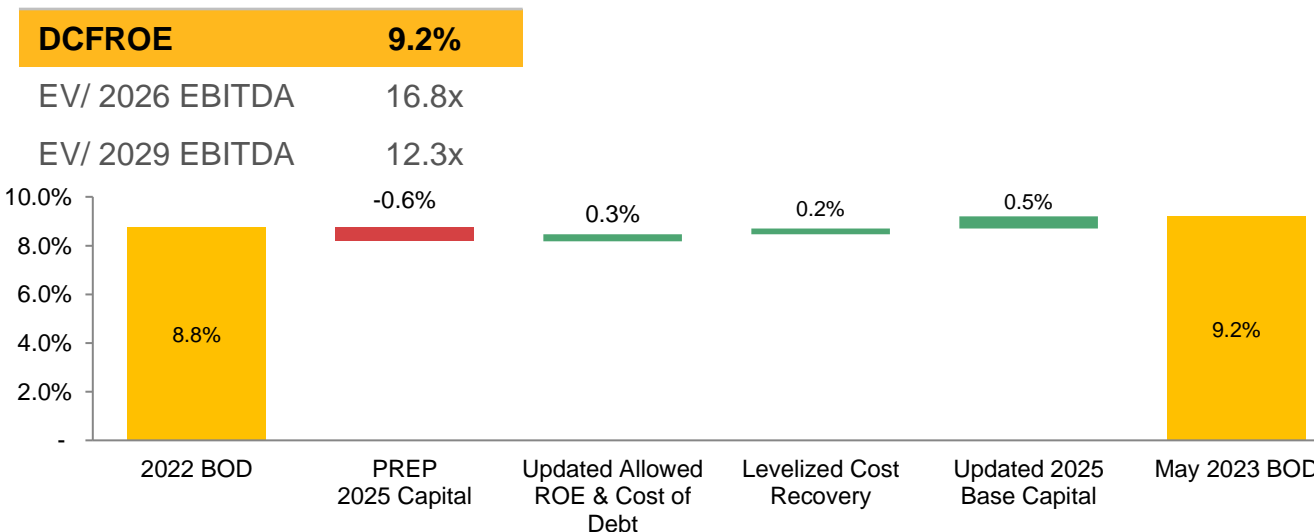
# Financial Evaluation

## Project Description and Changes

- **PREP 2025 Capital:** 2025 in-service capital was not included in 2024 EGI Rebasing Application
- **Updated Allowed ROE and Cost of Debt:** The revenue requirement for the total project is assumed as annual cost of service, with an allowed ROE of 8.9% in 2023, 9.2% for 2024 – 2028 and 9.1% for each subsequent period<sup>1</sup>
- **Levelized Cost Recovery:** Recovery of the 2024 in-service capital is levelized across 2024 – 2028, earning the same revenue requirement each year
- **Updated 2025 Base Capital:** Reflects the recovery of 2025 in-service capital of C\$106 MM with identified offsets in EGI's 2025 planned capital spend
- Evaluation parameters include:
  - C\$359 MM CAPEX (including IDC, overheads, and C\$21 MM contingency), Class 3
  - 40-year evaluation horizon, 26.5% Tax Rate
  - Debt to equity ratio consistent with 2024 cost of service filing<sup>4</sup> – ramps up to 58:42 in 2028, 4.65% cost of debt
  - In-service date: November 2024 & November 2025

## Financial Outlook

in \$MM	2022-23	2024	2025	2026	2027	2028	2029
Equity Cash Flow	2.8	(99.2)	(19.3)	7.9	8.8	9.4	15.7
EBITDA	-	7.2	4.8	21.4	23.1	24.5	29.3
Earnings	2.8	15.4	3.7	8.7	9.1	9.5	12.4
DCF	2.8	15.8	9.1	16.5	16.9	17.3	20.2
D/EBITDA		25.9x <sup>2</sup>	45.2x <sup>2</sup>	9.7x	8.6x	7.8x	6.4x
Annual ROE		130.5% <sup>3</sup>	3.6% <sup>3</sup>	6.2% <sup>3</sup>	6.5% <sup>3</sup>	6.8% <sup>3</sup>	9.1%



Investment realizes a strong return from low-risk cost of service investment

<sup>1</sup> Assumption reflects the latest forecast of allowed ROE for EGI; <sup>2</sup> High D/EBITDA multiples in 2024 & 2025 due to the utilization of a full year's worth of tax depreciation, while generating 2 months worth of revenue from the 2024 and 2025 in-service capital; <sup>3</sup> Annual ROE is lower than the allowed ROE of 9.2% in years 2025-2028 due to the effects of levelized cost recovery. 2024 will be earning above the allowed ROE

<sup>4</sup> Should the debt to equity ratio remain at current levels at 64:36, the EBITDA would gradually decrease over the first 5 years over the introductory period, up to a maximum of ~\$1.5M/year for 2029 onwards when compared to 58:42, with no impact to DCFROE

# Recommendation

**Management recommends that the Board of Directors of Enbridge Inc. (the “Board”) (a) take no exception to, and (b) defer to the Board of Directors of Enbridge Gas Inc. (the “Corporation”) with respect to, the approval of the following:**

- Increased funding for the Panhandle Regional Expansion Project, as revised (the “Project”), including the authority of the Corporation and the officers of the Corporation to take all such action, and to cause the subsidiaries of the Corporation to take all such action, necessary or advisable to effectuate the Project consistent with the project materials provided to the Board (the “Project Memo”);

**Management recommends that the Board approve funding for the Project, including:**

- An additional capital appropriation of C\$45 million for the Project, including AIDC, for an aggregate capital expenditure for the Project not to exceed C\$359 million;
- A corresponding increase to the applicable budgets, to the extent necessary or appropriate; and
- Entry by Enbridge Inc. or its subsidiaries into such funding arrangements as may be required on terms as approved by the Executive Vice-President, Corporate Development, Chief Financial Officer & President, New Energy Technologies, or the Vice-President, Treasury, Risk & Pensions of Enbridge Inc.

Panhandle Regional Expansion Project  
 Alternatives Assessment – Summary  
 2023 Update for OEB Application

Why are incremental facilities required in Winter 2024/25?

Demand Forecast	Winter 22/23	Winter 23/24	Winter 24/25	Winter 25/26
Total System Demand	698	730	802	849
Incremental per Year	26	32	72	47
System Capacity (No Project)	737	737	737	737
Shortfall (No Project)	+38	+6	-112	-127

Based on the Winter 2024/2025 Panhandle System design forecast, a minimum of 69 TJ/d of incremental deliveries at Ojibway would be required to delay the in-service date of the proposed Project by one year (over triple the capacity which is operationally available to deliver to into Ojibway). This is larger than the forecast Panhandle System shortfall of 66 TJ/d because increasing deliveries at Ojibway will not efficiently serve the Leamington-Kingsville market demands.

Enhanced Target Energy Efficiency (ETEE)

Enbridge Gas engaged Posterity in 2023 to assess whether including the Windsor and Chatham areas in addition to the Leamington area (which was the geographic scope of the original ETEE IRPA analysis) would result in a viable ETEE IRPA in relation to the updated Project. The analysis focused on assessing the extent to which an ETEE IRPA could eliminate or reduce the scope of the NPS 36 Panhandle Loop.

From June 5, 2023 Report:

A maximum peak hour reduction potential of approximately 72,000 m<sup>3</sup>/hour (57 TJ/d) from general service customers could be obtained by Winter 2029/2030 and would cost approximately \$468 million. This results in \$8.2 million per TJ, whereas the preferred alternative provides capacity at a cost of \$2.14 million per TJ.

Trucked CNG

A CNG analysis indicated that approximately 420 loads per day would be required to meet the shortfall capacity of 156 TJ/d on a Design Day. This alternative poses issues both in terms of logistics and in terms of security of supply. This alternative is not a viable solution and was not pursued further.

New LNG Plant

In the PRP proceeding, Enbridge Gas evaluated constructing and operating an LNG storage facility as an alternative. The estimated cost was \$287 million (approximately \$390 million in today’s dollars) with about \$5 million in annual operating expenses to address 106 TJ/d of system growth. This would only provide a portion of the capacity of the proposed Project. Enbridge Gas expects an LNG solution to require more significant investment in both the size of the facility required and annual operating expenses. Enbridge Gas expects the costs to be 50% to 80% more than the estimated costs from the PRP proceeding (upwards of \$580 million) that addressed 156 TJ/d of system shortfall. As a result, Enbridge Gas deemed this alternative to be financially infeasible and did not assess it further.

Panhandle Regional Expansion Project  
 Alternatives Assessment – Summary  
 2023 Update for OEB Application

Analysis of PEPL Available Capacity

Annual	Winter
PEPL website at time of RFP showed 21 TJ/d  19 TJ/d was noted in Tenaska RFP bid  Tenaska confirmed via follow-up that 21 TJ/d is available on a long term basis.	PEPL website does not show capacity for future years or winter  No bids were received for Winter Only Service in the Enbridge RFP

On June 1, 2023, the PEPL website indicated that up to 21 TJ/d of delivery capacity was available at Ojibway. The available PEPL system capacity with delivery to Ojibway did not change since the RFP was conducted.

A firm exchange is not commercially available to defer the need for the proposed project to Winter 2025/26.

Estimated Costs of Ojibway Deliveries

	Unit Cost (C/GJ/d)	Estimated Annual Costs (\$MM)	
		21 TJ/d Delivery	42 TJ/d Delivery**
RFP Bid	0.55	\$4.2	\$8.4

Why is the NPS 36 the Preferred Alternative?

Potential Alternative	Incremental Capacity (TJ/d)	Cost (\$ Million)	Net Present Value (\$ Million)	Cost per Unit of Capacity (\$/TJ/d)
Facility Alternative: Looping of NPS 20 Panhandle				
Proposed Project 19 km Loop with NPS 36	168	\$358.0	\$(153.5)	\$2.13
19 km Loop with NPS 30	160	\$342.7 (2)	\$(144.6)	\$2.14

- (1) The calculation of the Net Present value does not include Overheads
- (2) The estimated cost of \$342.7 M for an NPS 30 alternative is based on a November 1, 2024 in-service date, for the purpose of displaying a direct comparative to the proposed Project. The actual installation of an NPS 30 alternative would result in a November 1, 2025 in-service date and as such the estimated cost would be higher due to inflationary impacts.

Panhandle Regional Expansion Project  
 Alternatives Assessment – Summary  
 2023 Update for OEB Application

Hybrid Alternative	Capacity (TJ/d)	Facility Costs (\$ Million)	O&M Costs (\$ Million)*	Cost per Unit of Capacity (\$/TJ/d)	NPV (\$ Million)
17.86 km NPS 36 and 21 TJ/d Ojibway to Dawn Exchange	168	\$351.0	\$4.2 Annually \$(66.2) over a 40-year term	\$2.48	\$(212.1)
16.20 km (i.e., Wheatley Road end-point) NPS 36 and 21 TJ/d Ojibway to Dawn Exchange	153	\$330.5	\$4.2 Annually \$(66.2) over a 40-year term	\$2.59	\$(204.0)

\*The estimated O&M costs are based on the bid received in the RFP. The bid stated pricing is subject to refresh based on the market conditions at the time of contracting.

- Economic Feasibility:
  - ✓ Proposed Project provides the lowest cost per unit of capacity relative to all other alternatives assessed.
  
- Timing:
  - ✓ Provides market assurance in meeting the growing firm demands along the Panhandle System for the next five years.
  - ✓ Can meet required in service date of November 1, 2024.
  
- Safety & Reliability:
  - ✓ Positions the Panhandle System and the distribution pipelines connecting to it to meet forecasted long-term growth in the most efficient manner.
  - ✓ Alleviates the largest bottleneck, increasing the reliability of service for existing customers and allowing for growth for both existing and new customers.
  
- Risk Management:
  - ✓ Increases price transparency of the Dawn Hub and Ontario customer’s access to diverse supply, and storage
  - ✓ Scalable with future system growth
  - ✓ Directly serves areas of growth
  
- Environmental and Socio-economic Impact:
  - ✓ Minimizes project impact by paralleling existing right of way

Panhandle Regional Expansion Project  
Alternatives Assessment – Summary  
2023 Update for OEB Application

Additional Benefits of NPS 36 Loop vs NPS 30 Loop

Extending the existing NPS 36 pipeline from Dawn through to Comber Transmission at the same diameter will reduce overall system costs for operations and maintenance. A common pipe size benefits a system from a maintenance perspective in the reduced costs associated with two separate pipeline inspection programs and minimizes the number of overall facilities therefore minimizing impacts to Indigenous peoples, municipalities, and landowners, and environmental; and costs to build and operate.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Pollution Probe (“PP”)

INTERROGATORY

Reference:

“The proposed Project provides many benefits and is the best alternative for meeting the identified needs for the following reasons” [C/1/1 Pg. 24]

Question:

Please provide a table identifying each option/alternative considered and indicate what the relative impact/rating was for each of the following criteria used by Enbridge for decision making.

- Lowest cost per unit of capacity
- Meets required November 1, 2023 in-service date
- Provides market assurance in meeting the growing firm demands along the Panhandle System for the next five year
- Increases Ontario customers access to diverse supply, storage, and price transparency of the Dawn Hub
- Provides load balancing between existing laterals to reduce the pressure drop between the NPS 20 Panhandle Line and the Leamington-Kingsville market, which also allows for incremental growth throughout the entire Panhandle Market.
- Scalable with system growth.
- Directly feeds area of growth.
- Contains the lowest risk relative to other alternatives assessed.
- Contains the lowest environmental and socio-economic impacts relative to all viable alternatives assessed.

Response

Please see the response to Exhibit I.STAFF.7, Attachments 1 and 2. Enbridge Gas did not rank each item listed in the response at Exhibit I.STAFF.7, as many items listed are binary (pass/fail) criteria, such as: “Meets required November 1, 2023 in-service date”.

In addition, once an alternative was deemed not to be viable, Enbridge Gas did not continue assessing further criteria for the option.

Enbridge Gas's approach in this regard was guided by prior OEB direction from its Decision and Order on the Company's Panhandle Reinforcement Project (EB-2016-0186), at page 16:

Union is required to explore alternatives, but once an alternative is assessed to be less appropriate, Union is not required to go further. The preferred option needs to be as good as, or better, than the alternatives analyzed.



ENBRIDGE GAS INC.

Answer to Interrogatory from  
Pollution Probe ("PP")

INTERROGATORY

Reference:

Posterity Report [C/1/1, Attachment 2]

Question:

- a) Please provide the RFP (if applicable), statement of work and contract with Posterity Group for the IRP analysis and report.
- b) Is the 2 page report filed the only material received from Posterity Group related to this project? If no, please provide all other materials (reports, presentations, emails, etc.).

**Response**

- a) Please see Attachment 1 to this response for the scoping document between Posterity Group and Enbridge Gas. Enbridge Gas has redacted commercially sensitive information within Attachment 1 pertaining to the negotiated price for Posterity's services.
- b) Please see the response at Exhibit I.ED.7 for additional materials and communications between Posterity and Enbridge Gas in relation to the Project.



POSTERITY  
GROUP

## Scoping Document: Leamington IRPA

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Date: March 8, 2022

Amrit Kuner  
Enbridge Gas Inc.  
500 Consumers Road  
North York, M2J 1P8

Posterity Group  
140 Yonge Street, Unit 200  
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## Contents

<u>1 Background and Objectives</u>	<u>1</u>
<u>2 Support Activities</u>	<u>1</u>
<u>3 Timeline</u>	<u>2</u>
<u>4 Estimated Level of Effort</u>	<u>2</u>
<u>5 Checklist of Information we need from Enbridge</u>	<u>2</u>





# 1 Background and Objectives

## Context

Enbridge Gas Inc. (EGI) requires integrated resource planning alternatives (IRPA) analysis support for the Leamington Interconnect transmission component of the upcoming Panhandle Regional Expansion Project (PREP) leave to construct (LTC) application.

The IRPA being assessed are enhanced targeted energy efficiency (ETEE), and demand response (DR).

## Priorities for Posterity Group's Support

- ✓ Develop scaled version of IRPA model to support Leamington Interconnect ETEE and DR analysis.
- ✓ Deliver analysis output in Excel and draft a memo highlighting findings.

# 2 Support Activities

## Work Package 1 – Leamington Interconnect IRPA Analysis

### Value and outcomes for Enbridge:

- Scaling the IRPA model will allow EGI to develop location (sub-region) specific estimates of ETEE and DR IRPAs.
- This scaled model approach will be faster and more defensible than trying to derive estimates from rate-zone level outputs; it will also be more cost effective than developing a unique model for LTC impacted customers.

### Activities:

This work package involves scaling down the legacy Union South rate-zone region in the IRPA model to enable ETEE and DR analysis on the subset of customers associated with the Leamington Interconnect:

- Receive data on customers impacted in the Leamington Interconnect sub-region [see Section 5 for a checklist of information we need from EGI]
- Identify the corresponding 'legacy Union South rate-zone + IESO Zone' sub-region, and scale down this sub-region to align with customer data
- Update reference case growth rates to align with Enbridge's updated data for the applicable rate classes and segments.
- Run model to develop ETEE and DR outputs and QC model outputs
- Post outputs to Excel and present the following information:
  - Peak hour reduction (m<sup>3</sup>/hr): by measure, end-use, customer type, and sector
  - Cost: program spending by year and by measure
  - Report peak reduction and cost for both ETEE and DR combined and separately
- Draft a memo highlighting findings





### 3 Timeline

- Project Start Date: As soon as possible.
- Project Completion: Target 6 weeks after initiation [We plan to reduce this timeline for future analyses. We need more elapsed time for this assignment to facilitate development of a process to update reference case growth rates as part of the IRPA analysis].

### 4 Estimated Level of Effort

The table below presents a level of effort estimate for the proposed work.

[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]

Similar to previous engagements with EGI, we propose undertaking work on an hourly basis with a monthly billing cycle for fees incurred in the preceding month.

### 5 Checklist of Information we need from Enbridge

The checklist below presents the information we need from EGI as inputs for the ETEE and DR analysis.

- Normalized annual volume by customer
  - Year should be clearly specified so that we can scale customer segments using the appropriate year in the IRPA model
  - It likely makes sense for EGI to select the most recent calendar year for which it has a complete set of normalized annual volume data
- Hourly Peak by customer
  - Data from DOE (coincident system hourly peak on design day)
- Rate class, Sector, Segment data by customer
  - We ideally need to map EGI data to the rate, sector, and segment data schema we have in the IRPA model [See tables below for a list of rate classes, sectors, and segments that are in the model]
  - If segment data doesn't perfectly match the options present in the IRPA model data schema, we may be able to make assumptions about how to characterize customer information (provided there are alternate segment descriptions to work with).
- Location by customer
  - Only needed if customers span more than one IESO zone or legacy gas utility rate zone.
  - If needed, we would require postal code data by customer
- Direction on hourly peak reduction target(s)
- Direction on timelines associated with peak reduction targets (e.g., Are there milestone years that are important?)





- Direction on which customers should be excluded from IRPAs (i.e., IRPA will not be applied to these customers)
  - The hourly peak for these customers will show up in the forecast period, but IRPA measures will not be applied to this subset of customers (i.e., they will not contribute to peak reduction potential)
  - e.g., if there are contract customers in the dataset provided and these should be excluded, specifically identify the relevant rate class, sector and segments that should be excluded from IRPA measures
- Direction on whether Posterity should calibrate load shapes to customer subset.
- Direction on whether Posterity should update reference case growth rates. If yes, we need:
  - Direction on the specific rate classes/segments that are departing from the IRPA model's reference case (currently, this is the same reference case which is being used for ETSA analysis and is based on EGI's 2020 10-year forecast)
  - Updated growth rates for these rate classes/segments: account (customer) and consumption forecasts by rate class and segment
  - Direction on how to extend growth rates out to 2038 (the final year in the forecast period): e.g., take annual growth rate for each rate class from 2022-2032, and extend the trend of annual changes in year-over-year growth out to 2038

Exhibit 1: Rate classes by Sector in IRPA Model

Residential	Commercial	Industrial
<ul style="list-style-type: none"> <li>• E1</li> <li>• U1</li> <li>• 10</li> <li>• 110</li> <li>• 6</li> <li>• M1</li> <li>• M2</li> <li>• M4</li> </ul>	<ul style="list-style-type: none"> <li>• 1</li> <li>• 10</li> <li>• 100</li> <li>• 110</li> <li>• 115</li> <li>• 135</li> <li>• 145</li> <li>• 170</li> <li>• 6</li> <li>• 9</li> <li>• M1</li> <li>• M2</li> <li>• M4</li> <li>• M5A</li> <li>• M7</li> <li>• R20</li> <li>• T1</li> <li>• T2</li> </ul>	<ul style="list-style-type: none"> <li>• 1</li> <li>• 10</li> <li>• 100</li> <li>• 110</li> <li>• 115</li> <li>• 135</li> <li>• 145</li> <li>• 170</li> <li>• 6</li> <li>• M1</li> <li>• M10</li> <li>• M2</li> <li>• M4</li> <li>• M5</li> <li>• M5A</li> <li>• M7</li> <li>• M9</li> <li>• R10</li> <li>• R100</li> <li>• R20</li> <li>• R25</li> <li>• T1</li> <li>• T2</li> </ul>





Exhibit 2: Segments by Sector in the IRPA Model

Residential	Commercial	Industrial
<ul style="list-style-type: none"> <li>• Detached House</li> <li>• Attached or Row House</li> <li>• Multi-Res_High Rise</li> <li>• Multi-Res_Low Rise</li> <li>• Low Income_SF</li> <li>• Low Income_MF</li> <li>• Large House</li> <li>• Other Residential</li> </ul>	<ul style="list-style-type: none"> <li>• Data Centre</li> <li>• Food Retail</li> <li>• Hospital</li> <li>• Large Hotel</li> <li>• Large Non-Food Retail</li> <li>• Large Office</li> <li>• Long Term Care</li> <li>• Other Commercial</li> <li>• Other Hotel_Motel</li> <li>• Other Non-Food Retail</li> <li>• Other Office</li> <li>• Restaurant</li> <li>• School</li> <li>• University_College</li> <li>• Warehouse</li> <li>• Street Lighting</li> </ul>	<ul style="list-style-type: none"> <li>• Agriculture</li> <li>• Chemicals Mfg</li> <li>• Fabricated Metals Mfg</li> <li>• Food and Beverage Mfg</li> <li>• Mining; Quarrying and Oil &amp; Gas Extraction</li> <li>• Non-metallic Minerals Product Mfg</li> <li>• Other Industrial</li> <li>• Petroleum Mfg</li> <li>• Plastic and Rubber Mfg</li> <li>• Primary Metals Mfg</li> <li>• Pulp; Paper; and Wood Products Mfg</li> <li>• Transportation</li> <li>• Transportation and Machinery Mfg</li> <li>• Utility</li> <li>• Water &amp; Wastewater Treatment</li> <li>• Hydrogen Production</li> </ul>



ENBRIDGE GAS INC.

Answer to Interrogatory from  
Pollution Probe (“PP”)

INTERROGATORY

Reference:

“The total gross cost of the approximately 6,900 m<sup>3</sup>/hr of potential reduction that could be obtained by winter 2029/2030 would be approximately \$50 million”. [Posterity Report C/1/1, Attachment 2, Page 1]

Question:

Please provide a similar model reduction estimate for the following DSM cost ranges.

- \$100 million
- \$200 million
- \$300 million

Response

Please see the response at Exhibit I.ED.7, part g).



ENBRIDGE GAS INC.

Answer to Interrogatory from  
Pollution Probe (“PP”)

INTERROGATORY

Question:

Enbridge is currently coordinating its rebasing application for 2024. Please explain how this project relates (if at all) with rebasing.

**Response**

Please refer to Exhibit A, Tab 3, Schedule 1, Paragraph 13.

/U

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Pollution Probe (“PP”)

INTERROGATORY

Question:

Please confirm that the Environmental Report only assessed the proposed pipeline option selected by Enbridge and did not compare the other alternatives identified in the Leave to Construct application. If that is incorrect, please provide the references to where all project alternatives were compared from an Environmental and Socio-economic perspective.

**Response**

Confirmed.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Pollution Probe (“PP”)

INTERROGATORY

Question:

Has Enbridge received the final review and approval letter from TSSA? If not, please indicate when it is expected.

**Response**

Yes, the TSSA completed their review of the design for the Project and provided its final review letter on July 26, 2022. Please also see the response to Exhibit I.STAFF.16.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Pollution Probe (“PP”)

INTERROGATORY

Question:

Please provide an updated project schedule including major milestones including permits and approvals.

**Response**

Please see Figure 1 below for an updated Project schedule.



ENBRIDGE GAS INC.

Answer to Interrogatory from  
Pollution Probe (PP)

INTERROGATORY

Reference:

“The Project as proposed is designed to reliably serve increased demands for firm service in the Panhandle Market, including, in particular, incremental demands from the greenhouse, automotive, and power generation sectors” [A/2/1]

Question(s):

a) Enbridge previously confirmed that there is only one incremental automotive customer proposed on the Panhandle system and that it would only use natural gas for potential space and/or water heating. Has this changed for the updated Project? If so, please provide details for any incremental automotive customers, proposed use for natural gas and the proposed annual volume / peak demand for each of these potential customers.

b) Enbridge removed the Leamington Interconnect from the Project reducing greenhouse customers for the Project. Please explain what the difference in greenhouse customers is for the Project with that Project component removed and the resulting annual volume / peak demand increases forecasted. Please note which of the greenhouse customers (if any) are new incremental load and if so, what year they are forecasted to come on the system.

c) Is there a change in the number/size of power generation customers from the 2022 application. If so, please provide details and which year they are forecasted to be added/removed.

Response:

a) The contract for the automotive customer referenced within the interrogatory has been executed starting in 2023 and is being supported by the existing system capacity. Please note, this customer’s volume is for space heating, water heating, industrial processes, and back-up power generation.

Enbridge Gas is engaged in ongoing discussions with several automotive industry customers within the Project area. The total incremental natural gas demands of these customers are believed to be approximately 8.5 TJ/d, however due to the early

stage of these discussions Enbridge Gas has not included these incremental demands within the demand forecast at this time.

- b) For clarity, the removal of the Leamington Interconnect from the Project scope did not result in the removal of greenhouse customers from the demand forecast, rather updates to the capacity position of the Panhandle System, as well as an updated demand forecast, resulted in the ability to remove the Leamington Interconnect from the Project scope. Please see the response at Exhibit I.SEC.5, part a) for more information regarding the removal of the Leamington Interconnect from the Project scope. The proposed Project provides sufficient capacity to serve the updated forecast demands of customers, including greenhouse customers, for the next five years.

For information regarding changes to greenhouse customer demands between the initial application filed June 2022 and the amended application filed June 2023, please see Table 2 within the response at Exhibit I.ED.26, part b).

- c) Yes. There is an increase of 31 TJ/day in the demand forecast starting in Winter 2025/2026 among two power generation customers. For information regarding changes to power generation customer demands between the initial application filed June 2022 and the amended application filed June 2023, please see Table 2 within the response at Exhibit I.ED.26, part b).

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Pollution Probe (PP)

INTERROGATORY

Reference:

The additional capacity of 168 TJ/d resulting from the Project will support the continued reliable and secure delivery of natural gas to the growing residential, commercial, and industrial customer segments within the Panhandle Market. [A/3/1 Page 2]

Question(s):

a) Please provide a summary of the incremental customers (by residential, commercial, and industrial customer segments) by year that are driving the Project need.

b) Please explain why the Panhandle system would not be able to provide “continued reliable and secure delivery” to already existing customers without the Project.

Response:

a) Please see the response at Exhibit I.ED.2 for the forecasted general service attachments by residential, commercial, and industrial.

Please see the response at Exhibit I.STAFF.24, part a) for the list of incremental contract rate customer contracts (executed and in negotiation).

b) As per Enbridge Gas’s demand forecast, natural gas demand (from both existing and new customers) is expected to exceed current system capacity. Therefore, Enbridge Gas would not be able to provide reliable, firm natural gas service to existing and new customers to meet their future demand requirements without the Project.



ENBRIDGE GAS INC.

Answer to Interrogatory from  
Pollution Probe (PP)

INTERROGATORY

Question(s):

Please confirm that Enbridge did not conduct a 40 year demand forecast to validate the peak demand capacity that would be provided by the project options consider and the proposed project. If Enbridge did conduct that analysis, please provide a copy.

Response:

Confirmed.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Pollution Probe (PP)

INTERROGATORY

Reference:

A/4/1 Page 4:

- Winter 2023/2024 customer demands decreased by 14 TJ/d, from 744 TJ/d to 730 TJ/d.
- The 5-year demand forecast (i.e., the total forecast demand in Winter 2028/2029) decreased by 40 TJ/d, from 932 TJ/d to 892 TJ/d.

Question(s):

- a) Please provide a table and corresponding graph showing forecasted annual customer demand from current to Winter 2028/2029 and indicate the customer categories driven the demand. In the major categories, please include residential, contract automotive, contract greenhouse and contract power generation.
- b) For the forecasted increase in customer demand (per part a) from current to Winter 2028/2029, please provide a summary of how much is secured through executed contracts.
- c) A primary driver of the Project put forward was to maintain delivery pressure for power generation customers. Is this still a Project driver or has that issue no longer a consideration.

Response:

- a) Enbridge Gas does not use annual volumes when designing the Panhandle System.

Please see the response at Exhibit JT1.23 for the design day demand forecast broken out by general service, contract power generation, contract greenhouse and contract large commercial/industrial. Automotive customers are included within large commercial/industrial. Please see the response at Exhibit I.PP.33 for a corresponding graph.

- b) Please see the response at Exhibit I.STAFF.24, part a).

- c) The primary driver for the Project is natural gas demand growth across the Panhandle System. This is not to be confused with the hydraulic design constraint on the Panhandle System, which includes maintaining pressure to power generation customers. There are two minimum pressure constraints identified and discussed at Exhibit B, Tab 2, Schedule 1, Paragraphs 12-13. Maintaining pressures to constrained locations is a design requirement rather than a driver for incremental facilities or non-facilities alternatives.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Pollution Probe (PP)

INTERROGATORY

Question(s):

- a) When was the proposed project first identified in the Enbridge Asset Management Plan (AMP)?
- b) Please provide the page references from Enbridge's most current Asset Management Plan that explains the basis for the project and where it ranks against all other projects in the AMP.
- c) Enbridge indicated that it intends file an Updated AMP in the fall 2023. If this is not the most recent version provided in response to part b, please explain the differences between the AMP version referenced in part b with the Updated 2023 AMP (if any).
- d) What process will Enbridge use to file the Updated AMP in fall 2023 (i.e. is it via this proceeding)?

Response:

- a) Please refer to the response at Exhibit I.PP.2, part b).
- b) The Project was identified as a growth-driven investment under EBO 134. Growth driven investments under EBO 134 have fixed timing based on when the incremental facilities are required and have not been directly ranked against other projects in the asset management plan.

Page references to the Panhandle Regional Expansion Project found in Enbridge Gas's most current AMP (2024-2028 Natural Gas Distribution Rates, EB-2022-0200, filed October 31, 2022) are provided below:

- Exhibit 2, Tab 6, Schedule 2, Pages 16 and 17:
  - 1. Executive Summary, 1.4 Capital Expenditures, 1.4.1 Capital Considerations

- Exhibit 2, Tab 6, Schedule 2, Page 74:
  - 5. Customers and Assets, 5.1.9 Growth and Hydrogen Strategy Outcomes, 5.1.9.4 Transmission System Reinforcement System Growth under EBO 184

Additionally, the following updates were filed August 18, 2023 under EB-2022-0200:

- Exhibit J13.11, Attachment 1, Pages 40, 45 and 46:
  - Updated investment summary reports, originally provided in Exhibit 2, Tab 6, Schedule 2, Appendix A at Attachment 1.

c) The 2023 to 2032 AMP filed in Phase 1 of the Company's Rebasing Application (EB-2022-0200 at Exhibit 2, Tab 6, Schedule 2) is the most current version as the 2023 Addendum has not yet been filed.

d) As promised in the IRP Framework proceeding, EGI will file an AMP/or an Addendum to the AMP annually. The AMP describes the 10-year system needs and constraints and will be filed every two years, while the Addendum provides updates to forecasts for the year in which it is filed and the following year, and addresses any material changes to the 10-year system needs identified in the previous AMP. Each document provides the status of consideration of IRP alternatives in regards to meeting these system needs. During the deferred rebasing term, the AMP/Addendum to the AMP has been filed in the annual rate application to support the request for Incremental Capital Module (ICM). For 2023, there is no ICM request. Therefore, for this year, EGI will file the Addendum to the AMP as a stand-alone document with a cover letter. It will be filed under the IRP Framework docket number and copied to all parties in that proceeding. Similar to prior years, the Addendum to the AMP is being filed for information purposes and EGI is not seeking any approvals in relation to this filing.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Pollution Probe (PP)

INTERROGATORY

Reference:

EGI\_Correspondence\_PO6\_20230825\_eSigned. Enbridge indicated that the response several pieces of evidence was no longer accurate.

Question(s):

Please provide the accurate response to following (Please refile each marked as updated for administrative efficiency).

<ul style="list-style-type: none"><li>• JT1.16</li><li>• JT1.19</li><li>• JT1.21</li><li>• JT1.23</li><li>• JT1.32</li><li>• JT2.9</li><li>• JT2.10</li><li>• JT2.11</li><li>• JT2.12</li><li>• JT2.7 (Given that JT2.7 refers to I.PP.5, please confirm that I.PP.5 remains accurate and please provide an updated response to JT2.7 with the updates required.)</li><li>• JT1.5</li></ul>	<ul style="list-style-type: none"><li>• I.PP.3 (also please provide a copy of all documents and specific information sources outlining the growth assumptions that would affect the Panhandle system.)</li><li>• I.EP.3</li><li>• I.PP.5</li><li>• I.PP.8</li><li>• I.PP.14</li><li>• I.PP.16</li><li>• I.PP.23</li><li>• I.STAFF.7</li><li>• I.STAFF.9</li><li>• I.APPrO.6</li><li>• I.ED.2</li><li>• I.STAFF.11</li><li>• I.ED.12</li></ul>
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Response:

The responses referenced within the interrogatory were updated and filed by Enbridge Gas on October 3, 2023.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Pollution Probe (PP)

INTERROGATORY

Reference:

EGI\_Correspondence\_PO6\_20230825\_eSigned. Enbridge indicated that the response to the original JT2.8 is no longer accurate,

Question(s):

- a) Please provide an updated response that is accurate based on current information.
- b) Please provide details on which customers are expected to experience a drop below the contracted pressure constraint (in chronological order starting with the first to occur) and provide the following information:
  - Customer name
  - Current annual volume
  - Expected annual volume for years 2024-2030 (or the range available)
  - Current contracted demand
  - Expected contracted demand for years 2024-2030 (or the range available)
  - Current delivery pressure, expected delivery pressure in Winter 2029/2030
  - Year that pressure is expected to go below the pressure constraint value without the Project.

Response:

- a) Please see the responses to Exhibit JT2.8.STAFF 2 and Exhibit JT2.8.STAFF 3, updated October 3, 2023. Please note the Exhibit JT2.8.STAFF 1 has not been updated as the information remains accurate.
- b) Enbridge Gas would not continue to attach Panhandle System customers without the Project facilities. Providing the requested hypothetical information would require extensive scenario modelling and it would not be reasonable to produce due to the numerous variables and permutations that would impact the analysis. On that basis, Enbridge Gas is not able to provide the requested information.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Pollution Probe (PP)

INTERROGATORY

Reference:

Reference: Enbridge previously indicated that Contract rate customer demand makes up approximately 98% of the capacity of the proposed Project. However, in the updated Project (updated Application) Enbridge indicates that contract rate (Rate M/BT4, Rate M/BT5, Rate M/BT7, Rate T-1 and Rate T-2) demand accounts for approximately 55% of firm demand served by the Panhandle System as of Winter 2021/2022.

Question(s):

- a) Please reconcile the discrepancy.
- b) Why did Enbridge only survey Contract customers making up 55% of Panhandle system demand, rather than surveying the Contract customers making up 95% of Panhandle system demand?
- c) Please summarize the types of Contract customers not included in the survey.
- d) If the OEB were to require a CIAC for Contract customers requiring incremental demand that is driving the Project, please explain why it would only apply to those surveyed by Enbridge and not the larger list of Contract customers that were not surveyed?
- e) If the OEB were to require a CIAC for Contract customers requiring incremental demand, please provide a table (and accompanying Excel) indicating the following:
  - Contract Customer
  - Incremental Demand
  - % of Incremental Demand from the Project
  - CIAC (calculated based on the total cost of the Project times the % of total Incremental Demand due to the customer)
  - % of total customer CIAC compared to the total Project cost.



Response:

- a) There is no discrepancy to reconcile. For clarity, The Panhandle System is comprised of transmission pipelines to transport natural gas between Enbridge Gas's Dawn Compressor Station, located in the Township of Dawn-Euphemia and the Ojibway Valve Site, located in the City of Windsor. The Panhandle System feeds distribution systems serving residential, commercial, and industrial markets in the municipalities of Dawn- Euphemia, St. Clair, Chatham-Kent, Windsor, Lakeshore, Leamington, Kingsville, Essex, Amherstburg, LaSalle, and Tecumseh.<sup>1</sup> Please see Exhibit B, Tab 2, Schedule 1 for information regarding the Panhandle system, including Figure 1 at p. 2 for a visual representation of the Panhandle System.

The Project consists of:<sup>2</sup>

- Approximately 19 km of Nominal Pipe Size ("NPS") 36 natural gas pipeline with a Maximum Operating Pressure ("MOP") of 6040 kPag from the existing Enbridge Gas Dover Transmission Station in the Municipality of Chatham-Kent to a new valve site in the Municipality of Lakeshore; and,
- Ancillary measurement, pressure regulation, and station facilities within the Township of Dawn Euphemia and in the Municipality of Chatham-Kent.

Please see Exhibit D, Tab 1, Schedule 1 for information regarding the Project, including Figure 1 at p. 2 for a visual representation of the Project (in red).

The 55% figure reflects the percentage of contract customers on the entire Panhandle System, while the 98% figure reflected the percentage of the Project's capacity expected to be driven by contract rate customers.

- b) – d)  
Enbridge Gas surveyed all contract rate customers within the Project's Area of Benefit.
- e) Please see the response at Exhibit I.ED.29, part c).

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<sup>1</sup> Exhibit A, Tab 3, Schedule 1, p. 1, para. 2.

<sup>2</sup> Exhibit A, Tab 3, Schedule 1, p. 1, para. 1.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Pollution Probe (PP)

INTERROGATORY

Reference:

Enbridge highlights potential significant gas demand increases due to the Brighton Beach Generating Station (“BBGS”) and the potential Capital Power expansion at its existing East Windsor Cogeneration Centre. [B/1/1 Page 18]

Question(s):

- a) Please indicate when Enbridge expects a firm commitment from these customers related to the increased gas demand which could occur or if a commitment has already been signed, please provide a copy.
- b) Please provide the current and forecasted future peak demand for these power generation facilities should they expand as forecasted by Enbridge.

Response:

- a) Enbridge Gas has a firm distribution contract commitment with a power generator for service commencing in 2024 and is currently negotiating additional capacity for service commencing in 2025. Enbridge is also negotiating with another power generator for capacity in 2025.

Please see Attachment 1 to this response a for a copy of the executed contract referenced above. Please note that Enbridge Gas is requesting confidential treatment for certain information contained in Attachment 1.

For the incremental capacity requirements beginning in 2025, Enbridge Gas expects distribution contracts to be executed in the next 30 – 90 days.

- b) Please see Table 2 at Exhibit B, Tab 1, Schedule 1, p. 13. Current demand for power generation customers is 106 TJ/d and is forecast to be 195 TJ/d by Winter 2025/2026.

Contract ID	
Contract Name	ATURA POWER

## T2 CONTRACT

This GAS STORAGE AND DISTRIBUTION CONTRACT (“**Contract**”), made as of the 7<sup>th</sup> day of January, 2022

BETWEEN:

Enbridge Gas Inc.

hereinafter called the “the **Company**”

- and -

Brighton Beach Power L.P., doing business as Atura Power, by its general partner, Brighton Beach Power Ltd.

hereinafter called “**Customer**” or “**Atura**”

**WHEREAS**, the Company has built, or proposes to build, certain facilities for the Panhandle Regional Expansion Project (the “**Expansion Facilities**”) to increase the capacity of the pipeline system to serve the Brighton Beach Generating Station located at 100 Broadway Street, Windsor, ON (the “**Plant**”). Customer owns and operates the Plant;

**WHEREAS**, Customer has requested the Company, and the Company has agreed to, provide certain Services to Customer;

**AND WHEREAS**, the Company will deliver Customer-owned Gas to Customer’s Points of Consumption or Storage under this Contract and pursuant to the T2 Rate Schedule;

**IN CONSIDERATION** of the mutual covenants contained herein, the parties agree as follows:

### **1 INCORPORATIONS**

The following are hereby incorporated into and form part of this Contract:

- a) Schedule 1 – Delivery, Storage and Distribution Services Parameters (Rate T2), and Schedule 1a – Supplemental Services Parameters (Rate T2), as each may be amended from time to time upon agreement by the parties;
- b) The latest posted version of the T2 Contract Terms and Conditions contained in Schedule 2, subject to Section 12.18 of the Company’s general terms and conditions applicable to Union Rate Zones (“**General Terms and Conditions**”);
- c) The latest posted version of the General Terms and Conditions, subject to Section 12.18 of the General Terms and Conditions; and
- d) The applicable T2 Rate Schedule, as amended from time to time and as approved by the Ontario Energy Board.

For the purposes of this Contract, “Points of Receipt” shall mean those points identified in Schedule 1 attached hereto where the Company may receive Gas from Customer.

**2**      **CONDITIONS PRECEDENT**

2.01 The obligations of the Company to provide Services hereunder are subject to the following conditions precedent that are for the sole benefit of the Company, and which may be waived or extended, in whole or in part, in the manner provided in this Contract:

- a) The Company shall have obtained, in form and substance satisfactory to the Company, and all conditions shall have been satisfied under all governmental, regulatory and other third party approvals, consents, orders and authorizations, that are required to:
  - i. provide the Services; and
  - ii. construct the Expansion Facilities;
- b) The Company shall have obtained all internal approvals that are necessary or appropriate to:
  - i. provide the Services; and
  - ii. construct the Expansion Facilities;
- c) The Company shall have completed and placed into Service the Expansion Facilities; and
- d) If Customer has elected direct purchase services, Customer and the Company shall have executed and maintained in good standing a Southern Bundled T.

The Company shall use commercially reasonable efforts to satisfy and fulfill the conditions precedent specified in Sections 2.01 a), c) and d). The Company shall notify Customer forthwith in writing of the Company's satisfaction or waiver of each condition precedent for the Company's benefit. If the Company concludes that it will not be able to satisfy or waive a condition precedent, it may, upon written Notice, terminate this Contract and upon giving such Notice, this Contract shall be of no further force and effect and each of the parties shall be released from all further obligations hereunder.

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

3 **CONTRACT TERM**

This Contract shall be effective from the date hereof. However, the Services and the Company's obligation to provide the Services under Section 4 shall commence on the later of (such later date being the "**Day of First Delivery**")

Subject to the provisions hereof, this Contract shall continue in full force and effect for a period of five (5) Contract Years (the "**Initial Term**") and continuing thereafter on a year to year basis unless written Notice to terminate is provided by one party to the other at least three (3) Months prior to the end of the then-current term.

4 **SERVICES PROVIDED**

The Company agrees to provide Storage Services and Distribution Services as specified in Schedule 1 and Schedule 1a.

**5 FIRM DAILY CONTRACT DEMAND**

[NOT USED].

**6 RATES FOR SERVICE**

Customer agrees to pay for Services herein pursuant to the terms and conditions of this Contract and the T2 Rate Schedule, as amended from time to time by the Ontario Energy Board.

**7 EXPANSION FACILITIES**

The Company will use commercially reasonable efforts to construct the Expansion Facilities to serve the Plant. The target date for completion of these facilities is July 16, 2024. The Company will provide written Notice to Customer when such facilities are complete and placed into service.

The Company and Customer agree that the Company shall not be obligated to construct any portion of the Expansion Facilities between December 15 of any year and March 31 of the subsequent calendar year.

**8 AID AMOUNT PAYMENT SCHEDULE**

Customer will be required to pay to the Company the Aid Amount of \$0.00.

Any applicable taxes will be applied to all amounts paid under this Section. Customer warrants and represents that no payment to be made by Customer under this Contract is subject to any withholding tax.

**9 CREDIT REQUIREMENTS**

By no later than January 1, 2024, Customer shall provide financial assurances acceptable to the Company in accordance with the General Terms and Conditions.

**10 AGENCY**

If an agent on behalf of Customer executes this Contract then, if requested by the Company, the agent shall at any time provide a copy of such authorization to the Company.

Notwithstanding the provisions of Section 9 the agent shall be responsible for providing security arrangements acceptable to the Company in accordance with the General Terms and Conditions.

The agent and Customer acknowledge and agree that they are unconditionally and irrevocably jointly and severally liable for all Customer obligations under the Contract.

**11 CONTRACT SUCCESSION**

This Contract, unless terminated pursuant to Section 2 hereof, replaces all previous Gas Distribution Contracts between the parties, subject to settlement of any surviving obligations.

The undersigned execute this Contract as of the above date. If an Agent on behalf of Customer executes this Contract then, if requested by the Company, Agent or Customer shall at any time provide a copy of such authorization to the Company.




Enbridge Gas Inc.

\_\_\_\_\_  
Authorized Signatory

Tanya Mushynski, VP Customer Care

\_\_\_\_\_  
Please Print Name

CUSTOMER



\_\_\_\_\_  
Authorized Signatory

Chris Fralick

\_\_\_\_\_  
Please Print Name

Contract ID	
Contract Name	ATURA POWER

**Schedule 1**  
**Delivery, Storage and Distribution Services Parameters**  
**Rate T2**

**1. DATES**

This Schedule 1 is effective on the Day of First Delivery.

**2. DAILY CONTRACT QUANTITY (DCQ)\***

**Ontario Point(s) of Receipt**

Location	Obligated Daily Contract Quantity (DCQ) GJ per Day	Non-Obligated Maximum Daily Delivery Quantity GJ per Day
Dawn	█	█

\* Obligated DCQ does not include compressor fuel

**3. SUPPLY OF COMPRESSOR FUEL**

Customer shall supply compressor fuel for the Company’s distribution and storage services.

**4. STORAGE PARAMETERS**

Parameters	Quantity	Unit of Measure
<b>Storage:</b>		
Annual Firm Storage Space	█	GJ
Annual Firm Injection/Withdrawal Right (Utility provides deliverability inventory)	█	GJ per Day

**5. DISTRIBUTION PARAMETERS**

**Delivery Pressures and Volumes**

<b>BBP</b>				
Station #	Meter Number	Minimum Delivery Pressure (kPa)	Maximum Hourly Volume (m³/hour)	Firm Hourly Quantity (m³/hour)
06A-625I	2548275	█	█	█
	2548276			



**Daily Contract Demand**

Location	Firm (m <sup>3</sup> /day)	Interruptible (m <sup>3</sup> /day)
BBP	██████████	██████████

**Maximum Number of Days Interruption: 40 Days**

**Notice Period for Interruption: 4 hours**

**Negotiated Rate Parameters**

Interruptible Transportation Commodity

BBP		
Jan 1, 2022 -	██████████	cents per m <sup>3</sup>

**6. MINIMUM ANNUAL VOLUME("MAV")**

Location	Firm (m <sup>3</sup> /year)	Interruptible (m <sup>3</sup> /year)
BBP	██████████	0

Contract ID	
Contract Name	ATURA POWER

**Schedule 1a**  
 Supplemental Services Parameters  
 Rate T2

**1 Firm Backstop Gas Service**

Start	End	Location	Total Quantity (GJ)	Daily Quantity (GJ)	Demand Charge (\$/GJ/month)	Commodity Charge (\$/GJ)

**2 Reasonable Efforts Backstop Gas Service**

Start	End	Location	Total Quantity (GJ)	Daily Quantity (GJ)	Commodity Charge (\$/GJ)

**3 Market Priced Storage Space**

Service	Start	End	Total Quantity (GJ)	Demand Charge (\$/GJ)
MP Storage Space				

Market Priced (MP) Storage is storage space above the customer’s storage space per Schedule 1.

**4 Market Priced Storage Injection/Withdrawal**

Service	Start	End	Total Quantity (GJ/day)	Demand Charge (\$/GJ/month)	Commodity Charge (Rate/GJ)	Fuel Ratio (%)
MP Firm Injection / Withdrawal Right	Day of First Delivery		■	■	As per the Rate Schedule	As per the Rate Schedule

Market Priced (MP) injection/withdrawal rights (supplemental deliverability) are rights above the customer’s injection/withdrawal rights per Schedule 1 to provide additional access to the storage space in the T2 Contract.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Pollution Probe (PP)

INTERROGATORY

Question(s):

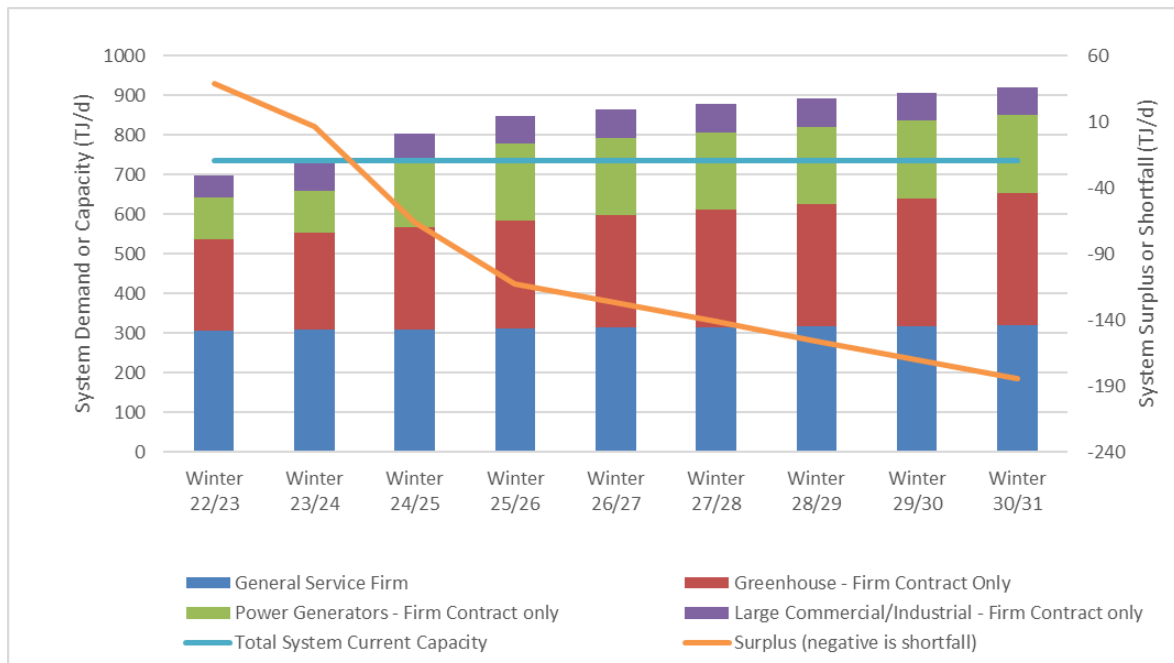
Please replicate Figure 3: Graph of the Forecast Panhandle System Capacity, Design Day Demand and Shortfall [B/2/1 Page 12] and segment the bars in the chart by the following categories:

- General Service
- Large Industrial/Commercial
- Greenhouse Market
- Power Generation

Response:

Please see Figure 1 below.

Figure 1: Graph of the Forecast Panhandle System Capacity, Design Day Demand (by Customer Type) and Shortfall



ENBRIDGE GAS INC.

Answer to Interrogatory from  
Pollution Probe (PP)

INTERROGATORY

Question(s):

It appears that Enbridge has added the peak demand (current and forecasted increase) for all Contract demand customers to arrive at its forecast. The resulting system peak demand would be much lower if the customer peak demands are not concurrent (e.g. some peak in summer and others peak in winter). Please explain what analysis (if any) Enridge has done to reduce the projected system peak demand increase based on nonconcurrent customer peak demand.

Response:

Enbridge Gas already incorporates non-coincident customer peaking (demand diversity) into the design of the system. This approach recognizes that some customers do not consume their maximum demand at the same time. This demand diversity results in a lower total demand on the system. This method is currently used for the existing general service customers and contract rate customers where applicable.

Regarding winter and summer peak demands being stacked; winter peaks occur in the winter analysis and summer peaks occur in the summer analysis. To clarify, these demands are recognized as time of year specific and are not stacked for design day hydraulic modelling purposes.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Pollution Probe (PP)

INTERROGATORY

Reference:

“No customer indicated that they would be willing to provide CIAC for a transmission system expansion project ...” [A/4/1 Page 6].

Question(s):

- a) Please provide a copy of the CIAC related survey/questions sent to customers.
- b) Based on the information collected how many customers would pay a CIAC if it was required by the OEB, rather than forgo their forecasted incremental gas demand?

Response:

- a) A survey and/or questions were not sent to customers. Please see the response at Exhibit I.STAFF.25, part a).
- b) Customers generally indicated opposition to being required to provide CIAC to support transmission system expansion in this instance. No customer indicated that they would be willing to provide CIAC for a transmission system expansion project without understanding the magnitude of the CIAC and the unique justification for its selective application in this instance.<sup>1</sup>

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<sup>1</sup> Exhibit A, Tab 4, Schedule 1, para. 21.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Pollution Probe (PP)

INTERROGATORY

Question(s):

- a) Please provide a list of the IRP alternatives considered for the Project.
- b) Please provide a copy of the IRP assessment materials (form/checklist, presentation, report, or other materials) for each IRP option evaluated.

Response:

- a) Please refer to Exhibit C, Tab 1, Schedule 1, Page 5, Paragraph 13.
- b) See below for additional information/references regarding the IRPAs listed in part a) above. Please see Attachment 9 at Exhibit I.PP.16 for a summary of the alternatives assessment.

*1. Firm exchange between Dawn and Ojibway*

- i) On September 16, 2021, Enbridge Gas completed a Request for Proposal (“RFP”) for a Firm Exchange Service. The RFP package is included at Exhibit C, Tab 1, Schedule 1, Attachment 1.
- ii) On September 19, 2021, Enbridge Gas held a virtual meeting with members of Energy Transfer Partners to determine whether they were interested in participating in the Firm Exchange Service RFP. The meeting invitation and minutes are included in the response at Exhibit I.FRPO.7, Attachment 1.
- iii) On October 7, 2021, Enbridge Gas received a non-binding bid for a Firm Exchange Service which can be found at Exhibit I.PP.16, Attachment 1.

2. *Firm exchange between Dawn and Ojibway in combination with looping of the NPS 20 Panhandle Line west of Dover Transmission (Hybrid Alternatives)*

- i) The Hybrid alternative utilized the information noted above in part b) above.
- ii) Please see Exhibit C, Tab 1, Schedule 1, Table 4 (Hybrid Alternative Economic Assessment).

3. *Trucked Compressed Natural Gas ("CNG")*

- i) A CNG tube trailer has a natural gas capacity of approximately 10,000m<sup>3</sup>. Based on the capacity shortfall of 156TJ/day, or approximately 4,200,000m<sup>3</sup>/day, 420 trucks would be required.
- ii) Please refer to Exhibit C, Tab 1, Schedule 1, Page 16, Paragraph 62.

4. *ETEE*

- i) On April 21, 2023, Enbridge Gas engaged Posterity as part of the alternatives assessment for non-facility alternatives. Please see Attachment 1 to this response for the scoping document.
- ii) Enbridge Gas provided Posterity with the growth assumptions for general service (see Attachment 2 to this response).
- iii) A summary of the results from Posterity's analysis can be found in Exhibit C, Tab 1, Schedule 1, Attachment 3.



POSTERITY  
GROUP

# Scoping Document: Panhandle Regional Expansion Project IRPA

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Date: May 24, 2023

Whitney Wong  
Enbridge Gas Inc.  
500 Consumers Road  
North York, M2J 1P8

Posterity Group  
140 Yonge Street, Unit 200  
Toronto, ON M5C 6S3





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# 1 Background and Objectives

## Context

Enbridge Gas Inc. (EGI) requires integrated resource planning alternatives (IRPA) analysis support for the upcoming Panhandle Regional Expansion Project (PREP) leave to construct (LTC) application. The options assessed via this PREP IRPA analysis are enhanced targeted energy efficiency (ETEE), and demand response (DR).

## Priorities for Posterity Group's Support

- Develop a scaled version of the IRPA model to support the PREP IRPA ETEE and DR analysis.
- Deliver analysis output in Excel and draft a memo highlighting findings.

# 2 Support Activities

## Work Package 1 – PREP IRPA Analysis

### Value and outcomes for Enbridge:

- Scaling the IRPA model will allow EGI to develop location (sub-region) specific estimates of ETEE and DR IRPAs.
- This scaled model approach will be faster and more defensible than trying to derive estimates from rate-zone level outputs; it will also be more cost effective than developing a unique model for LTC impacted customers.

### Activities:

This work package involves scaling down the appropriate legacy rate-zone region in the IRPA model to enable ETEE and DR analysis on the subset of customers associated with the PREP IRPA analysis:

- Receive data on customers impacted as part of the PREP IRPA analysis [see Section 5 for a checklist of information we need from EGI].
- Identify the corresponding EGI and IESO sub-regions, and scale down this sub-region to align with customer data.
- Calibrate load shapes to customer subset.
- Update reference case growth rates to align with Enbridge's updated data for the applicable rate classes and segments.
- Include the full list of ETEE and DR measures.
- Run model to develop ETEE and DR outputs and QC model outputs.
- Post outputs to Excel and present the following information, on a year-by-year basis:
  - Peak hour reduction (m3/hr): by measure, end-use, customer type, and sector.
  - Annual consumption reduction: by measure, end-use, customer type, and sector.
  - Per-customer peak hour percentage change compared to the base year: by measure type, sector, and customer type.
  - Per-customer annual consumption percentage change compared to the base year: by measure type, sector, and customer type.
  - Cost: program spending by year and by measure.
  - Report peak reduction and cost for both ETEE and DR combined and separately.





- Provide measure data to calculate DCF+.
- Draft a memo highlighting findings.

### 3 Timeline

- Project Start Date: As soon as possible.
- Project Completion: Target 4 weeks after initiation.

### 4 Estimated Level of Effort

The table below presents a level of effort estimate for the proposed work.

Work Package	Level of Effort (hrs)	Hourly Rate (\$/hr)	Budget
████████████████████	██	██	██████
████████████████████████████████████	██	██	██████
██	██		██████

Similar to previous engagements with EGI, we propose undertaking work on an hourly basis with a monthly billing cycle for fees incurred in the preceding month.

### 5 Checklist of Information we need from EGI

The checklist below presents the information we need from EGI as inputs for the ETEE and DR analysis.

- Weather normalized annual volume by customer:
  - Year should be clearly specified so that we can scale customer segments using the appropriate year in the IRPA model.
  - It likely makes sense for EGI to select the most recent calendar year for which it has a complete set of normalized annual volume data.
- Hourly Peak by customer:
  - Data from DOE (coincident system hourly peak on design day).
- Rate class, Sector, Segment data by customer:
  - We ideally need to map EGI data to the rate, sector, and segment data schema we have in the IRPA model [see tables below for a list of rate classes, sectors, and segments that are in the model].
  - If segment data doesn't perfectly match the options present in the IRPA model data schema, we may be able to make assumptions about how to characterize customer information (provided there are alternate segment descriptions to work with).
- Location by customer:
  - Only needed if customers span more than one IESO zone or legacy gas utility rate zone.
  - If needed, we would require postal code data by customer.
- Reference case growth rates:





- Direction on the specific rate classes/segments that are departing from the IRPA model's reference case.
- Updated growth rates for these rate classes/segments: account (customer) and consumption forecasts by rate class and segment.

Direction on how to extend growth rates out to 2063 (the final year in the forecast period): e.g., take annual growth rate for each rate class from 2022-2032, and extend the trend of annual changes in year-over-year growth out to 2063:

- Direction on hourly peak reduction target(s).
- Direction on timelines associated with peak reduction targets (e.g., are there milestone years that are important?).
- Direction on which customers should be excluded from IRPAs (i.e., IRPA will not be applied to these customers):
  - The hourly peak for these customers will show up in the forecast period, but IRPA measures will not be applied to this subset of customers (i.e., they will not contribute to peak reduction potential).
  - E.g., if there are contract customers in the dataset provided and these should be excluded, specifically identify the relevant rate class, sector and segments that should be excluded from IRPA measures.

Exhibit 1: Rate classes by Sector in IRPA Model

Residential	Commercial	Industrial
<ul style="list-style-type: none"> <li>• E1</li> <li>• U1</li> <li>• 10</li> <li>• 110</li> <li>• 6</li> <li>• M1</li> <li>• M2</li> <li>• M4</li> </ul>	<ul style="list-style-type: none"> <li>• 1</li> <li>• 10</li> <li>• 100</li> <li>• 110</li> <li>• 115</li> <li>• 135</li> <li>• 145</li> <li>• 170</li> <li>• 6</li> <li>• 9</li> <li>• M1</li> <li>• M2</li> <li>• M4</li> <li>• M5A</li> <li>• M7</li> <li>• R20</li> <li>• T1</li> <li>• T2</li> </ul>	<ul style="list-style-type: none"> <li>• 1</li> <li>• 10</li> <li>• 100</li> <li>• 110</li> <li>• 115</li> <li>• 135</li> <li>• 145</li> <li>• 170</li> <li>• 6</li> <li>• M1</li> <li>• M10</li> <li>• M2</li> <li>• M4</li> <li>• M5</li> <li>• M5A</li> <li>• M7</li> <li>• M9</li> <li>• R10</li> <li>• R100</li> <li>• R20</li> <li>• R25</li> <li>• T1</li> </ul>





		<ul style="list-style-type: none"> <li>• T2</li> </ul>
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Exhibit 2: Segments by Sector in the IRPA Model

Residential	Commercial	Industrial
<ul style="list-style-type: none"> <li>• Detached House</li> <li>• Attached or Row House</li> <li>• Multi-Res_High Rise</li> <li>• Multi-Res_Low Rise</li> <li>• Low Income_SF</li> <li>• Low Income_MF</li> <li>• Large House</li> <li>• Other Residential</li> </ul>	<ul style="list-style-type: none"> <li>• Data Centre</li> <li>• Food Retail</li> <li>• Hospital</li> <li>• Large Hotel</li> <li>• Large Non-Food Retail</li> <li>• Large Office</li> <li>• Long Term Care</li> <li>• Other Commercial</li> <li>• Other Hotel_Motel</li> <li>• Other Non-Food Retail</li> <li>• Other Office</li> <li>• Restaurant</li> <li>• School</li> <li>• University_College</li> <li>• Warehouse</li> <li>• Street Lighting</li> </ul>	<ul style="list-style-type: none"> <li>• Agriculture</li> <li>• Chemicals Mfg</li> <li>• Fabricated Metals Mfg</li> <li>• Food and Beverage Mfg</li> <li>• Mining; Quarrying and Oil &amp; Gas Extraction</li> <li>• Non-metallic Minerals Product Mfg</li> <li>• Other Industrial</li> <li>• Petroleum Mfg</li> <li>• Plastic and Rubber Mfg</li> <li>• Primary Metals Mfg</li> <li>• Pulp; Paper; and Wood Products Mfg</li> <li>• Transportation</li> <li>• Transportation and Machinery Mfg</li> <li>• Utility</li> <li>• Water &amp; Wastewater Treatment</li> <li>• Hydrogen Production</li> </ul>





# IRPA Analysis Project

## *Panhandle Regional Expansion Project Analysis Modelling Approach*

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**Project:** Integrated Resource Planning Alternative Analysis (IRPA Analysis)

**Re:** Panhandle Regional Expansion Project IRPA

**Submitted by:** Posterity Group (PG)

**Date:** June 5, 2023

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This memo presents information on the approach that was taken to develop the model used for the Panhandle Regional Expansion Project (PREP) IRPA.

## 1 Notes on the Modeling Approach

The following sections summarize the modelling method used to conduct the analysis:

### 1.1 Model Updates

We started with the Posterity 'mirror model' of the 2019 Achievable Potential Study (APS), and incorporated the following updates to support IRPA modelling (creating the Posterity IRPA model):

- Calibrated the base year accounts to the 2021 accounts provided, calibrated the base year consumption to weather adjusted 2021 consumption, calibrated the total base year peak hour consumption per account to the 2021 value provided, and updated the reference case to align with Enbridge's forecast of customer growth for the PREP region.
- Corrected customer regional mapping for the base year and reference case according to customer data supplied by Enbridge (EGI).
- Added rate class and customer account data.
- Developed hours-use peak factors for each region, sector, segment, and end use.
- Added a residential demand response measure (Shifting Heating Off Peak).

### 1.2 Adjustments to Produce a Regional Model

We made the following adjustments to the Posterity IRPA model to produce a regional model:

- The Union Gas South - West region was selected. All other regions were ignored.
- Scenario B was used (the scenario with the greatest potential from the achievable potential study).
- Only the following rates were selected:
  - Residential: M1, M2
  - Commercial: M1, M2
  - Industrial: M1, M2





- Using customer data for the PREP region, scaling factors were developed for each segment within the three sectors that were studied: residential, commercial, and industrial. These scaling factors were calculated by comparing the 2021 account numbers from the PREP dataset provided by EGI and the 2021 account numbers for the Union Gas South - West region from Posterity’s IRPA model. This step was done to determine the proportion of accounts in the Union Gas South - West region that can be attributed to the PREP region. The scaling factors were applied to the accounts in Posterity’s IRPA model to scale down the Union Gas South - West region to represent the PREP region.
- Accounts were added to each segment in the proportion that they were present in 2021 in the Union Gas South - West region from Posterity’s IRPA model such that the total account growth in each sector matched the growth forecast provided by Enbridge for each year in the reference case. More information on the segments analyzed is provided in the following section.
- The Unit Energy Consumption (UEC) assumptions were calibrated for existing buildings to match the reference year (2021) consumption values for each sector provided in the PREP dataset. Additionally, the UEC assumptions for new buildings were also calibrated to match the expected growth in peak hourly demand forecasted for each sector from the dataset provided by EGI.

### 1.3 Segment Scaling Factors

Exhibit 1 below shows the segments that are accounted for in the IRPA model, the Union Gas South - West and PREP account numbers for 2021, and the account scaling factor derived from them. There are additional segments in the model that were not present in the PREP dataset and were thus assigned an account scaling factor of zero. Account scaling factors were slightly adjusted after the first iteration of the model to match the account numbers provided in the PREP dataset.

**Exhibit 1– Segment Consumption Scaling Factors**

Sector	Segment	Rate Class	2021 Union Gas South - West Accounts	2021 PREP Account	Account Scaling Factor
Residential	Detached House	M1	272,355	157,239	0.606
	Attached or Row House	M1	49,241	19,216	0.410
	Multi-Residential Low Rise	M1	3,907	6,082	1.634
	Multi-Residential High Rise	M1	3,685	1,036	0.295
		M2	117	66	0.593
	Low Income – Single Family	M1	67,927	804	0.012
	Low Income – Multi Family	M1	6,372	236	0.0389





		M2	205	19	0.097
<b>Commercial</b>	Food Retail	M1	1,434	657	0.463
		M2	40	14	0.358
	Hospital	M1	9	2	0.222
		M2	9	4	0.442
	Large Hotel	M2	13	9	0.711
	Large Non-Food Retail	M1	1,343	615	0.463
		M2	37	13	0.358
	Large Office	M1	1,670	15	0.009
		M2	64	61	0.958
	Long Term Care	M1	86	60	0.706
		M2	83	37	0.449
	Other Commercial	M1	9,095	4,853	0.539
		M2	460	221	0.485
	Other Motel/Hotel	M1	79	75	0.956
	Other Non-Food Retail	M1	4,858	2,227	0.463
		M2	134	48	0.358
	Other Office	M1	3,633	2,238	0.622
	Restaurant	M1	1,808	905	0.505
		M2	98	27	0.280
	School	M1	324	183	0.570
		M2	195	106	0.549
	Warehouse	M1	1,425	571	0.405
		M2	101	33	0.331
	University/College	M1	27	16	0.593
M2		21	8	0.379	







<b>Industrial</b>	Agriculture	M1	1,066	730	0.685
		M2	257	176	0.686
	Chemicals Manufacturing	M1	70	30	0.429
		M2	37	19	0.518
	Food and Beverage Manufacturing	M1	101	75	0.743
		M2	47	29	0.623
	Other Industrial	M1	863	672	0.779
		M2	288	191	0.662
	Primary Metals Manufacturing	M2	8	1	0.126
	Pulp, Paper, and Wood Products Manufacturing	M1	135	79	0.585
		M2	23	6	0.263
	Transportation and Machinery Manufacturing	M2	10	2	0.202
Power and Other Utility	M1	156	103	0.660	

Exhibit 2 shows the segments that are accounted for in the IRPA model, the number of accounts by rate class in 2021 in the Union Gas South - West region, and the corresponding account scaling factors used to implement the growth forecast provided by Enbridge. The account scaling factors are calculated as a percentage of the total number of accounts within the sector and rate class, with the sum of all of the account scaling factors for each sector adding up to one. These account scaling factors are then multiplied by the number of new accounts for each sector and rate class in a given year to reflect the growth rate with accurate proportions. Due to the fact that there was no growth rate forecasted in the general service industrial sector during the years analyzed, account scaling factors are not required for that sector. As with the consumption scaling, there are additional segments in the model that were not present in the PREP dataset and were thus assigned an account scaling factor of zero (i.e., Large House).

**Exhibit 2 – Segment Accounts Growth Factors**

Sector	Segment	Rate Class	2021 Union Gas South - West Accounts	Accounts Scaling Factor
<b>Residential</b>	Detached House	M1	272,355	0.6745
	Attached or Row House	M1	49,241	0.1219
	Multi-Residential Low Rise	M1	3,907	0.0097





	Multi-Residential High Rise	M1	3,685	0.0091
		M2	117	0.0003
	Low Income – Single Family	M1	67,927	0.1682
	Low Income – Multi Family	M1	6,372	0.0158
M2		205	0.0005	
<b>Commercial</b>	Food Retail	M1	1,434	0.0530
		M2	40	0.0015
	Hospital	M1	9	0.0003
		M2	9	0.0003
	Large Hotel	M2	13	0.0005
	Large Non-Food Retail	M1	1,343	0.0496
		M2	37	0.0014
	Large Office	M1	1,670	0.0617
		M2	64	0.0024
	Long Term Care	M1	86	0.0032
		M2	83	0.0031
	Other Commercial	M1	9,095	0.3363
		M2	460	0.0170
	Other Motel/Hotel	M1	79	0.0029
	Other Non-Food Retail	M1	4,858	0.1796
		M2	134	0.0050
	Other Office	M1	3,633	0.1343
	Restaurant	M1	1,808	0.0669
		M2	98	0.0036
	School	M1	324	0.0120
M2		195	0.0072	
Warehouse	M1	1,425	0.0527	





		M2	101	0.0037
	University/College	M1	27	0.0010
		M2	21	0.0008



ENBRIDGE GAS INC.

Answer to Interrogatory from  
Pollution Probe (PP)

INTERROGATORY

Question(s):

Please provide a copy of the following:

- a) Communications to current or proposed customers fed (directly or indirectly) from the Panhandle system with the potential demand or pressure challenges that Enbridge has highlighted in this Leave to Construct application.
- b) Communications to current or proposed customers fed (directly or indirectly) from the Panhandle system that were asked for input on IRP options or alternatives.
- c) Communications to current or proposed customers fed (directly or indirectly) from the Panhandle system indicating that a contribution (e.g. CIAC), charge or other fee may be required from the customer to support the proposed Reinforcement.

Response:

Regarding the interrogatory's reference to directly or indirectly-fed customers, please see the response at Exhibit I.STAFF.25, part b).

- a) Enbridge Gas did not discuss Panhandle system demand or pressure challenges with customers.
- b) Enbridge Gas did not discuss integrated resource planning with customers. However, customers who responded to the EOI/ROS were asked to provide additional information regarding the viability of interruptible service as an alternative to new firm service, including whether they would be more inclined to consider interruptible service over new firm service if the ability to negotiate lower than posted interruptible rates was available. Customers were also asked to confirm that their EOI bid amounts are inclusive of all future expected natural gas conservation activities, including natural gas conservation activities within and outside of Enbridge Gas's Demand Side Management programs, and the use of non-natural gas alternatives.<sup>1</sup> The questions can be found at Exhibit B, Tab 1, Schedule 1, Attachment 8, p. 6, and Exhibit B, Tab 1, Schedule 1, Attachment 9, pp. 1-2.
- c) Please see the response at Exhibit I.STAFF.25, part a).

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<sup>1</sup> Exhibit A, Tab 4, Schedule 1, para. 16.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Pollution Probe (PP)

INTERROGATORY

Question(s):

- a) Please provide a copy of all marketing and communication material provided to consumers/businesses served by the Panhandle system to promote (targeted) DSM or other energy efficiency opportunities.
- b) Please provide a copy of all communication material provided by Enbridge or partners to educate consumers/businesses served by the Panhandle system on options and incentives under the Greener Homes program (delivered by Enbridge in Ontario).
- c) Please provide a table (or marketing material if a table is already included) of potential Greener Homes Grant Program incentives for residential homes, including those for air source heat pumps.
- d) Please confirm how many customers served by the Panhandle system have expressed interest to leverage incentives through the Greener Homes Grant program.
- e) Please confirm how many customers served by the Panhandle system have completed one or more home audits required to participate in the Greener Homes Grant Program.
- f) Has Enbridge conducted analysis on consumers served by the Panhandle system that can or have (currently or recently) participated in the Greener Homes Grant Program. If yes, please provide a copy of the information and analysis.

Response:

- a) and b)  
The Company has not directly marketed DSM or other energy efficiency opportunities to consumers but rather relies on mass marketing materials and communications to all existing and potential customers. Information regarding these programs can be found at the following links:

<https://www.enbridgegas.com/residential/rebates-energy-conservation>  
<https://www.enbridgegas.com/business-industrial/incentives-conservation>

- c) Please see Attachment 1 to this response.
- d) Over 2,800 HER+ website leads have come in from the Project area since January 4, 2023. Please note that the Company cannot differentiate between a customer and non-customer with respect to website leads. For information specifically regarding electric air source heat pump uptake with respect to the HER+ Program, please see response at Exhibit J3.6. /u
- e) There are approximately 3,200 participants in HER+ that have one or more audits completed in the Project area. /u
- f) No.

**OEB-APPROVED ADDITIONAL MEASURE INCENTIVES FOR JOINT RESIDENTIAL WHOLE HOME PROGRAM**

NRCan Canada Greener Homes Grant Measures	NRCan Incentive	EGI Proposed Enhanced Incentive	OEB-Approved Measures	OEB- Approved Incentives for EGI	Total Enhanced Incentive (NRCan + OEB- Approved EGI)
<b>Energy Audits</b>			<b>Energy Audits</b>		
ENERGuide Pre & Post Evaluations	\$600	\$0	ENERGuide Pre & Post Evaluations	\$0	\$600
<b>Attic/Cathedral Insulation</b>			<b>Attic/Cathedral Insulation</b>		
Increase attic insulation to at least R50 from less than R12	\$1,800	\$200	Increase attic insulation to at least R50 from less than R12	\$550	\$2,350
Increase attic insulation to at least R50 from greater than R12 up to R25	\$600	\$400	Increase attic insulation to at least R50 from greater than R12 up to R25	\$200	\$800
Increase attic insulation to at least R50 from greater than R25 up to R35	\$250	\$600	Increase attic insulation to at least R50 from greater than R25 up to R35	\$75	\$325
Increase cathedral/flat roof insulation to at least R-28 from R12 or less	\$600	\$400	Increase cathedral/flat roof insulation to at least R-28 from R12 or less	\$200	\$800
Increase cathedral/flat roof insulation to at least R-28 from greater than R12 up to R25	\$250	\$600	Increase cathedral/flat roof insulation to at least R-28 from greater than R12 up to R25	\$75	\$325
Upgrade uninsulated cathedral ceiling/flat roof to at least R20 from R12 or less	\$600	\$400	Upgrade uninsulated cathedral ceiling/flat roof to at least R20 from R12 or less	\$200	\$800
<b>Exterior Wall Insulation</b>			<b>Exterior Wall Insulation</b>		
For adding insulation value of at least greater than R20 for 100% of building	\$5,000	\$2,500	For adding insulation value of at least greater than R20 for 100% of building	\$1,750	\$6,750
For adding insulation value greater than R12 up to R20 to 100% of the building	\$3,800	\$1,700	For adding insulation value greater than R12 up to R20 to 100% of the building	\$1,200	\$5,000
For adding insulation value greater than R7.5 up to R12 for 100% of building	\$3,300	\$1,200	For adding insulation value greater than R7.5 up to R12 for 100% of building	\$1,200	\$4,500
<b>Exposed Floor Insulation</b>			<b>Exposed Floor Insulation</b>		
For adding insulation value of at least R20 for entire exposed area (minimum area of 11 square meters or 120 square feet)	\$350	\$150	For adding insulation value of at least R20 for entire exposed area (minimum area of 11 square meters or 120 square feet)	\$100	\$450
<b>Basement Insulation</b>			<b>Basement Insulation</b>		
For sealing and insulating at least 80% of basement header to a minimum R20	\$240	\$110	For sealing and insulating at least 80% of basement header to a minimum R20	\$85	\$325
For sealing and insulating at least 50% of the entire basement slab by a minimum of R3.5	\$400	\$200	For sealing and insulating at least 50% of the entire basement slab by a minimum of R3.5	\$150	\$550
For adding insulation value greater than R22 to 100% of basement	\$1,500	\$1,000	For adding insulation value greater than R22 to 100% of basement	\$500	\$2,000

NRCan	NRCan Incentive	EGI Proposed Enhanced Incentive	OEB-Approved Measures	OEB-Approved Incentives for EGI	Total Enhanced Incentive (NRCan + OEB-Approved EGI)
Canada Greener Homes Grant Measures					
For adding insulation value of R10 to R22 to 100% of basement	\$1,050	\$450	For adding insulation value of R10 to R22 to 100% of basement	\$350	\$1,400
For adding insulation value of R10 to R22 to 100% of exterior crawl space wall area, including header	\$1,300	\$700	For adding insulation value of R10 to R22 to 100% of exterior crawl space wall area, including header	\$400	\$1,700
For adding insulation value of R10 to R22 to 100% of exterior crawl space wall area, including header	\$1,040	\$460	For adding insulation value of R10 to R22 to 100% of exterior crawl space wall area, including header	\$360	\$1,400
For adding insulation value greater than R24 to 100% of crawl space ceiling	\$800	\$400	For adding insulation value greater than R24 to 100% of crawl space ceiling	\$250	\$1,050
<b>Furnace/Boiler</b>			<b>Furnace/Boiler</b>		
N/A	N/A	N/A	N/A	N/A	N/A
<b>Space Heating Heat Pump</b>			<b>Space Heating Heat Pump</b>		
Install a ground source heat pump – full system.	\$5,000	\$0	Install a ground source heat pump – full system.	\$1,500	\$6,500
Replace a ground source heat pump – heat pump unit only.	\$3,000	\$0	Replace a ground source heat pump – heat pump unit only.	\$1,000	\$4,000
Install a complete ENERGY STAR certified new or replacement air source heat pump (ASHP) system or a variable capacity cold climate air source heat pump (ccASHP) system. The system must be intended to service the entire home.	\$2,500	\$0	Install a complete ENERGY STAR certified new or replacement air source heat pump (ASHP) system or a variable capacity cold climate air source heat pump (ccASHP) system. The system must be intended to service the entire home.	\$750	\$3,250
Install a complete ENERGY STAR certified new or replacement air source heat pump (ASHP) system, intended to service the entire home.	\$4,000	\$0	Install a complete ENERGY STAR certified new or replacement air source heat pump (ASHP) system, intended to service the entire home.	\$1,250	\$5,250
Install a complete new or replacement variable capacity cold climate air source heat pump (ccASHP) system, intended to service the entire home.	\$5,000	\$0	Install a complete new or replacement variable capacity cold climate air source heat pump (ccASHP) system, intended to service the entire home.	\$1,500	\$6,500
<b>Water Heating</b>			<b>Water Heating</b>		
Replace domestic water heater with an ENERGY STAR certified domestic hot water heat pump (DHW-HP)	\$1,000	\$0	Replace domestic water heater with an ENERGY STAR certified domestic hot water heat pump (DHW-HP)	\$300	\$1,300
<b>Windows &amp; Doors</b>			<b>Windows &amp; Doors</b>		
Replace windows or sliding glass doors with ENERGY STAR most efficient models.	\$250	\$0	Replace windows or sliding glass doors with ENERGY STAR most efficient models.	\$75	\$325
Replace windows or sliding glass doors with ENERGY STAR certified models.	\$125	\$0	Replace windows or sliding glass doors with ENERGY STAR certified models.	\$50	\$175
Replace hinged doors, with or without sidelites or transoms with ENERGY STAR certified models.	\$125	\$0	Replace hinged doors, with or without sidelites or transoms with ENERGY STAR certified models.	\$50	\$175



NRCan	NRCan Incentive	EGI Proposed Enhanced Incentive	OEB-Approved Measures	OEB-Approved Incentives for EGI	Total Enhanced Incentive (NRCan + OEB-Approved EGI)
Canada Greener Homes Grant Measures					
<b>Air Sealing</b>			<b>Air Sealing</b>		
Achieve base target	\$550	\$0	Achieve base target	\$175	\$725
Achieve 10% or more above base target	\$810	\$0	Achieve 10% or more above base target	\$240	\$1,050
Achieve 20% or more above base target	\$1,000	\$0	Achieve 20% or more above base target	\$300	\$1,300
<b>Renewable Energy System</b>			<b>Renewable Energy System</b>		
Install solar panels (photovoltaic (PV) system) ≥ 1.0 kW	\$1,000 per kW	\$0	N/A	\$0	\$1,000 per kW
<b>Resiliency Measures</b>			<b>Resiliency Measures</b>		
Batteries connected to Photovoltaic systems	\$1,000	\$0	Batteries connected to Photovoltaic systems	\$0	N/A
Roofing Membrane	\$150	\$0	Roofing Membrane	\$0	N/A
Foundation water-proofing	\$875	\$0	Foundation water-proofing	\$0	N/A
Moisture proofing crawl space floor, walls and headers	\$600	\$0	Moisture proofing crawl space floor, walls and headers	\$0	N/A
<b>Thermostat</b>			<b>Thermostat</b>		
Replace a manual thermostat with a programmable thermostat	\$50		Replace a manual thermostat with a programmable thermostat	\$20	\$70
Replace a manual thermostat with a adaptive thermostat (Natural gas heated participants in the Enbridge franchise area are eligible for an enhanced \$75 rebate (or \$125 rebate if Moderate Income eligible), all other participants eligible for \$50 rebate.	\$50	\$75	Replace a manual thermostat with a adaptive thermostat (Natural gas heated participants in the Enbridge franchise area are eligible for an enhanced \$75 rebate (or \$125 rebate if Moderate Income eligible), all other participants eligible for \$50 rebate.	\$75	\$125
<b>Multi Measure Bonus</b>			<b>Multi Measure Bonus</b>		
N/A	\$0		N/A	N/A	N/A

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Pollution Probe (PP)

INTERROGATORY

Reference:

Final Transcript for EB-2022-0157 Enbridge LTC Panhandle Day 2, Page 2 lines 14-21.

Question(s):

- a) Enbridge confirmed that there approximately 5-6 customers directly served from the Panhandle transmission pipelines. Please confirm this remains accurate and if not, please provide an update.
- b) If customers are directly served from the pipeline, please explain why EBO 188 requirements do not apply.

Response:

For clarity, the Panhandle System is comprised of transmission pipelines to transport natural gas between Enbridge Gas's Dawn Compressor Station, located in the Township of Dawn-Euphemia and the Ojibway Valve Site, located in the City of Windsor. The Panhandle System feeds distribution systems serving residential, commercial, and industrial markets in the municipalities of Dawn- Euphemia, St. Clair, Chatham-Kent, Windsor, Lakeshore, Leamington, Kingsville, Essex, Amherstburg, LaSalle, and Tecumseh. Please see Exhibit B, Tab 2, Schedule 1 for information regarding the Panhandle system, including Figure 1 at p. 2 for a visual representation of the Panhandle System.

The Project consists of:

- Approximately 19 km of Nominal Pipe Size ("NPS") 36 natural gas pipeline with a Maximum Operating Pressure ("MOP") of 6040 kPag from the existing Enbridge Gas Dover Transmission Station in the Municipality of Chatham-Kent to a new valve site in the Municipality of Lakeshore; and,
- Ancillary measurement, pressure regulation, and station facilities within the Township of Dawn Euphemia and in the Municipality of Chatham-Kent.

Please see Exhibit D, Tab 1, Schedule 1 for information regarding the Project, including Figure 1 at p. 2 for a visual representation of the Project (in red).

- a) Confirmed for the Panhandle System. Not confirmed for the Project. Please see the information provided above.
- b) No customers will be directly connected to the Project.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Pollution Probe (PP)

INTERROGATORY

Reference:

Exhibit C,, Tab 1, Schedule 1, Attachments 2 & 3

Question(s):

- a) Please explain how current and potential customer feedback was collected and used in the Posterity IRP analysis and reports.
- b) Please provide a list of customers surveyed for their consideration of (targeted) DSM, fuel switching or other IRP alternatives.
- c) Please provide a list of stakeholders consulted during the IRP analysis and report creation.
- d) Please explain how/if Posterity was involved in the selection of IRP Pilot options (per the EB-2020-0091 Decision) and why this Project was not considered.
- e) If electric-ccASHPs with electric backup were added as an IRP incentive option, please explain what impact that would have on the Posterity analysis for this Project.
- f) Please provide an estimate of the peak demand reduction if 10% of the residential customers served by the Panhandle system left the gas system for other options.
- g) Please provide an estimate of the peak demand reduction if the proposed Stellantis facility used non-gas options (e.g. geothermal, etc.) for space and water heating.

Response:

Please note that Exhibit C, Tab 1, Schedule 1, Attachment 2 referenced within the interrogatory reflects Posterity's 2022 analysis which was filed June 10, 2022 and was not updated within Enbridge Gas's amended application filed in June 2023. The responses to this interrogatory are being provided in relation to Exhibit C, Tab 1, Schedule 1, Attachment 3 which reflects Posterity's 2023 analysis which was an update within the Company's amended application filed in June 2023.

- a) – c)  
The scope of the Posterity analysis consisted of the general service market and did not include customer or stakeholder feedback.
- d) The issue of the selection of pilot options for the IRP Pilot Projects (EB-2022-0335) is not within the scope of this proceeding.
- e) The OEB determined that it not appropriate to provide funding for electricity IRP alternatives,<sup>1</sup> therefore electric-ccASHP with electric backup was not considered within Posterity's analysis.
- f) 16.4 TJ/d based on Winter 2023/2024 demand.
- g) Details of the planned peak demand by end use application (space heating, process, DHW, and power generation) for the NextStar battery plant has not been shared with Enbridge Gas. Absent this information or comparable information from other similar operations within Enbridge Gas's franchise area the Company is not able to provide an estimate of peak demand reduction possible from non-gas alternatives (if any).

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<sup>1</sup> OEB IRP Framework for Enbridge Gas (EB-2020-0091), p. 6.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Pollution Probe (PP)

INTERROGATORY

Reference:

Exhibit E, Tab 1, Schedule 5, Page 1

Question(s):

a) Please confirm Year 1 in the DCF Table represents 2024 and that the Year 1 Revenue figure represents 2 months (i.e. In-service November 1, 2024). If incorrect, please provide the correct interpretation.

b) Please provide a table and corresponding pie chart (with percent) breaking the Year 1 (\$3,572,000) and Year 7 (\$9,246,000) Revenues into the following categories:

- General Service
- Large Industrial/Commercial
- Greenhouse Market
- Power Generation

c) For the Year 7 Revenue (\$9,246,000), what percent of the revenue is related to customers that are on the system before Year 1 (i.e. currently) and what percent is due to new incremental customers?

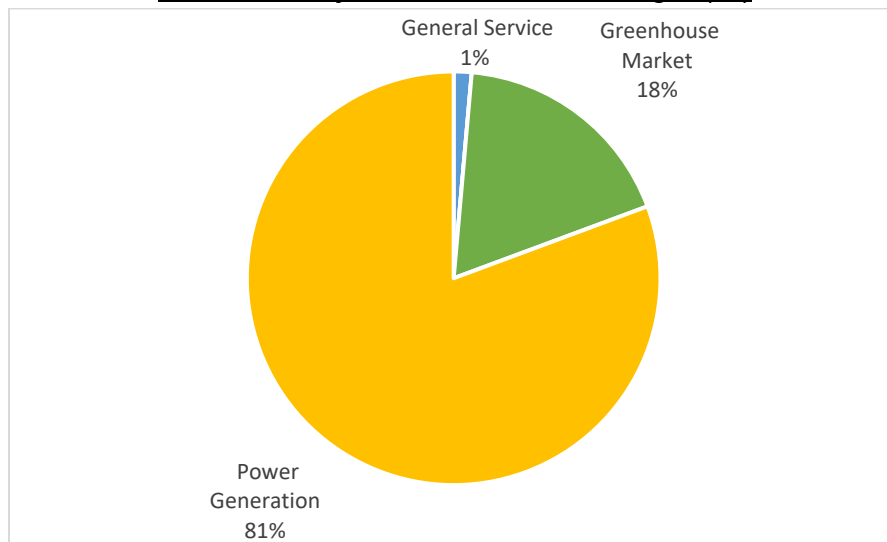
Response:

- a) Not confirmed. Year 1 represents the first year of in-service for the Project (i.e., November 2024 to October 2025).

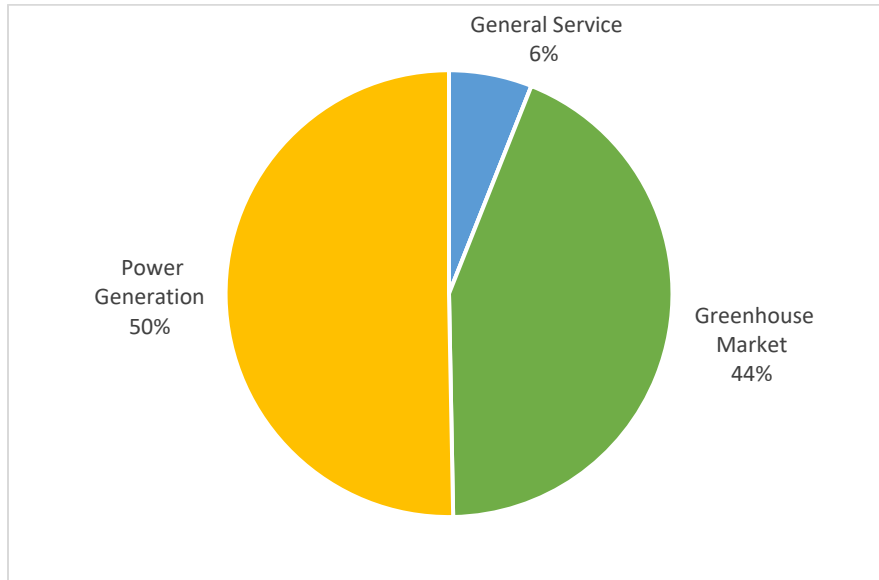
b) Please see below for the requested information.

<b>Category</b>	<b>Year 1 - Project Transmission Margin (\$000's)</b>	<b>Year 7 - Project Transmission Margin (\$000's)</b>
General Service	50	556
Large Industrial/Commercial	0	0
Greenhouse Market	641	4,039
Power Generation	2,881	4,651
<b>Total</b>	<b>3,572</b>	<b>9,246</b>

Year 1 – Project Transmission Margin (%)



Year 7 – Project Transmission Margin (%)



c) The revenue underlying the DCF analysis as seen at Exhibit E, Tab 1, Schedule 4, p. 1 is not established at the customer level. Rather, it relies on the transmission margin for the forecasted contract and general service demands on an aggregate basis. Enbridge Gas is therefore unable to provide the requested information.



ENBRIDGE GAS INC.

Answer to Interrogatory from  
Pollution Probe (PP)

INTERROGATORY

Question(s):

Enbridge indicated in its Rebasing application (EB-2022-0200) that PREP is significantly different (e.g. larger) from other proposed projects over the 2024-2028 period.

a) Please explain how this project is different from other projects in the 2024-2028 timeframe (and/or provide the relevant EB-2022-0200 references providing this information).

b) Please explain the treatment Enbridge proposes for recovery from rate payers for this project and how/why it differs from the typical approach used to recover costs related to large projects requiring Leave to Construct approval.

Response:

a) and b)

Enbridge Gas is not seeking cost recovery of the Project as part of this application.<sup>1</sup>

Please see Table 1 at Exhibit E, Tab 1, Schedule 1, Page 2 for a project cost comparison to a recent Enbridge Gas pipeline project in close proximity to the Project area.

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<sup>1</sup> Exhibit A, Tab 3, Schedule 1, para. 13.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Pollution Probe (PP)

INTERROGATORY

Question(s):

Has Enbridge conducted a risk assessment on the probability that the proposed Project will become a stranded asset before being fully depreciated? If yes, please provide a copy of the assessment and all related materials. If no, what evidence exists to support that the pipeline will remain used and useful for the full amortization period.

Response:

Enbridge Gas has no reasonable basis to believe that the proposed facilities will become stranded assets and thus has had no reason to complete the assessment in question.

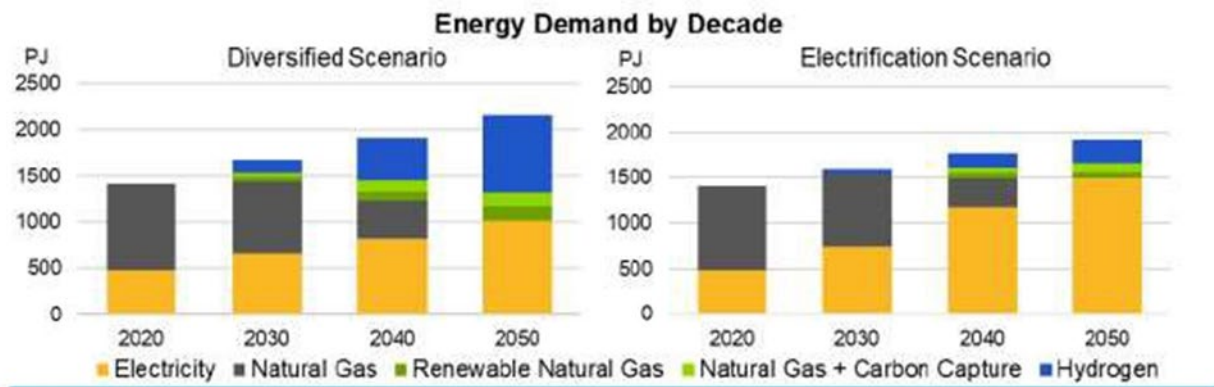
ENBRIDGE GAS INC.

Answer to Interrogatory from  
Pollution Probe (PP)

INTERROGATORY

Reference:

Pathways to Net Zero Emissions for Ontario 1.



Question(s):

Enbridge indicates that for both the (Enbridge-preferred) Diversified Scenario and the Electrification Scenario that by 2050 natural gas will no longer be used in Ontario with the potential exception of select large volume industrial customers that have economic access to carbon capture and geological sequestration.

- Please explain why an amortization period past 2050 (i.e. greater than 25 years) is appropriate if natural gas will no longer be available to these customers prior to 2050.
- Please confirm that Enbridge has not received approval (from the OEB, TSSA or other relevant regulator) for use of 100% hydrogen for the Project assets proposed. If approval has been received for 100% hydrogen, please provide a copy of such approval.
- If Enbridge intends to use hydrogen to serve Panhandle customers once natural gas is no longer available, please provide details on the source, transmission and lifecycle carbon emissions of the proposed hydrogen.

Response:

- a) PP's interrogatory is premised on an inaccurate characterization of the Pathways to Net Zero Emissions for Ontario Study ("P2NZ"). The objective of the P2NZ study was not to forecast, predict or define an "Enbridge-preferred" future Ontario scenario, rather, the analysis was meant to consider different scenarios, each with a set of established assumptions, for how Ontario's energy system might support the achievement of net zero emissions by 2050 in the province. There are many different permutations that a diversified scenario could take.

Enbridge Gas submits that the P2NZ's net-zero emissions by 2050 provincial-level scenario analyses does not represent a forecast or prediction of what is expected to occur in the Panhandle project's areas of impact. Enbridge Gas's natural gas demand forecast for the Project relies on the energy interests expressed by actual customers within the Project area. Based on the current demand forecast, Enbridge Gas does not have any indication that the pipe would not be utilized in or post 2050 and, therefore, at this point in time does not believe that an amortization of 25 years would be appropriate. If Enbridge Gas becomes aware of customers leaving the system or decreased utilization in the future, it will revise depreciation studies to accelerate recovery to reduce risk of stranded costs.

- b) Confirmed.
- c) Enbridge Gas has proposed a Hydrogen Blending Grid Study (EB-2022-200, Exhibit 4, Tab 2, Schedule 6, pages 16 to 18) to help identify and prioritize the sections of the gas grid most suitable for hydrogen blending and to identify associated costs and benefits. Until the completion of this study, it is not yet known how hydrogen may be able to serve the Project area.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Pollution Probe (PP)

INTERROGATORY

Reference:

IESO Pathways to Decarbonization Report - Pathways to Decarbonization (ieso.ca)

Question(s):

IESO analysis suggests that natural gas capacity can be reduced to 8,000 MW from the current 10,000 MW by 2035 and completely phased out in the 2050 scenario.

- a) Please provide Enbridge's assumptions for how long each current or proposed gas fired generating station served (directly or indirectly) by the Panhandle system will be in service.
- b) Please confirm the amortization period for the proposed pipeline.
- c) If the proposed amortization period for the proposed pipeline is greater than 25 years (i.e. by 2050), please explain how recovery of the unamortized portion of the pipeline will be recovered if no gas fired generating stations remain on the Panhandle system.

Response:

- a) Both of the gas-fired generation customers that bid into the EOI received contract extensions of 10 years or more from the IESO. Although the draft Clean Electricity Regulations released by the government of Canada notes that the new regulations will come into effect in 2035, at this time, Enbridge Gas has no reason to believe that these power producers will not remain connected to the Panhandle System after their current contract, as these gas-fired generators can remain operational in the future by pursuing energy transition solutions that allow them to meet net zero goals. In addition, the draft Clean Electricity Regulations released by the government of Canada also makes reference to allowing natural gas facilities to operate outside of the performance standard for short periods of time over the course of the year; therefore, these gas plants could be kept as a backup to address periods of high demand or to balance variable production from renewables.
- b) The current OEB-approved depreciation rate for transmission pipelines in the Union Rate Zone assumes an average service life of 55 years.

c) The impacts of the energy transition remain uncertain. As noted in part a), Enbridge Gas has no reason to expect, at this point, that power generators will not be connected to the Panhandle System for the duration of the asset's average service life. Further, changes over the next 25 years could result in other existing or new customers utilizing the system. Enbridge Gas expects that it will be able to recover the costs of prudently invested capital. If changes in future utilization indicate the need for a shorter average service life, the Company would leverage regulatory processes and mechanisms (e.g. accelerated depreciation) to maintain the regulatory compact.

Enbridge Gas is not seeking cost recovery of the Project as part of this application.<sup>1</sup>

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<sup>1</sup> Exhibit A, Tab 3, Schedule 1, para. 13.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Pollution Probe (PP)

INTERROGATORY

Question(s):

The Environmental Report published April 22, 2022 was file for this application on June 10, 2022 as EGI\_Appl\_Panhandle Regional Expansion Project\_F-1-1\_Attachment 1\_20220610. Updates were identified in the summary table to the updated application that relate to the Environmental Report, but it appears than an updated Environmental Report was not filed.

a) Please indicate if the Environmental Report filed June 10, 2022 is the current version and if so, how the project updates have been applied. If there is an updated version of the Environmental Report, please file a copy and provide a summary of the differences between the June 2022 version and the most recent version.

b) Was the OPCC and related stakeholder consultation process conducted for the Updated Project or is Enbridge relying on the process used for the previous Project submitted in 2022?

c) Was additional consultation, surveys or open houses conducted related to the Updated Project? If yes, please provide a copy of the materials used and any feedback received.

Response:

Pollution Probe has incorrectly characterized Enbridge Gas's updated evidence. The summary table provided in Enbridge Gas's covering letter to the Company's June 16, 2023 updated application does not identify updates that relate to the Environmental Report ("ER"). The ER can be found at Exhibit F, Tab 1, Schedule 1, Attachment 1.

- a) The ER filed June 10, 2022 is the current version (Exhibit F, Tab 1, Schedule 1, Attachment 1). Regarding the requirement for updates to the ER to reflect the amended application filed June 16, 2023, please see Exhibit F, Tab 1, Schedule 1, Paragraph 4, "In May 2023 AECOM confirmed that that the ER included at Attachment 1 to this Exhibit remains appropriate with respect to the 2023 updated Project scope."

- b) Enbridge Gas is relying on the consultation process conducted for the Project in 2022. However, OPCC members, Municipalities, Conservation Authorities, Indigenous communities and landowners were notified that the original application was placed into abeyance in December 2022, and of Enbridge Gas's intention to file the amended application with a revised in-service date of November 1, 2024 for the Project.
  
- c) Please see the responses to part b) above and Exhibit I.STAFF.29.



ENBRIDGE GAS INC.

Answer to Interrogatory from  
Pollution Probe (PP)

INTERROGATORY

Question(s):

Please provide an update on the negotiation and execution of agreements required for the proposed Project (e.g. # outstanding and impact if they are not completed)

Response:

Option agreements in addition to easement and temporary workspace agreements have been secured with all except 2 landowners. Option agreements will be exercised upon leave to construct. If all land rights are not obtained to facilitate construction in 2024, Enbridge Gas may install an above-ground tie-in valve, in order to place the pipeline into service to meet Winter 2024/2025 demands. If land rights have not been secured for the properties related to the remaining two landowners after approval of the Project by the OEB, Enbridge Gas would pursue expropriation.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
School Energy Coalition (SEC)

INTERROGATORY

Reference:

[E-1-1, p.1] Enbridge states that: “The costs are based upon a class 3 estimate prepared in Q1 2023, updated to reflect market conditions based on Q4 2022 contractor responses to RFP”.

Question(s):

- a. How many contractors responded to the RFP and what was each of their bids?
- b. Is the contract work being undertaken as part of Enbridge’s ‘Alliance Partners’ contracts?
- c. Please explain the structure of the contracts and the specific details regarding allocation of cost risk.

Response:

- a. Enbridge Gas invited 7 proponents to bid and received 6 responses. Enbridge Gas invites proponents to present their technical, commercial, and socio-economic offerings in their proposal. Proposals are evaluated against pre-established evaluation criteria to determine a fair and lawful evaluation outcome that may result in the awarding to one or more proponents. Proposals are complex and the evaluation of proposals requires assessment of many factors, including but not limited to technical, health and safety, environmental matters – in addition to bid price. As such, bid amounts would not be valuable information.

The average proposal price from the top three (3) most competitive proponents was used for the current estimate. The contract has not yet been executed for the Project.

- b. No. To ensure a competitive bidding process Enbridge Gas included proponents that are not master agreement holders therefore existing master agreements (such as the Alliance contracts) were not used.

- c. The contract has not yet been executed for the Project and therefore finalized details regarding allocation of cost risk are not available. Alternative contract structures including lump sum and unit price were requested as part of the RFP process.

Enbridge Gas considers lump sum and unit price contract structures to manage the risk of cost overages on construction projects. These contract structures incentivize construction contractor(s) to manage their resources efficiently by allocating the risk of cost overruns due to inefficient use of resources to the construction contractor(s). Other cost risks that are external to Enbridge Gas and the construction contractor(s), such as severe weather conditions, are shared between Enbridge Gas and the construction contractor(s).

ENBRIDGE GAS INC.

Answer to Interrogatory from  
School Energy Coalition (SEC)

INTERROGATORY

Reference:

E-1-2

Question(s):

With respect to the updated project costs and scope:

- a. Please provide a table that shows, broken down by category, a comparison of projects costs in the original and updated application, limited to the project scope included in the updated application.
- b. Please provide a detailed explanation of costs increased, by category, including in part (a).

Response:

- a) Please see Table 1 below:

Table 1: Project Costs Comparison

		<b>19km of NPS 36 Pipeline and Ancillary Facilities (Amended Application, June 2023)</b>	<b>19km of NPS 36 Pipeline and Ancillary Facilities (Initial Application, June 2022)</b>
<b><u>Item No.</u></b>	<b><u>Cost Description</u></b>	<b><u>Project Costs (\$)</u></b>	<b><u>Project Costs (\$)</u></b>
1	Materials	57,000,000	56,600,000
2	Labour, External Permitting and Land, and Outside Services	199,300,000	124,100,000
3	Contingency	20,800,000	19,200,000
4	Interest During Construction	12,100,000	3,500,000
5	Total Direct Capital Cost	289,200,000	203,400,000
6	Indirect Overheads	68,800,000	43,200,000
7	Total Project Cost	358,000,000	246,600,000

- b) Enbridge Gas attributes the variances to the following three causes: a) bid to estimate variance; b) unforeseen inflation; and c) scope refinement. Consistent with the proposed Project, Enbridge Gas has experienced inflationary pressures on all projects within the capital portfolio.

Please see the information below for details regarding the items in Table 1 with increased costs compared to the initial application.

*Labour, External Permitting and Land, and Outside Services*

The Project costs in the initial application were developed using 2021 Construction Contractor Request for Information (“RFI”) responses. The amended application relies on Contract Request for Proposal (“RFP”) responses for Q4 2022.

Increased cost estimates between the RFI and the RFP were driven primarily by inflationary pressures and, to a lesser extent, refinements in engineering design.

The Q4 2022 RFP amounts reflect inflationary increases in prime contractor costs including equipment rental rates, fuel prices, and labour rates. The prices for materials and labour had significantly increased since 2021, and these increases are believed to be driven by supply chain challenges that have arisen in recent years.

Other drivers for the cost estimate increase are related to scope refinements identified during the detailed design stage. As part of standard project development activities, further refinement was carried out on the Project design. The results of the refinements to engineering design included but are not limited to additional materials (e.g., valves, actuators, and cabling), additional trenchless crossings and added depth to open cuts, and increased inspection hours. This was offset in part by review of the design resulting in a streamlined design of the stations scope to realize cost reductions.

As discussed at the response to Exhibit I.SEC.1, the contract has not yet been executed. Enbridge Gas invited 7 proponents to bid and received 6 responses to the Q4 2022 RFP for prime contractor. The average proposal price from the top three (3) most competitive proponents was used for the current estimate.

Enbridge Gas continues to be proactive to reduce the impact of the higher cost estimate, and this includes a rigorous negotiation of contracts to select lower cost bids with the required technical expertise.

#### *Interest During Construction*

The primary drivers are increased interest rates and the increased capital cost of the Project.

#### *Indirect Overheads*

Indirect overheads are a function of the total capital cost and the overhead rate for the in-service year. The increase to indirect overheads is a function of the increase in direct capital spend and a revision to the rate applied due to the shift in timing of the Project (23.8% vs. 21.2%).

ENBRIDGE GAS INC.

Answer to Interrogatory from  
School Energy Coalition (SEC)

INTERROGATORY

Reference:

[Cover Letter, June 16, 2023] With respect to the Leamington Interconnect, Enbridge states: "Following Enbridge Gas's re-assessment of the Project in 2022 and 2023, the Company has elected to remove the Leamington Interconnect from the scope of the proposed Project and will reassess its need in the future should projected system shortfalls come to fruition and warrant its reconsideration."

Question(s):

Please provide a copy of the following documents:

- a. Any internal project business cases.
- b. All material provided to Enbridge's executive management team or Board of Directors to seek approval for the updated project.
- c. All material provided to Enbridge Inc. regarding the updated project.

Response:

- a) Please refer to the response at Exhibit I.SEC.4, part a) for information regarding the removal of the Leamington Interconnect from the Project scope. Please also see Attachment 1 to this response for Enbridge Gas's assessment of the demand forecast compared to facility options, prior to the development of the amended leave to construct application.
- b) and c)  
Please see the response to Exhibit I.PP.16 including attachments (updated October 3, 2023) for Capital Allocation Committee, Investment Review Committee and Board of Director approval material.

**Shortfall Analysis - Based on PREP Refresh Demands (as of April 21, 2023)**

TJ/d

4/21/2023

TJ/d	W 21/22	W 22/23	W 23/24	W 24/25	W 25/26	W 26/27	W 27/28	W 28/29	W 29/30	W 30/31	W 31/32	W 32/33	W 33/34
<i>Total Capacity - No Build</i>	<b>713</b>	<b>737</b>	<b>737</b>	<b>737</b>	<b>737</b>	<b>737</b>	<b>737</b>	<b>737</b>	<b>737</b>	<b>737</b>	<b>737</b>	<b>737</b>	<b>737</b>
<i>Total Demand Forecast</i>	672	698	730	802	849	863	878	892	906	921	935	949	963
<i>General Service Forecast</i>	310	306	308	310	312	314	315	317	319	320	321	323	324
<i>Contract Forecast</i>	256	286	316	329	342	354	367	380	393	406	418	431	444
<i>Power Generation</i>	106	106	106	163	195	195	195	195	195	195	195	195	195
<i>Shortfall</i>	41	38	6	(66)	(112)	(127)	(141)	(156)	(170)	(184)	(198)	(212)	(227)
<b>Total System Capacity</b>	<b>713</b>	<b>737</b>	<b>737</b>	<b>904</b>	<b>904</b>	<b>904</b>	<b>904</b>	<b>904</b>	<b>904</b>	<b>904</b>	<b>904</b>	<b>904</b>	<b>904</b>
19 km NPS 36 + Dawn Yard Incremental Capacity	0	0	0	168	168	168	168	168	168	168	168	168	168
<i>Shortfall</i>	41	38	6	102	55	41	26	12	(2)	(17)	(31)	(45)	(59)

**High-level Scope Summary**

Loop Richardson for the total 19 km in 2024

**Shortfall Analysis - Based on PREP Refresh Demands (as of April 21, 2023)**

TJ/d

4/21/2023

TJ/d	W 21/22	W 22/23	W 23/24	W 24/25	W 25/26	W 26/27	W 27/28	W 28/29	W 29/30	W 30/31	W 31/32	W 32/33	W 33/34
<i>Total Capacity - No Build</i>	<b>713</b>	<b>737</b>	<b>737</b>	<b>737</b>	<b>737</b>	<b>737</b>	<b>737</b>	<b>737</b>	<b>737</b>	<b>737</b>	<b>737</b>	<b>737</b>	<b>737</b>
<i>Total Demand Forecast</i>	672	698	730	802	849	863	878	892	906	921	935	949	963
<i>General Service Forecast</i>	310	306	308	310	312	314	315	317	319	320	321	323	324
<i>Contract Forecast</i>	256	286	316	329	342	354	367	380	393	406	418	431	444
<i>Power Generation</i>	106	106	106	163	195	195	195	195	195	195	195	195	195
<i>Shortfall</i>	41	38	6	(66)	(112)	(127)	(141)	(156)	(170)	(184)	(198)	(212)	(227)
<b>Total System Capacity</b>	<b>713</b>	<b>737</b>	<b>737</b>	<b>766</b>	<b>766</b>	<b>766</b>	<b>766</b>	<b>766</b>	<b>766</b>	<b>766</b>	<b>766</b>	<b>766</b>	<b>766</b>
12 km NPS 16 Interconnect Only	0	0	0	30	30	30	30	30	30	30	30	30	30
<i>Shortfall</i>	41	38	6	(36)	(82)	(97)	(111)	(126)	(140)	(154)	(168)	(183)	(197)

**High-level Scope Summary**

No Loop of NPS 20 Panhandle Line

Interconnect only

Not enough pressure available at Comber Transmission with Interconnect to facilitate growth.

NPS 20 Panhandle Line Bottleneck constrains growth on downstream networks



ENBRIDGE GAS INC.

Answer to Interrogatory from  
School Energy Coalition (SEC)

INTERROGATORY

Reference:

[Cover Letter, June 16, 2023] With respect to the Leamington Interconnect, Enbridge states: “Following Enbridge Gas’s re-assessment of the Project in 2022 and 2023, the Company has elected to remove the Leamington Interconnect from the scope of the proposed Project and will reassess its need in the future should projected system shortfalls come to fruition and warrant its reconsideration.”

Question(s):

- a. Please provide a detailed explanation of why Enbridge chose to remove the Leamington Interconnect from the scope of the proposed project.
- b. Please confirm that based on the Capital Update filed in EB-2022-0200, the Leamington Interconnect project is forecast to be completed in 2026 at a cost of \$118.8M (see EB-2022-0200, 2.6-CCC-71, Attach 1, p.6 (2023-07-06)).
- c. Please reconcile part (b) with the statement that Enbridge will reassess its need in the future.
- d. Please provide a revised DCF Analysis (E-1-5) that includes the cost of the Leamington Interconnect based on the costs forecast in the Capital Update of the EB-2022-0200 application. Please provide all supporting calculations and the DCF Analysis in Excel format.

Response:

- a) Enbridge Gas’s Alternatives Assessment Criteria for the Project includes a “timing” criterion whereby “the alternative must meet the growing firm demands on the Panhandle System for the next five years”.<sup>1</sup> At the time of the filing of Enbridge Gas’s initial application and evidence (i.e., June 2022) the Company projected that the Leamington Interconnect would be required to meet a system shortfall in Winter 2025/2026 (following construction of the Panhandle Loop) - within the 5-year

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<sup>1</sup> Exhibit C, Tab 1, Schedule 1, p. 3.

timeframe mentioned above. As a result, the Leamington Interconnect was included within the initial application and evidence.

In 2023, following receipt of the new cost information, the Company re-assessed the capacity position of the Panhandle System based on actual 2022 attachments and their system locations, as well as updated 2023 customer demand. These updates are described at Exhibit A, Tab 4, Schedule 1. The combined effects of these updates indicated that a further system shortfall (following construction of the Panhandle Loop) is not expected to occur until Winter 2029/2030 – beyond of the 5-year timeframe mentioned above. As a result, Enbridge Gas elected to remove the Leamington Interconnect from the scope of the Project.

- b) Confirmed.
- c) Enbridge Gas's best available information at this time reflects a system capacity shortfall as early as November 1, 2029. Alternatives including the Leamington Interconnect and/or other potential solutions will be assessed in the future. As with all growth projects included in the AMP, Enbridge Gas will continue to reassess/update their need.
- d) Enbridge Gas respectfully declines to provide the requested analysis, which is based on a Project scope (i.e., inclusion of the Leamington Interconnect) that the Company's is not seeking approval of. As per the response to part a) above, Enbridge Gas has removed the Leamington Interconnect from the Project's scope and will reassess its need in the future.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
School Energy Coalition (SEC)

INTERROGATORY

Reference:

[A-4-1, p.5-6] Enbridge states: "Following the OEB's remarks in Procedural Order No. 4 regarding CIAC, Enbridge Gas account managers conducted outreach to customers who indicated their intention to submit an EOI bid. Customers were asked about the impact a requirement for CIAC would have on their demands for new/incremental service."

Question(s):

- a. Please provide a copy of all correspondence and any notes of discussions between Enbridge and customers regarding the potential requirements for a CIAC payment.
- b. Please provide a copy of all instructions and/or guidance provided to Enbridge Account managers regarding the OEB's comments in Procedural Order No. 4.

Response:

- a) Please see the response at Exhibit.STAFF.25, part a).
- b) Please see Attachment 1 to this response for a Q&A reference sheet provided to Enbridge Gas account managers regarding the 2023 EOI/ROS process which included information regarding CIAC.

Please see Attachment 2 to this response for an e-mail (dated February 22, 2023) sent to Enbridge Gas account managers regarding the 2023 EOI/ROS process which included information regarding CIAC.

## **Panhandle Regional Expansion Project**

### **Q&A for EOI / Binding Reverse Open Season 2.0**

#### **Q: Why is Enbridge Gas again going out with another Expression of Interest and Reverse Open Season for the Panhandle Regional Expansion Project?**

Enbridge Gas filed a leave-to-construct application with the Ontario Energy Board in June 2022 for two new proposed transmission facilities and ancillary facilities (19 km of 36-inch looping “Panhandle Loop” and 12 km of new 16-inch pipe connecting the connect the existing Leamington North Lines to both the Kingsville East Line and the Leamington North Reinforcement Line “Leamington Interconnect”). Through the course of the regulatory process, new cost information became available which resulted in Enbridge requesting the LTC application be place in abeyance (on hold).

From Enbridge’s letter to the OEB dated December 5, 2022 (request to place project in abeyance):

*Very recently, Enbridge Gas received new cost information through a competitive procurement process that it has been undertaking in parallel with the application, in anticipation of the future construction of the proposed Project. Based on that new information, Enbridge Gas has identified potentially material increases to certain components of the estimated Project cost. Enbridge Gas is in the process of assessing this new cost information and its implications for the application and the evidence that is currently before the OEB.*

From Enbridge’s letter to the OEB dated February 1, 2023 (request for extended abeyance until no later than August 2023):

*Following the receipt of the new cost information, Enbridge Gas re-assessed the capacity position of the Panhandle System based on actual 2022 attachments and their system locations, as well as updated 2023 customer demand. As a result, the Company now anticipates that incremental demand for Winter 2023/2024 can be accommodated and that the Project’s in-service date can be deferred one year from November 1, 2023, to November 1, 2024.*

*The Company continues to assess the Project cost information, the capacity position of the Panhandle System, and future customer demand. Enbridge Gas expects to complete and file evidence amendments incorporating the Company’s assessment of these aspects as soon as possible and no later than August 2023 and is requesting that the OEB continue to hold the application in abeyance until that time.*

Given the time between the request for continued abeyance and when we expect to file the updated LTC application, Enbridge Gas is conducting this second EOI and Binding Reverse Open season to reconfirm market demands and timing. We are also trying to address some of the issues raised by intervenors and OEB staff during the regulatory process (energy transition & conservation, education of

alternatives to firm service i.e. reduced IT rates, DSM opportunities, and the potential for contributions-in-aid-of-construction or “CIAC” for transmission assets).

**Q: Do I have to submit a bid in this EOI if I previously submitted a bid in the 2021 EOI?**

Customers who participated in Enbridge Gas’ 2021 Non-Binding Expression of Interest should submit a new bid form as part of this Expression of Interest for the full amount of additional capacity required in 2024 and beyond. Unless Enbridge Gas receives a new bid form, the company will assume that no new capacity is required.

Customers who have already executed a distribution contract with Enbridge Gas do not have to resubmit a an EOI bid form unless they have new or incremental requirements beyond what has already been contracted for.

**Q: Are contributions-in-aid-of-construction (CIACs) required by Enbridge Gas for customers taking new/incremental firm service from the proposed transmission facilities?**

Enbridge Gas’ position is that customers should not be required to pay a CIAC to improve the economics of the proposed transmission project. Customers may be required to pay a CIAC in addition to executing a long-term distribution contract for any customer-specific distribution facilities (station, service, and/or localized distribution reinforcement required with/without a HAF being utilized).

This was the response provided by Enbridge for undertaking JT1.3 on the issue of CIACs for transmission assets.

Undertaking response for JT1.3

*Enbridge to explain why it did not make a proposal to enable seeking of a contribution for the capacity sought.*

**Response:**

*The proposed Project is a transmission project (please also see the response at Exhibit JT1.2 for Enbridge Gas’s definitions of transmission and distribution pipelines) that will increase capacity on the Panhandle System to meet forecast demand within a large area of benefit.<sup>1</sup> While the demand underpinning the need for the proposed Project is informed by customer demand throughout the area of benefit, there will be no customers directly connecting to the proposed Project (Panhandle Loop and Leamington Interconnect).*

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<sup>1</sup> Exhibit B, Tab 1, Schedule 1, p. 5, Figure 1

*Distribution projects, in comparison, generally provide customer premises with direct access to natural gas. In the case of distribution projects, it can be appropriate to seek a financial contribution from customers whose premises will be directly benefiting from the project. These financial contributions can minimize cross-subsidisation by customers who will not benefit from the distribution facilities.*

*It is not appropriate to seek a financial contribution from specific customers for the proposed transmission Project because, as a transmission system, the Panhandle System transports natural gas for the benefit of all customers within the Panhandle Market – rather than individual or specific customers. Once in service, the proposed Project will serve all customers, whether or not they participated in the expression of interest. The proposed Project addresses system bottlenecks, which once relieved, will improve the reliability of service for existing customers, and will allow for growth from existing and new customers.*

*It should be noted that the Company’s approach is consistent with previous Enbridge Gas applications to the OEB seeking leave to construct, including the Kingsville Transmission Reinforcement Project (“KTRP”) (EB-2018-0013). Within the OEB’s Decision in the KTRP leave to construct proceeding, the OEB found that the Company “appropriately followed the OEB’s E.B.O. 134 test for transmission projects” and confirmed that “currently there is no mechanism to have these parties make a contribution to the costs.”<sup>2</sup>*

*The Company’s approach is also in alignment with the OEB’s Decision (less than two years ago) on Enbridge Gas’s Application for Approval of a System Expansion Surcharge (“SES”), a Temporary Connection Surcharge (“TCS”), and an Hourly Allocation Factor (“HAF”), specifically:*

*“The OEB approves the use of HAF for projects that are primarily distribution and if there is a minor component of transmission then the OEB would still accept the use of HAF. For exclusively transmission projects, the OEB has not agreed to the application of HAF.”<sup>3</sup>*

**Q: Why is the EOI non-binding and the Reverse Open Season binding?**

The purpose of the EOI is to gather information on customer growth plans for the next 5-10 years and will be used as an input to the demand forecast as well as the validation of the proposed transmission facilities and/or potential alternatives. In order to capture total market potential, the EOI is non-binding, meaning customers are not committing to the capacity at this time.

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<sup>2</sup> EB-2018-0013, OEB Decision and Order (September 20, 2018), pp. 5-6

<sup>3</sup> EB-2020-0094, OEB Decision and Order (November 5, 2020), p. 20

Customers expressing interest in new/incremental firm capacity, and who wish to secure that capacity as part of the project, will need to execute a distribution contract or Letter of Indemnity to formally commit to the capacity they are requesting. Capacity will be available on a first-come first-serve basis.

The reverse open season is binding, meaning if a customer elects to turnback firm or interruptible capacity, or convert existing firm service to interruptible service, and if Enbridge accepts the bid with or without conditions attached, the customer will be required to proceed with the turnback request (a contract amendment would be processed to reflect the reduced contract parameters). If a customer exceeds their revised contract parameters after turnback, or wishes to increase contract parameters in the future, the request will be subject to available system capacity at the time the request is received. There is no guarantee that the capacity will be available for them in the future without new facilities and/or alternatives.

Any capacity turned back by customers through the Binding Reverse Open Season will be used to minimize any facilities and/or alternatives deemed to be required to serve incremental demand. Enbridge Gas reserves the right to reject any and all bids received.

**Q: Which customers are being included in the EOI / Reverse Open Season?**

The EOI & ROS is being sent to all distribution contract customers in the area of benefit for the proposed project (western Chatham-Kent and all of Windsor/Essex County). The email will be sent to all of the signing and alternate signing authorities attached to each distribution contract in the AOB. Account managers are encouraged to forward the email to any other relevant contacts for each account, as well as to any customers not currently in the AOB, but who may have future growth plans inside the AOB). Marketers in the LUG South rate zone representing customers in the AOB will also be included in the distribution list.

**Q: What is the new proposed in-service date for the proposed project?**

The revised in-service date for the proposed project is November 2024. Customers can request capacity earlier than November 2024 which may be available on a best-efforts basis or through the use of an interim IT bridging solution (for those requesting new/incremental firm service).

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**From:** Matt Ciupka <Matt.Ciupka@enbridge.com>  
**Sent:** Wednesday, February 22, 2023 4:33 PM  
**To:** In-Franchise Sales – Key Accounts <In-FranchiseSales\_KeyAccounts@enbridge.com>; In-Franchise Sales - LCI Accounts <In-FranchiseSales\_LCIAccounts@enbridge.com>; In-Franchise Sales – Strategic Accounts <In-FranchiseSales\_StrategicAccounts@enbridge.com>  
**Cc:** Ian Macpherson <Ian.Macpherson@enbridge.com>; Paolo Mastronardi <Paolo.Mastronardi@enbridge.com>; Todd Marentette <Todd.Marentette@enbridge.com>; Mark Prociw <Mark.Prociw@enbridge.com>  
**Subject:** INFORM: PREP Expression of Interest and Binding Reverse Open Season - 2023

Good Afternoon,

Tomorrow we will be launching the Expression of Interest (EOI) and Binding Reverse Open Season (ROS) for the Panhandle market area!

Once Web Publishing confirms the websites updates are live, a notification email will be sent from the **Enbridge Gas Large Volume Customer Communications** mailbox to all existing contract rate customers in the defined Area of Benefit. This should occur between 10am and noon tomorrow.

- The email will be sent to the Signing Authority and Signing Authority Alternates currently attached to each SA – please feel free to forward the email to any of your contacts if the Signing or Alt Signing Authority isn't your main contact. You are also encouraged to forward the email to any customers that are not in the area of benefit but considering the area for growth, or existing general service customers who may be expanding and would qualify for contract rate service.
- A copy of the EOI/ROS package, along with a listing of the customers that will receive the email, and a Q&A document have been uploaded to the new **DIFS PREP Team** channel in Teams.
- A tracking file to document the outreach progress and record information gained from customer discussions is also located on the **DIFS PREP Team** channel. **Please update the tracking file every time you've had a discussion with a customer.** You'll note that there is a column to record customer responses to the CIAC for transmission assets question. Please refer to the Q&A document for background on the question and EGI's current position on it –



and don't hesitate to reach out if you want more background or information on why we are asking this when speaking to customers.

- Weekly touchpoints have been set up for those who have accounts in the area to discuss outreach progress, customer feedback received, general observations and Q&A. Please feel free to add questions to the Q&A document and we will add on to it as new questions come up. If you haven't been included on the invite list but would like to attend the touchpoints please let me know and I'll add you.
- A copy of the EOI & ROS documents can also be found on the **Indmarketing** drive under **\Contract Sales Team\02 – PREP EOI ROS 2023**. We want to leverage the DIFS PREP Team channel as much as we can.
- The EOI BROS will remain open for 30 business days and will be **closing on Thursday April 6th, 2023 at 12 pm ET**. EOI and/or ROS bid forms must be submitted by customers to the [Economic.Development@Enbridge.com](mailto:Economic.Development@Enbridge.com) on or before that date. If you receive any bid forms directly from customers, please forward them to the [Economic.Development@Enbridge.com](mailto:Economic.Development@Enbridge.com) mailbox for control and tracking purposes.

**Please do not hesitate to reach out at any time if you have questions, concerns, comments or are seeking advice – remember, there are no dumb questions!**

I'm looking forward to the journey ahead and wish you all the best in your customer outreach efforts.

Thanks,  
Matt

**Matt Ciupka**, MBA (he/him)  
**Specialist, Economic Development**  
Strategic & Power Markets

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**Safety. Integrity. Respect. Inclusion.**

ENBRIDGE GAS INC.

Answer to Interrogatory from  
School Energy Coalition (SEC)

INTERROGATORY

Reference:

[E-1]

Question(s):

Please provide a copy in Excel, with all formulas intact, of Schedules 4-7.

Response:

Please see Attachment 1 to this response for the Excel file for Exhibit E, Tab 1, Schedule 4.

Please see Attachment 2 to this response for the Excel file for Exhibit E, Tab 1, Schedule 5.

Please see Attachment 3 to this response for the Excel file for Exhibit E, Tab 1, Schedule 6. Please also see the response at Exhibit I.ED.25.

Please see Attachment 4 to this response for the Excel file for Exhibit E, Tab 1, Schedule 7.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Three Fires Group (“TFG”)

INTERROGATORY

References:

Exhibit A, Tab 2, Schedule 2, p. 1

Preamble:

EGI requests leave to construct (i) approximately 19 km of NPS 36 natural gas existing Enbridge Gas Dover Transmission Station in the Municipality of Chatham-Kent to a new valve site in the Municipality of Lakeshore, (ii) approximately 12 km of NPS 16 natural gas pipeline in the Municipality of Lakeshore, the Town of Kingsville, and the Municipality of Leamington, and (iii) ancillary measurement, pressure regulation, and station facilities within the Township of Dawn Euphemia, in the Municipality of Chatham-Kent, and valve-site station facilities within the Town of Kingsville and the Municipality of Leamington (the “Project”).

EGI indicates that the Project is “designed to reliably serve increased demands for firm service in the Panhandle Market, including, in particular, incremental demands from the greenhouse, automotive, and power generation sectors” as identified in EGI’s addendum to its Asset Management Plan.<sup>1</sup>

Question:

- a) Please provide a detailed outline of EGI’s consultation with First Nations and Indigenous Communities on the alternatives to the Project that were studied and considered.
- b) Please indicate whether EGI has or will consider equity participation of First Nations, including Chippewas of Kettle and Stony Point First Nation (“CKSPFN”) and Caldwell First Nation (“CFN”) (together, the “Three Fires First Nations”), in relation to the Project. If yes, please discuss what equity participation means to EGI and how First Nations may participate. If no, please explain why not.

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<sup>1</sup> EB-2021-0148, EGI Asset Management Plan Addendum – 2022, Exhibit B, Tab 2, Schedule 3, p. 8.

**Response**

- a) Please see Exhibit C, Tab 1, Schedule 1 for Enbridge Gas's assessment of Project alternatives. The discussion of alternatives has not been the focus of Enbridge Gas's consultation with Indigenous communities to date as Enbridge Gas is not pursuing the alternatives given the determination that the assessed alternatives are not viable. Rather, discussions with First Nations and Indigenous Communities have focused upon, among other things, environmental and socio-economic impacts of the proposed Project. Nevertheless, the Company remains open to discussing concerns that any potentially affected Indigenous groups might have with respect to the Project, including alternatives.
- b) Given the nature of this Project, which is both brownfield and regulated, there will be no equity participation opportunities for Indigenous groups.

At this time, there are no clear mechanisms for revenue sharing under the current OEB regulatory framework for regulated assets such as this one. However, Enbridge Gas is meeting with and discussing the interests and priorities of Indigenous groups, including representatives of TFG, in an effort to explore opportunities to advance innovative partnerships and economic inclusion.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Three Fires Group ("TFG")

INTERROGATORY

References:

- Exhibit C, Tab 1, Schedule 1, p. 5
- Exhibit F, Tab 1, Schedule 1, Attachment 1, "Environmental Report, Panhandle Regional Expansion Project" (the "Environmental Report")

Preamble:

EGL has assessed the following facility alternatives:

- (i) Upsizing of the existing NPS 16 Panhandle Line or NPS 20 Panhandle Line west of Dover Transmission;
- (ii) Looping the existing NPS 20 Panhandle Line West of Dover Transmission and installing a Leamington lateral interconnect (ie. the Project); and
- (iii) A new liquified natural gas (LNG) Plant.

EGL identified and assessed the following Integrated Resource Planning Alternatives ("IRPA"):

- (i) Firm exchange between Dawn and Gateway;
- (ii) Firm exchange between Dawn and Ojibway, in combination with looping the NPS 20 Panhandle line west of Dover Transmission and installing a Leamington lateral interconnect;
- (iii) Trucked CNG deliveries to the Panhandle system; and
- (iv) Enhanced Targeted Energy Efficiency (ETEE).

Question:

- a) Please explain why only two facility alternatives, an upsize of existing pipelines and the construction of a new LNG plant, were considered and assessed, as opposed to other non-natural gas-based options?
- b) Please indicate whether EGL has considered hybrid solutions for the Project and the expansion of the Panhandle System. If yes, please provide details and indicate why these solutions were considered with respect to financial impacts on ratepayers, and why/how they were ruled out of inclusion for further consideration. If not, please explain.

- c) Has Enbridge sought any opportunities to work with IESO or any other electricity distributors to facilitate electricity-based energy solutions as part of the IRPA for the benefit of both electricity and gas ratepayers, and if not, why was this not done?
- d) Has Enbridge assessed the need for the project in relation to any rapid expansion of electricity infrastructure in the region, and overall impacts on both electricity and gas ratepayers?
- e) Would Enbridge expect any rapid expansion of electricity infrastructure in the region to impact the need for the proposed project?
- f) How does Enbridge determine whether the alternatives it has chosen to assess represent a complete picture of the viable alternatives to the Project? What criteria are used by EGI when selecting and assessing potential project alternatives and IRP's?
- g) Please explain how Enbridge assessed alternatives to the project with respect to short-term and generational financial impacts on ratepayers
- h) Please explain how Enbridge assessed alternatives to the project, specifically as they relate to impacts on each of the Three Fires First Nations.
- i) Please explain what project alternatives, including financial impacts on ratepayers, including First Nation ratepayers, were presented to each of the Three Fires First Nations.

## **Response**

- a) Through Enbridge Gas's assessment of facility alternatives, no additional alternatives were identified to meet customer demand. Please see Exhibit C, Tab 1, Schedule 1 for Enbridge Gas's assessment of project alternatives. Please also see the response to Exhibit I.STAFF.7 for more information on all alternatives assessed, including various facility alternatives. /U

Enhanced Targeted Energy Efficiency were also assessed under IRPAs (see Exhibit C, Tab 1, Schedule 1, Pages 10-21) and deemed not to be viable (please also see the response to Exhibit I.STAFF.7 Attachment 2).

- b) Yes, hybrid alternatives were considered, including the IRPA described at Exhibit C, Tab 1, Schedule 1, Pages 16-19. For more information on the assessment of alternatives, please see the response to Exhibit I.STAFF.7. /U
- c) No, Enbridge Gas did not identify viable electricity-based alternatives for the Project. However, Enbridge Gas did assess Enhanced Targeted Energy Efficiency ("ETEE") programming, but this alternative was deemed to be non-viable. For more information on the assessment of alternatives, please see the response at Exhibit I.STAFF.7.

The need for the proposed Project is underpinned by customer demands for natural gas specifically (as per the EOI process), which is used by natural gas-powered electricity generators as a supply input, to power their facilities, and by agricultural customers for heating and carbon dioxide (to feed plants). Electricity is typically used by agricultural customers for lighting and ventilation only.

d) No.

Customers in the Panhandle Area of Benefit were invited to share their new/incremental gas needs through the EOI process. They were also invited to share any plans to turnback or reduce current contract demands. The EOI was used to generate an informed forecast for net new expected demands in the Panhandle Market.

e) No.

As per the IESO reports (2021 APO & 2022 AAR), the rapid expansion of electricity infrastructure in the region is in response to growing demands and does not make reference to existing customers in the region converting their existing energy needs currently met by natural gas to electricity.

f) Enbridge Gas conducts an assessment to identify potential alternatives, including facility and non-facility alternatives, to provide a complete picture of options to meet customer demand. For the criteria used to assess alternatives, please refer to Exhibit C, Tab 1, Schedule 1, Pages 3-4.

g) Enbridge Gas assessed alternatives for economic feasibility (Exhibit C, Tab 1, Schedule 1, Page 3). This included an assessment of Net Present Value and cost per unit of capacity created, to assess long-term impacts. For more information on the assessment of alternatives, please see the response to Exhibit I.STAFF.7.

/U

h) Enbridge Gas assessed alternatives for environmental and socio-economic impact (Exhibit C, Tab 1, Schedule 1, Page 4), recognizing that the chosen alternative should minimize impacts to Indigenous peoples, municipalities, landowners, and the environment relative to other viable alternatives. For more information on the assessment of alternatives, please see the response to Exhibit I.STAFF.7.

i) Please see the response to Exhibit I.TFG.1 part a).

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Three Fires Group ("TFG")

INTERROGATORY

References:

Environmental Report, Integrated Resource Planning (IRP), PDF p. 310

Preamble:

IRP is a framework through which Enbridge Gas reviews alternative approaches to meeting energy needs, before building new infrastructure such as:

- (i) Delivering more energy without adding new pipelines using liquefied or compressed natural gas;
- (ii) Lowering energy use through effective energy efficiency programs; and
- (iii) Displacing conventional natural gas with carbon-neutral renewable natural gas and hydrogen.

Question:

- a) Has EGI considered whether the existing system could deliver more energy without adding new pipelines? If so, please explain and include reasons for why this alternative is not feasible.
- b) Has EGI considered whether energy efficiency programs could meet regional energy needs and possibly provide better financial cases for ratepayers? Please explain.
- c) Will alternative fuels like renewable natural gas and hydrogen blends be transported in the existing loop and new pipeline? If so, how has EGI considered the impacts on ratepayers for those alternative fuels?
- d) If alternative fuels will be transported, please comment on the measures taken to ensure pipeline integrity, and related integrity management costs to ratepayers. Please include short- and long-term measures.

Response

- a) Yes, alternatives that deliver more energy without incremental pipeline facilities were considered. The alternative assessment evaluation included Liquefied Natural Gas, Compressed Natural Gas and incremental third-party supplies. These alternatives



were determined to be non-viable mitigation for the forecast Panhandle System capacity shortfall (please see the response to Exhibit I.STAFF.7 Attachment 2).

b) Yes, as noted at Exhibit C, Tab 1, Schedule 1, Pages 20-21, Enbridge Gas assessed whether energy efficiency programs could meet the regional energy needs compared to the capacity created by the proposed Project. The assessment found that the Enhanced Targeted Energy Efficiency (“ETEE”) alternative is not technically or economically feasible to meet forecasted demands. /U

c) and d) Enbridge Gas believes that the natural gas system could be leveraged to reduce GHG emissions in Ontario by transitioning the system over time to deliver renewable natural gas (“RNG”) and hydrogen. Contract customers who are direct purchase may purchase RNG as part of their supply. As proposed in Phase 2 of Enbridge Gas’s Rebasing Application (EB-2022-0200) at Exhibit 4, Tab 2, Schedule 7, the Company has proposed a new Low Carbon Voluntary Program to enable system supplied customers the ability to voluntarily elect that a portion of their supply be RNG, pending OEB approval, beginning in 2025. However, Enbridge Gas has no immediate plans to blend RNG or hydrogen into the Panhandle System. /U

RNG is composed of mostly methane, as is natural gas, and is currently injected by various producers into some of Enbridge Gas’s systems. This RNG is blended within the natural gas stream. RNG is a one for one replacement of natural gas by volume and therefore would not have an impact on the proposed Project. Pipeline integrity measures for RNG are similar to those for traditional natural gas.

Enbridge Gas intends to evaluate the compatibility of its pipeline facilities with hydrogen gas in the future.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Three Fires Group ("TFG")

INTERROGATORY

References:

Exhibit C, Tab 1, Schedule 1, pp. 12, 24-25

Preamble:

EGI notes that the Project provides many benefits and is the best alternative for meeting the identified needs as it, among other reasons, contains the lowest environmental and socio-economic impacts relative to all viable alternatives assessed.

Question:

- a) Please discuss whether EGI evaluated the proposed project as well as project alternatives using the social cost of carbon. For reference, the social cost of carbon is the cost of the damages created by one extra ton of carbon dioxide emissions. In principle, it includes the value of all climate change impacts, including (but not limited to) changes in net agricultural productivity, human health effects, property damage from increased flood risk, natural disasters, disruption of energy systems, risk of conflict, environmental migration, and the value of ecosystem services.<sup>2</sup>
- b) Has EGI modeled the socio-economic costs by the proposed project, and compared these costs with proposed alternatives? If not, please explain.
- c) Has EGI considered how the proposed project will impact Indigenous economies and micro-economies including guided fishing tours and hunting in the project area? If yes, please provide documents associated with this economic analysis. If no, will EGI undertake to perform and provide this analysis?
- d) Has EGI considered the economic impacts of crossing waterbeds and the potential of contamination to disrupt local economies (specifically Indigenous economies)?

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<sup>2</sup> Resources for the Future, "Social Cost of Carbon 101", online at:  
<https://www.rff.org/publications/explainers/social-cost-carbon-101/>

## **Response**

- a) Enbridge Gas has not evaluated the proposed Project or alternatives using a social cost of carbon. However, carbon emissions using the cost of carbon in the Greenhouse Gas Pollution Pricing Act are considered in stage 2 of the Project economic evaluation (Exhibit E, Tab 1, Schedules 1 and 6).

Regarding scope 1 emissions (emissions from Enbridge Gas's own operations) please see the response to Exhibit I.TFG.9 part a).

- b) The socio-economic costs of the proposed project and proposed alternatives were not modeled. Please see the response to Exhibit I.PP.17.

Potential impacts on socio-economic features are outlined in Section 5.3.3 of the ER and align to the OEB's Environmental Guidelines for the Location, Construction and Operation of Hydrocarbon Pipelines and Facilities in Ontario (2016).

- c) The proposed Project will seek to support Indigenous economies through supply chain management inclusion and supporting the local economy. Guided fishing tour and hunting businesses did not express concerns during the two Virtual Open House processes or during any of the consultation process. Additionally, the water crossings that currently are used for, or could be used for, guided fishing tours are being Horizontal Directionally Drilled ("HDD") which is designed to reduce impact and therefore will not affect the ability to undertake guided fishing tours or hunting.

Economic impacts were assessed as part of the ER (Section 5.3.3) and net negative effects on the local economy, Indigenous economy and/or employment are not anticipated.

- d) Economic impacts were assessed as part of the ER, please see the response to part c) above. With respect to the concern regarding contamination, no contaminated sites were identified within the vicinity of the Project Study Areas ("PSAs") through review of major landfill locations, Provincial Registry ([Ministry of the Environment, Conservation and Parks] MECP Record of Site Condition ("RSC") filings) and Federal Contaminated Sites Inventory, and therefore, no significant adverse residual effects from Landfills and Contaminated Sites are anticipated. Additional mitigation measures related to contamination identified in Tables 5-3, 5-5, 5-7 and Section 7.2.2 of the ER will be implemented during the construction of the Project. These mitigation measures will be part of the Environmental Protection Plan for construction.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Three Fires Group (“TFG”)

INTERROGATORY

References:

- Environmental Report
- Ontario Energy Board: Environmental Guidelines for the Location, Construction and Operation of Hydrocarbon Pipelines and Facilities in Ontario (the “Environmental Guidelines”), Section 4.3.13 Social Impacts

Preamble:

The Environmental Guidelines provides that Social Impact Assessment (“SIA”) is an integral component of environmental analysis and ensures that the extent and distribution of the Project’s social impacts are considered in an explicit and systematic way.

The Environmental Guidelines further note that pipeline construction is associated with both real and perceived health and safety risks which may affect people's lives and how they feel about their homes and communities.

Question:

- a) Please discuss whether EGI has considered the social impacts of the proposed project on the Three Fires First Nations. If yes, please provide details and all related reports, presentations, or other documents specific to the Three Fires First Nations. If no, please explain why not.
- b) Please discuss whether EGI has considered the cultural heritage impacts of the proposed project on the Three Fires First Nations. If yes, please provide details and all related reports, presentations or other documents specific to each of the Three Fires First Nations. If no, please explain why not.
- c) Please discuss whether the required SIA considered the Project’s impacts on systemic social inequalities, including gender, gender diverse people, race, ethnicity, religion, age, mental or physical disability. If not, please explain why these identified types of social impacts were not considered as part of the SIA.
- d) Please discuss whether EGI has considered the safety risks of the expected construction workforce on the surrounding communities and vulnerable individuals, including the Three Fires First Nations, including as it relates to

safety risks such as potential substance abuse, disproportionate impacts on women in communities, and impacts on the sex trade. If yes, please explain how EGI intends to mitigate the identified safety risks. If no, please explain why not and discuss how EGI intends to mitigate these types of safety risks of the Project in the surrounding communities.

## **Response**

- a) Yes, Enbridge Gas considered social impacts to the Three Fires First Nations. Potential impacts to Indigenous communities, including the Three Fires First Nations, are outlined in Section 5.3.3 of the ER.
- b) Yes, Enbridge Gas considered the cultural heritage impacts of the Project. A Cultural Heritage Report was completed for the Project and was provided as part of the ER in Appendix F. The report concluded that there are no anticipated impacts to cultural heritage resources. /U
- c) Potential impacts on socio-economic features are outlined in Section 5.3.3 of the ER and align with the OEB's Environmental Guidelines for the Location, Construction and Operation of Hydrocarbon Pipelines and Facilities in Ontario (2016).

There would be no anticipated residual effects on systemic social inequalities due to the Project scope, anticipated existing local tradesperson workforce, and short duration of active construction timeline of approximately six months, coupled with the requirements of Enbridge Gas's Supplier Code of Conduct.

Enbridge Gas's suppliers, which includes its contractors and subcontractors, are required to follow Enbridge Inc.'s policies including the Supplier Code of Conduct, which states:

Enbridge believes that each individual with whom we come in contact deserves to be treated fairly, honestly, and with dignity. We do not condone any form of harassment, discrimination, or inappropriate actions or language of any kind.

Drug and Alcohol Programs, Respectful Workplace Training and Indigenous Peoples Awareness Training are specific to the Construction Contractor(s) that will construct the projects, which haven't been selected yet.

- d) The Panhandle Environmental Report was prepared with consideration 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)* (“Guidelines”). Guidance on the consideration of Social Impacts is provided in Section 4.3.13 of the OEB Environmental Guidelines. The Guidelines discuss “both real and perceived health and safety risks” at pages 41 and 42, which in the Panhandle Environmental Report are addressed through mitigation recommendations such as safety fencing and a Traffic Management Plan.

In addition, to mitigate additional safety risks (e.g., harassment, substance abuse) within the community, Enbridge Gas’s general contractors are required to follow Enbridge policies including the Supplier Code of Conduct, as described in part c) above.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Three Fires Group ("TFG")

INTERROGATORY

References:

- Environmental Report
- Environmental Guidelines, section 4.3.14 Cumulative Effects
- CKSPFN Declaration to the Waterways and Lakebeds within its Traditional Territory (see Appendix A)

Preamble:

The Environmental Guidelines state that “[i]n many situations, individual projects produce impacts that are insignificant. However, when these are combined with the impacts of other existing or approved projects, they become important.”

Further, the Environmental Guidelines state: “[p]articular attention should be paid to environments of known sensitivity and high eco-value (as defined by provincial policies and public input), to situations where opportunities exist to remedy past negative impacts, and to situations in which a combination of actions may result in identifiable environmental impacts that are different from the impacts of the actions by themselves”.

The Environmental Guidelines also indicate that, “[c]umulative impacts may result from pipeline projects which loop existing systems and should be addressed. This may include an examination of areas of known soil erosion, soil compaction or soil productivity problems. It may mean the examination of impacts associated with continued loss of hedgerows and woodlots in the same area. As well, it could mean the increased loss of enjoyment of property because of disruptions caused by the construction of successive pipelines on a landowner's property. There may also be heightened sensitivities as a result of improper or ineffective practices and mitigation measures in the past.”

Question:

- a) Please outline what steps EGI has taken to address outstanding concerns from the Three Fires First Nations about the cumulative effects of gas infrastructure and expansion across each of their respective territory as it relates to the Project.

- b) Please provide and discuss EGI's instructions to its environmental consultants for assessing cumulative effects for this Project.
- c) Please discuss whether EGI has considered all past, present, and future conditions in the cumulative effects assessment, including existing projects, the current project, and any future projects.
- d) Does EGI agree that non-provincially significant wetlands should be included in the Environmental Report methodology alongside "Provincially Significant Wetlands" and unevaluated wetlands? If not, please explain why not considering CKSPFN's water assertion and the cultural significance of wetlands other than those deemed "Provincially Significant Wetlands".

### **Response**

- a) Enbridge Gas continues to provide the Three Fires Group with information regarding its projects that may potentially impact the Nations represented, as well as the opportunity to meet with Enbridge Gas representatives to discuss the impact of its projects on the rights and interests of the Nations represented by the Three Fires Group. During such meetings, specific concerns regarding projects and their associated cumulative effects can be discussed. In addition, the Three Fires Group and the Nations it represents have the opportunity to comment on the related Environmental Reports, including the cumulative effects assessment. Enbridge Gas considers such comments to determine whether concerns have been appropriately addressed through, for example, project design or the implementation of mitigation measures.

Enbridge Gas met with CKSPFN representatives on May 30, 2022, and the parties discussed cumulative effects within their traditional territory. CKSPFN expressed that cumulative effects would be a multi-party discussion and CKSPFN would be engaging with the provincial government in this regard. Enbridge Gas expressed support for the ongoing discussion on cumulative impacts within the traditional territory with government and industry. Enbridge Gas is committed to continuing to engage with the Three Fires Group and the Nations it represents regarding cumulative effects.

- b) Enbridge Gas instructs and relies upon its environmental consultants to conduct environmental studies of proposed projects, including assessments of cumulative effects, in consideration of the guidance outlined in the OEB's *Environmental Guidelines for the Location, Construction and Operation of Hydrocarbon Pipelines and Facilities in Ontario (2016)* (the "Guidelines"). The Company provides the environmental consultants with relevant supporting information as necessary/appropriate in support of the completion of any assessment of cumulative effects.



- c) The Project inclusion list for the cumulative effects assessment is provided in Section 6.3, Project Inclusion List of the Environmental Report. Infrastructure already in place are assessed as existing conditions, which is provided in Section 4, Environmental and Socio-economic Features of the Environmental Report. Where residual effects from impacts on these existing conditions remain after mitigation, they are carried forward to the cumulative effect assessment. The current Project and any known future projects within the spatial study boundary were considered in the cumulative effects assessment.
  
- d) Yes. Non-provincially significant wetlands were included in the ER in Section 4.3 with mitigation outlined in Section 5.3.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Three Fires Group ("TFG")

INTERROGATORY

References:

Exhibit F, Tab 1, Schedule 1, pp.3-4

Preamble:

EGI notes that it will comply with all mitigation measures recommended in the Environmental Report, including the development of an Environmental Protection Plan ("EPP") prior to construction" and that the EPP will incorporate recommended mitigation measures contained within the Environmental Report and those recommended by permitting agencies

Question:

- a) Will EGI's EPP consider mitigation measures recommended by Indigenous communities including the Three Fires First Nations? If yes, please provide details of how these mitigation measures will be communicated to EGI and how they will be incorporated into the EPP.

**Response**

- a) Yes, mitigation measures recommended by Indigenous communities will be considered and can be communicated to Enbridge Gas through ongoing consultation. Any additional mitigation measures identified and agreed upon will be included in the Environmental Protection Plan by Enbridge Gas.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Three Fires Group ("TFG")

INTERROGATORY

References:

Exhibit B, Tab 1, Schedule 1, p. 10

Preamble:

EGI notes that it "is aware of, has reviewed, and is working in conjunction with the municipalities within the Panhandle Market to determine whether the expansion of the Panhandle System impacts their ability to achieve the greenhouse gas emissions (GHG) reduction goals."

Question:

- a) Please indicate whether EGI has considered whether the Project and the expansion of the Panhandle System will impact the ability for Indigenous communities to achieve a reduction in GHG emissions across the treaty territory. If yes, please provide details and indicate why this was not included in the Application. If not, please explain the difference in treatment between Municipalities and Indigenous Communities.
- b) To what extent does the proposed project align with the energy plans brought forward by municipalities and counties? Please identify which municipal energy plans were considered and indicate whether this Project aligns with municipality and county energy plans. If not, please explain.
- c) How does EGI plan to incorporate best practices to support the 35% efficiency gain in emissions sought by all municipalities in the Windsor-Essex region?

Response

- a) While Enbridge Gas has not specifically considered whether the Project impacts the ability for Indigenous communities to achieve a reduction in GHG emissions across the treaty territory, Enbridge Gas would be open to learning more about Indigenous communities' plans to achieve GHG reductions in order to better understand how the Project may impact GHG emissions reduction goals.

- b) Please see the response at Exhibit I.EP.2 for the energy plans that were considered by Enbridge Gas.

The Project is supported by the City of Windsor, the County of Essex, and the Municipality of Chatham-Kent. Please see Exhibit B, Tab 1, Schedule 1, Attachment 3.

- c) Enbridge Gas will continue to deliver Demand Side Management (“DSM”) programs to all major customer groups in the region (Residential, Commercial, Industrial, Low Income) to support local energy efficiency goals.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Three Fires Group (“TFG”)

INTERROGATORY

References:

Enbridge Inc. “Net Zero by 2050: Pathways to reducing our emissions”<sup>3</sup> (The “Net Zero Plan”), pp. 2 and 9-11

Preamble:

EGL notes that it “is aware of, has reviewed, and is working in conjunction with the municipalities within the Panhandle Market to determine whether the expansion of the Panhandle System impacts their ability to achieve the greenhouse gas emissions (GHG) reduction goals.”

In March 2022, EGL published the Net Zero Plan which includes targets of reducing the intensity of GHG emissions from their operations by 35% by 2030 and achieving net zero greenhouse gas (“GHG”) emissions from their business by 2050 (the “Commitments”).

Question:

- a) Please indicate and provide details of how Enbridge Inc. and EGL intend to reach the Commitments as it relates to the Project. Please comment on, and file any and all analysis EGL has performed in connection with, how the shipping and burning of methane gas across the traditional territories of the Three Fires First Nations will, or is anticipated to, affect the Commitments.
- b) Has EGL modelled the fugitive methane emissions that will be released by the proposed Project? If yes, please describe the modelling that was undertaken and provide all related results. If not, please explain.
- c) Please provide information on EGL’s leak detection, repair and reporting protocol for related infrastructure, including accounting for fugitive emissions.
- d) Canada has committed to developing a plan to reducing oil and gas methane emissions by at least 75 percent below 2012 levels by 2030, pursuant to the

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<sup>3</sup> Enbridge Inc. “Net Zero by 2050: Pathways to reducing our emission” (March 2022), available online at: [https://www.enbridge.com/~/\\_media/Enb/Documents/About%20Us/Net\\_Zero\\_by\\_2050.pdf?la=en](https://www.enbridge.com/~/_media/Enb/Documents/About%20Us/Net_Zero_by_2050.pdf?la=en).

Global Methane Pledge (see Appendix B).<sup>4</sup> Please explain EGI's understanding of and describe how the Project contributes to or detracts from Canada's commitments under the Global Methane Pledge.

- e) Please file any and all analysis EGI has performed to assess GHG emissions over the lifespan of the Project. If EGI has not undertaken any such analysis, please explain why no such analysis has been undertaken, in light of the Commitments.

## **Response**

- a) Enbridge Gas's assessment of the Project included calculating its incremental GHG emissions and demonstrating a plan to mitigate these emissions to support its commitment of achieving its 2030 emissions intensity reduction target and its 2050 net zero target. /U

The incremental GHG emissions associated with the proposed Project are 4,100 tCO<sub>2</sub>e annual emissions, primarily from incremental compressor fuel use. The incremental emissions due to this Project represent less than 1% of current emissions.

The Project's scope 1 mitigation costs are currently based on the cost of purchasing carbon offsets. However, an assessment will be completed to determine the most appropriate emission reduction option.

- b) Yes, Enbridge Gas has estimated the fugitive emissions for the project. Calculations were undertaken following the methodologies prescribed by provincial and federal GHG reporting programs, including the use of emission factors and engineering estimates, as well as company-specific emission factors based on direct measurement of fugitive emissions.

Considering the fugitive emissions due to operation only, the Project is estimated to result in an increase in fugitive emissions of approximately 120 tCO<sub>2</sub>e/year

- c) Enbridge Gas currently manages its fugitive emissions, in accordance with industry accepted best management practices (CSA Z620.1) and government regulations including the *Regulations Respecting Reduction in the Release of Methane and Certain Volatile Organic Compounds (Upstream Oil and Gas Sector)*, to reduce

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<sup>4</sup> Government of Canada, News Release, "Canada confirms its support for the Global Methane Pledge and announces ambitious domestic actions to slash methane emissions" (October 11, 2021), available online at: <https://www.canada.ca/en/environment-climate-change/news/2021/10/canada-confirms-its-support-for-the-global-methane-pledge-and-announces-ambitious-domestic-actions-to-slash-methaneemissions.html>

emissions from its operations. In July 2020, Enbridge Gas implemented a harmonized leak operating standard, which includes:

- (i) increased traceability and tracking of leak repairs,
- (ii) increased monitoring frequencies,
- (iii) harmonized repair timelines for above ground leaks, and
- (iv) initiation of a station leak survey program.

Pipelines are inspected annually by way of a foot patrol, during which a leak survey is conducted. A flame ionization gas detector is utilized during the foot patrol in order to detect leaks, if present. The results of these surveys are tracked and applied to the appropriate fugitive emission calculations within Enbridge Gas’s federal and provincial emissions regulatory reporting.

- d) The Global Methane Pledge aims to reduce methane emissions by 30 percent below 2020 levels by 2030. Canada has committed to developing a plan to reduce methane emissions from oil and gas by at least 75 percent below 2012 levels by 2030. In November 2022, Environment and Climate Change Canada released their proposed regulatory framework to amend the existing federal Methane Regulations to achieve at least a 75% reduction in oil and gas sector methane by 2030 relative to 2012. /U

As indicated in part a) above, the proposed project would result in an increase in emissions of up to 4,100 tCO<sub>2</sub>e/year over current emissions levels (methane accounting for approximately 290 tCO<sub>2</sub>e/year). In support of Canada’s commitments, Enbridge Gas will continue to comply with the Federal Methane Regulation, which was implemented in order to support Canada’s methane reduction targets.

- e) As discussed in response at a), Enbridge Gas has assessed emissions associated with the Project (operational only) and has determined that construction of the Project will result in an overall increase of up to 4,100 tCO<sub>2</sub>e/year compared to baseline emissions (please see Table 1 for further breakdown of this increase). /U

Table 1

<b>Emissions Source</b>	<b>Emissions (tCO<sub>2</sub>e)</b>
Stationary Combustion	3,900
Fugitives	120
Vented	80
<b>TOTAL</b>	<b>4,100</b>

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Three Fires Group ("TFG")

INTERROGATORY

References:

Environmental Report, Section 3.6.1, p. 19

Preamble:

The Environmental Report notes that four additional comments were received from the public via the interactive mapping tool noting concerns over a species sighting (Western Chorus Frog [*Pseudacris triseriata*]) near the Leamington Interconnect.

Question:

- a) Is EGI aware that the habitat of the Western Chorus Frog is protected in Ontario by the Provincial Policy Statement (PPS) under the Planning Act?
- b) Please comment on the habitat surveys (conducted to date) on the Western Chorus Frog?
- c) Will future surveys (conducted by Enbridge and/or third-party contractor(s)) attempt to identify Western Chorus Frog and its associated habitat?
- d) Please comment on the measures taken (throughout the project's lifecycle) to ensure the protection of the Western Chorus Frog and its associated habitat

Response

- a) Yes, as stated in Section 4.3.3.1 of the Environmental Report the Western Chorus frog is listed provincially and federally as a species at risk for the Great Lakes/ St. Lawrence population. The Carolinian population, however, is not considered at risk, nor is it considered rare in Ontario with an S-rank of S4. However, Enbridge Gas recognizes that the species may be afforded protection under the PPS under significant wildlife habitat in terms of significant amphibian breeding habitat.
- b) and c)  
Ecological land classification and significant wildlife habitat screening were conducted to identify candidate habitat for amphibian breeding. Targeted surveys specific to the Western Chorus Frog were not completed as all suitable habitat was



considered potentially significant amphibian breeding habitat. Consequently, mitigation measures were developed to protect potential amphibian habitat and have been included in the ER in Section 5.3.2 for application during construction.

- d) The mitigation measures proposed in Table 5-9 of the ER will be employed to avoid impacts to candidate amphibian breeding habitat. Some of these mitigation measures include installing and maintaining sediment and erosion controls, such as silt fence barriers, obeying site speed limits etc.

It is possible that further integrity maintenance activities may be required in the future which have the potential to impact amphibian habitat. In those instances, Enbridge Gas may need to undertake further ground disturbance. Such maintenance activities will go through a separate environmental review and permitting process, if required, outside of the scope of the Project ER.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Three Fires Group ("TFG")

INTERROGATORY

References:

Environmental Report, Section 4.2.3, p. 23

Preamble:

The Environmental Report notes that a segment north of Jeannettes Creek, approximately 5km in length, and the north end of the Panhandle Route lies within a Significant Groundwater Recharge Area and a Highly Vulnerable Aquifer.

Question:

- a) Please indicate and provide details of how EGI intends to protect the segment north of Jeannette's Creek (i.e., Significant Groundwater Recharge Area and Highly Vulnerable Aquifer), and the associated costs for this protection. Please comment on, and file any and all analysis EGI has performed in connection with, how the construction and operation of the pipeline will, or is anticipated to, affect the above-mentioned segment.
- b) Please explain how the integrity of the Significant Groundwater Recharge Area and Highly Vulnerable Aquifer will be protected and provide an assessment of associated costs.
- c) Please include relevant mitigation measures that will be taken (throughout the project's lifecycle) to ensure the longevity of the aquifer and its recharge zones and provide an assessment of associated costs.
- d) Please provide Three Fires with the permits EGI has obtained to construct nearby a Significant Groundwater Recharge Area and a Highly Vulnerable Aquifer. If these permits have not yet been obtained, please outline EGI's application timeline.

Response

- a) - c)  
Enbridge Gas has received confirmation from the Conservation and Source Protection Branch (CSPB) of MECP stating that

[n]atural gas pipelines are not identified as a threat to drinking water sources under the Clean Water Act, 2006. However, certain activities related to the construction of pipelines may pose a risk to sources of drinking water.

Consequently, potential effects and mitigation measures to groundwater resources are summarized in ER Table 5-1. Through the implementation of mitigation measures, including the presence of a full-time environmental inspector, no significant adverse residual effects on groundwater are anticipated. This includes the Significant Groundwater Recharge Area and Highly Vulnerable Aquifer identified in ER Section 4.2.3.

There are no additional costs required to mitigate impacts to groundwater resources. Enbridge Gas has required contractors to include the costs of implementing all relevant mitigation measures in their construction estimates. To ensure the contractor adheres to the ER and EPP mitigation measures, Enbridge Gas will employ a full-time environmental inspector to monitor construction.

- d) No specific permit is required for work near a Significant Groundwater Recharge Area and a Highly Vulnerable Aquifer. However, the project will be applying for either a Permit to Take Water or will be registered on the Environmental Activity and Sector Registry related to construction dewatering and discharge. The permit application is anticipated for late October 2022. Further, Enbridge Gas will obtain permits from the Lower Thames Conservation Authority for work within the area related to floodplain and shoreline protection.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Three Fires Group ("TFG")

INTERROGATORY

References:

Environmental Report, Section 4.3.1.1, p. 25

Preamble:

The Environmental Report notes that there are twenty-nine watercourses that are crossed by the Panhandle Loop based on a desktop review of relevant aerial imagery and watercourse mapping. They include 11 named drains, 15 unnamed drains, Jeannettes Creek, Baptiste Creek, and the Thames River. Ultimately, these watercourses drain to the Thames River or Lake St. Clair.

Question:

- a) Please outline in table format, crossing methods for each of the twenty-nine watercourses impacted by the proposed project, and provide the associated costs for accommodating the crossing methods.
- b) Please outline in table format, how direct impacts to each of the twenty-nine watercourses will be mitigated, and the associated costs of this mitigation.
- c) Please explain whether EGI will seek consent of CKSPFN to cross each of the twenty-nine watercourses, in light of the CKSPFN Declaration to the Waterways and Lakebeds within its Traditional Territory (Appendix A).

**Response**

- a) Since the completion of the ER, detailed field surveys have confirmed the need for 42 watercourse crossings for the Panhandle Loop. A table outlining the watercourse crossings as well as the proposed crossing method can be found at Attachment 1 to this response.

Watercourses on the Panhandle Project vary significantly, from small streams to rivers, which, in order to meet environmental and municipal compliances, can vary

significantly in costs. Enbridge Gas does not have an estimate of costs per crossing at this time.

- b) Please refer to ER Section 5.3.2.1 for mitigation measures related to watercourses. Furthermore, Enbridge Gas has provided the Three Fires Group with the generic sediment and control plans for watercourse crossings (e.g., horizontal direction drill, dam and pump and temporary vehicle crossings). Mitigation costs are included within crossing costs. Refer to part a) above.
- c) Enbridge Gas appreciates that CKFPSN has a declaration and asserts authority to the Waterways and Lakebeds within its Traditional Territory. Enbridge Gas also understand that CKSFPN may be in conversations with various levels of government on this matter. Enbridge Gas currently understands that formal consent of the CKFPSN is not legally required. Nevertheless, a goal of Enbridge Gas's engagement is to aim to secure consent and avoid or mitigate any potential impacts the Project may have on CKSPFN's rights, including its asserted rights to the Waterways and Lakebeds within its Traditional Territory.

Watercourse Name	Watercourse Crossing ID	Proposed Pipeline Crossing Method
Boucher Drain	SC1A	Dam & Pump
Unnamed Trib to Boucher Drain 001 (1)	SC1	Dam & Pump
Thilbert Drain (2)	SC2	Dam & Pump
Tremblay Creek Drain (2) / Tilbury Creek (3)	SC3	Dam & Pump
Unnamed Non-Flowing Waterbody 001 (1)	SC4	Dam & Pump
Unnamed Trib to Malott Diversion Drain 001 (1)	SC5	Trenchless
Unnamed Trib to Malott Diversion Drain 002 (1)	SC6	Trenchless
Unnamed Non-Flowing Waterbody 002 (1)	SC7	Dam & Pump
Unnamed Non-Flowing Waterbody 003 (1)	SC8	Dam & Pump
Thompson-Paulus Drain (4)	SC9	Dam & Pump
King and Whittle Drain (2)(4)	SC10	Dam & Pump
Gagnier Drain (2)(4)	SC11	Dam & Pump
Powell Drain (2)(4)	SC12	Dam & Pump
Unnamed Trib to King and Whittle Drain 001 (1)	SC13	Dam & Pump
Ivison Drain (2)(4)	SC14	Dam & Pump
King and Whittle Drain (2)(4)	SC15	Access Only
Anesser Drain (2)(4)	SC16	Trenchless
Unnamed Trib to King and Whittle Drain 002 (1)	SC17	Access Only
King and Whittle Drain (2)(4)	SC18	Access Only
Baptiste Creek (2)(4)	SC19	Trenchless
Unnamed Trib to Johnston Drain 001 (1)	SC20	Trenchless
Unnamed Trib to Johnston Drain 002 (1)	SC21	Trenchless
Unnamed Trib to Johnston Drain 003 (1)	SC22	Trenchless
Olds Drain (2)(4)	SC23	Dam & Pump
Unnamed Trib to Olds Drain 001 (1)	SC24	Dam & Pump
Forbes Internal Drain (4)	SC25	Dam & Pump
Unnamed Non-Flowing Waterbody 004 (1)	SC26	Trenchless
Jeannettes Creek (2)(4)	SC27	Trenchless
Peltier Drain (4)	SC28	Dam & Pump
Thames River (2)(4)	SC29	Trenchless
Unnamed Trib to Thames River 001 (1)	SC30	Trenchless
Unnamed Non-Flowing Waterbody 005 (1)	SC31	Dam & Pump
Myers Pump Works Drain (2)(4)	SC32	Dam & Pump
Myers Pump Works Drain (2)(4)	SC33	Dam & Pump
Unnamed Trib to Myers Pump Works Drain 001 (1)	SC34	Dam & Pump
Unnamed Trib to Myers Pump Works Drain 002 (1)	SC35	Dam & Pump
Unnamed Trib to Myers Pump Works Drain 003 (1)	SC36	Dam & Pump
Unnamed Trib to Myers Pump Works Drain 004 (1)	SC37	Dam & Pump
Unnamed Trib to Myers Pump Works Drain 005 (1)	SC38	Dam & Pump
Unnamed Trib to Myers Pump Works Drain 006 (1)	SC39	Dam & Pump
Unnamed Trib to Jack's Creek Drain (1) / McFarlane Relief Drain (5)	SC40	Trenchless
McFarlane Relief Drain (4) / Unnamed Trib to McFarlane Relief Drain (5)	SC41	Trenchless

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Three Fires Group ("TFG")

INTERROGATORY

References:

Environmental Report, Section 4.3.1.3, pp. 26-30

Preamble:

The Environmental Report notes that Jack's Creek Drain is categorized as a municipal Class D drain meaning it is permanent, has a fall or fall and spring restriction window, and contains sensitive fish. The drain was categorized in 2019 as containing Lake Chubsucker (*Erimyzon sucetta* – Endangered (END) under SARA, Threatened (THR) under Endangered Species Act (ESA)) and the recently downlisted Special Concern Mapleleaf mussel (*Quadrula quadrula* – Special Concern (SC) under SARA and ESA). The drain flows North-West for 2.5 km from the crossing before it meets another drain, merges, and then flows into Lake St. Clair. The following fish community is known as Jacks Creek from the LIO dataset (MNDMNR, 2022). Jacks Creek provides habitat to an assemblage of 28 warmwater and coolwater fish species (Table 4-2) several species of mussels and is characterized overall as having a warmwater thermal regime.

Question:

- a) Please file any and all analysis EGI has performed to assess SAR fish and mussel species within Jack's Creek Drain over the lifespan of the Project. If EGI has not undertaken any such analysis, please explain why no such analysis has been undertaken.
- b) Please provide information on EGI's protection plan for related sensitive and SAR fish and mussel species within Jack's Creek Drain, and the associated costs of this plan. If EGI has not developed a protection plan, please explain why no such plan has been developed, in light of the sensitive ecosystem.
- c) Please provide TFG with all records, protection plans, and associated costs for sensitive or SAR fish and mussel species within the following:
  - i. Jack's Creek Drain (PSC28);
  - ii. Unnamed Agricultural Drains (PSC25, PSC24, PSC23) and Myers Pump Works Drain (PSC21);
  - iii. Thames River (PSC19);

- iv. Jeanette's Creek (PSC14);
- v. Unnamed Agricultural Drain and Olds Drain (PSC13, PSC12);
- vi. Baptiste Creek (PSC11); and
- vii. Leamington Interconnect – Aquatic SAR.

## **Response**

- a) Ecological field surveys have been completed in 2022 to enhance the understanding of watercourse crossings and their potential for fish and mussel SAR and SAR habitat. Enbridge Gas has completed a Natural Heritage Background Review and Field Investigations Technical Memorandum and provided a copy to Three Fires Group on September 7, 2022 which outlined the surveys completed and the findings. The Technical Memorandum can be found at Attachment 1 to this response.
- b) Enbridge Gas intends to use trenchless crossing methods and will implement best management practices which will avoid impacts to any SAR species within the Jack's Creek Drain. In addition, a full-time Environmental Inspector will be present on-site to monitor for any inadvertent fluid releases or erosion and sediment control issues in relation to the drain. Any additional mitigation may be identified and included in the Environmental Protection Plan through continued consultation with the Ministry of Environment Conservation and Parks and the Department Fisheries and Oceans.
- c) Details on the surveys completed at the identified crossings can be found in the Natural Heritage Background Review and Field Investigations Technical Memorandum which has been completed and was provided to the Three Fires Group on September 7, 2022 and can be found at Attachment 1 to this response. A request for review has been submitted to the Department of Fisheries and Oceans (DFO) and any authorization or mitigation requirements identified by the DFO will be incorporated into the Environmental Protection Plan. Currently, Enbridge Gas is not aware of any additional costs required to mitigate impacts to SAR fish and mussel species within noted watercourses.





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To: Chippewas of Kettle and Stony Point First Nation

Date: August 8, 2022

Project #: 60665521

From: Kristan Washburn (AECOM)

Johanna Perz (AECOM)

Nicholas Allen (AECOM)

cc: Evan Tomek (Enbridge)

# Memorandum

Subject: **Enbridge – Panhandle Regional Expansion Project – Natural Heritage Background Review and Field Investigations Technical Memorandum**

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## 1. Project Description

AECOM Canada Ltd. (hereafter referred to as AECOM) has been retained by Enbridge Gas Inc. (Enbridge Gas) to complete an Environmental Report (ER) and to assess the potential environmental and socio-economic effects of increasing the capacity of the Panhandle Transmission System, which serves residential, commercial, industrial, greenhouse and power generation customers in Windsor, Essex County and Chatham-Kent. The Project includes the construction of the following:

- Panhandle Loop: Approximately 19 kilometres (km) of new pipeline which loops – or parallels – the existing 20-inch Panhandle Pipeline. The new pipeline will be 36 inches in diameter and located adjacent to an existing pipeline corridor from approximately Richardson Side Road in the Municipality of Lakeshore, and Enbridge Gas’ existing Dover Transmission Station in the Municipality of Chatham-Kent.
- Leamington Interconnect: Approximately 12 km of new pipeline, 16 inches in diameter, adjacent to or within an existing road allowance on public or private property to connect the existing Leamington North Lines to both the Kingsville East Line and Leamington North Reinforcement Line, located in the Municipality of Lakeshore, Town of Kingsville, and the Municipality of Leamington.

The ER was prepared in accordance with the Ontario Energy Board’s (OEB) *Environmental Guidelines* (2016). The *Environmental Guidelines* are designed to provide direction to proponents in the preparation of an ER and to assist in determining how to identify, manage and document potential effects associated with their projects on the environment (OEB, 2016). The ER was submitted to the OEB, along with Enbridge Gas’ Leave-to-Construct application for the Panhandle Regional Expansion Project, in April 2022. OEB review and approval to proceed is required prior to construction. Proposed construction dates for the Panhandle Loop and Leamington Interconnect are 2023 and 2024, respectively.

The following memorandum documents the methods and results of the natural heritage background information review and field investigations completed in 2022 to address Chippewas of Kettle and Stony Point First Nation



as presented in the Environmental Report Review (Vertex Professional Services Ltd., 2022). The Study Area of the Panhandle Loop (Panhandle Study Area) and Leamington Interconnect (Leamington Study Area) includes the Preferred Routes and an additional 120 m to allow for the identification of adjacent lands as defined by the Natural Heritage Reference Manual (MNR, 2010).

## 1.1 Preferred Route

The Preferred Route for the Panhandle Loop has the pipeline travelling in a semi-diagonal orientation southwest from the Dover Transmission Station in the Municipality of Chatham-Kent, paralleling the existing 20-inch Panhandle Pipeline to a new proposed transmission station at approximately Richardson Side Road in the Municipality of Lakeshore.

The Preferred Route for the Leamington Interconnect travels adjacent to or within an existing road allowance on public or private property. The pipeline travels west from the existing Leamington North Lines along Mersea Road 10 before tying into the existing Leamington North Reinforcement Line. The pipeline continues to travel north on County Road 31, turns west, and travels along County Road 8 before tying into the existing Kingsville East Line. The pipeline would travel adjacent to or within an existing road allowance on public or private property.

The Preferred Routes for the Panhandle Loop and Leamington Interconnect are currently illustrated within approximate locations. Enbridge Gas is currently undertaking detailed design to refine the exact locations of the running lines, permanent easements, Temporary Land Use (TLU) requirements and road/watercourse crossing methods. The detailed design process will be influenced by supplemental studies (including environmental studies) and site-specific requests from landowners and agencies. In general, the evaluation has sought to avoid socio-economic features and sensitive natural features to the extent possible.

## 2. Background Information Review

A summary of background information as documented in the Panhandle Regional Expansion Project Environmental Report (AECOM, 2022) is provided below.

### 2.1 Methods

A background information review was completed using the secondary sources listed in **Table 2-1**.

**Table 2-1: Background Information Sources**

Information Source	Website or Contact Information	Date of Background Review
Land Information Ontario	<a href="https://www.ontario.ca/page/land-information-ontario">https://www.ontario.ca/page/land-information-ontario</a>	February 2, 2022
Natural Heritage Information Centre (NHIC)	<a href="https://www.ontario.ca/page/make-natural-heritage-area-map">https://www.ontario.ca/page/make-natural-heritage-area-map</a>	February 2, 2022
Ontario Breeding Bird Atlas (OBBA)	<a href="http://www.birdsontario.org/atlas/index.jsp?lang=en%20">http://www.birdsontario.org/atlas/index.jsp?lang=en%20</a>	February 2, 2022
Ontario Butterfly Atlas (OBA)	<a href="https://www.ontarioinsects.org/atlas/">https://www.ontarioinsects.org/atlas/</a>	February 2, 2022
eBird	<a href="https://ebird.org/home">https://ebird.org/home</a>	February 2, 2022
iNaturalist	<a href="https://www.inaturalist.org/">https://www.inaturalist.org/</a>	February 2, 2022
Ontario Reptile and Amphibian	<a href="https://www.ontarioinsects.org/herp/">https://www.ontarioinsects.org/herp/</a>	February 2, 2022

Information Source	Website or Contact Information	Date of Background Review
Atlas (ORAA)		
Bat Conservation International (BCI)	<a href="http://www.batcon.org/">http://www.batcon.org/</a>	February 2, 2022
Fisheries and Oceans Canada (DFO) Aquatic Species at Risk Maps	<a href="https://www.dfo-mpo.gc.ca/species-especies/sara-lep/map-carte/index-eng.html">https://www.dfo-mpo.gc.ca/species-especies/sara-lep/map-carte/index-eng.html</a>	February 2, 2022
Ministry of Natural Resources and Forestry (MNR) Fish Online	<a href="https://www.livestockapplications.lrc.gov.on.ca/fishonline">https://www.livestockapplications.lrc.gov.on.ca/fishonline</a>	February 2, 2022
Ministry of Environment MECP Species at Risk (SAR) Range Maps	<a href="https://www.ontario.ca/page/species-risk-ontario#section-0">https://www.ontario.ca/page/species-risk-ontario#section-0</a>	February 2, 2022

## 2.2 Results

### 2.2.1 Aquatic Features

#### 2.2.1.1 Surface Water

Based on air photo interpretation, the Study Areas are within an area of dynamic agriculturally dominant land use and thus there is an extensive network of field and field edge drainage ditches designed to lower water levels in the surrounding agricultural fields. These drainage ditches and flow conveyance features can potentially contain or support fish habitat but may periodically change configuration through regular farming and maintenance practices.

#### Panhandle Loop

There are 42 watercourse crossings in the Panhandle Loop based on a desktop review of relevant aerial imagery and watercourse mapping and several site visits. They include 20 named drains including Jeannettes Creek, Baptiste Creek, and Thames River as well as 22 unnamed drains. Ultimately, these watercourses drain to the Thames River or Lake St. Clair. These drains and watercourses are shown in relation to the route in **Figure 2**.

For more information regarding fish and fish habitat, refer to **Section 2.2.1.2** below.

#### Leamington Interconnect

Based on a desktop review of relevant aerial imagery and watercourse mapping, there are 11 watercourse crossings along the Leamington Interconnect. These drains and watercourses are shown in relation to the Leamington Interconnect on **Figure 1**. Aside from Hollingsworth Drain which flows North for 3 km before joining Duck Creek and flowing 10 km into Lake St. Clair all the other drains flow and converge with the Ruscom River or are branches of the Ruscom River themselves. Some drains flow for up to 7.5 km before meeting with the Ruscom River.

DFO drainage classification was reviewed to assess habitat sensitivity within the drains that transect the Leamington Interconnect. For this project, reference to drainage classification is intended to infer if a drain is classified as direct fish habitat and if sensitive habitat is present in the drain. All the municipal drains within the Leamington Interconnect are categorized as Class F suggesting that the watercourse is intermittent. There are three crossings of the Ruscom River, classified as Class C, which indicates spring spawning fish with no sensitive species. There was no other publicly available information regarding the fish communities.

For more information regarding fish and fish habitat, refer to **Section 2.2.1.2** below

**2.2.1.2 Fish and Fish Habitat**

The DFO drainage classification of each watercourse was reviewed to assess habitat sensitivity within the drains that transect the Panhandle Loop and Leamington Interconnect. Drainage classification is determined by a combination of flow periodicity (i.e., permanent vs. intermittent), thermal regime, fish community assemblage, and time since last clean out, as shown in **Table 2-2** (DFO, 2017). The classification system indicates fish habitat sensitivity in the drain and the level of approval required for drainage maintenance and operations under the Drainage Act. Based on that information a Restricted Activity Timing Window is selected for the watercourse. This means that no in-water work may occur during those times; a spring restricted activity window means all work has to take place before or after the spring, typically March to July.

For this project, reference to drainage classification is intended to infer if a drain is classified as direct fish habitat and if sensitive habitat is present in the drain. In addition, the LIO database published by the Ministry of Northern Development, Mines, Natural Resources, and Forestry (MNRF) was used to develop fish community assemblages and thermal regimes.

**Table 2-2: Summary of DFO Drain Classification Types**

Class	Flow	Restricted Activity Timing Window <sup>1</sup>	Species	Present in Study Areas
A	Permanent	Fall or Combination Spring/Fall	No sensitive fish species present	0
B	Permanent	Spring	Sensitive fish species present	0
C	Permanent	Spring	No sensitive fish species present	2
D	Permanent	Fall or Combination Spring/Fall	Sensitive fish species present	2
E	Permanent	Spring	Sensitive fish species present	3
F	Intermittent	Periods of Flow <sup>4</sup>	Not Applicable	5
Unrated (NR)	Unknown	Unknown	Unknown	39

Source: DFO (2017)

1. Restricted activity timing windows vary by geographic location and fish species present.
2. Time since last cleanout is no longer collected as part of the Drain Classification Project as per a decision made by the Drainage Action Working Group (DAWG) in 2010. No new Class B drains will be assigned and any existing Class B drains will not change classification unless new data becomes available to support the reclassification.
3. If work was to occur during a period of flow (e.g., spring), a site specific review will be required.
4. Flow is defined as the movement of water between two points.
5. For details, see Appendix 10 – Sensitive Fish Species List.
6. If there is data on flow and fish species for the drain, a Class Authorization may be issued; otherwise, a site-specific review will be required.

**2.2.1.3 Aquatic Species at Risk**

**2.2.1.3.1 Panhandle Loop - Aquatic SAR**

According to the DFO Online Aquatic SAR Mapping Tool (2022), 11 watercourses within the Study Area have been identified as providing habitat for aquatic SAR, including critical habitat as per the Species at Risk Act (SARA). Species listed as Special Concern under Schedule 1 of SARA receive management initiatives under SARA but do not receive individual or habitat protection. Additionally, species listed as Special Concern under the ESA are not provided species or habitat protection under the provincial legislation. All the Threatened and Endangered species within the Study Area receive protection under both the provincial ESA and federal SARA.

This section focuses on watercourses that contain provincially or federally listed SAR. While all of the water crossings within the Panhandle Loop and Leamington Interconnect have the potential to contain fish habitat, the additional concerns around SAR warrant the extra detail and focus of this section. Fish community sampling and fish/mussel habitat assessment were completed at the proposed watercourse crossings in 2022.

If a watercourse containing provincially or federally listed SAR will be affected by the project (e.g., open-cutting SAR Habitat for the pipeline installation), additional correspondence with agencies will be required. The DFO may require a *Fisheries Act* Authorization for the Harmful Alteration, Disruption or Destruction (HADD) to fish habitat or activities that result in the death of fish. An authorization would include constructing compensation habitat to offset for potential impacts to fish and fish habitat. Additionally, consultation with MECP to determine permitting requirements under the ESA will likely be required for any proposed impacts to a watercourse that provides habitat for aquatic SAR. Potential permitting requirements could either come as mitigation advice that would support avoidance or contravention of the ESA, a notification of activity under O.Reg. 242/08, or a permit under Section 17(2)(c).

The following watercourses have been identified to contain or potentially contain aquatic SAR:

#### **Unnamed Non-Flowing Waterbody 002 (SC-07)**

This 0.46 acre pond is an offline waterbody with no surface connection to the surrounding watercourses and is assumed to be used or developed for irrigation. There is no publicly available information about this pond regarding thermal classification, but a warmwater regime is assumed. This pond is included as a SAR waterbody because several Lilliput (*Toxolasma parvum* – END under SARA, THR under ESA) mussel shells were found along the shoreline, likely predated by a local muskrat.

#### **Baptiste Creek (SC-19)**

Baptiste Creek flows West towards to its confluence with the Thames River 1.5 km downstream of the crossing. Several sections of the creek appear to have been re-aligned. While Baptiste Creek does not have a drain classification, it is a permanently flowing watercourse that provides fish habitat for sensitive fish species which would likely generate a Class E characterization. Background information indicates that Baptiste Creek provides habitat for nine species of fish, including the Spotted Sucker, Mapleleaf, and Lilliput.

#### **Jeannettes Creek (SC-27)**

Jeannettes Creek flows North-west through agricultural land towards its confluence with the Thames River 2 km downstream of the crossings. The proposed watercourse crossing of Jeannettes Creek is located approximately 2 km upstream from its confluence with the Thames River. Several sections of the watercourse appear to have been aligned historically, and the creek becomes markedly wider after crossing under County Road 7 and receiving inputs from two agricultural drains. Jeannettes Creek is categorized as Class E, meaning it has a permanent flow regime, is direct fish habitat, and has sensitive fish species present. Jeannettes Creek contains 17 species, of which two are SAR species: Spotted Sucker (*Minytrema melanops* – SC under SARA and ESA) and Silver Lamprey (*Ichthyomyzon unicuspis* – SC under SARA and ESA).

#### **Thames River (SC-29)**

The Thames River watershed runs through agricultural lands in southwestern Ontario and drains to Lake St. Clair. The river is 273 km long and drains 5,285 square kilometres (km<sup>2</sup>) of land, making it the second-largest watershed in southwestern Ontario (UTRCA, 2017). Before its confluence with Lake St. Clair, numerous agricultural drains flow into the Thames River. LIO data indicates that the Thames River is a warmwater watercourse that supports a fish community assemblage of warmwater and coolwater species (MNR, 2022). The Thames River is classified as a Class E drain, meaning it has a permanent flow regime and provides fish

habitat for sensitive fish species. There are 66 species within the Thames River, of which 17 are SAR. The complete list of species and SAR is available in **Table 2-3**.

#### **Unnamed Trib to the Thames River 001 (SC-30)**

This unnamed tributary to the Thames River flows North-west towards the Thames at a very gentle gradient. The watercourse is classified as a Class E drain, meaning it has a permanent flow regime and provides fish habitat for sensitive fish species. There is no publicly available information about this drain regarding flow regime or thermal classification but a warmwater regime is assumed. This drain is mapped by DFO (2022) as containing Lake Chubsucker.

#### **Myers Pump Works Drain (SC-33)**

Myers Pump Works Drain flows North East towards McFarlane Relief Drain. The watercourse is unrated by the DFO with respect to drainage classification. There is no publicly available information about this drain regarding flow regime or thermal classification. This drain is mapped by DFO (2022) as containing Lake Chubsucker.

#### **Unnamed Trib to Myers Pump Works Drain 001 (SC-34)**

This unnamed tributary flows South-East towards Myers Pump Works Drain. The watercourse is unrated by the DFO with respect to drainage classification and there is no publicly available information about this drain regarding flow regime or thermal classification. According to DFO Aquatic SAR Online Mapping (2022), Lake Chubsucker have been identified within this watercourse.

#### **Unnamed Trib to Myers Pump Works Drain 002 (SC-35)**

This unnamed tributary flows South-East towards Myers Pump Works Drain. The watercourse is unrated by the DFO with respect to drainage classification and there is no publicly available information about this drain regarding flow regime or thermal classification. According to DFO Aquatic SAR Online Mapping (2022), Lake Chubsucker have been identified within this watercourse.

#### **Unnamed Trib to Myers Pump Works Drain 003 (SC-36)**

This unnamed tributary flows South-East towards Myers Pump Works Drain. The watercourse is unrated by the DFO with respect to drainage classification and there is no publicly available information about this drain regarding flow regime or thermal classification. According to DFO Aquatic SAR Online Mapping (2022), Lake Chubsucker have been identified within this watercourse.

#### **Unnamed Trib to Myers Pump Works Drain 004 (SC-37)**

This unnamed tributary flows South-East towards Myers Pump Works Drain. The watercourse is unrated by the DFO with respect to drainage classification and there is no publicly available information about this drain regarding flow regime or thermal classification. According to DFO Aquatic SAR Online Mapping (2022), Lake Chubsucker have been identified within this watercourse.

#### **McFarlane Relief Drain (SC-40)**

McFarlane Relief Drain flows North-West for 2.5 km from the crossing before it meets merges with Jacks Creek and then flows into Lake St. Clair. This watercourse is categorized as a municipal Class D drain meaning it is permanent, has a fall or fall and spring restriction window, and contains sensitive fish. McFarlane Relief Drain provides habitat for an assemblage of 28 warmwater and coolwater fish species (Table 2-3), several species of mussels, and is characterized overall as having a warmwater thermal regime. Additionally, DFO SAR mapping (2022) identified Lake Chubsucker (*Erimyzon sucetta* – Endangered (END) under SARA, Threatened (THR) under Endangered Species Act (ESA)) and the recently down-listed Mapleleaf mussel (*Quadrula quadrula* – Special Concern (SC) under SARA and ESA) within the watercourse.



**Table 2-3: Species at Risk Fish Communities within the Panhandle Loop**

Common Name	Scientific Name	SARA	ESA	Preferred Thermal Regime	Unnamed Non-Flowing Waterbody 002 (SC-07)	Baptiste Creek (SC-19)	Jeannettes Creek (SC-27)	Thames River (SC-29)	Unnamed Trib to the Thames River 001 (SC-30)	Myers Pump Works Drain (PSC21)	Unnamed Trib to Myers Pump Drain 001 (SC-34)	Unnamed Trib to Myers Pump Drain 002 (SC-35)	Unnamed Trib to Myers Pump Drain 003 (SC-36)	Unnamed Trib to Myers Pump Drain 004 (SC-37)	McFarlane Relief Drain (SC40)
<b>Black Bullhead</b>	<i>Ameiurus melas</i>	-	-	warmwater	-	-	X	-	-	-	-	-	-	-	X
<b>Black Crappie</b>	<i>Pomoxis nigromaculatus</i>	-	-	coolwater	-	X	-	-	-	-	-	-	-	-	X
<b>Black Redhorse</b>	<i>Moxostoma duquesnei</i>	THR	THR	warmwater	-	-	-	X	-	-	-	-	-	-	-
<b>Blackchin Shiner</b>	<i>Notropis heterodon</i>	NAR	NAR	coolwater	-	-	-	X	-	-	-	-	-	-	-
<b>Blackside Darter</b>	<i>Percina maculata</i>	-	-	coolwater	-	-	X	X	-	-	-	-	-	-	-
<b>Bluegill</b>	<i>Lepomis macrochirus</i>	-	-	warmwater	-	X	-	X	-	-	-	-	-	-	X
<b>Bluntnose Minnow</b>	<i>Pimephales notatus</i>	NAR	NAR	warmwater	-	-	X	X	-	-	-	-	-	-	-
<b>Bowfin</b>	<i>Amia calva</i>	-	-	warmwater	-	-	-	-	-	-	-	-	-	-	X
<b>Brook Silverside</b>	<i>Labidesthes sicculus</i>	NAR	NAR	warmwater	-	-	-	-	-	-	-	-	-	-	X
<b>Brook Stickleback</b>	<i>Culaea inconstans</i>	-	-	coolwater	-	-	-	X	-	-	-	-	-	-	-
<b>Brown Bullhead</b>	<i>Ameiurus nebulosus</i>	-	-	warmwater	-	-	-	-	-	-	-	-	-	-	X
<b>Central Mudminnow</b>	<i>Umbra limi</i>	-	-	coolwater	-	-	-	X	-	-	-	-	-	-	-
<b>Central Stoneroller</b>	<i>Camptostoma anomalum</i>	NAR	NAR	coolwater	-	-	-	X	-	-	-	-	-	-	-
<b>Channel Catfish</b>	<i>Ictalurus punctatus</i>	-	-	warmwater	-	-	-	X	-	-	-	-	-	-	X
<b>Common Carp</b>	<i>Cyprinus carpio</i>	-	-	warmwater	-	-	X	X	-	-	-	-	-	-	X
<b>Common Shiner</b>	<i>Luxilus cornutus</i>	-	-	coolwater	-	-	-	X	-	-	-	-	-	-	-
<b>Creek Chub</b>	<i>Semotilus atromaculatus</i>	-	-	coolwater	-	-	X	X	-	-	-	-	-	-	-
<b>Eastern Sand Darter</b>	<i>Ammocrypta pellucida</i>	THR	THR	-	-	-	-	X	-	-	-	-	-	-	-
<b>Emerald Shiner</b>	<i>Notropis atherinoides</i>	-	-	coolwater	-	-	-	X	-	-	-	-	-	-	X
<b>Fallfish</b>	<i>Semotilus corporalis</i>	-	-	coolwater	-	-	-	X	-	-	-	-	-	-	-



Common Name	Scientific Name	SARA	ESA	Preferred Thermal Regime	Unnamed Non-Flowing Waterbody 002 (SC-07)	Baptiste Creek (SC-19)	Jeannettes Creek (SC-27)	Thames River (SC-29)	Unnamed Trib to the Thames River 001 (SC-30)	Myers Pump Works Drain (PSC21)	Unnamed Trib to Myers Pump Drain 001 (SC-34)	Unnamed Trib to Myers Pump Drain 002 (SC-35)	Unnamed Trib to Myers Pump Drain 003 (SC-36)	Unnamed Trib to Myers Pump Drain 004 (SC-37)	McFarlane Relief Drain (SC40)
Fantail Darter	<i>Etheostoma flabellare</i>	-	-	coolwater	-	-	-	x	-	-	-	-	-	-	-
Freshwater Drum	<i>Aplodinotus grunniens</i>	-	-	warmwater	-	-	-	x	-	-	-	-	-	-	x
Gizzard Shad	<i>Dorosoma cepedianum</i>	-	-	coolwater	-	x	x	x	-	-	-	-	-	-	x
Goldfish	<i>Carassius auratus</i>	-	-	warmwater	x	-	-	-	-	-	-	-	-	-	-
Golden Redhorse	<i>Moxostoma erythrurum</i>	NAR	NAR	warmwater	-	-	-	x	-	-	-	-	-	-	-
Gravel Chub	<i>Erimystax x-punctatus</i>	EXP	EXP	-	-	-	-	x	-	-	-	-	-	-	-
Green Sunfish	<i>Lepomis cyanellus</i>	NAR	NAR	warmwater	-	-	x	x	-	-	-	-	-	-	x
Greenside Darter	<i>Etheostoma blennioides</i>	NAR	NAR	warmwater	-	-	-	x	-	-	-	-	-	-	-
Hornyhead Chub	<i>Nocomis biguttatus</i>	NAR	NAR	coolwater	-	-	-	x	-	-	-	-	-	-	-
Iowa Darter	<i>Etheostoma exile</i>	-	-	coolwater	-	-	-	x	-	-	-	-	-	-	-
Johnny Darter	<i>Etheostoma nigrum</i>	-	-	coolwater	-	-	x	x	-	-	-	-	-	-	-
Lake Sturgeon	<i>Acipenser fulvescens</i>	END	END	coldwater	-	-	x	x	-	-	-	-	-	-	-
Lake Chubsucker	<i>Erimyzon sucetta</i>	END	THR	warmwater	-	-	-	x	x	x	-	x	x	x	x
Lake Whitefish	<i>Coregonus clupeaformis</i>	DD	-	coldwater	-	-	-	-	-	-	-	-	-	-	x
Largemouth Bass	<i>Micropterus salmoides</i>	-	-	warmwater	-	x	x	x	-	-	-	-	-	-	x
Logperch	<i>Percina caprodes</i>	-	-	warmwater	-	-	-	x	-	-	-	-	-	-	x
Longnose Dace	<i>Rhinichthys cataractae</i>	-	-	coolwater	-	-	-	x	-	-	-	-	-	-	-
Longnose Gar	<i>Lepisosteus osseus</i>	-	-	warmwater	-	-	-	-	-	-	-	-	-	-	x
Mimic Shiner	<i>Notropis volucellus</i>	-	-	warmwater	-	x	-	x	-	-	-	-	-	-	-
Mooneye	<i>Hiodon tergisus</i>	-	-	coolwater	-	-	-	x	-	-	-	-	-	-	-
Mottled Sculpin	<i>Cottus bairdii</i>	-	-	coolwater	-	-	-	x	-	-	-	-	-	-	-
Muskellunge (muskie)	<i>Esox masquinongy</i>	-	-	warmwater	-	-	-	x	-	-	-	-	-	-	-





Common Name	Scientific Name	SARA	ESA	Preferred Thermal Regime	Unnamed Non-Flowing Waterbody 002 (SC-07)	Baptiste Creek (SC-19)	Jeannettes Creek (SC-27)	Thames River (SC-29)	Unnamed Trib to the Thames River 001 (SC-30)	Myers Pump Works Drain (PSC21)	Unnamed Trib to Myers Pump Drain 001 (SC-34)	Unnamed Trib to Myers Pump Drain 002 (SC-35)	Unnamed Trib to Myers Pump Drain 003 (SC-36)	Unnamed Trib to Myers Pump Drain 004 (SC-37)	McFarlane Relief Drain (SC40)
Northern Hog Sucker	<i>Hypentelium nigricans</i>	-	-	warmwater	-	-	-	x	-	-	-	-	-	-	-
Northern Madtom	<i>Noturus stigmosus</i>	END	END	-	-	-	-	x	-	-	-	-	-	-	-
Northern Pike	<i>Esox lucius</i>	-	-	coolwater	-	-	x	-	-	-	-	-	-	-	x
Northern Sunfish	<i>Lepomis peltastes</i>	SC	SC	-	-	-	-	x	-	-	-	-	-	-	-
Pugnose Minnow	<i>Opsopoeodus emiliae</i>	THR	THR	-	-	-	-	x	-	-	-	-	-	-	-
Pumpkinseed	<i>Lepomis gibbosus</i>	-	-	warmwater	-	x	x	x	-	-	-	-	-	-	x
Quillback	<i>Carpiodes cyprinus</i>	-	-	coolwater	-	-	-	x	-	-	-	-	-	-	x
Rainbow Darter	<i>Etheostoma caeruleum</i>	-	-	coolwater	-	-	-	x	-	-	-	-	-	-	-
Redfin Shiner	<i>Lythrurus umbratilis</i>	NAR	NAR	-	-	-	x	-	-	-	-	-	-	-	-
River Chub	<i>Nocomis micropogon</i>	NAR	NAR	coolwater	-	-	-	x	-	-	-	-	-	-	-
River Redhorse	<i>Moxostoma carinatum</i>	SC	SC	-	-	-	-	x	-	-	-	-	-	-	-
Rock Bass	<i>Ambloplites rupestris</i>	-	-	coolwater	-	-	-	x	-	-	-	-	-	-	x
Rosyface Shiner	<i>Notropis rubellus</i>	NAR	NAR	warmwater	-	-	-	x	-	-	-	-	-	-	-
Sand Shiner	<i>Notropis stramineus</i>	-	-	warmwater	-	-	-	-	-	-	-	-	-	-	x
Shorthead Redhorse	<i>Moxostoma macrolepidotum</i>	-	-	warmwater	-	-	-	x	-	-	-	-	-	-	-
Silver Lamprey	<i>Ichthyomyzon unicuspis</i>	SC	SC	-	-	-	x	x	-	-	-	-	-	-	-
Silver Redhorse	<i>Moxostoma anisurum</i>	-	-	coolwater	-	-	-	x	-	-	-	-	-	-	-
Smallmouth Bass	<i>Micropterus dolomieu</i>	-	-	coolwater	-	-	-	x	-	-	-	-	-	-	-
Silver Chub	<i>Macrhybopsis storeriana</i>	END	THR	-	-	-	-	x	-	-	-	-	-	-	-
Silver Shiner	<i>Notropis photogenis</i>	THR	THR	-	-	-	-	x	-	-	-	-	-	-	-
Spotfin Shiner	<i>Cyprinella spiloptera</i>	-	-	warmwater	-	-	x	x	-	-	-	-	-	-	-
Spottail Shiner	<i>Notropis hudsonius</i>	-	-	coolwater	-	-	-	x	-	-	-	-	-	-	x



Common Name	Scientific Name	SARA	ESA	Preferred Thermal Regime	Unnamed Non-Flowing Waterbody 002 (SC-07)	Baptiste Creek (SC-19)	Jeannettes Creek (SC-27)	Thames River (SC-29)	Unnamed Trib to the Thames River 001 (SC-30)	Myers Pump Works Drain (PSC21)	Unnamed Trib to Myers Pump Drain 001 (SC-34)	Unnamed Trib to Myers Pump Drain 002 (SC-35)	Unnamed Trib to Myers Pump Drain 003 (SC-36)	Unnamed Trib to Myers Pump Drain 004 (SC-37)	McFarlane Relief Drain (SC40)
Spotted Sucker	<i>Minytrema melanops</i>	SC	SC	-	-	x	x	x	-	-	-	-	-	-	-
Stonecat	<i>Noturus flavus</i>	-	-	warmwater	-	-	-	x	-	-	-	-	-	-	-
Walleye	<i>Stizostedion vitreum</i>	-	-	coolwater	-	-	-	x	-	-	-	-	-	-	x
White Bass	<i>Morone chrysops</i>	-	-	warmwater	-	x	-	x	-	-	-	-	-	-	x
White Crappie	<i>Pomoxis annularis</i>	-	-	warmwater	-	x	-	x	-	-	-	-	-	-	x
White Perch	<i>Morone americana</i>	-	-	warmwater	-	-	-	x	-	-	-	-	-	-	x
White Sucker	<i>Catostomus commersonii</i>	-	-	coolwater	-	-	x	x	-	-	-	-	-	-	x
Yellow Bullhead	<i>Ameiurus natalis</i>	-	-	warmwater	-	-	x	x	-	-	-	-	-	-	-
Yellow Perch	<i>Perca flavescens</i>	-	-	coolwater	-	-	-	x	-	-	-	-	-	-	-
Fawnsfoot	<i>Truncilla donaciformis</i>	END	END	N/A	-	-	-	x	-	-	-	-	-	-	-
Hickorynut	<i>Obovaria olivaria</i>	END	END	N/A	-	-	-	x	-	-	-	-	-	-	-
Lilliput	<i>Toxolasma parvum</i>	END	THR	N/A	x	x	-	-	-	-	-	-	-	-	-
Mapleleaf	<i>Quadrula quadrula</i>	SC	SC	N/A	-	-	-	x	-	x	x	-	-	-	x
Round Hickornut	<i>Obovaria subrotunda</i>	END	END	N/A	-	-	-	x	-	-	-	-	-	-	-
Threehorn Wartyback	<i>Obliquaria reflexa</i>	THR	THR	N/A	-	-	-	x	-	-	-	-	-	-	-

Source: DFO (2022), MNRFLIO (2022)

Notes:

END – Endangered

THR – Threatened

SC – Special Concern

NAR – Not at Risk

DD – Data Deficient



#### 2.2.1.3.2 Leamington Interconnect - Aquatic SAR

According to DFO's aquatic SAR mapping (DFO, 2022), there are no records of aquatic SAR within the watercourses crossed by the Leamington Interconnect. Fish community sampling and fish/mussel habitat assessment did not identify any SAR during the 2022 field investigations.

### 2.2.2 Designated Natural Areas and Vegetation

The project is located within the most southern ecoregion of Ontario, Ecoregion 7E (Lake Erie-Lake Ontario). It extends from Windsor and Sarnia east to the Niagara Peninsula and Toronto. Approximately 78% of the ecoregion has been converted to agricultural and developed land. The remaining natural areas consist of Carolinian forest remnants, dense deciduous, sparse deciduous and mixed deciduous forest cover (Crins et al., 2009). This ecoregion also supports the largest remnants of tall-grass prairie in the province.

The project also falls fully within ecodistrict 7E-1 (Essex). The majority of this ecodistrict has been converted to cropland and pasture. Where there is remaining forest (roughly 4% of the ecodistrict), deciduous forests are the dominant natural vegetation (Wester et al., 2018). Tree species include sugar maple (*Acer saccharum*), American beech (*Fagus grandifolia*), red oak (*Quercus rubra*), white ash (*Fraxinus americana*), pin cherry (*Prunus pensylvanica*), white oak (*Quercus alba*), American basswood (*Tilia americana*), black cherry (*Prunus serotina*), bitternut hickory (*Carya cordiformis*), trembling aspen (*Populus tremuloides*), large-toothed aspen (*Populus grandidentata*), yellow birch (*Betula alleghaniensis*), and balsam poplar (*Populus balsamifera*). Marshes are common adjacent to lakes and rivers in this ecodistrict (Wester et al., 2018).

#### 2.2.2.1 Significant Wetlands

Based on the results of the background review using the sources listed in **Table 2-1**, the St. Clair Marsh Provincially Significant Wetland (PSW) Complex was identified within the Panhandle Study Area. Two wetland units of the St. Clair Marsh PSW Complex fall within the Study Area. One unit is located east of the Dover Transmission Station more than 100 m from the Panhandle Loop. The other unit is located south of Bradley Line about 15 m from the Panhandle Loop.

#### 2.2.2.2 Significant Woodlands

Woodlands were identified within the Panhandle and Leamington Study Areas. The Panhandle Loop crosses four significant woodlands, and one is candidate significant woodland, as defined in the Official Plan for the Municipality of Chatham-Kent. No significant woodlands are crossed by the Leamington Interconnect.

#### 2.2.2.3 Significant Valleylands

There were no significant valleylands identified within the Study Areas.

#### 2.2.2.4 Areas of Natural and Scientific Interest

The St. Clair Marsh PSW Complex unit located east of the Dover Transmission Station within the Panhandle Study Area is also designated provincially significant Life Science Area of Natural and Scientific Interest (ANSI).

### 2.2.3 Significant Wildlife Habitat

As the Study Areas fall within the Lake Erie – Lake Ontario Ecoregion 7E, the criteria for determining significant wildlife habitat (SWH) are outlined in the Significant Wildlife Technical Guide (MNR, 2000) and the Significant Wildlife Habitat Criteria Schedules for Ecoregion 7E (MNRF, 2015a). SWH includes habitat for Species of Conservation Concern (SOCC). SOCC includes species designated as Special Concern (MNRF, 2015a) under the ESA, which are not afforded species or habitat protection under the Act.



In addition to Special Concern species, SOCC includes flora and fauna provincially ranked by the NHIC as extremely rare in Ontario (S1), very rare in Ontario (S2) or rare to uncommon in Ontario (S3). SOCC are also considered species listed under Schedule 1 of the federal SARA. Several Ontario natural heritage databases exist that can be accessed to conduct a screening for existing SOCC records in a given area. The resources outlined in **Table 2-1** above were reviewed to identify SOCC in the vicinity of the Study Areas. A total of 26 SOCC were identified for the Study Areas and are presented in **Table 2-4**.

A colonial waterbird nesting area was confirmed through the background review within the Lake St. Clair Marsh PSW Complex. There is also the potential for the presence of additional SWH including but not limited to amphibian breeding habitat, turtle nesting habitat and/or reptile hibernacula.

**Table 2-4: Species of Conservation Concern records in the vicinity of the Study Areas identified through background review**

Common Name	Scientific Name	Taxonomic Group	S-Rank <sup>1</sup>	SARA Schedule 1 Status <sup>2</sup>	ESA Status <sup>3</sup>	Study Area <sup>4</sup>	Data Source <sup>5</sup>
Western Chorus Frog	<i>Pseudacris maculata</i>	Amphibian	S4	THR <sup>6</sup>	-	L, P	ORAA
Bald Eagle	<i>Haliaeetus leucocephalus</i>	Bird	S4	NAR	SC	P	NHIC
Black Tern	<i>Chlidonia niger</i>	Bird	S3B, S4M	NAR	SC	P	OBBA, NHIC
Common Nighthawk	<i>Chordeiles minor</i>	Bird	S4B	THR	SC	L	OBBA
Dickcissel	<i>Spiza americana</i>	Bird	S2M	N/A	N/A	L	OBBA
Eastern Wood-pewee	<i>Contopus virens</i>	Bird	S4B	SC	SC	L, P	OBBA
Purple Martin	<i>Progne subis</i>	Bird	S3B	N/A	N/A	L, P	OBBA
Short-eared Owl	<i>Asio flammeus</i>	Bird	S4?B, S2S3N	SC	SC	P	NHIC
Wood Thrush	<i>Hylocichla mustelina</i>	Bird	S4B	THR	SC	L, P	OBBA
American Lotus	<i>Nelumbo lutea</i>	Insect	S2S3	N/A	N/A	P	NHIC
Duke's Skipper	<i>Euphyes dukesi</i>	Insect	S2	N/A	N/A	L, P	OBA
Monarch	<i>Danaus plexippus</i>	Insect	S2N, S4B	SC	SC	L, P	OBA
Short-winged Green Grasshopper	<i>Dichromopha viridis</i>	Insect	S2	-	-	P	NHIC
Midland Painted Turtle	<i>Chrysemys picta marginata</i>	Reptile	S4	SC	N/A	L, P	NHIC, ORAA
Northern Map Turtle	<i>Graptemys geographica</i>	Reptile	S3	SC	SC	P	NHIC, ORAA
Snapping Turtle	<i>Chelydra serpentina</i>	Reptile	S3	SC	SC	P	NHIC, ORAA
Climbing Prairie Rose	<i>Rosa setigera</i>	Vascular Plant	S2S3	SC	SC	L	NHIC
Crowned Beggarticks	<i>Bidens trichosperma</i>	Vascular Plant	S2	-	-	P	NHIC
Cup Plant	<i>Silphium perfoliatum</i>	Vascular Plant	S2	-	-	P	NHIC
Field Thistle	<i>Cirsium arvense</i>	Vascular Plant	S3	-	-	P	NHIC
Giant Ironweed	<i>Vernonia gigantea</i>	Vascular Plant	S1?	-	-	P	NHIC
Grey-headed Prairie Coneflower	<i>Ratibida pinnata</i>	Vascular Plant	S3	-	-	P	NHIC
Mead's Sedge	<i>Carex meadii</i>	Vascular Plant	S2	-	-	P	NHIC
Shellback Hickory	<i>Carya laciniosa</i>	Vascular Plant	S3	-	-	L	NHIC
Swamp Rose-mallow	<i>Hibiscus moscheutos</i>	Vascular Plant	S3	SC	SC	P	NHIC
Walter's Barnyard Grass	<i>Echinochloa walteri</i>	Vascular Plant	S3	-	-	P	NHIC
Wingstem	<i>Verbesina alternifolia</i>	Vascular Plant	S3	-	-	P	NHIC

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

SX - Presumed Extirpated—Species or community is believed to be extirpated from the province. Not located despite intensive searches of historical sites and other appropriate habitat, and virtually no likelihood that it will be rediscovered.  
 SH - Possibly Extirpated (Historical)—Species or community occurred historically in the province, and there is some possibility that it may be rediscovered. Its presence may not have been verified in the past 20-40 years. A species or community could become SH without such a 20-40-year delay if the only known occurrences in a province were destroyed or if it had been extensively and unsuccessfully looked for.



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

- <sup>2</sup>COSEWIC Status: The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) provides the Canadian government with advice regarding wildlife species that are nationally at risk of extinction or extirpation. Species assessed and designated at risk by COSEWIC may qualify for legal protection and recovery under the SARA. The following are categories of at risk:  
 EXT (Extirpated) – A species that no longer exists in the wild in Canada but exists elsewhere.  
 END (Endangered) – A species facing imminent extirpation or extinction in Canada.  
 THR (Threatened) – A species that is likely to become an endangered through all or a large portion of its Canadian range if limiting factors are not reversed.  
 SC (Special Concern) – A species that may become threatened or endangered due to a combination of biological characteristics and identified threats.  
 NAR (Not at Risk) – A species that has been evaluated and found to be not at risk.
- <sup>3</sup>ESA Status: The Endangered Species Act, 2007 (ESA) protects species listed as Threatened and Endangered on the Species at Risk in Ontario (SARO) List on provincial and private land. The Minister lists species on the SARO list based on recommendations from the Committee on the Status of Species at Risk in Ontario (COSSARO), which evaluates the conservation status of species occurring in Ontario. The following are the categories of at risk:  
 END (Endangered) – A species facing imminent extinction or extirpation in Ontario.  
 THR (Threatened) – Any native species that, on the basis of the best available scientific evidence, is at risk of becoming endangered throughout all or a large portion of its Ontario range if the limiting factors are not reversed.  
 SC (Special Concern) – A species that may become threatened or endangered due to a combination of biological characteristics and identified threats.  
 NAR (Not at Risk) – A species that has been evaluated and found to be not at risk.
- <sup>4</sup>Study Area: L: Leamington Interconnect  
 P: Panhandle Loop
- <sup>5</sup> Data Source: NHIC: Record obtained from MNR's Make-a-Map: Natural Heritage Areas Application (2022).  
 OBBA: Record obtained from the OBBA (BSC et al., 2006)  
 ORAA: Record obtained from the ORAA (Ontario Nature, 2022).  
 OBA: Record obtained from the OBA (Macnaughton et al., 2022).
- <sup>6</sup> Only the Western Chorus Frog – Great Lake – St. Lawrence – Canadian Shield Population is designated as THR under Schedule 1 of the SARA. The Carolinian population, which may occur in the Study Areas is not considered at risk.

## 2.2.4 Species at Risk

Based on the background resources outlined in **Table 2-1**, 44 provincial SAR designated as Threatened (THR), Endangered (END) or Extirpated (EXP) under the *Endangered Species Act* (ESA;2007) were identified as having records in the vicinity of the project Study Areas (e.g., 1 x 1 km squares, 10 x 10 km squares based on information sources). **Table 2-5** provides an outline of the provincial SAR identified during the background review and includes the most recent observation date as per the information sources, where applicable.

**Table 2-5: Species at Risk records in the vicinity of the Study Areas identified through background review**

Common Name	Scientific Name	Family	S-Rank <sup>1</sup>	SARA Schedule 1 Status <sup>2</sup>	ESA Status <sup>3</sup>	Study Area <sup>4</sup>	Data Source <sup>5</sup>
Bank Swallow	<i>Riparia riparia</i>	Bird	S4B	THR	THR	P, L	OBBA
Barn Owl	<i>Tyto alba</i>	Bird	S1	END	END	P	OBBA
Barn Swallow	<i>Hirundo rustica</i>	Bird	S4B	THR	THR	P, L	NHIC, OBBA
Bobolink	<i>Dolichonyx oryzivorus</i>	Bird	S4B	THR	THR	P, L	NHIC, OBBA
Chimney Swift	<i>Chaetura pelagica</i>	Bird	S3B	THR	THR	P, L	OBBA

Common Name	Scientific Name	Family	S-Rank <sup>1</sup>	SARA Schedule 1 Status <sup>2</sup>	ESA Status <sup>3</sup>	Study Area <sup>4</sup>	Data Source <sup>5</sup>
Eastern Meadowlark	<i>Sturnella magna</i>	Bird	S4B, S3N	THR	THR	P, L	NHIC, OBBA
Henslow's Sparrow	<i>Centronyx henslowii</i>	Bird	S1B	END	END	P	NHIC
King Rail	<i>Rallus elegans</i>	Bird	S1B	END	END	P	NHIC, OBBA
Least Bittern	<i>Ixobrychus exilis</i>	Bird	S4B	THR	THR	P	NHIC, OBBA
Prothonotary Warbler	<i>Protonotaria citrea</i>	Bird	S1B	END	END	P	NHIC, OBBA
Eastern Small-footed Myotis	<i>Myotis leibii</i>	Mammal	S2S3	N/A	END	P, L	BCI
Little Brown Myotis	<i>Myotis lucifugus</i>	Mammal	S3	END	END	P, L	BCI
Northern Myotis	<i>Myotis septentrionalis</i>	Mammal	S3	END	END	P, L	BCI, MECP
Tri-colored Bat	<i>Perimyotis subflavus</i>	Mammal	S3?	END	END	P, L	BCI
Dense Blazing Star	<i>Liatrix spicata</i>	Plant	S2	THR	THR	P, L	NHIC
Blanding's Turtle (Great Lakes / St. Lawrence population)	<i>Emydidea blandingii</i>	Reptile	S3	END	THR	P	NHIC, ORAA
Common Five-lined Skink (Five-lined Skink; Carolinian population)	<i>Plestiodon fasciatus</i>	Reptile	S2	END	END	P	NHIC, ORAA
Eastern Foxsnake (Carolinian population)	<i>Pantherophis gloydi</i>	Reptile	S2	END	END	P, L	ORAA
Massasauga (Carolinian Population)	<i>Sistrurus catenatus</i>	Reptile	S1	END	END	P	ORAA
Queensnake	<i>Regina septemvittata</i>	Reptile	S2	END	END	P	ORAA
Spiny Softshell	<i>Apalone spinifera</i>	Reptile	S2	END	END	P	NHIC
Timber Rattlesnake	<i>Crotalus horridus</i>	Reptile	SX	EXP	EXP	P	NHIC

<sup>1</sup>S-rank: As noted in the footnote to Table 2-4

<sup>2</sup>SARA Status: As noted in the footnote in Table 2-4

<sup>3</sup>ESA Status: As noted in the footnote in Table 2-4

<sup>4</sup>Study Area: L: Leamington Interconnect  
P: Panhandle Loop

<sup>5</sup>Data Source: NHIC: Record obtained from MNRF's Make-a-Map: Natural Heritage Areas Application (2022).

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

ORAA: Record obtained from the ORAA (Ontario Nature, 2022).

OBA: Record obtained from the OBA (Macnaughton et al., 2022).

BCI: Record obtained from Bat Conservation International (BCI)

MECP: Record obtained from MECP range mapping.

### 3. Field Investigations

#### 3.1 Methods

##### 3.1.1 Preliminary Site Visit

AECOM ecologists conducted a preliminary review of habitat of each Study Area on November 9, 2021 to gain an understanding of possible locations of SAR and SAR habitat within the Study Areas. During the preliminary field investigations, AECOM ecologists noted all species and habitat features observed with a focus on the potential SAR identified during the background review. The results of the preliminary site visit were used to inform the 2022 field investigations.

##### 3.1.2 Aquatic Habitat Assessments

Visual aquatic habitat assessments were completed at each of the watercourse crossings in support potential *Fisheries Act* approvals and permits under the Federal SARA and the ESA. Field investigations were completed within the pipeline right-of-way where property access was permitted. Investigations included an assessment of morphology, approximate channel dimensions, substrates, aquatic vegetation, and SAR habitat suitability as well as identifying potential enhancement opportunities for the watercourse. One survey was completed for each watercrossing April 25-26, 2022. As several crossings were identified after the initial assessment a second site visit was completed May 10-13 to finalize the surveys.

Watercourses that did not contain SAR also underwent fish community assessments using backpack electrofishing equipment to determine community makeup and potentially identify any unmapped SAR fish presence. This work was completed May 10-11, 2022.

### **3.1.3 Ecological Land Classification**

Vegetation communities within the Panhandle and Leamington Study Areas were delineated following the Ecological Land Classification (ELC) for Southern Ontario: First Approximation and its Application (Lee et al., 1998). A botanical inventory was conducted in conjunction with the ELC surveys to document local diversity and determine the presence of SAR or rare plants within each Study Area. ELC surveys were conducted on November 9, 2021 and June 7-8, 2022. The results of these field investigations were also used to assess the presence of candidate SWH and SAR habitat. Micro-habitat features for wildlife including SAR e.g., hibernation or nesting habitat were searched for as part of the ELC surveys.

### **3.1.4 Bat SAR Surveys**

Potential maternity roost habitat was identified according to Phase 1: Bat Habitat Suitability Assessment of the *Survey Protocol for Species at Risk Bats within Treed Habitats: Little Brown Myotis, Northern Myotis & Tri-Colored Bat* (MNR, 2017). Forested communities identified within each Study Area through ELC were recorded and mapped.

Impacts to anthropogenic structures (i.e., buildings and barns) potentially suitable for roosting, identified during the background review within each Study Area, are not anticipated to be impacted by the proposed scope of work. One forested ELC community, a Fresh – Moist Poplar Deciduous Forest (FOD8-1), was identified within the Panhandle Study Area along both banks of the Thames River (SC29). Additional surveys including snag density surveys and acoustic monitoring were not completed as the community is not expected to be impacted by the trenchless crossing methods (i.e., Horizontal Directional Drilling [HDD]) proposed at this location. Rock piles, which may provide suitable maternity roost habitat for Eastern Small-footed Myotis were also considered.

Two forested ELC communities were identified within the Leamington Study Area. Of the two forested ELC communities identified, only one, the Fresh – Moist Shagbark Hickory Deciduous Forest (FOD9-4) community, is expected to be impacted by the proposed works. The FOD9-4 within the limits of works were surveyed during the leaf-off period on May 12, 2022 to identify the presence of suitable maternity roost trees (snags, i.e., any standing live or dead tree at least 10 cm diameter-at-breast-height [dbh] with cracks, crevices, hollows, cavities and/or loose or naturally exfoliating bark) following the methods outlined in the *Survey Protocol for Species at Risk Bats within Treed Habitats: Little Brown Myotis, Northern Myotis & Tri-colored Bat* (MNR, 2017). Rock piles, which may provide suitable maternity roost habitat for Eastern Small-footed Myotis was also considered.

Acoustic monitoring surveys were then completed within the FOD9-4 in accordance with Maternity Roost Surveys in Treed Habitats (MECP, 2021). Four acoustic monitors (SM4BAT, Wildlife Acoustics Brand) were deployed within the woodlot before dusk on June 7 and recorded until June 17, 2022. The monitors were programmed to record from dusk for a period of five hours. The acoustic monitors were mounted on tree trunks at an average height of 1.6 m and ultrasonic microphones attached to the detector using 3 m recording cables; microphones were positioned as high as possible, away from potential obstacles and angled away from prevailing winds. This placement improves recording quality by reducing surface echoes and ground noise caused by proximal vegetation, which can distort ultrasonic signals. The locations of the acoustic monitors are illustrated on **Figure 1-4**. The precise locations of acoustic monitoring stations were selected in-situ. Field staff considered landscape, likelihood of recording clean calls and proximity to maternity roosting features of interest (i.e., maternity roosting trees, leaf clusters (if noted), and rock piles (including rock outcrops, rocky former fence lines etc.).



Recorded ultrasonic data was analyzed using the Wildlife Acoustics' Kaleidoscope Pro 5.4.2 Analysis Software in order to identify the bat species present. This software is designed to convert files, sort, and categorize bat data by species. It identifies bats to species by comparing the recorded ultrasonic patterns (also known as a pass) to those of known species-specific patterns using the up-to-date Bats of North America classifier (version 5.4.0). Where the recordings are not consistent with the known typical characteristics of a bat or the recording are beyond the software's capability to apply species identification, the analyser assigns the recording as "No ID". No ID recordings can result from background noise such as vehicles, rustling plants, other wildlife, incomplete recordings of bat calls, or bats which are outside of the range of the microphone. AECOM conducted an extensive review of the No ID files to further identify potential bat SAR within the dataset. No ID calls were then run through a secondary software program, SonoBat (Version 4.4.5) to gain a second opinion on the calls. SAR bat calls identified by both programs were manually verified by qualified AECOM ecologists to ensure the patterns were consistent with the typical characteristics of a call for each species.

### 3.1.5 Turtle SAR Surveys

The potential presence of SAR turtles within the Panhandle and Leamington Study Areas was addressed through Visual Encounter Surveys (VES) generally conducted employing the Survey Technique for Open Water Wetlands as described in the *Survey Protocol for Blanding's Turtle* (MNRFP, 2015b). At each watercourse or constructed drain crossing, the surveyor used binoculars to examine basking sites (up to 1 m from the water's edge on shoreline and channel banks, logs, rocks etc.). The water was also scanned to locate swimming turtles. When vegetation obscured the view of the shoreline or other available basking sites (e.g., floating logs), turtles were searched for in conjunction with the snake SAR surveys described below. Surveys were carried out during sunny periods when air temperature was above 5°C. Surveys were also carried out on partially cloudy or overcast days only when air temperature was above 15°C.

Surveys were completed on May 9-13, 16-20, 2022 between 8 am and 5 pm. Turtle survey locations for each Study Area are shown on **Figure 1-1 to Figure 1-13** and **Figure 2-1 to Figure 2-20**, with the number of surveys completed presented in **Table 3-1** below. Surveys were discontinued following email correspondence with the Ministry of the Environment, Conservation and Parks (MECP) on May 14, 2022 that confirmed reptile SAR surveys were not required.

**Table 3-1: Number of turtle surveys completed by Study Area**

Study Area	Number of Stations	Total Number of Rounds	Total Number of Surveys
Panhandle	32	~3	98
Leamington	6	3	15

### 3.1.6 Queensnake Surveys

Species presence/absence within the Panhandle Study Area was assessed generally following the *Survey Protocol for Queensnake (Regina septemvittata) in Ontario* (MNRFP, 2015c). Surveys for Queensnake involved searching for individuals basking in shoreline vegetation (e.g., shrub branches overhanging water), foraging for crayfish in calm shallow water near the shore or hiding beneath cover objects (i.e., rocks as small as 8 cm in diameter submerged or along the bank, logs, geotextile, scrap metal and any other debris). Surveys were conducted in terrestrial habitats within 5 m of the water and aquatic habitats within 3 m of the shoreline. Surveys occurred on sunny/partly sunny days when air temperature was between 12°C and 30°C. Surveys were conducted within 100 m on either side of the Thames River (SC29), Jeannettes Creek (SC27), watercourse crossing south of Jeannettes Creek (SC25) and Baptiste Creek (SC19) to identify category 1 habitat (the watercourse within 100 m of a Queensnake occurrence plus the adjacent terrestrial area up to 30 m inland,



which has the lowest tolerance to alteration; MECP, 2022). In addition to individuals, potential Queensnake hibernacula were also searched for during surveys. A total of eight Queensnake surveys, or one round at each of the eight survey locations mapped on **Figure 2-10**, **Figure 2-13**, **Figure 2-15** and **Figure 2-16**, were completed May 17-18, 2022. Surveys ceased following email correspondence with the MECP that confirmed reptile SAR surveys were not required.

### **3.1.7 Eastern Foxsnake Surveys**

VES were generally conducted in accordance with the *Survey Protocol for Ontario's Species at Risk Snakes* (MNRF, 2016) to assess the presence/absence of Eastern Foxsnake within the Panhandle Study Area. Habitat for Eastern Foxsnakes in the Carolinian population includes marsh, prairie, old fields, woodlands, and patches of habitat (riparian, grass or hedgerow) along drainage ditches, creeks, roads and railway tracks (Eastern Foxsnake Recovery Team, 2010). As such, VES consisted of searching for snakes or suitable Eastern Foxsnake micro-habitat features (i.e., hibernacula or natural or non-natural egg laying sites) within 100 m of the Preferred Route where it crosses natural and semi-natural habitat and along watercourses or constructed drains. Surveys occurred under sunny conditions when air temperature was between 10°C and 25°C or under overcast conditions when air temperature was between 15°C and 30°C. A total of 172 VES for SAR snakes were completed May 9-12, 16-20, 2022 between 9 am and 5pm, approximately three rounds at each of the 56 snake survey locations mapped on **Figure 2-1** to **Figure 2-20**.

The presence/absence of Eastern Foxsnake within the Leamington Study Area was assessed through road surveys generally conducted in accordance with the *Survey Protocol for Ontario's Species at Risk Snakes* (MNRF, 2016). Surveys were carried out by driving at a speed that did not exceed 45 km/h with a spotter as a passenger. Road surveys were carried out when air temperature was between 20°C and 30 °C. Road surveys were not carried out during or immediately following periods of heavy rain. In addition to road surveys within the Leamington Study Area, snakes and Eastern Foxsnake micro-habitat features (i.e., hibernacula or natural or non-natural egg laying sites) were searched for within natural and semi-natural habitat and watercourses/drains that cross the Preferred Route.

## **3.2 Results**

### **3.2.1 Aquatic Features**

A total of 42 watercrossing were identified within the Panhandle Study Area. They are numbered from South to North and shown on **Figure 2-1** to **Figure 2-20**. The watercrossing habitat assessments are compiled within **Attachment A**. In total there were 5 ephemeral watercourses, 9 intermittent watercourses, 27 permanent watercourses, and 1 unknown watercourse due to land access constraints.

A total of 11 watercrossings were identified within the Leamington Study Area. They are number from East to West and shown on **Figure 1-1** to **Figure 1-13**. The watercrossing habitat assessments are compiled within **Attachment B**. In total there were 2 ephemeral watercourses, 4 intermittent watercourses, and 5 permanent watercourses.

### **3.2.2 Ecological Land Classification**

A total of four ELC communities were identified within the Panhandle Study Areas and five within the Leamington Study Area. The locations and classification of these vegetation communities are shown on **Figure 1-1** to **Figure 1-13** and **Figure 2-1** to **Figure 2-20**. In addition, these figures include anthropogenic (A) areas which include most non-natural, human-created features in the landscape such as buildings, driveways, lawns



and ornamental plantings. Agricultural fields (F) encompass areas that are used to grow crops including winter wheat. These vegetation communities are further described in **Table 3-2** below. This table includes common names of plant species; the scientific species names for these species can be found in the plant list included in **Attachment C**. In total, 159 vascular plants were observed with the Panhandle and Leamington Study Area. Of these, 94 (59%) were native and 52 (33%) are exotic to Ontario. European reed (*Phragmites australis* spp. *australis*) was noted within the ROW of both Study Areas as well as within the MAS2-9b community. European reed is considered an invasive species in Ontario as it is an aggressive plant which spreads quickly and out-competes native vegetation. It releases toxins from its roots into the soil to hinder the growth of and kill surrounding plants.

Cultural Hedgerow (CUH) and the majority of Dry – Moist Old Field Meadow (CUM1-1) communities within the Study Areas represented narrow strips of vegetation along waterways or within the road ROW. Woody vegetation within these communities included northern red oak, Freeman’s maple, Manitoba maple, green ash, black walnut, swamp white oak, thicket creeper, riverbank grape, red raspberry, hawthorn, staghorn sumac, and grey dogwood. Disturbance-tolerant and/or weedy plant species dominated ground cover of these communities and included species such as reed canary grass, orchard grass, wild parsnip, and European reed. However, five locally rare plants were observed: Canada anemone, smooth sumac, Canada plum, rough avens, and planted honey locust.

The rarity of each species was determined using Appendices J and M of the *Significant Wildlife Habitat Technical Guide* (MNR, 2000) and the Natural Heritage Information Centre. No SAR plants were observed during the field investigations, however four SOCC plants and an additional eight locally rare plants were identified as described in **Table 3-2**.

**Table 3-2: Summary of Ecological Land Classification Communities**

ELC Code	ELC Name	Tree Canopy	Shrub Layer	Ground Layer	Locally Rare and SOCC Plants	Location
<b>Forest (FO) Communities</b>						
<b>Deciduous Forest (FOD)</b>						
<b>FOD2-2</b>	Dry - Fresh Oak - Hickory Deciduous Forest	Greater than 60% cover: canopy dominated by Shagbark Hickory and Bur Oak. Subcanopy dominated by silky dogwood, prickly ash, and red raspberry.	Could not be assessed from roadside.	Could not be assessed from roadside.	None identified.	Leamington Study Area on south side of Concession Road 10 between Highway 77 and Albuna Townline.
<b>FOD8-1</b>	Fresh – Moist Poplar Deciduous Forest	Greater than 60% cover: canopy dominated by eastern cottonwood with less crack willow and large-toothed aspen. Subcanopy	Between 25 and 60% shrub cover: dominated by poison ivy, riverbank grape, grey dogwood and red raspberry	Greater than 60% Ground cover (0.2-0.5 m) included poison ivy, smooth brome, spotted jewelweed and reed canarygrass.	Wingstem.	Panhandle Study Area along both sides of the Thames River (SC29).



ELC Code	ELC Name	Tree Canopy	Shrub Layer	Ground Layer	Locally Rare and SOCC Plants	Location
		dominated by Manitoba maple, red ash with less eastern cottonwood and crack willow.				
<b>FOD9-4</b>	Fresh – Moist Shagbark Hickory Deciduous Forest	Greater than 60% cover: canopy heavily dominated by shagbark hickory with less white elm, swamp white oak, and Freeman’s maple. Subcanopy heavily dominated by shagbark hickory with less white elm and green ash.	Greater than 60% shrub cover: dominated by prickly ash with less shagbark hickory, chokecherry, and eastern prickly gooseberry.	Greater than 60% ground cover dominated by running strawberry bush with less poison ivy, thicket creeper, and broad-leaved enchanter’s nightshade.	Inland sedge, necklace sedge, Swan’s sedge, and swamp pin oak.	Leamington Study Area on north side of Highway 8 between Lakeshore Road 229 and 233.
<b>Marsh (MA) Communities</b>						
<b>Shallow Marsh (MAS)</b>						
<b>MAS2-9a</b>	Jewelweed Mineral Meadow Marsh	N/A	N/A	Between 25 and 60% ground cover: dominated by swamp loosestrife with less swamp milkweed, broad-leaved arrowhead, and swamp rose mallow. The water surface was between 25 and 60% cover and dominated by fragrant water lily with less European frogbit.	Swamp loosestrife, fragrant water lily, and swamp rose mallow.	Panhandle Study Area at the southeast corner of the St. Clair Marsh PSW Complex.



ELC Code	ELC Name	Tree Canopy	Shrub Layer	Ground Layer	Locally Rare and SOCC Plants	Location
MAS2-9b	Jewelweed Mineral Meadow Marsh	N/A	N/A	Between 25 and 60% ground cover: heavily dominated by flowering-rush with less Aster sp., common reed, and spikerush sp. The water surface and underwater community was between 10 and 25% cover and dominated by lesser duckweed and potamogeton sp. respectively.	None identified.	Panhandle Study Area south of Highway 8 between Wheatley Road and King & Whittle Road.
<b>Cultural (CU) Communities</b>						
<b>Plantation (CUP)</b>						
CUP1	Deciduous Plantation	Between 25 and 60% canopy cover: canopy equally dominated by northern red oak, bur oak, and swamp pin oak with less sycamore.	Between 10 and 25% shrub cover: dominated by eastern red cedar with less eastern redbud, white elm, and black walnut.	Greater than 60% ground cover: dominated by tall goldenrod with less Kentucky bluegrass, and much less common milkweed and Canada goldenrod.	Swamp pin oak.	Leamington Study Area on the north side of Concession Road 10 between Highway 77 and Albuna Town Line.
<b>Cultural Meadow (CUM)</b>						
CUM1-1	Hedgerow/Dry - Moist Old Field Meadow	N/A	N/A	Greater than 60% ground cover: dominated by goldenrod sp., with less foxtail, orchard grass, thistle sp., and Dame's rocket.		Abandoned agricultural fields within the Leamington Study Area

**3.2.3 Significant Wildlife Habitat**

As described in **Section 2.2.3**, several candidate SWHs were identified to potentially occur in the Study Areas based on information collected through a review of available background resources and interpretation of aerial

photography. Further analysis using the results of the field investigations confirmed the presence of three SWH types within the Study Area. The following provides details regarding confirmed SWH:

#### **Special Concern and Rare Wildlife Species:**

Special Concern and/or provincially rare (S1-S3) plants and animals are quite rare and/or have experienced population declines in Ontario. Habitats of four Species Concern and/or provincially rare (S1-S3) species were observed within the Study Areas during field investigations:

- Provincially rare Swamp rose-mallow (S3) is listed as Special Concern under the ESA and Schedule 1 of the SARA; this species was identified within the Panhandle Study Area in the MAS2-9 community recognized as PSW (St. Clair Marsh Complex). The St. Clair Marsh PSW Complex occurs beyond the construction footprint and any potential indirect effects will be avoided/minimized through the application of mitigation measures.
- Provincially rare Wingstem (S3) was identified within the Panhandle Study Area in the FOD8-1 community located on the banks of the Thames River. The FOD8-1 community is not expected to be impacted by the proposed works as trenchless crossing methods (HDD) will be used to drill under both communities).
- Midland Painted Turtle (S4) is listed as Special Concern under Schedule 1 of the SARA; individuals were observed in multiple aquatic features throughout the Panhandle Study Area.
- Provincially rare Snapping Turtle (S3) is listed as Special Concern under the ESA and Schedule 1 of the SARA; individuals were observed in multiple aquatic features throughout the Panhandle and Leamington Study Areas.

Generally, SWH is limited to the St. Clair Marsh PSW Complex, watercourses and constructed drains and forest communities. Additional SWHs may be present within the Study Area but could not be confirmed as targeted surveys were not performed as it is anticipated any potential negative effects can be avoided or minimized through the application of mitigation measures. **Attachment D** provides the complete SWH assessment.

### **3.2.4 Species at Risk**

A SAR habitat assessment was conducted utilizing background information and the results of field investigations to determine whether SAR and their habitats exist within the Study Areas. The detailed SAR Screening is appended to this document as **Attachment E**. The following sections describe the results of the SAR habitat assessment and field investigations.

#### **3.2.4.1 Aquatic SAR**

A total of twelve aquatic SAR listed as Threatened or Endangered under the ESA or SARA were identified within the Panhandle Study Area during the desktop review. No aquatic SAR records were identified in the other Study Areas. **Table 3-3** provides a list of the Critical SAR Aquatic Habitat and SAR that are present at each of the proposed watercourse crossing where records were available, as per the Fisheries and Oceans Canada (DFO) Aquatic SAR mapping. Watercourse crossing locations are displayed on **Figure 2-1** to **Figure 2-20**. In addition to the DFO records, NHIC records indicate that Lake sturgeon (*Acipenser fulvescens*, THR) has been identified within both the Thames River and Jeannettes Creek. Aquatic habitat assessments were completed in 2022 at each watercourse crossing for the Panhandle and Leamington preferred routes to determine whether they provide fish habitat. Where aquatic SAR had been identified, an assessment was completed to confirm suitable habitat is present to support the SAR.



**Table 3-3: DFO Aquatic Species at Risk records per Watercourse Crossing**

Crossing ID	Water Feature	Crossing Method	Critical Habitat <sup>1</sup>	Species at Risk Found <sup>1</sup>
SC-07	Unnamed Non-Flowing Waterbody 002	Open Cut	N/A	Lilliput
SC-19	Baptiste Creek	HDD	N/A	Lilliput
SC-27	Jeannettes Creek	HDD	N/A	Lake Sturgeon
SC-29	Thames River	HDD	Fawnsfoot ( <i>Truncilla donaciformis</i> , END)	Hickorynut, Fawnsfoot, Lake Chubsucker, Black Redhorse, Eastern Sand Darter, Northern Madtom, Pugnose Minnow, Silver Chub, Round Hickorynut, Threehorn Wartyback, Lake Sturgeon
SC-30	Unnamed Trib to Thames River 001	HDD	N/A	Lake Chubsucker
SC-33	Myers Pump Works Drain	Open Cut	N/A	Lake Chubsucker
SC-34	Unnamed Trib to Myers Pump Works Drain 001	Open Cut	N/A	Lake Chubsucker
SC-35	Unnamed Trib to Myers Pump Works Drain 002	Open Cut	N/A	Lake Chubsucker
SC-36	Unnamed Trib to Myers Pump Works Drain 003	Open Cut	N/A	Lake Chubsucker
SC-37	Unnamed Trib to Myers Pump Works Drain 004	Open Cut	N/A	Lake Chubsucker
SC-40	McFarlane Relief Drain	Trenchless	N/A	Lake Chubsucker

<sup>1</sup> THR – Threatened, END – Endangered

At all of the listed watercourse crossings it was determined that the watercourse could provide suitable habitat for the identified SAR. There is no expected impact from any crossing using HDD or Trenchless techniques, however Open Cut will require DFO and MECP authorization.

**3.2.4.2 Plant SAR**

The potential for dense blazing star (*Liatrix spicata*, THR) and other SAR or rare plants within the Study Areas was addressed through botanical inventories completed in conjunction with ELC surveys. No SAR plants were identified within the Panhandle and Leamington Study Areas (refer to **Section 3.2.2**). However, swamp rose

mallow (*Hibiscus moscheutos*), listed as Special Concern in Ontario, was identified in the MAS2-9a community located in the St. Clair Marsh PSW Complex (**Table 3-2**). Additionally, Wingstem (*Verbesina alternifolia*) and planted honey locust (*Gleditsia triacanthos*), which are considered provincially rare, were identified in the FOD8-1 and hedgerows within the Panhandle Study Area (**Table 3-2**). Vegetation clearing will neither be occurring within the St. Clair Marsh PSW Complex nor the FOD8-1 communities.

#### **3.2.4.3 Bat SAR**

In total there were 44 passes of Little Brown Myotis (*Myotis lucifugus*) and 15 passes of Tri-colored bat (*Perimyotis subflavus*) recorded in the vicinity of the acoustic monitoring locations within the Leamington Study Area during the bat maternity roosting period. These data reflect the number of times ultrasonic noise from a bat was recorded by the acoustic monitor (i.e., the number of times a bat flew by the acoustic monitor's microphone). These data confirm species presence within the FOD9-4; however, does not provide an indication of the number of individuals present.

The Little Brown Myotis roosts during the day in trees and buildings (barns, attics, and abandoned structures) (MNRF, 2016). In natural areas, the Little Brown Myotis roosts in tree cavities in old growth deciduous, mixed or conifer forests (COSEWIC, 2013). A total of 56 suitable maternity roost trees were identified within and adjacent to the proposed easement and TLU areas. The average density of suitable maternity roost trees of the FOD9-4 was calculated at 47 per hectare (ha); this value is generally representative of high-quality maternity roosting bat habitat (MNRF, 2017). Tri-colored Bat lives in a variety of forested habitats, forming day roosts and maternity colonies in older forests and occasionally in anthropogenic structures. Roosting habitat for this species is strongly associated with leaf clusters in oak and maple trees (MNRF, 2017). Specific surveys to assess potentially suitable maternity roosting habitat during the leaf-on season was not undertaken. However, the presence of oaks, maples and leaf clusters (i.e., Tri-colored Bat habitat) were taken into consideration during acoustic monitor installation. While both oak species and maple species were present in the Leamington Study Area, field staff did not identify the presence of any leaf clusters considered suitable for Tri-colored Bat maternity roosting within the vicinity of the proposed easement and TLU areas. However, suitable leaf-clusters may be present throughout the remainder of the FOD9-4 community.

#### **3.2.4.4 Turtle SAR**

The presence of Snapping Turtle was confirmed within both Study Areas during field investigations, which included three rounds of turtle surveys. Midland Painted Turtle was also observed during surveys within the Panhandle Study Area. Although no Blanding's Turtles or Spiny Softshell were observed, presence of these species within the Panhandle Study Area is assumed given occurrence records.

Blanding's Turtle often prefer relatively eutrophic environments, with shallow water (less than 2 m deep, often less than 50 cm), soft highly organic substrates, and abundant submergent, floating and emergent vegetation that can occur in a variety of wetland habitats, slow flowing rivers and creeks, pools, lakes, bays, sloughs, marshy meadows, and artificial channels (MECP, 2019a). Blanding's Turtle often travel long distances (up to 6 km from their wetland of origin) to seek out suitable open areas for nesting, which includes beaches, shorelines, meadows, rocky outcrops, forest clearings and a variety of human-altered sites (e.g., gardens, gravel roads, road shoulders, etc.; MECP, 2019a).

Within the Panhandle Study Area suitable habitat was observed within the St. Clair Marsh PSW Complex and watercourses and constructed drains as well as their associated riparian habitats. Blanding's Turtle may also use or move through human-altered habitats within the Panhandle Study Area including agricultural fields and road shoulders (MECP, 2019). Evidence of nesting by an unknown turtle species was observed within or in the vicinity of TLUs associated with the Panhandle Pipeline crossing of SC35 and SC32.

Spiny Softshell turtles rarely leave the water, and most home ranges are associated with large bodies of water such as rivers or lakes, although they can also occur in connected streams or adjacent ponds or wetlands (MECP, 2019b). Within the Panhandle Study Area, the St. Clair Marsh PSW Complex, Thames River (SC29) and Jeannettes Creek (SC27) may provide suitable habitat to carry out life processes including foraging, thermoregulation, movement, predator avoidance and hibernation. Spiny Softshell turtle use terrestrial habitats only for nesting and remain close to the water with nests typically laid within 50 m of the shoreline (MECP, 2019). Nests are usually found in areas with little vegetation, low slope and a sand or a mix of sand and gravel substrate (MECP, 2019). No suitable nesting sites or evidence of turtle nesting were observed in proximity to the St. Clair Marsh PSW, Thames River (SC29) or Jeannettes Creek (SC27).

### **3.2.4.5 Snake SAR**

#### **3.2.4.5.1 Queensnake**

This species was not observed; however, only one round of Queensnake surveys were performed and the species is assumed present for the purposes of impact assessment and the development of mitigation measures. Queensnake is a highly aquatic species of snake rarely venturing far overland and usually confined within three to five meters of a shoreline (Gillingwater, 2011). This species prefers rock or gravel bottomed streams or rivers and is assumed present within the St. Clair Marsh PSW Complex, Thames River (SC29), Jeannettes Creek (SC27), SC25 and Baptiste Creek (SC19) and their associated riparian habitats, considering existing records. Very little is known about Queensnake hibernation habitat, but sites may include abutments of old bridges, crevices in bedrock outcrops and crayfish or small mammal burrows (COSEWIC, 2000). Although a number of burrows were identified during field investigations, none were located in close proximity of the St. Clair Marsh PSW, Thames River (SC29), Jeannettes Creek (SC27), SC25 or Baptiste Creek (SC19).

#### **3.2.4.5.2 Eastern Foxsnake**

A total of two Eastern Foxsnakes were observed within the Panhandle Study Area moving in the vicinity of agricultural drains. While studies have shown that Eastern Foxsnake within the Carolinian population have a strong avoidance of agricultural fields, extensive habitat loss in the last century has led to the species utilizing anthropogenically modified habitats including semi-maintained grass and fields greater than 15 m in width along drainage ditches, creeks, roads and railway tracks (Eastern Foxsnake Recovery Team, 2010). The Panhandle and Leamington Study Areas are largely dominated by agricultural lands and suitable habitat is generally limited to the riparian areas associated with watercourses and constructed drains.

Hibernation sites for Eastern Foxsnake across the Carolinian region includes any natural (e.g., animal burrows) or anthropogenic features (e.g., old wells) that extend below the frostline (Eastern Foxsnake Recovery Team, 2010). Several animal burrows were identified during field investigations within the Panhandle Study Area, in the vicinity of the easement incidentally. The majority of the burrows likely belonged to Woodchuck (*Marmota monax*) which were observed during field investigations. This species typically has one main entrance but up to four other exits. Other species observed using the area, such as European Hare (*Lepus europaeus*), also have multiple entrances and exits to their burrow. If it happens that one entrance falls within the trenched area of construction, it may still be possible for snakes to access the area for overwintering through the other entrances. The majority of the animal burrows were also located in the riparian areas of agricultural drains that are largely less than 15 m in width or within the agricultural fields themselves, indicating that preferred habitat of the Eastern Foxsnake is typically not present next to these burrows.

Oviposition habitats include rotten, interior cavities of large logs and stumps; decaying leaf, wood or compost piles created by humans; abandoned drains under roads and intentionally created artificial nests (Eastern Foxsnake Recovery Team, 2010). Suitable nesting sites were not identified within 100 m of the open cut easement.



### **3.2.4.6 Bird SAR**

No species targeted surveys were completed; however, bird SAR incidentally observed during field investigations were recorded.

#### **3.2.4.6.1 Bank Swallow**

Bank Swallow was not observed during field investigations; however, targeted surveys were not completed. Candidate nesting habitat was identified within the Leamington Study Area within 50 m including exposed banks at crossing LSC-11 and a large dirt pile on private property at the intersection of County Road 31 and County Road 8.

#### **3.2.4.6.2 Barn Owl**

Barn Owl was not observed; however, targeted surveys were not completed as part of the field investigations. Buildings or hollowed out trees present within the Panhandle Study Area may provide candidate nesting habitat for Barn Owl (Ontario Barn Owl Recovery Team, 2010). Barn Owls also utilize open areas including agricultural fields for foraging (Ontario Barn Owl Recovery Team, 2010). Buildings within the Panhandle Study Area are not expected to be impacted by the proposed works.

#### **3.2.4.6.3 Barn Swallow**

Barn Swallow will forage over agricultural fields as well as a wide range of open terrestrial, aquatic and wetland habitats. Agricultural fields dominate the landscape and foraging Barn Swallows were observed on numerous occasions and at multiple locations throughout the Study Areas incidentally during field investigations. Barn Swallows build their cup-shaped mud nests almost exclusively on human-made structures that provide either a horizontal nesting surface (e.g., a ledge) or a vertical face, often with some sort of overhang that provides shelter (COSEWIC, 2021). Barn Swallows were confirmed nesting within the Panhandle Study Area. More than 10 Barn Swallow nests were observed under the Mint Line Bridge over SC19 located approximately 13 m from the construction footprint. Barn Swallows were also assumed nesting under the Balmoral Line bridge over SC40, immediately adjacent to the construction footprint.

#### **3.2.4.6.4 Bobolink and Eastern Meadowlark**

Bobolink was observed within the Study Areas on several occasions incidentally during field investigations. Eastern Meadowlark was not observed in either Study Area; however, this species is assumed present given that targeted surveys were not performed and there is an abundance of existing information documenting their presence.

These species prefer to nest in native grasslands of at least 5 ha in size (McCracken et al., 2013). This habitat type is becoming increasingly rare in Ontario and as such, both species can now be found utilizing agricultural hayfields and pastures as nesting habitat (McCracken et al., 2013). Agricultural fields that dominate the Study Areas were found to be mostly comprised of annual row crops like corn and soybean rarely used by Bobolink or Eastern Meadowlark. Therefore, Bobolinks observed within the Study Areas were likely nesting in large winter wheat fields given that the availability of more suitable, alternative breeding habitat (i.e., hayfields and pastures) was limited.

#### **3.2.4.6.5 Chimney Swift**

Buildings with chimneys suitable for Chimney Swift nesting or roosting may be present within each Study Area; however, are not expected to be impacted by the proposed scope of work.

#### **3.2.4.6.6 King Rail and Least Bittern**

King Rails prefer larger marshes or wetlands with a lower percentage of shrub cover (Kraus, 2016) and Least Bittern have been found to have an affinity to larger marsh communities dominated by cattails that contain a



network of open pools and channels for hunting and stable water levels during the nesting season (COSEWIC, 2011). Given the habitat requirements for each species, it is likely that the records of each species are associated with the St. Clair Marsh PSW Complex situated at the northern end of the Panhandle Study Area. The St. Clair Marsh PSW Complex, which contains larger areas of marsh habitat with open channels and pools, is not expected to be impacted by the proposed scope of work.

#### **4. Effects Assessment and Mitigation Measures**

Effects identification, assessment and mitigation were provided in the ER; however, site-specific and species-specific mitigation will be developed based on the results of the 2022 field investigations and in consultation with the MECP and DFO.

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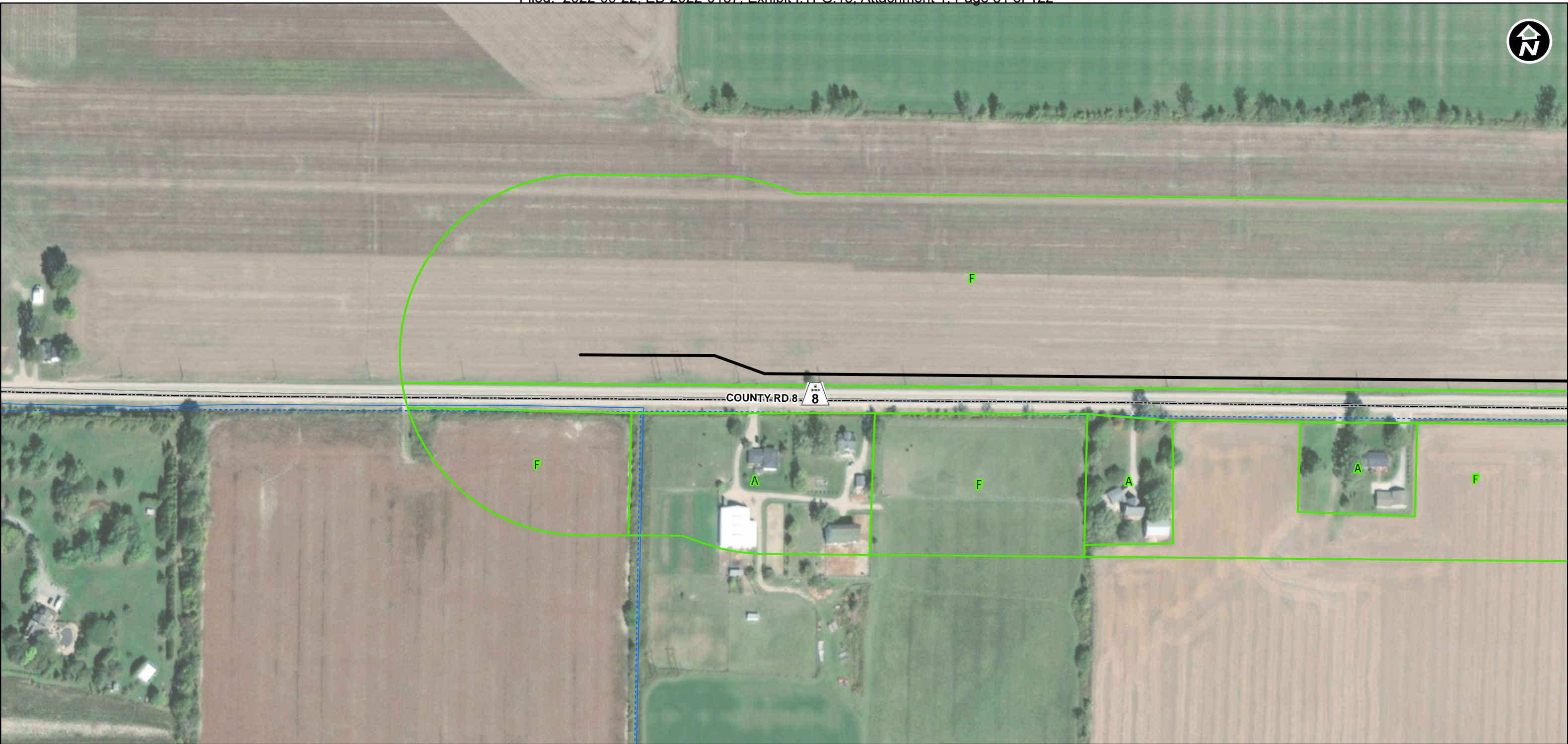
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2017 Upper Thames River Watershed Report Cards – Summary 2017. Available online:  
[https://thamesriver.on.ca/wp-content/uploads/Watershed ReportCards/UTRwatershedreportcard-summary2018.pdf](https://thamesriver.on.ca/wp-content/uploads/Watershed_ReportCards/UTRwatershedreportcard-summary2018.pdf). Accessed February 2022.

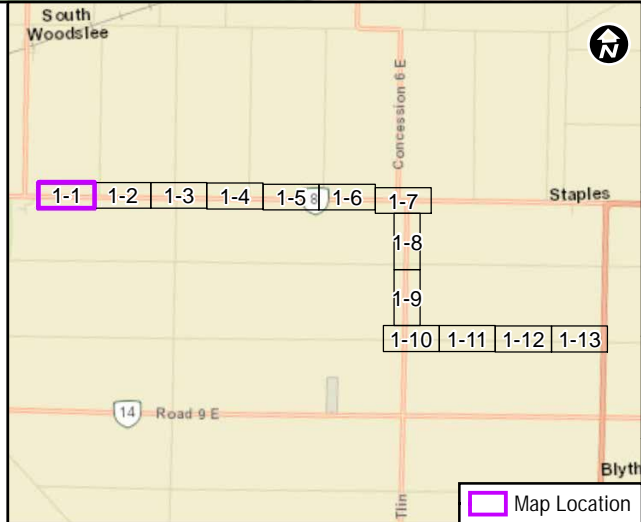
# Figures



**Legend**

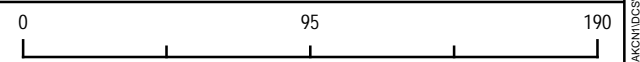
- Preferred Route
- - - - Constructed Drain
- Permanent Stream
- ▭ Municipal Boundaries
- ▭ ELC

Label	ELC Description
A	Anthropogenic
CUH	Cultural Hedgerow
CUM1-1	Dry – Moist Old Field Meadow Type
F	Agricultural Field
FOD 9-4	Fresh – Moist Shagbark Hickory Deciduous Forest
FOD2-2	Dry – Fresh Oak – Hickory Deciduous Forest Type
OAO	Open Aquatic



**Panhandle Regional Expansion Project**

Leamington Interconnect  
ELC



July 2022	1:2,500 * when printed 11"x17"	Source: MNR 2020 Image: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community
P#:60665521	V#:	

<b>AECOM</b>	<b>Figure 1-1</b>
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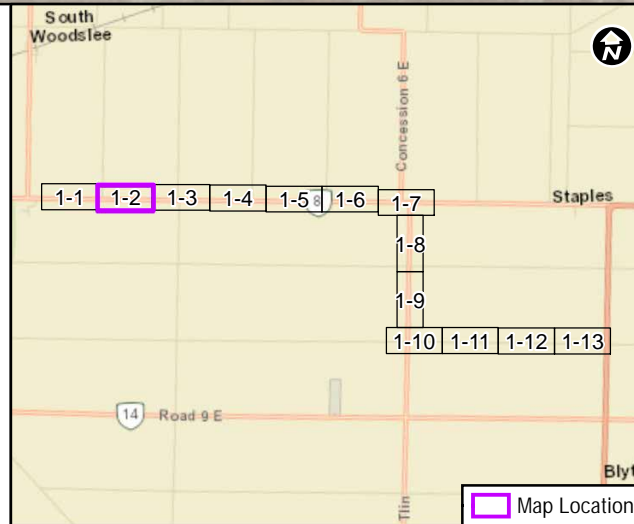
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**Legend**

- Turtle Survey Location
- Preferred Route
- Constructed Drain
- Permanent Stream
- Municipal Boundaries
- ELC

Label	ELC Description
A	Anthropogenic
CUH	Cultural Hedgerow
CUM1-1	Dry – Moist Old Field Meadow Type
F	Agricultural Field
FOD 9-4	Fresh – Moist Shagbark Hickory Deciduous Forest
FOD2-2	Dry – Fresh Oak – Hickory Deciduous Forest Type
OAO	Open Aquatic



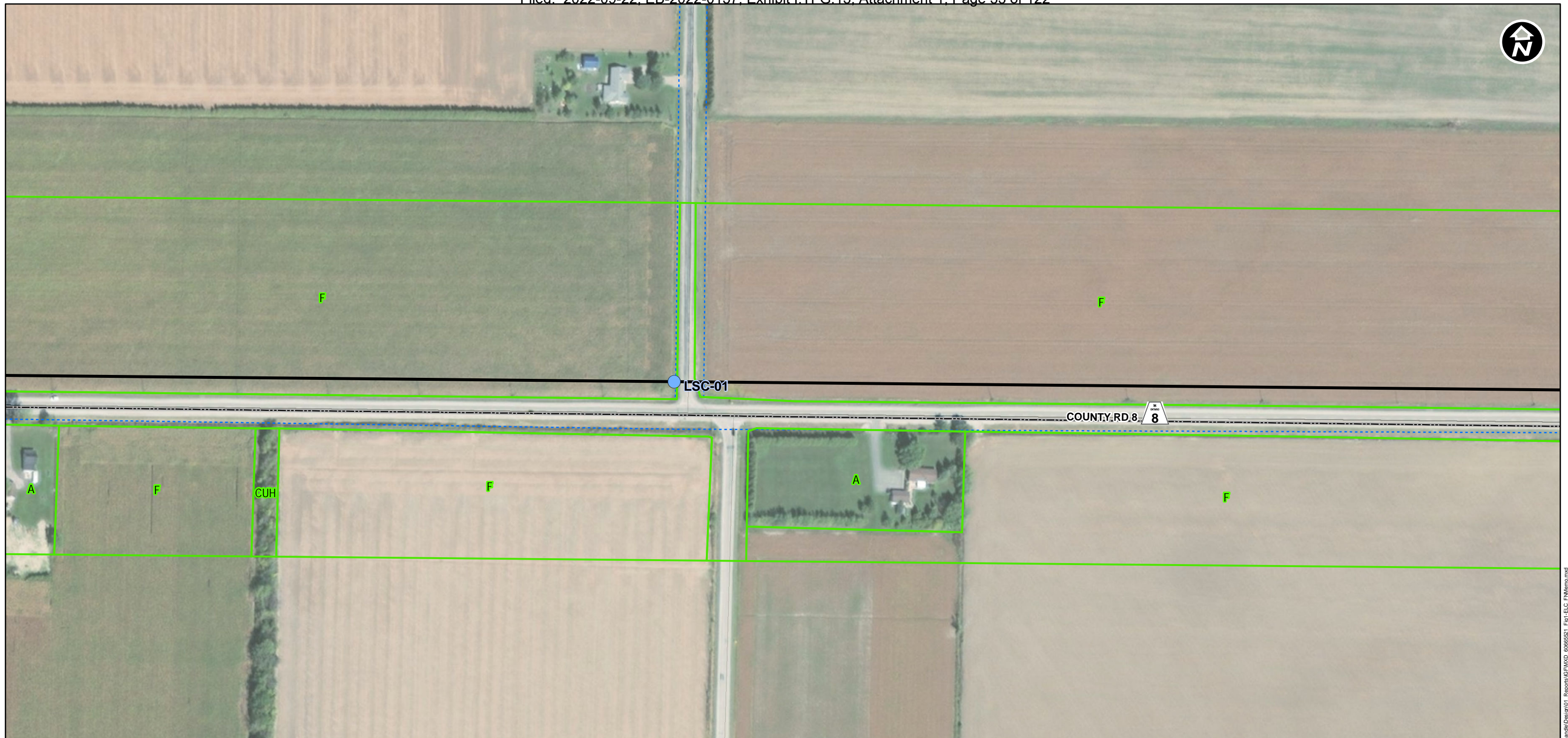
**Panhandle Regional Expansion Project**

**Leamington Interconnect  
ELC**






0 95 190  
Meters  
DATUM: NAD 1983 UTM Zone 17N

July 2022	1:2,500 <small>* when printed 11"x17"</small>	<small>Source: MNRF 2020 Image: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community</small>
P#:60665521	V#:	
<b>AECOM</b>		<b>Figure 1-2</b>
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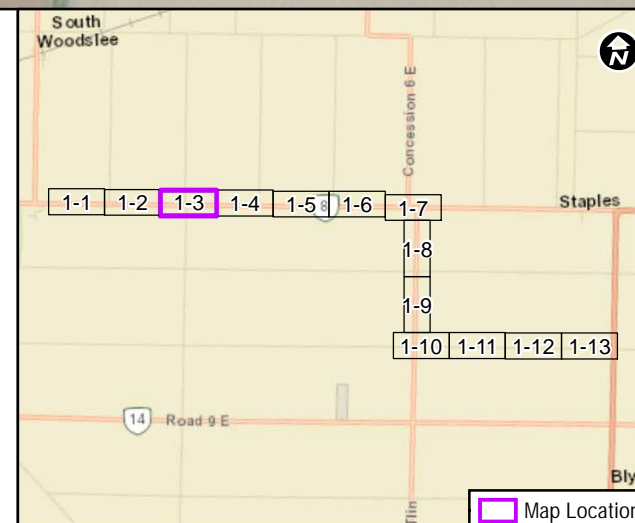




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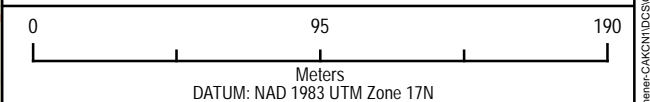
-  Watercourse Crossing
-  Preferred Route
-  Constructed Drain
-  Municipal Boundaries
-  ELC

Label	ELC Description
A	Anthropogenic
CUH	Cultural Hedgerow
CUM1-1	Dry – Moist Old Field Meadow Type
F	Agricultural Field
FOD 9-4	Fresh – Moist Shagbark Hickory Deciduous Forest
FOD2-2	Dry – Fresh Oak – Hickory Deciduous Forest Type
OAO	Open Aquatic



**Panhandle Regional Expansion Project**

**Leamington Interconnect  
ELC**



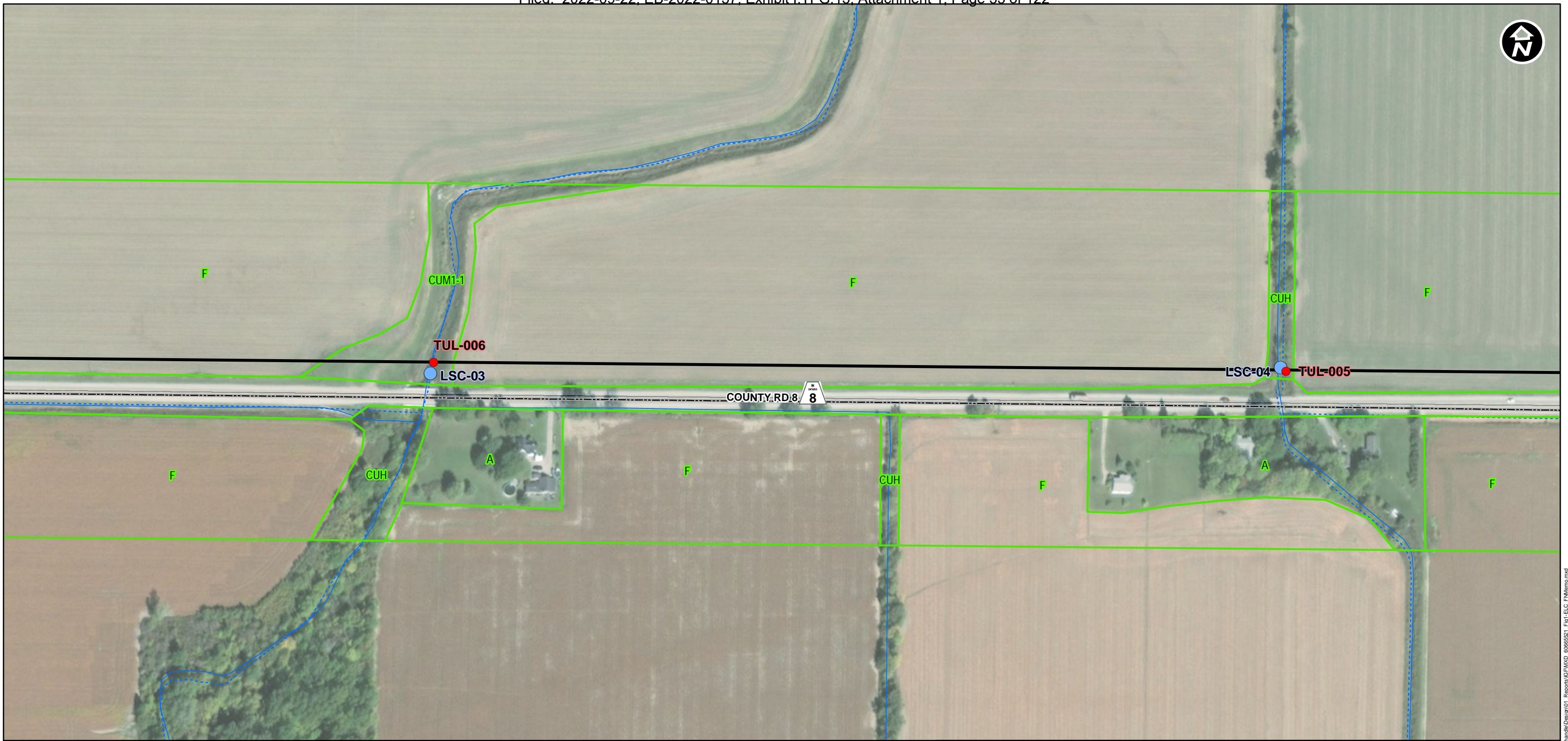
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P#:60665521	V#:	



**Figure 1-3**

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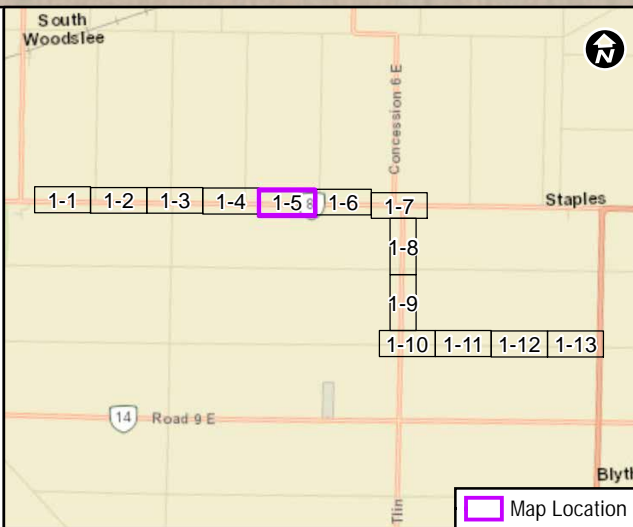




### Legend

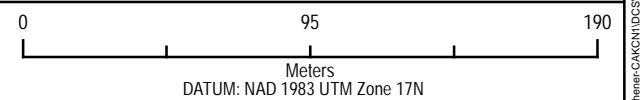
- Turtle Survey Location
- Watercourse Crossing
- Preferred Route
- - - -** Constructed Drain
- Permanent Stream
- Municipal Boundaries
- ELC

Label	ELC Description
A	Anthropogenic
CUH	Cultural Hedgerow
CUM1-1	Dry – Moist Old Field Meadow Type
F	Agricultural Field
FOD 9-4	Fresh – Moist Shagbark Hickory Deciduous Forest
FOD2-2	Dry – Fresh Oak – Hickory Deciduous Forest Type
OAO	Open Aquatic



### Panhandle Regional Expansion Project

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ELC



July 2022  
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\* when printed 11"x17"

Source: MNR 2020  
Increment P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

**AECOM**

**Figure 1-5**

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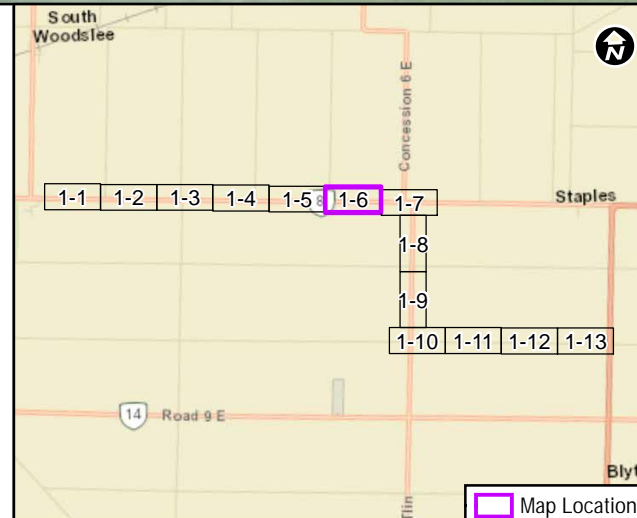
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**Legend**

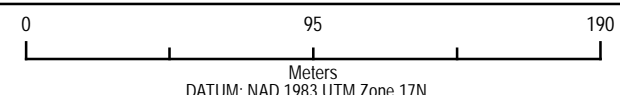
- Watercourse Crossing
- Preferred Route
- Constructed Drain
- Permanent Stream
- Municipal Boundaries
- ELC

Label	ELC Description
A	Anthropogenic
CUH	Cultural Hedgerow
CUM1-1	Dry – Moist Old Field Meadow Type
F	Agricultural Field
FOD 9-4	Fresh – Moist Shagbark Hickory Deciduous Forest
FOD2-2	Dry – Fresh Oak – Hickory Deciduous Forest Type
OAO	Open Aquatic



**Panhandle Regional Expansion Project**

**Leamington Interconnect  
ELC**



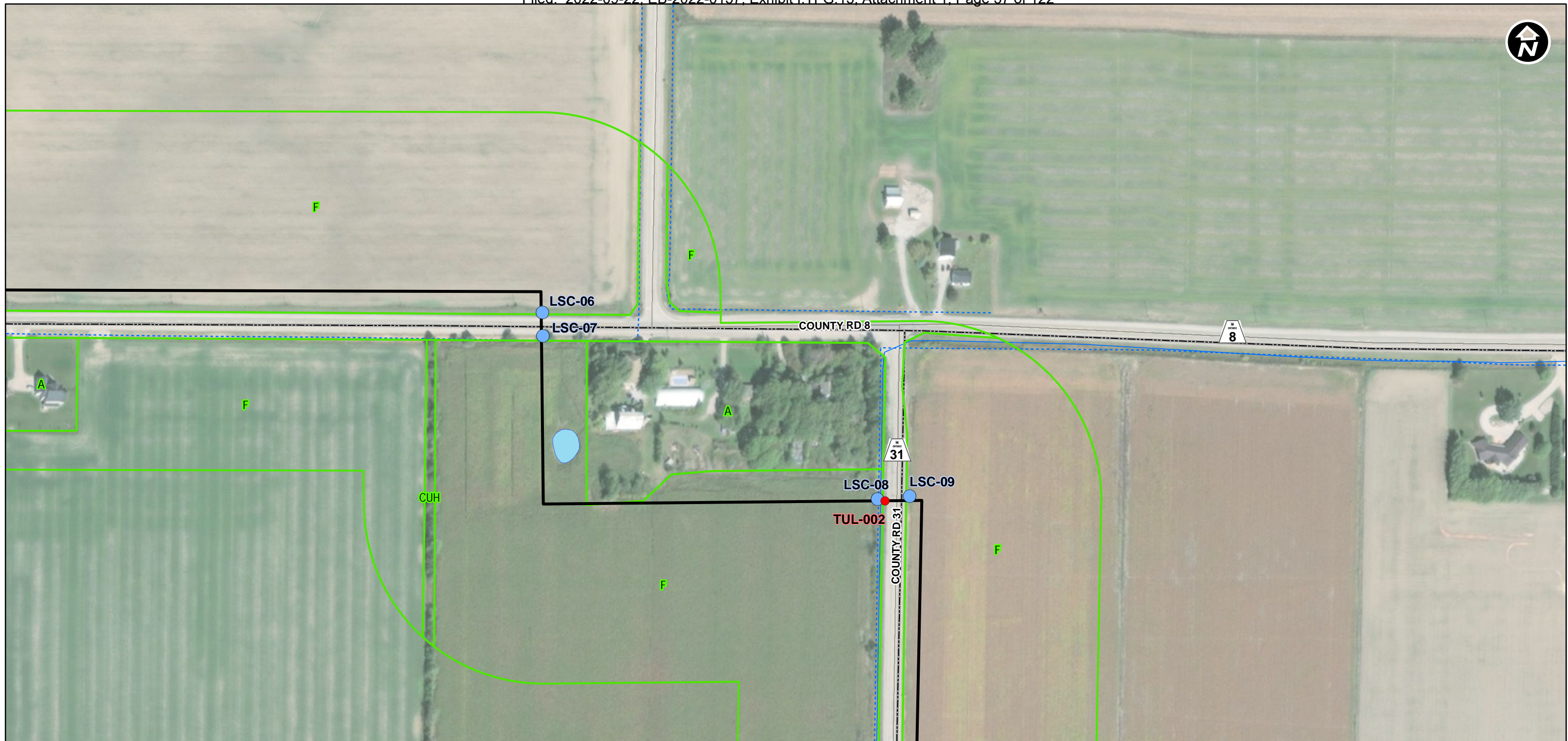
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\* when printed 11"x17"

P#:60665521      V#:

**Figure 1-6**

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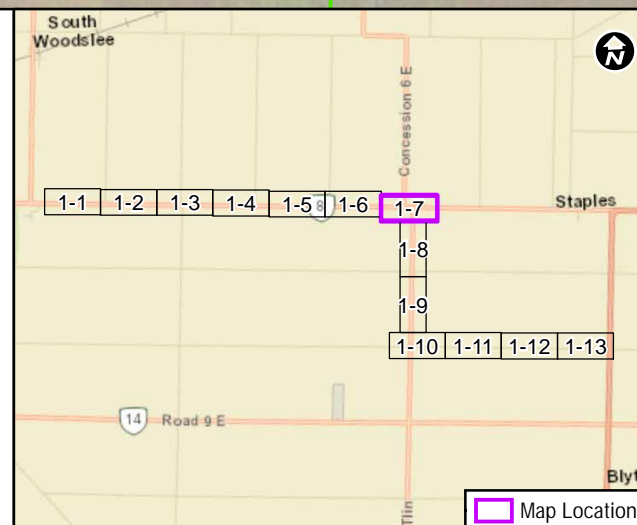
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**Legend**

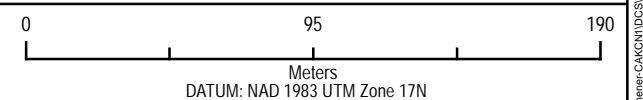
- Turtle Survey Location
- Watercourse Crossing
- Preferred Route
- - - Constructed Drain
- Permanent Stream
- Waterbody
- ▭ Municipal Boundaries
- ▭ ELC

Label	ELC Description
A	Anthropogenic
CUH	Cultural Hedgerow
CUM1-1	Dry – Moist Old Field Meadow Type
F	Agricultural Field
FOD 9-4	Fresh – Moist Shagbark Hickory Deciduous Forest
FOD2-2	Dry – Fresh Oak – Hickory Deciduous Forest Type
OAO	Open Aquatic



**Panhandle Regional Expansion Project**

**Leamington Interconnect  
ELC**

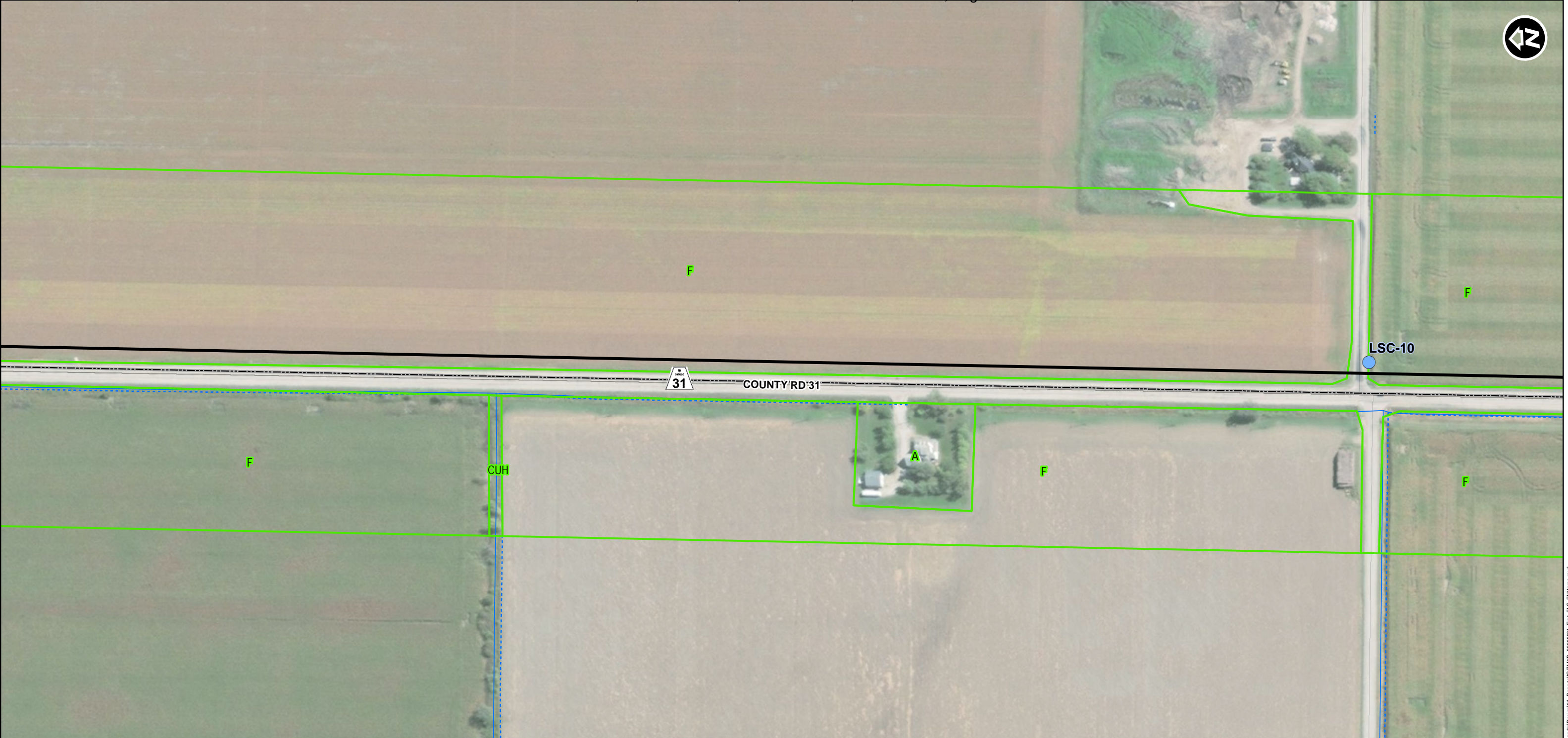


July 2022 1:2,500  
\* when printed 11"x17"

P#:60665521 V#:

**AECOM** **Figure 1-7**

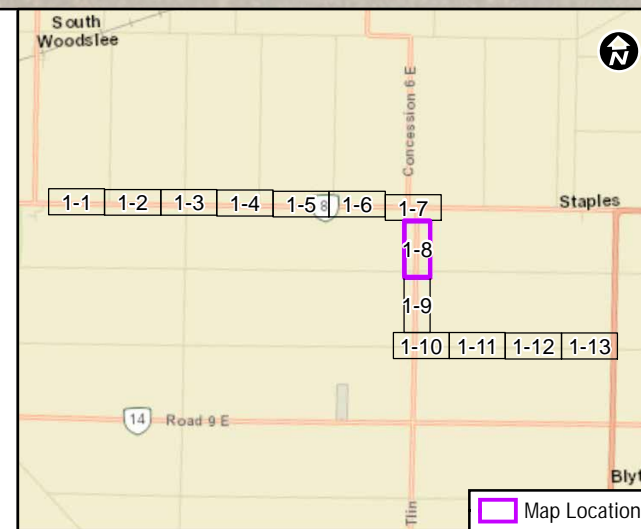
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**Legend**

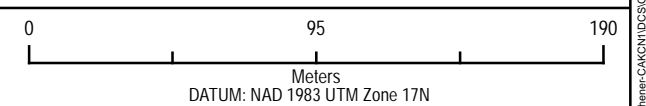
- Watercourse Crossing
- Preferred Route
- Constructed Drain
- Permanent Stream
- Municipal Boundaries
- ELC

Label	ELC Description
A	Anthropogenic
CUH	Cultural Hedgerow
CUM1-1	Dry – Moist Old Field Meadow Type
F	Agricultural Field
FOD 9-4	Fresh – Moist Shagbark Hickory Deciduous Forest
FOD2-2	Dry – Fresh Oak – Hickory Deciduous Forest Type
OAO	Open Aquatic



**Panhandle Regional Expansion Project**

**Leamington Interconnect ELC**

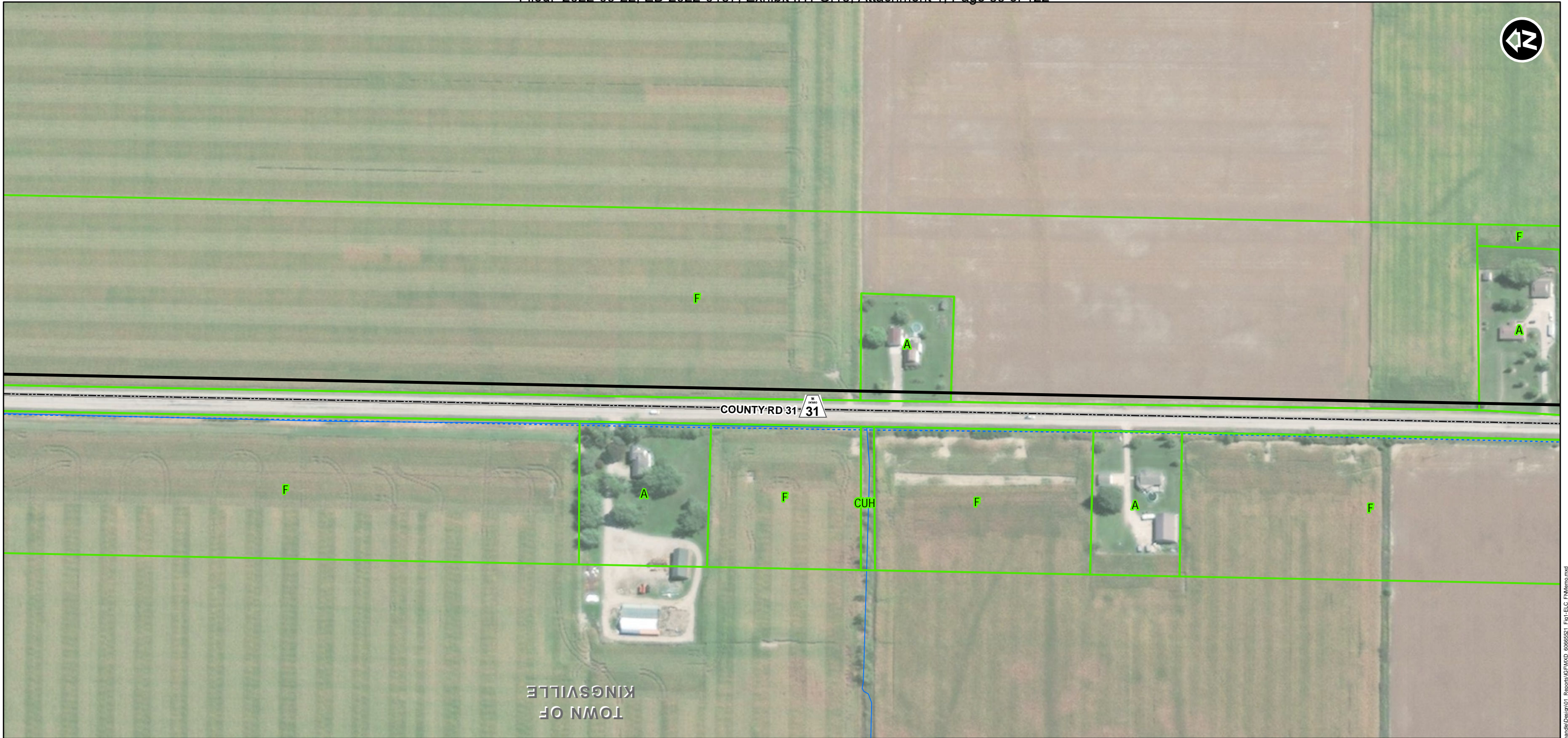


July 2022	1:2,500 <small>* when printed 11"x17"</small>	Source: MNRF 2020 Image: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community
P#:60665521	V#:	



**Figure 1-8**

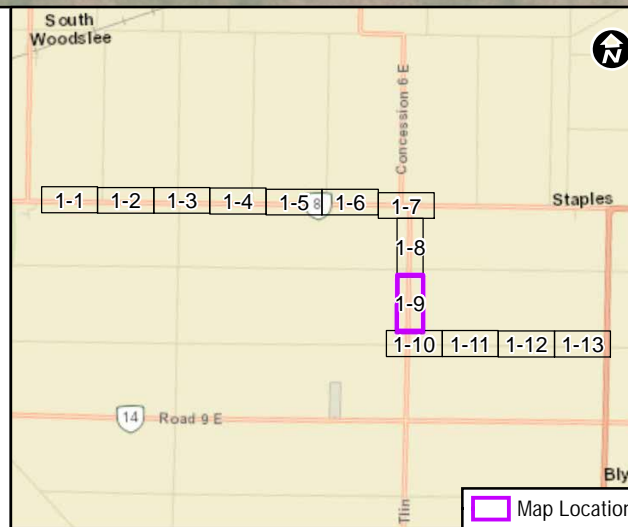
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**Legend**

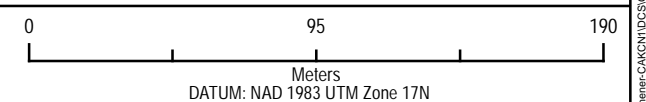
- Preferred Route
- Constructed Drain
- Permanent Stream
- Municipal Boundaries
- ELC

Label	ELC Description
A	Anthropogenic
CUH	Cultural Hedgerow
CUM1-1	Dry – Moist Old Field Meadow Type
F	Agricultural Field
FOD 9-4	Fresh – Moist Shagbark Hickory Deciduous Forest
FOD2-2	Dry – Fresh Oak – Hickory Deciduous Forest Type
OAO	Open Aquatic



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Leamington Interconnect  
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July 2022 1:2,500  
\* when printed 11"x17"

Source: MNR 2020  
Image: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

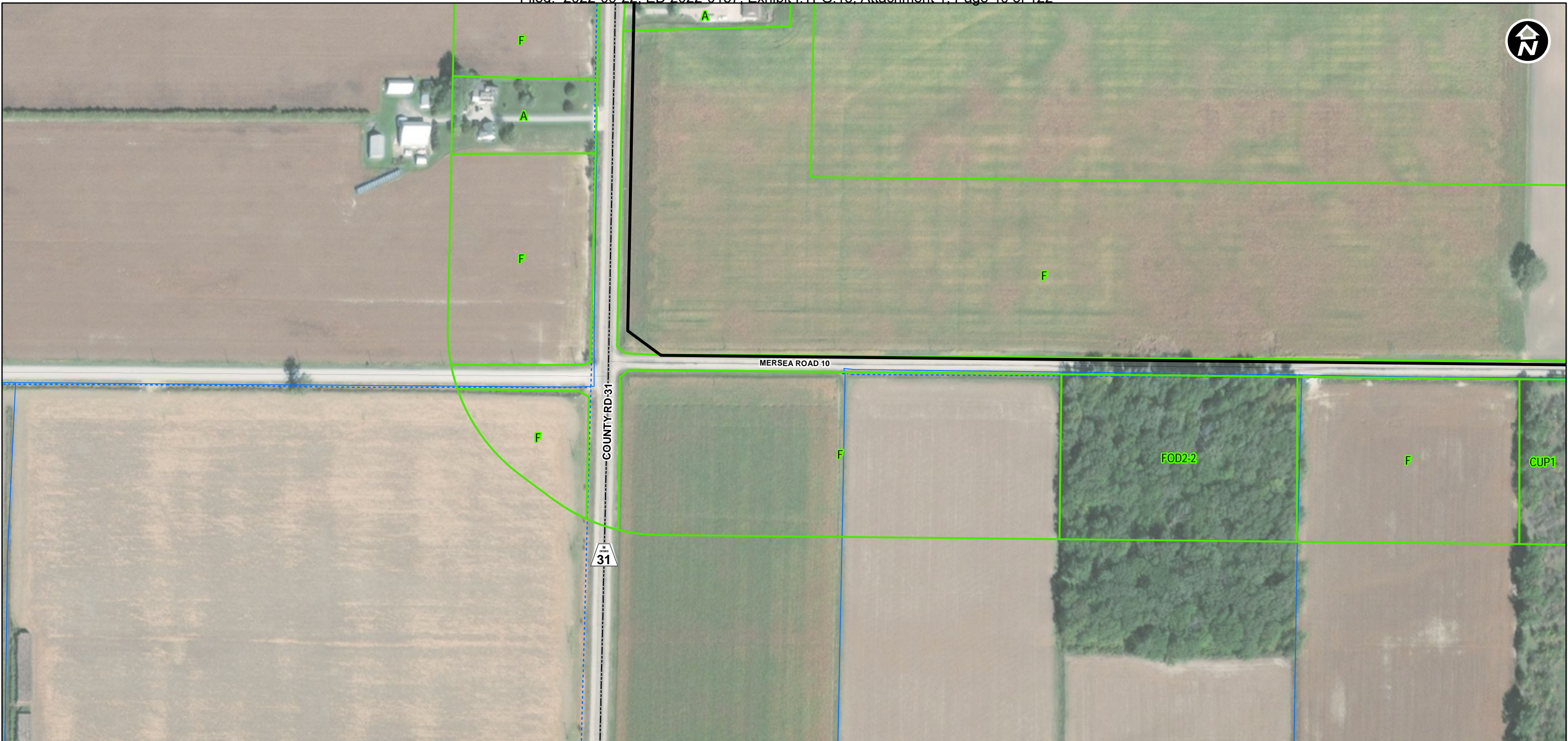
P#:60665521

V#:



**Figure 1-9**

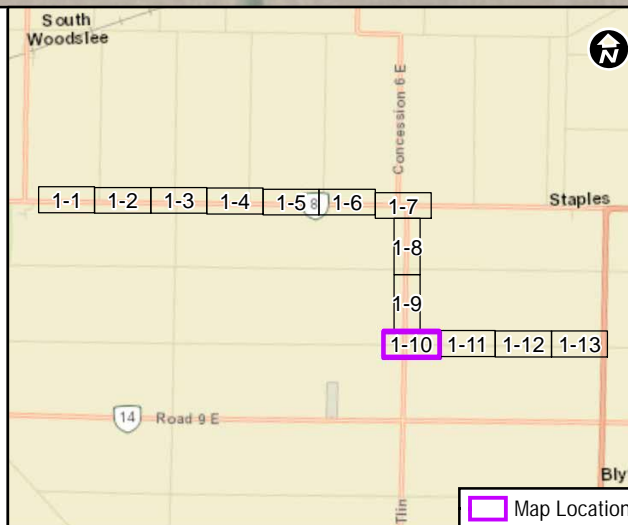
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**Legend**

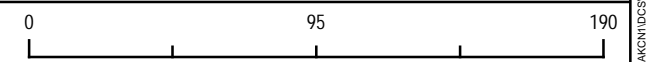
- Preferred Route
- Constructed Drain
- Permanent Stream
- ▭ Municipal Boundaries
- ▭ ELC

Label	ELC Description
A	Anthropogenic
CUH	Cultural Hedgerow
CUM1-1	Dry – Moist Old Field Meadow Type
F	Agricultural Field
FOD 9-4	Fresh – Moist Shagbark Hickory Deciduous Forest
FOD2-2	Dry – Fresh Oak – Hickory Deciduous Forest Type
OA0	Open Aquatic



**Panhandle Regional Expansion Project**

**Leamington Interconnect  
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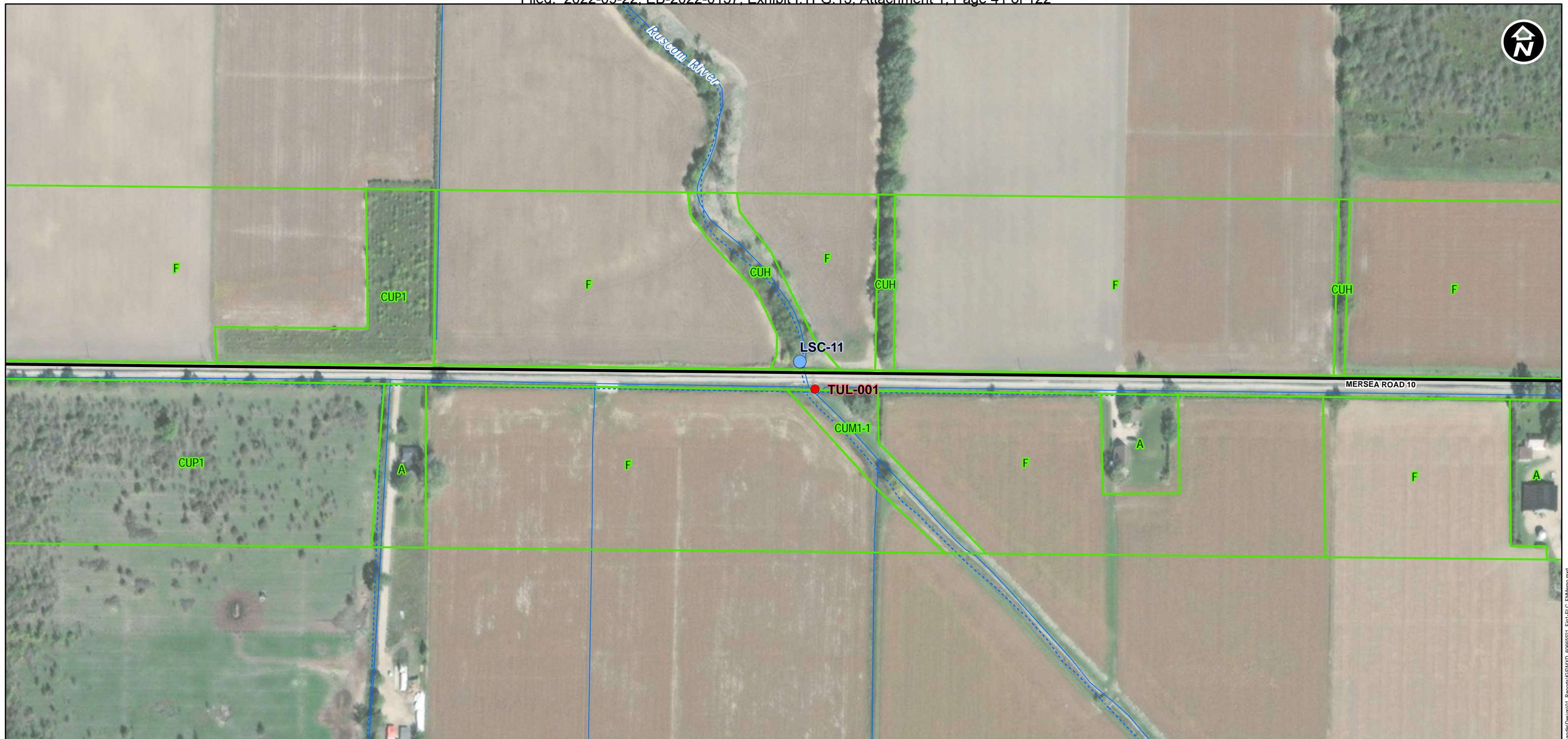
DATUM: NAD 1983 UTM Zone 17N

July 2022     1:2,500  
\* when printed 11"x17"  
 P#:60665521     V#:

	<b>Figure 1-10</b>
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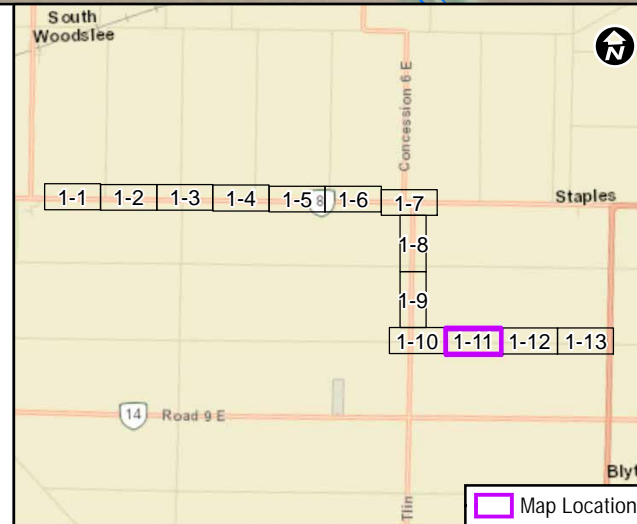




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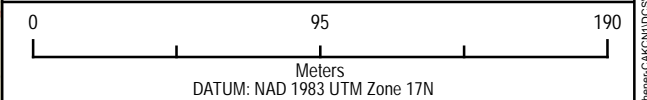
- Turtle Survey Location
- Watercourse Crossing
- Preferred Route
- Constructed Drain
- Permanent Stream
- Municipal Boundaries
- ELC

Label	ELC Description
A	Anthropogenic
CUH	Cultural Hedgerow
CUM1-1	Dry – Moist Old Field Meadow Type
F	Agricultural Field
FOD 9-4	Fresh – Moist Shagbark Hickory Deciduous Forest
FOD2-2	Dry – Fresh Oak – Hickory Deciduous Forest Type
OAO	Open Aquatic

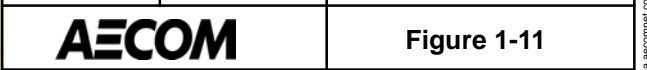


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July 2022	1:2,500 * when printed 11"x17"	Source: MNRF 2020 Image: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community
P#:60665521	V#:	



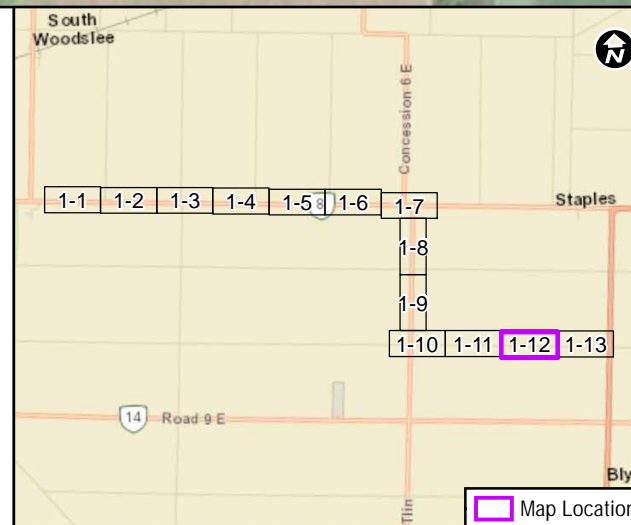
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**Legend**

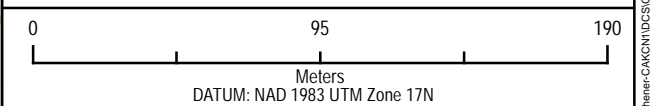
- Preferred Route
- Constructed Drain
- Permanent Stream
- Municipal Boundaries
- ELC

Label	ELC Description
A	Anthropogenic
CUH	Cultural Hedgerow
CUM1-1	Dry – Moist Old Field Meadow Type
F	Agricultural Field
FOD 9-4	Fresh – Moist Shagbark Hickory Deciduous Forest
FOD2-2	Dry – Fresh Oak – Hickory Deciduous Forest Type
OAO	Open Aquatic



**Panhandle Regional Expansion Project**

**Leamington Interconnect  
ELC**



July 2022	1:2,500 * when printed 11"x17"	Source: MNRF 2020 Image: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community
P#:60665521	V#:	



**Figure 1-12**

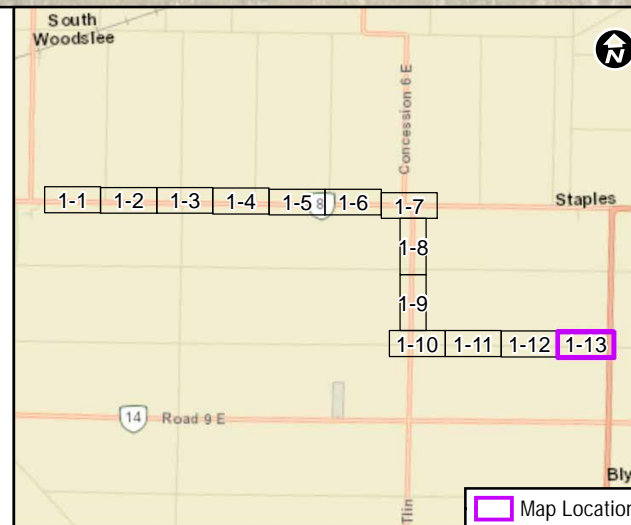
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**Legend**

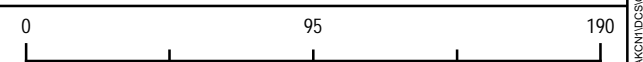
- Preferred Route
- Constructed Drain
- Permanent Stream
- Municipal Boundaries
- ELC

Label	ELC Description
A	Anthropogenic
CUH	Cultural Hedgerow
CUM1-1	Dry – Moist Old Field Meadow Type
F	Agricultural Field
FOD 9-4	Fresh – Moist Shagbark Hickory Deciduous Forest
FOD2-2	Dry – Fresh Oak – Hickory Deciduous Forest Type
OAO	Open Aquatic



**Panhandle Regional Expansion Project**

**Leamington Interconnect  
ELC**



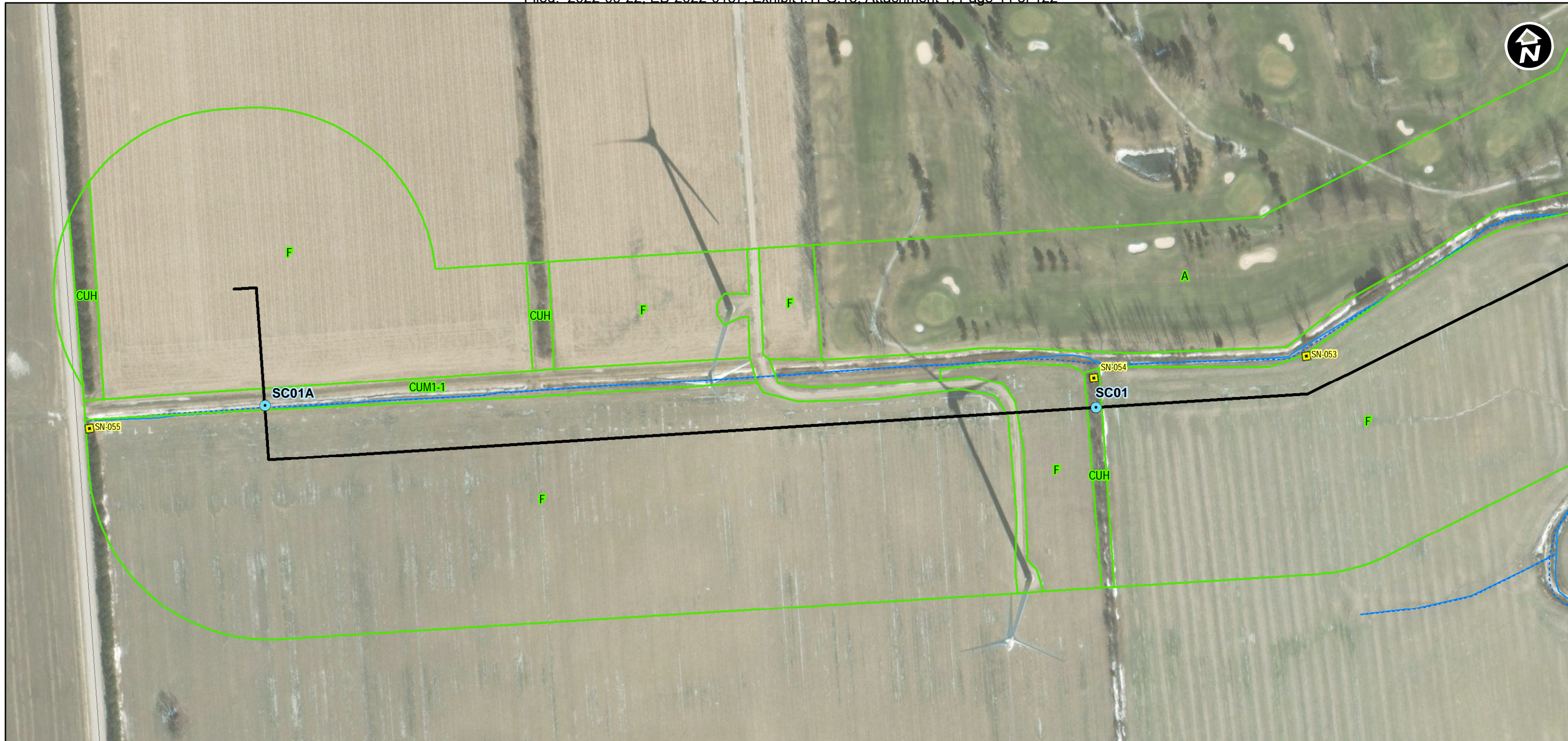
DATUM: NAD 1983 UTM Zone 17N

July 2022	1:2,500 <small>* when printed 11"x17"</small>	<small>Source: MNR 2020 Image: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community</small>
P#:60665521	V#:	



**Figure 1-13**

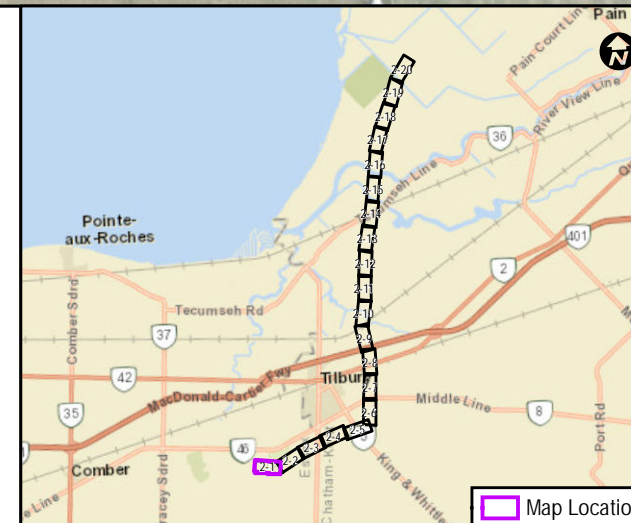
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**Legend**

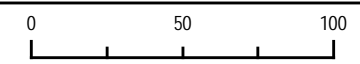
- Snake Survey Locations
- Watercourse Crossing
- Preferred Route 2022-06-03
- Constructed Drain
- Watercourse
- ELC

Label	ELC Description
A	Anthropogenic
CUM1-1	Dry – Moist Old Field Meadow Type
CUH	Cultural Hedgerow
F	Agricultural Field
FOD8-1	Fresh – Moist Poplar Deciduous Forest Type
MAS2-9	Forb Mineral Shallow Marsh Type
OAO	Open Aquatic



**Panhandle Regional Expansion Project**

ELC  
Panhandle



DATUM: NAD 1983 UTM Zone 17N

July 2022	1:2,500 * when printed 11"x17"	Source: MNRF 2020 Image: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community
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**Figure 2-1**

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**Legend**

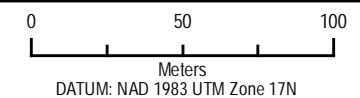
- Turtle Survey Locations
- Snake Survey Locations
- Watercourse Crossing
- Preferred Route 2022-06-03
- Constructed Drain
- Watercourse
- ELC

Label	ELC Description
A	Anthropogenic
CUM1-1	Dry – Moist Old Field Meadow Type
CUH	Cultural Hedgerow
F	Agricultural Field
FOD8-1	Fresh – Moist Poplar Deciduous Forest Type
MAS2-9	Forb Mineral Shallow Marsh Type
OAO	Open Aquatic



**Panhandle Regional Expansion Project**

ELC  
Panhandle



July 2022	1:2,500 * when printed 11"x17"	Source: MNRF 2020 Image: Sources: Esri, HERE, Garmin, USGS, Intermap INCREMENT P, NRCAn, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community
P#: 60665521	V#:	



**Figure 2-2**

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**Legend**

- Snake Survey Locations
- Watercourse Crossing
- Preferred Route 2022-06-03
- - - - - Constructed Drain
- Watercourse
- ELC

Label	ELC Description
A	Anthropogenic
CUM1-1	Dry – Moist Old Field Meadow Type
CUH	Cultural Hedgerow
F	Agricultural Field
FOD8-1	Fresh – Moist Poplar Deciduous Forest Type
MAS2-9	Forb Mineral Shallow Marsh Type
OAO	Open Aquatic



**Panhandle Regional Expansion Project**

**ELC**  
**Panhandle**

0      50      100  
Meters  
DATUM: NAD 1983 UTM Zone 17N

July 2022	1:2,500 * when printed 11"x17"	Source: MNR 2020 Image: Sources: Esri, HERE, Garmin, USCS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community
P#: 60665521	V#:	

**AECOM**      **Figure 2-3**

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Map Location: \\nas0201\mrc\GIS\Projects\2022\2022-09-22\_21:16:53 PM User Name: mshane\mshane



**Legend**

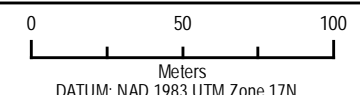
- Turtle Survey Locations
- Snake Survey Locations
- Watercourse Crossing
- Preferred Route 2022-06-03
- Constructed Drain
- Watercourse
- ELC

Label	ELC Description
A	Anthropogenic
CUM1-1	Dry – Moist Old Field Meadow Type
CUH	Cultural Hedgerow
F	Agricultural Field
FOD8-1	Fresh – Moist Poplar Deciduous Forest Type
MAS2-9	Forb Mineral Shallow Marsh Type
OAO	Open Aquatic



**Panhandle Regional Expansion Project**

ELC  
Panhandle

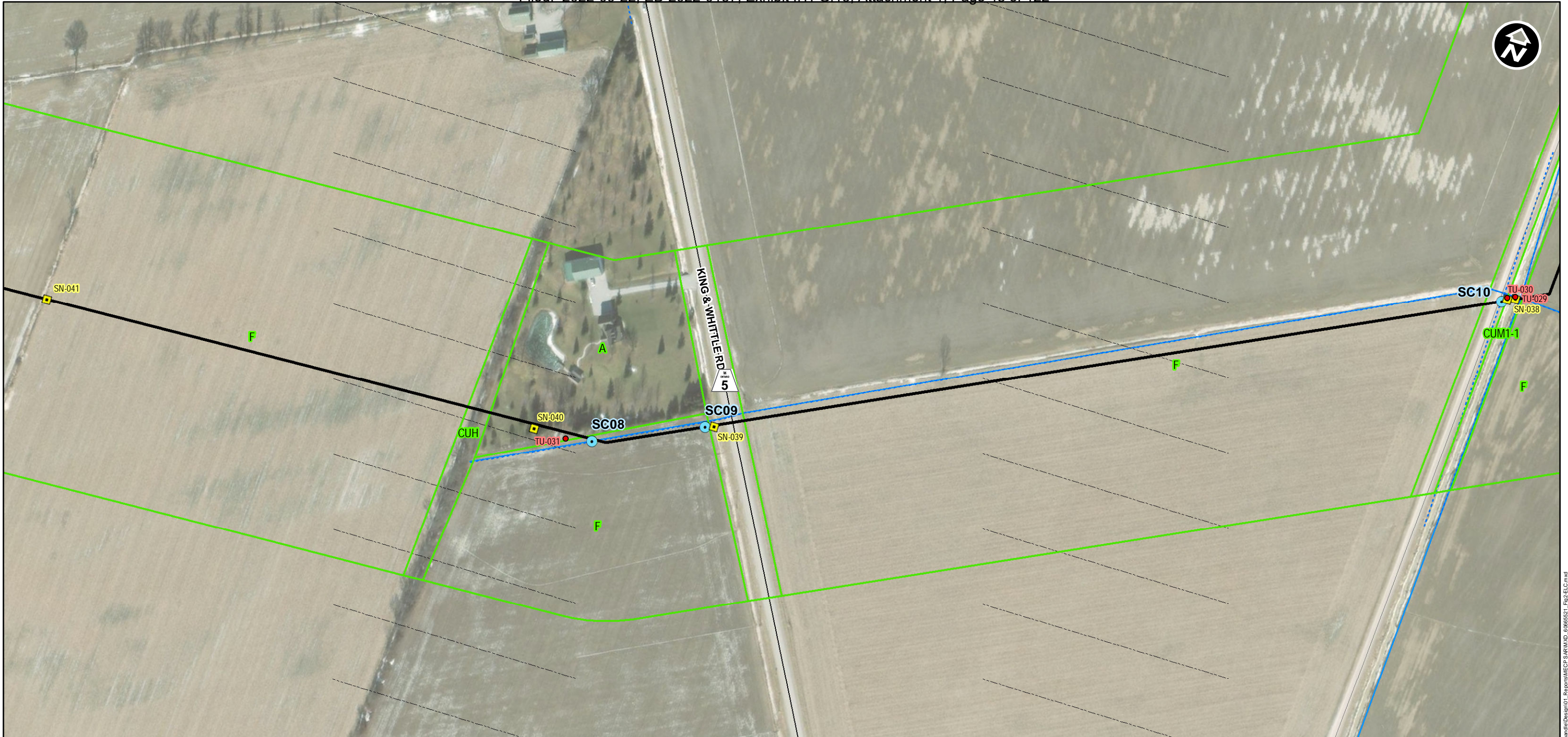


July 2022	1:2,500 * when printed 11"x17"	Source: MNRF 2020 Image: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community
P#:60665521	V#:	

**AECOM** **Figure 2-4**

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Map Location: C:\Users\mrcan\OneDrive\Documents\Projects\60665521\_Ebldg\_Panhandle\Design\01\_Report\METP\SUP\MXD\_06665521\_Fig2.ELC.mxd Date Saved: 2022-09-22 4:10:53 PM User Name: mrcan@ecm.com



**Legend**

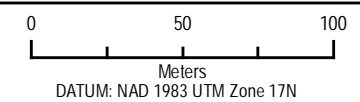
- Turtle Survey Locations
- Snake Survey Locations
- Watercourse Crossing
- Preferred Route 2022-06-03
- Constructed Drain
- Watercourse
- ELC

Label	ELC Description
A	Anthropogenic
CUM1-1	Dry – Moist Old Field Meadow Type
CUH	Cultural Hedgerow
F	Agricultural Field
FOD8-1	Fresh – Moist Poplar Deciduous Forest Type
MAS2-9	Forb Mineral Shallow Marsh Type
OAO	Open Aquatic



**Panhandle Regional Expansion Project**

ELC  
Panhandle



July 2022	1:2,500 * when printed 11"x17"	Source: MNRF 2020 Image: Sources: Esri, HERE, Garmin, USGS, Intermap INCREMENT P, NRCAn, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community
P#: 60665521	V#:	



**Figure 2-5**

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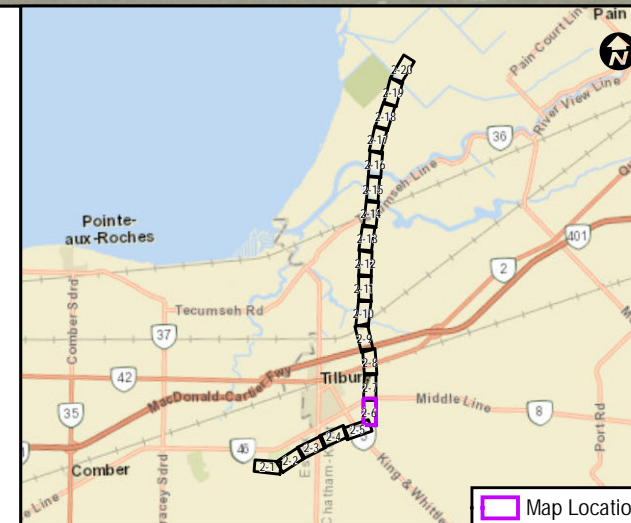




**Legend**

- Turtle Survey Locations
- Snake Survey Locations
- ⊙ Watercourse Crossing
- Preferred Route 2022-06-03
- - - - Constructed Drain
- Watercourse
- ELC
- Category 3 Habitat
- Category 2 Habitat

Label	ELC Description
A	Anthropogenic
CUM1-1	Dry – Moist Old Field Meadow Type
CUH	Cultural Hedgerow
F	Agricultural Field
FOD8-1	Fresh – Moist Poplar Deciduous Forest Type
MAS2-9	Forb Mineral Shallow Marsh Type
OAO	Open Aquatic



**Panhandle Regional Expansion Project**

ELC  
Panhandle

0 50 100  
Meters  
DATUM: NAD 1983 UTM Zone 17N

July 2022	1:2,500 * when printed 11"x17"	Source: MNRF 2020 Image: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community
P#: 60665521	V#:	

**AECOM** **Figure 2-6**

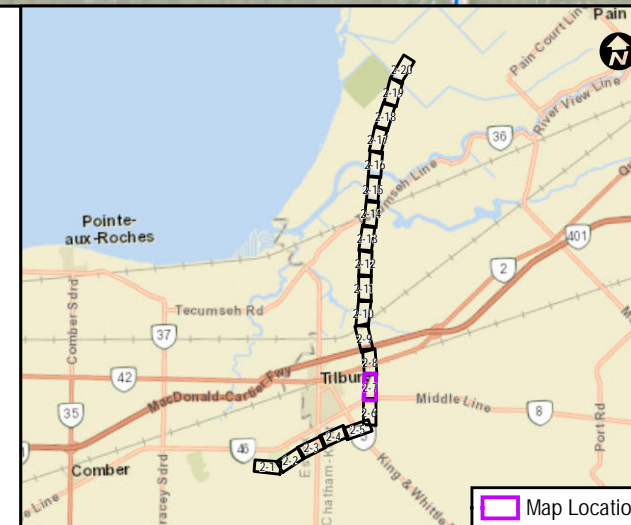
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**Legend**

- Turtle Survey Locations
- Snake Survey Locations
- Watercourse Crossing
- Preferred Route 2022-06-03
- Constructed Drain
- Watercourse
- ELC
- Eastern Foxsnake Habitat**
- Category 2 Habitat
- Category 3 Habitat

Label	ELC Description
A	Anthropogenic
CUM1-1	Dry – Moist Old Field Meadow Type
CUH	Cultural Hedgerow
F	Agricultural Field
FOD8-1	Fresh – Moist Poplar Deciduous Forest Type
MAS2-9	Forb Mineral Shallow Marsh Type
OAO	Open Aquatic



**Panhandle Regional Expansion Project**

ELC  
Panhandle

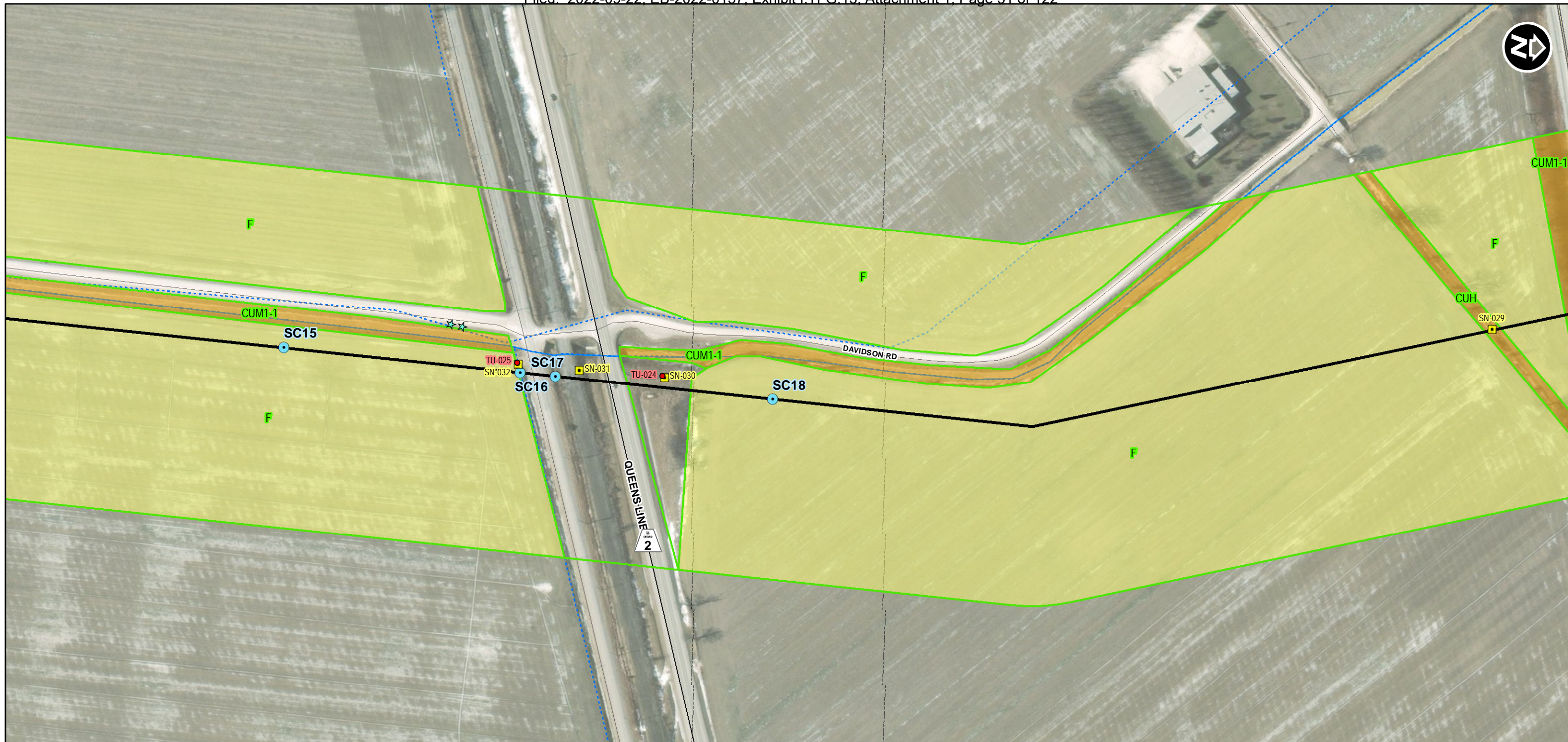
Meters  
DATUM: NAD 1983 UTM Zone 17N

July 2022	1:2,500 * when printed 11"x17"	Source: MNRF 2020 Image: Sources: Esri, HERE, Garmin, USCS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community
P#: 60665521	V#:	

**Figure 2-7**

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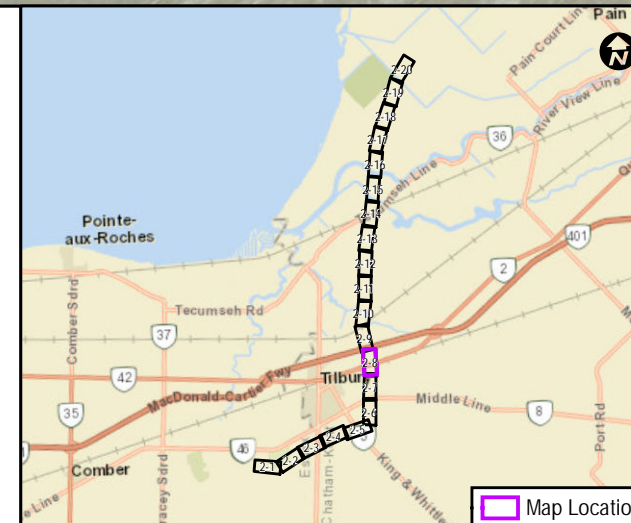
Map Location: \\sawtooth\mrs.com\GIS\PROJECTS\2022\60665521\MapLocation\MapLocation.mxd; Date Saved: 8/24/2022 4:10:53 PM; User Name: mrs.com\mrs.com



**Legend**

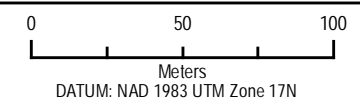
- Turtle Survey Locations
- Snake Survey Locations
- Watercourse Crossing
- Preferred Route 2022-06-03
- Constructed Drain
- Watercourse
- ELC
- Eastern Foxsnake Habitat**
- Category 2 Habitat
- Category 3 Habitat

Label	ELC Description
A	Anthropogenic
CUM1-1	Dry – Moist Old Field Meadow Type
CUH	Cultural Hedgerow
F	Agricultural Field
FOD8-1	Fresh – Moist Poplar Deciduous Forest Type
MAS2-9	Forb Mineral Shallow Marsh Type
OAO	Open Aquatic



**Panhandle Regional Expansion Project**

ELC  
Panhandle

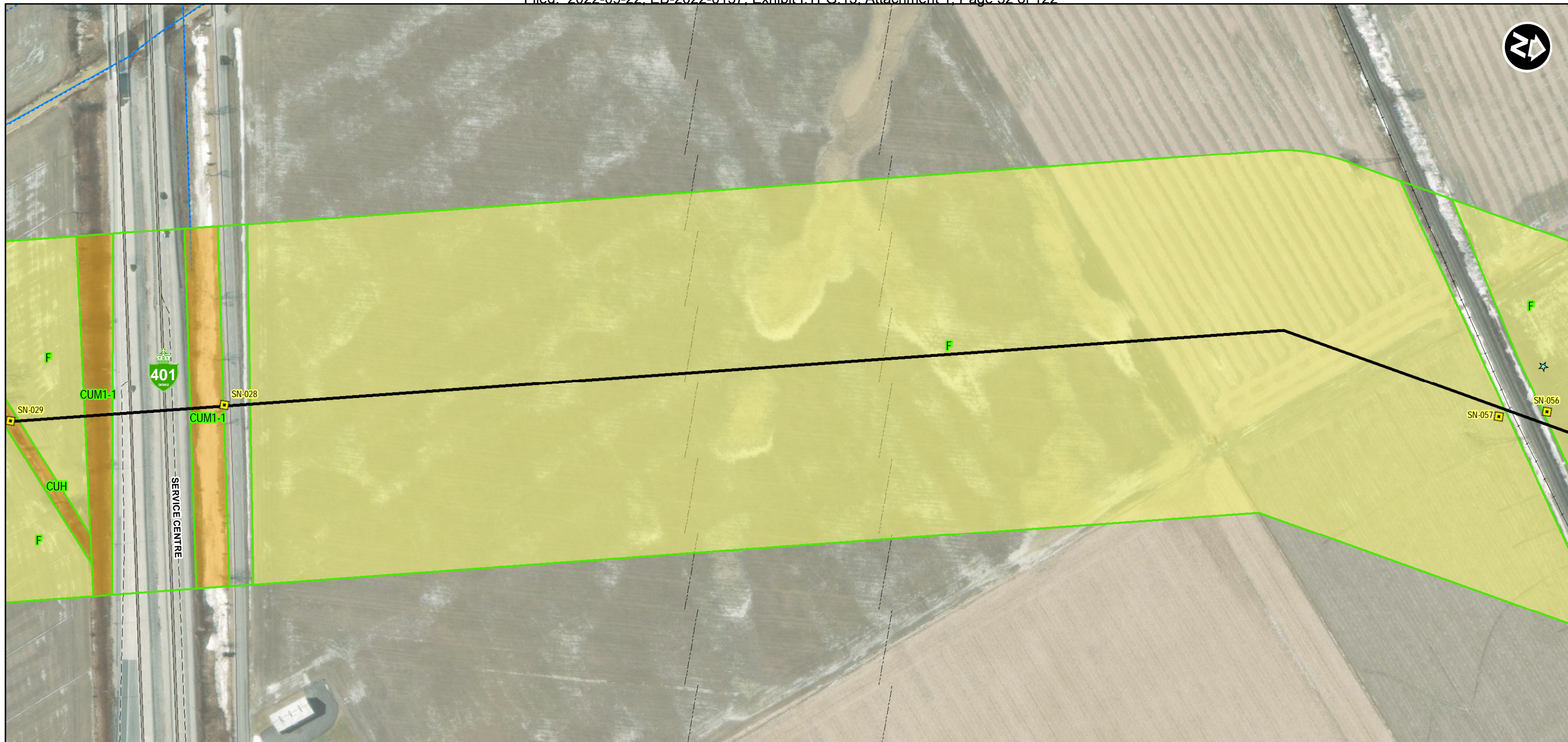


July 2022	1:2,500 * when printed 11"x17"	Source: MNRF 2020 Image: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community
P#: 60665521	V#:	

**AECOM**

**Figure 2-8**

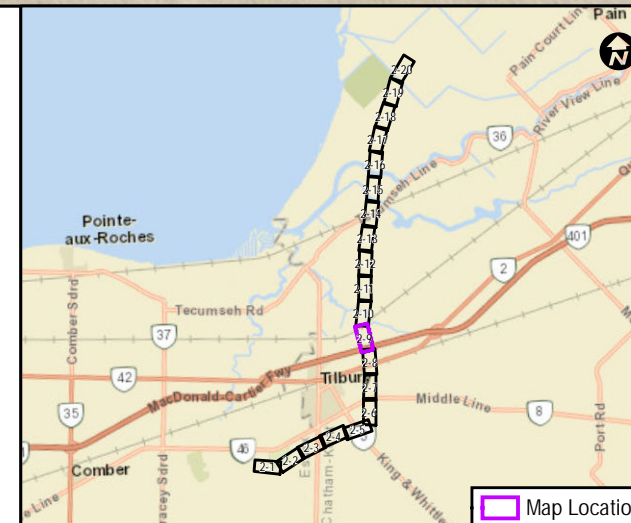
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**Legend**

- Snake Survey Locations
- Watercourse Crossing
- Preferred Route 2022-06-03
- Constructed Drain
- Watercourse
- ELC
- Eastern Foxsnake Habitat**
- Category 2 Habitat
- Category 3 Habitat

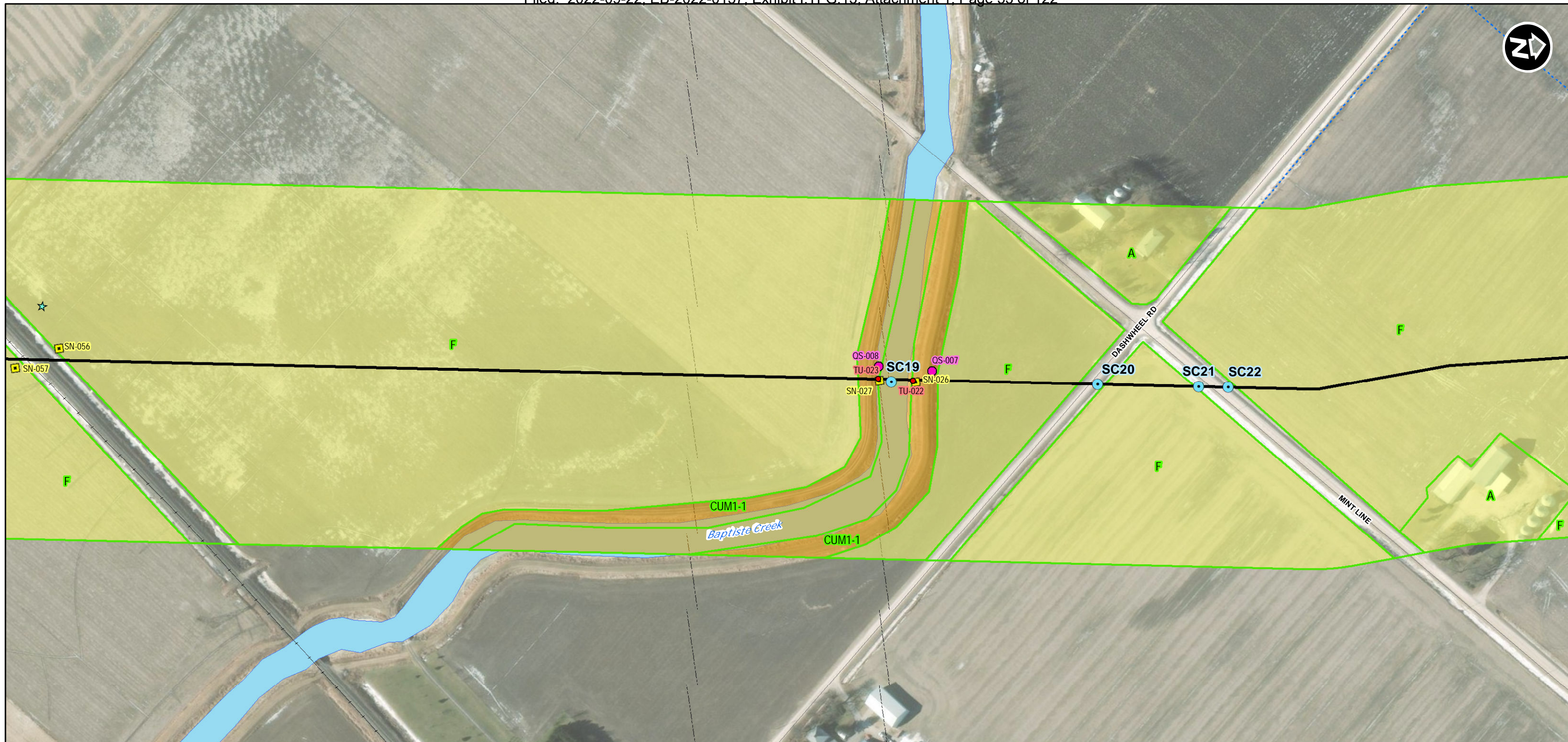
Label	ELC Description
A	Anthropogenic
CUM1-1	Dry – Moist Old Field Meadow Type
CUH	Cultural Hedgerow
F	Agricultural Field
FOD8-1	Fresh – Moist Poplar Deciduous Forest Type
MAS2-9	Forb Mineral Shallow Marsh Type
OAO	Open Aquatic



**Panhandle Regional Expansion Project**

<b>ELC</b>	
<b>Panhandle</b>	
DATUM: NAD 1983 UTM Zone 17N	
July 2022	1:2,500 <small>* when printed 11"x17"</small>
P#: 60665521	V#:
<b>Figure 2-9</b>	
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Map Location: C:\Users\mrc\OneDrive\Documents\60665521\MapLocation\MapLocation.mxd; Date Saved: 8/24/2022 4:16:53 PM; User Name: mrc@aec.com



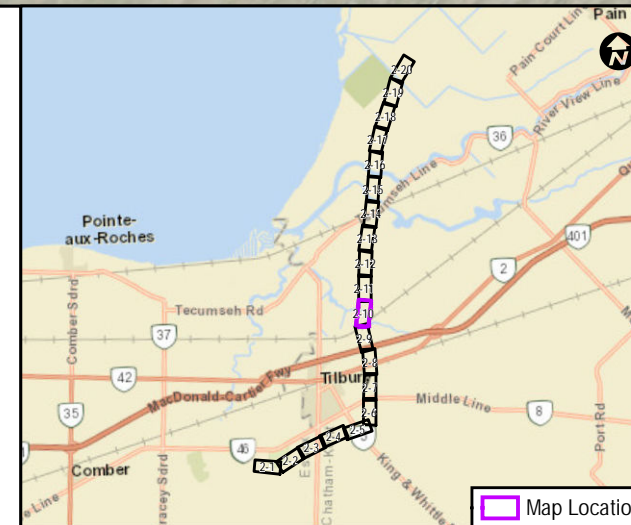
**Legend**

- Turtle Survey Locations
- Snake Survey Locations
- Queen Snake Survey
- Watercourse Crossing
- Preferred Route 2022-06-03
- Constructed Drain
- Watercourse
- ELC

**Eastern Foxsnake Habitat**

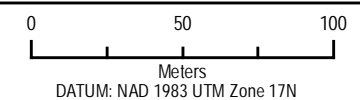
- Category 2 Habitat
- Category 3 Habitat

Label	ELC Description
A	Anthropogenic
CUM1-1	Dry – Moist Old Field Meadow Type
CUH	Cultural Hedgerow
F	Agricultural Field
FOD8-1	Fresh – Moist Poplar Deciduous Forest Type
MAS2-9	Forb Mineral Shallow Marsh Type
OAO	Open Aquatic



**Panhandle Regional Expansion Project**

ELC  
Panhandle



July 2022	1:2,500 * when printed 11"x17"	Source: MNR 2020 Image: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community
P#:60665521	V#:	









**Figure 2-10**

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**Legend**

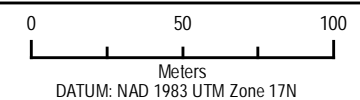
-  Watercourse Crossing
-  Preferred Route 2022-06-03
-  Constructed Drain
-  Watercourse
-  ELC
- Eastern Foxsnake Habitat**
-  Category 3 Habitat

Label	ELC Description
A	Anthropogenic
CUM1-1	Dry – Moist Old Field Meadow Type
CUH	Cultural Hedgerow
F	Agricultural Field
FOD8-1	Fresh – Moist Poplar Deciduous Forest Type
MAS2-9	Forb Mineral Shallow Marsh Type
OAO	Open Aquatic



**Panhandle Regional Expansion Project**

ELC  
Panhandle

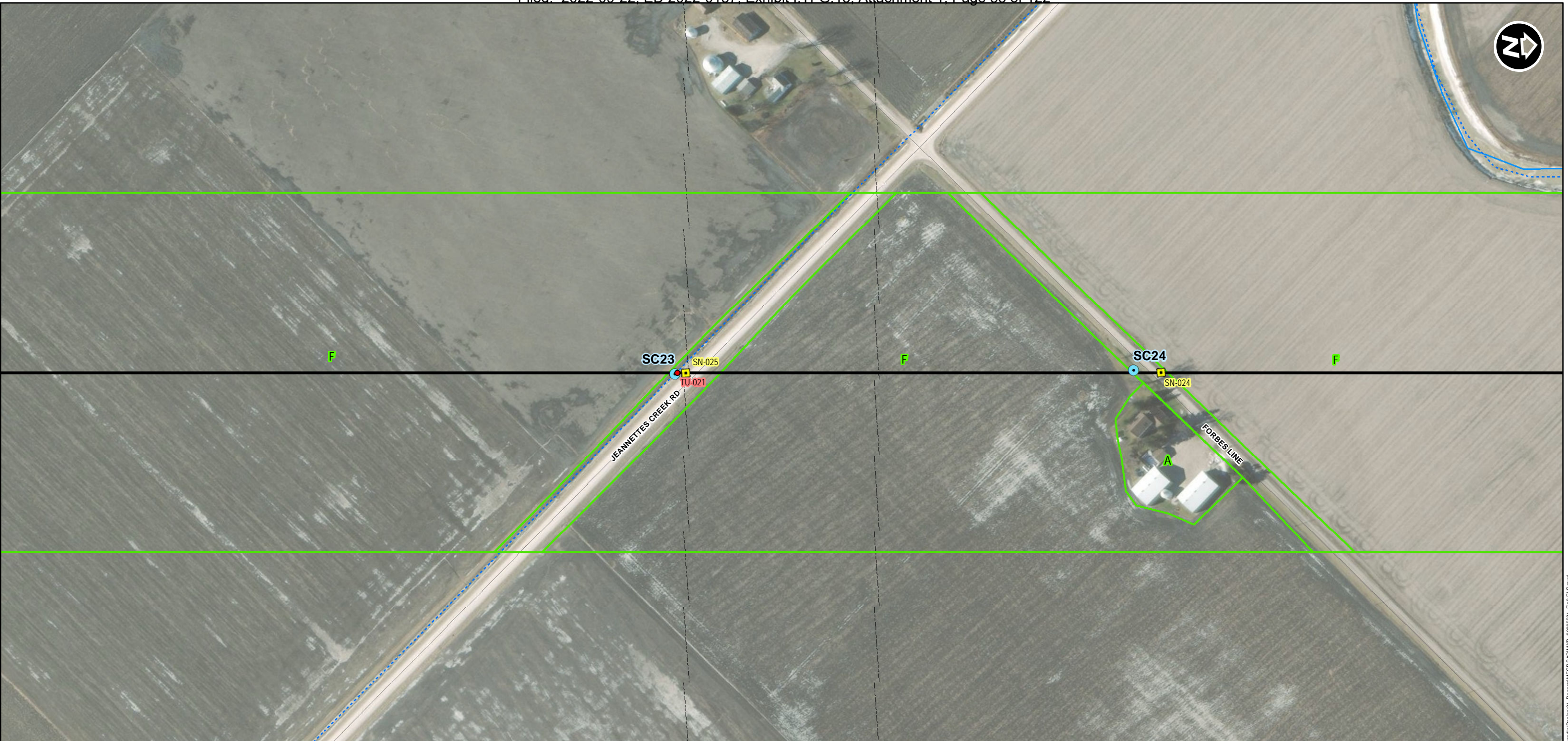


July 2022	1:2,500 *when printed 11"x17"	Source: MNRF 2020 Image: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community
P#:60665521	V#:	



**Figure 2-11**

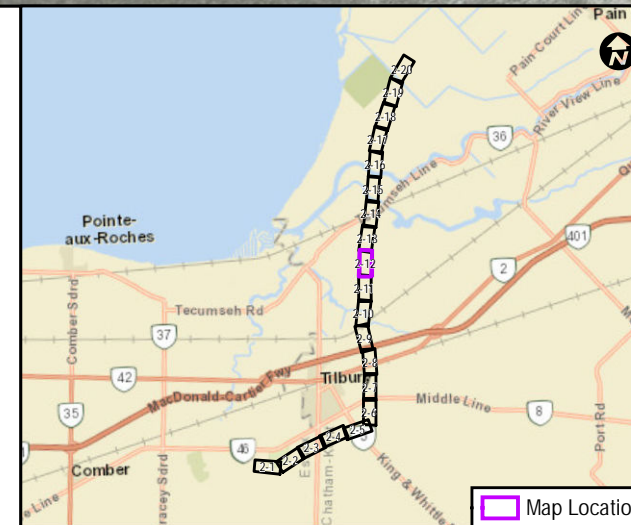
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**Legend**

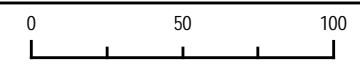
- Turtle Survey Locations
- Snake Survey Locations
- Watercourse Crossing
- Preferred Route 2022-06-03
- Constructed Drain
- Watercourse
- ELC

Label	ELC Description
A	Anthropogenic
CUM1-1	Dry – Moist Old Field Meadow Type
CUH	Cultural Hedgerow
F	Agricultural Field
FOD8-1	Fresh – Moist Poplar Deciduous Forest Type
MAS2-9	Forb Mineral Shallow Marsh Type
OAO	Open Aquatic



**Panhandle Regional Expansion Project**

ELC  
Panhandle



DATUM: NAD 1983 UTM Zone 17N

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P#:60665521	V#:	

**AECOM** **Figure 2-12**

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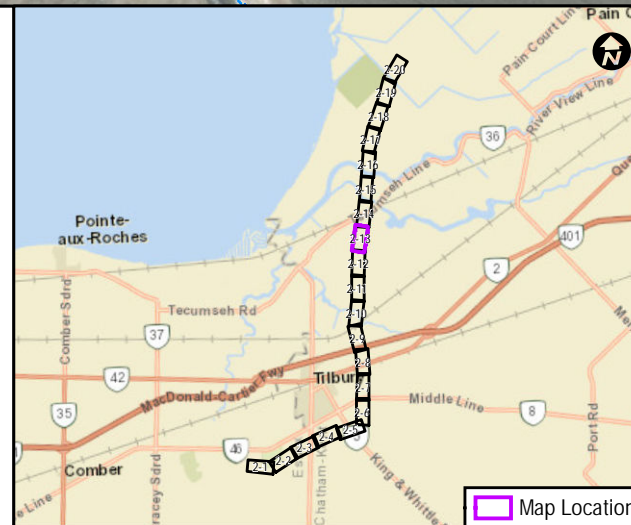
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Date Saved: 9/22/22 4:16:53 PM User Name: mrs@aec.com



**Legend**

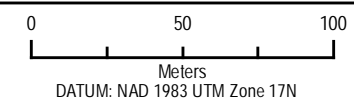
- Turtle Survey Locations
- Snake Survey Locations
- Queen Snake Survey
- Watercourse Crossing
- Preferred Route 2022-06-03
- Constructed Drain
- Watercourse
- ELC

Label	ELC Description
A	Anthropogenic
CUM1-1	Dry – Moist Old Field Meadow Type
CUH	Cultural Hedgerow
F	Agricultural Field
FOD8-1	Fresh – Moist Poplar Deciduous Forest Type
MAS2-9	Forb Mineral Shallow Marsh Type
OAO	Open Aquatic



**Panhandle Regional Expansion Project**

ELC  
Panhandle



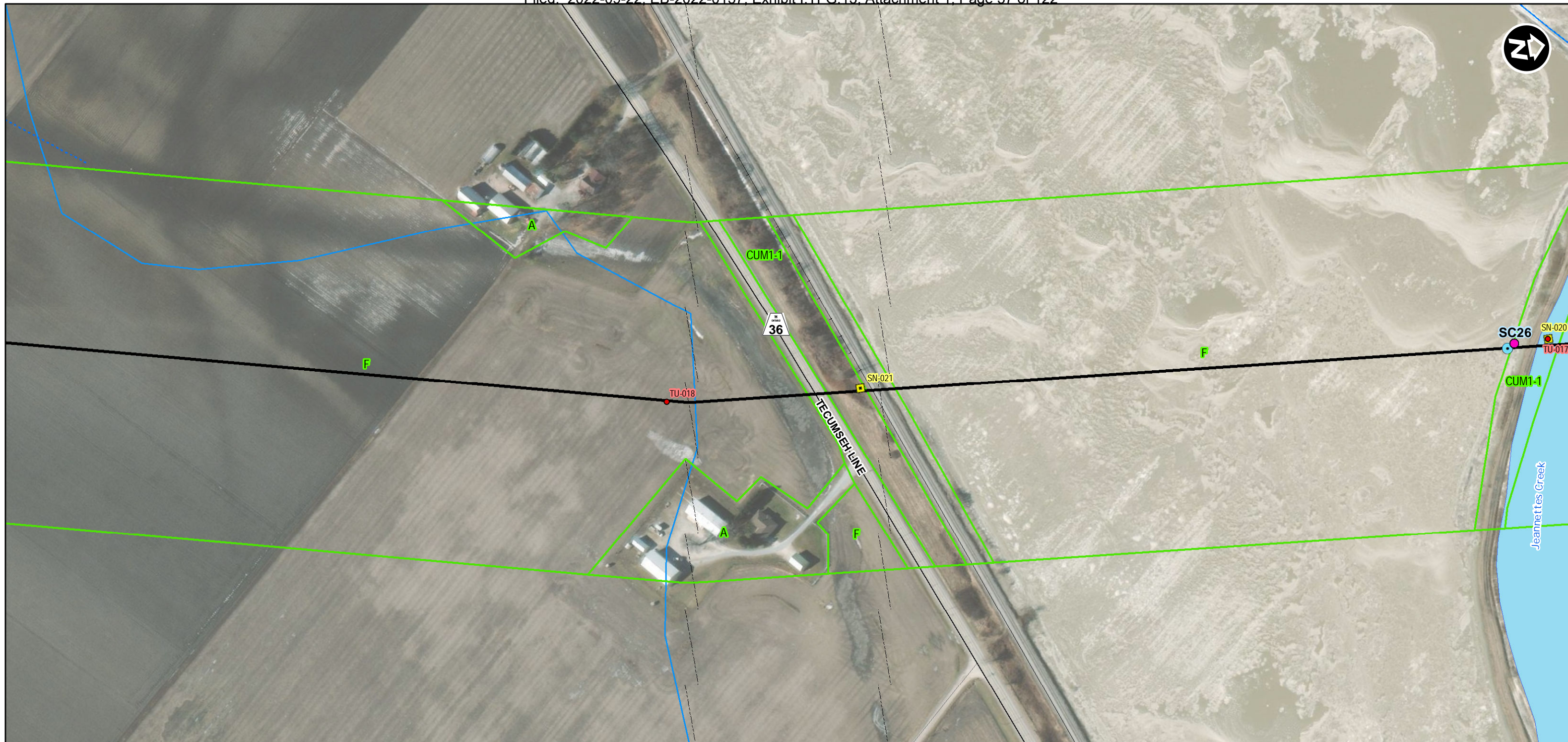
July 2022	1:2,500 * when printed 11"x17"	Source: MNRF 2020 Image: Sources: Esri, HERE, Garmin, USGS, Intermap INCREMENT P, NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community
P#: 60665521	V#:	



**Figure 2-13**

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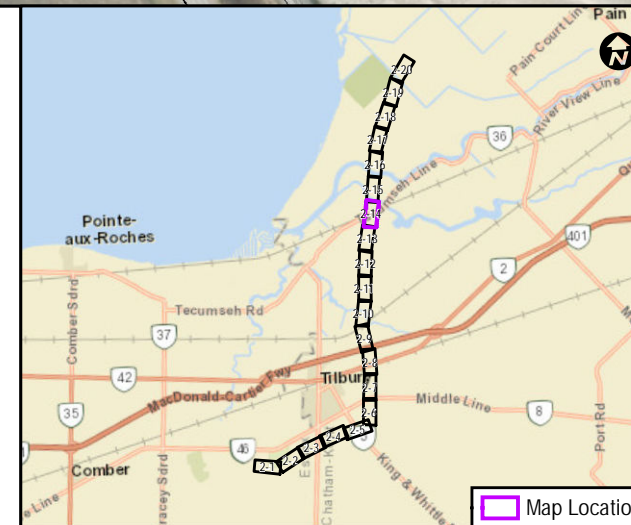




**Legend**

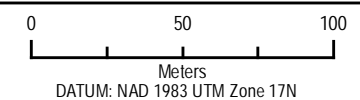
- Turtle Survey Locations
- Snake Survey Locations
- Queen Snake Survey
- Watercourse Crossing
- Preferred Route 2022-06-03
- Constructed Drain
- Watercourse
- ELC

Label	ELC Description
A	Anthropogenic
CUM1-1	Dry – Moist Old Field Meadow Type
CUH	Cultural Hedgerow
F	Agricultural Field
FOD8-1	Fresh – Moist Poplar Deciduous Forest Type
MAS2-9	Forb Mineral Shallow Marsh Type
OAO	Open Aquatic



**Panhandle Regional Expansion Project**

ELC  
Panhandle



July 2022	1:2,500 * when printed 11"x17"	Source: MNRF 2020 Image: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community
P#:60665521	V#:	



**Figure 2-14**

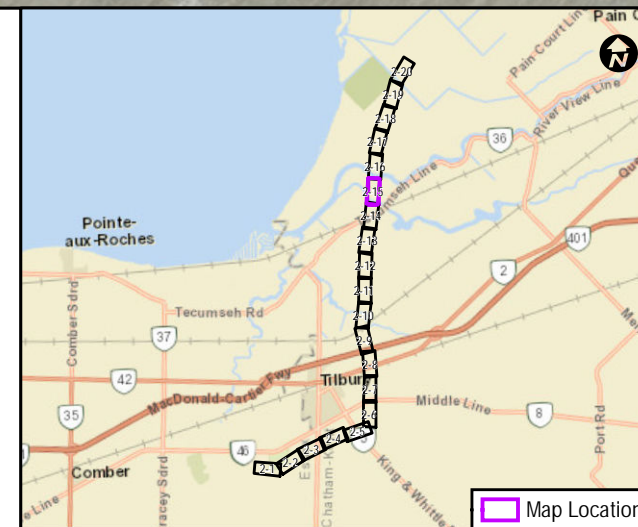
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**Legend**

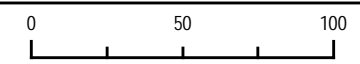
- Turtle Survey Locations
- Snake Survey Locations
- Queen Snake Survey
- Watercourse Crossing
- Preferred Route 2022-06-03
- Constructed Drain
- Watercourse
- ELC

Label	ELC Description
A	Anthropogenic
CUM1-1	Dry – Moist Old Field Meadow Type
CUH	Cultural Hedgerow
F	Agricultural Field
FOD8-1	Fresh – Moist Poplar Deciduous Forest Type
MAS2-9	Forb Mineral Shallow Marsh Type
OAO	Open Aquatic



**Panhandle Regional Expansion Project**

ELC  
Panhandle



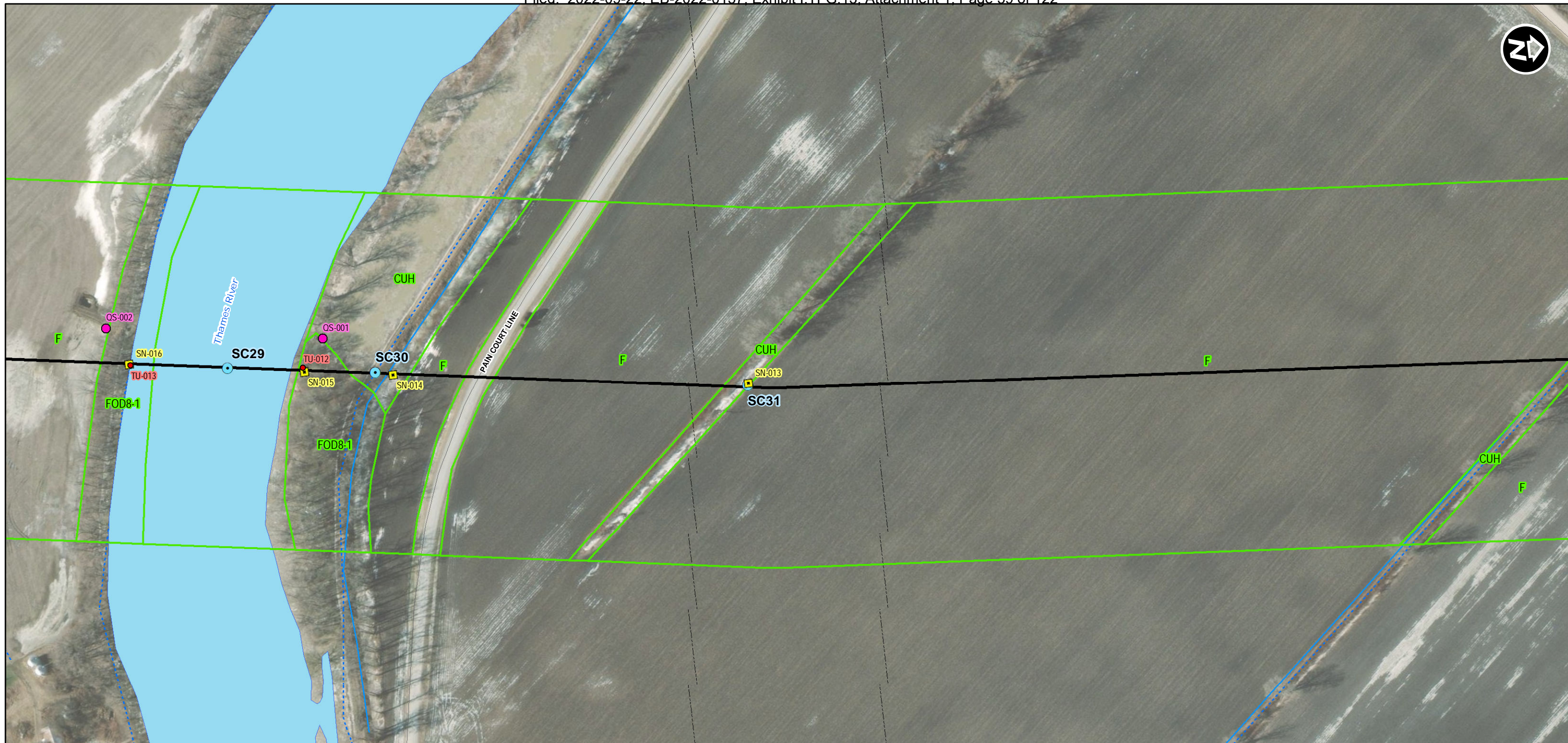
DATUM: NAD 1983 UTM Zone 17N

July 2022	1:2,500 * when printed 11"x17"	Source: MNRF 2020 Image: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community
P#: 60665521	V#:	

**AECOM** **Figure 2-15**

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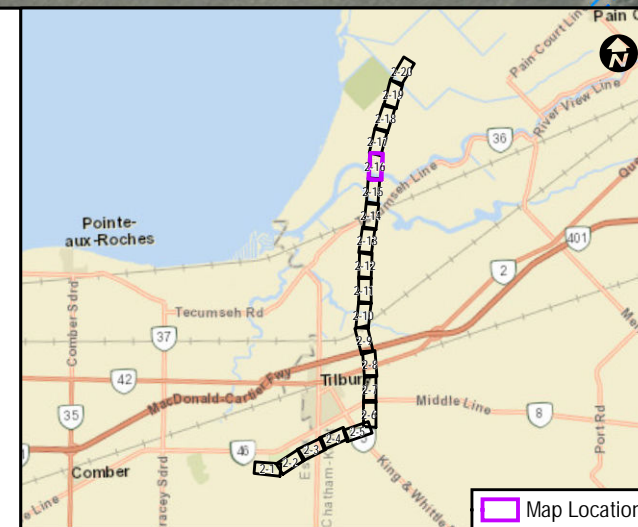
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**Legend**

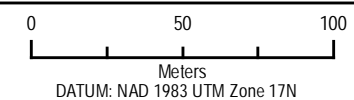
- Turtle Survey Locations
- Snake Survey Locations
- Queen Snake Survey
- Watercourse Crossing
- Preferred Route 2022-06-03
- Constructed Drain
- Watercourse
- ELC

Label	ELC Description
A	Anthropogenic
CUM1-1	Dry – Moist Old Field Meadow Type
CUH	Cultural Hedgerow
F	Agricultural Field
FOD8-1	Fresh – Moist Poplar Deciduous Forest Type
MAS2-9	Forb Mineral Shallow Marsh Type
OAO	Open Aquatic



**Panhandle Regional Expansion Project**

ELC  
Panhandle

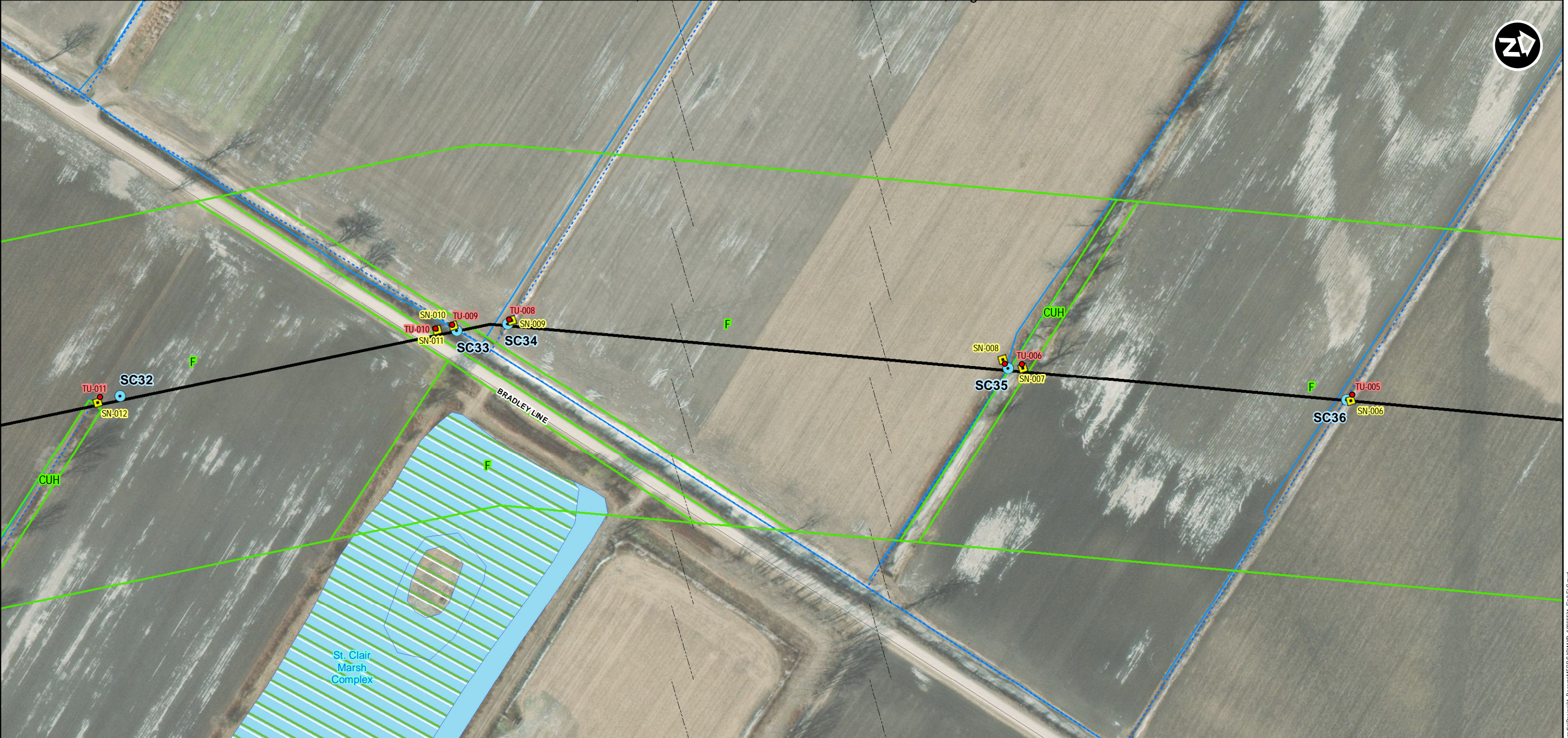


July 2022	1:2,500 * when printed 11"x17"	Source: MNRF 2020 Image: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community
P#: 60665521	V#:	



**Figure 2-16**

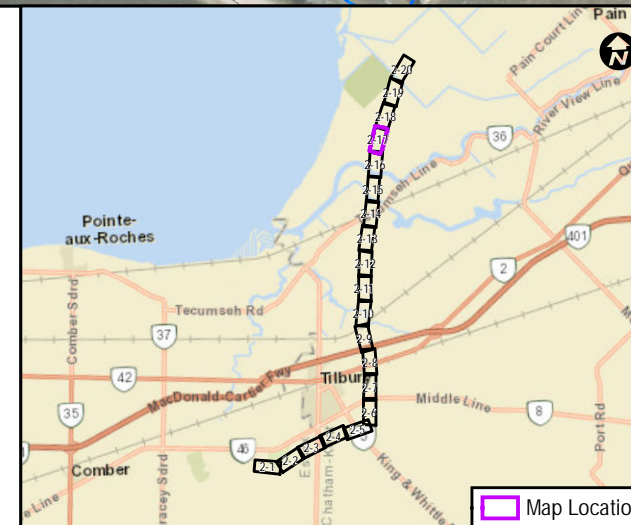
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**Legend**

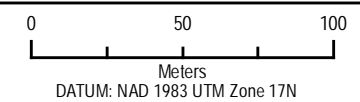
- Turtle Survey Locations
- Snake Survey Locations
- Watercourse Crossing
- Preferred Route 2022-06-03
- - - -** Constructed Drain
- Watercourse
- Provincially Significant Wetland
- ELC

Label	ELC Description
A	Anthropogenic
CUM1-1	Dry – Moist Old Field Meadow Type
CUH	Cultural Hedgerow
F	Agricultural Field
FOD8-1	Fresh – Moist Poplar Deciduous Forest Type
MAS2-9	Forb Mineral Shallow Marsh Type
OAO	Open Aquatic



**Panhandle Regional Expansion Project**

ELC  
Panhandle



July 2022	1:2,500 * when printed 11"x17"	Source: MNRF 2020 Image: Sources: Esri, HERE, Garmin, USCS, Intermap INCREMENT P, NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community
P#: 60665521	V#:	



**Figure 2-17**

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Date Saved: 2022-09-22 11:03:39 AM User Name: mrc@aec.com



**Legend**

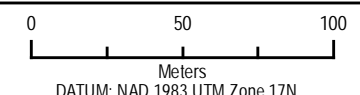
- Turtle Survey Locations
- Snake Survey Locations
- Watercourse Crossing
- Preferred Route 2022-06-03
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- Watercourse
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**Panhandle Regional Expansion Project**

ELC  
Panhandle



July 2022	1:2,500 * when printed 11"x17"	Source: MNRF 2020 Image: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community
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**Figure 2-18**

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Date Saved: 9/22/22 4:16:53 PM User Name: mrdave@ecm.com



**Legend**

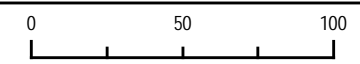
- Turtle Survey Locations
- Snake Survey Locations
- Watercourse Crossing
- Preferred Route 2022-06-03
- Constructed Drain
- Watercourse
- Provincially Significant Wetland
- ELC

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**Panhandle Regional Expansion Project**

ELC  
Panhandle



DATUM: NAD 1983 UTM Zone 17N

July 2022	1:2,500 * when printed 11"x17"	Source: MNRF 2020 Image: Sources: Esri, HERE, Garmin, USGS, Intermap INCREMENT P, NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community
P#: 60665521	V#:	

**AECOM** **Figure 2-19**

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Map location: C:\Users\mrc\OneDrive\Documents\AECOM\GIS\Projects\60665521\_Ebldg\_Panhandle\Design\01\_Report\MAPS\SUP\MXD\_06065521\_Fig2-19.mxd  
Date Saved: 2022-09-22 4:10:53 PM User Name: mrc@aec.com



**Legend**

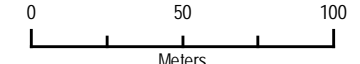
- Turtle Survey Locations
- Snake Survey Locations
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**Panhandle Regional Expansion Project**

ELC  
Panhandle



DATUM: NAD 1983 UTM Zone 17N

July 2022	1:2,500 * when printed 11"x17"	Source: MNRF 2020 Image: Sources: Esri, HERE, Garmin, USGS, Intermap INCREMENT P, NRCAn, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community
P#: 60665521	V#:	

**AECOM** **Figure 2-20**

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Map location: C:\Users\mrc\OneDrive\Documents\Projects\60665521\_Panhandle\Design\01\_Report\MAPS\SUPP\MXD\_06665521\_Fig2-ELC.mxd Date Saved: 9/20/2022 4:10:53 PM User Name: mrc@aec.com

# **Attachment A**

## **Panhandle Existing Fish Habitat Summary**



**TEMPLATE D2A: EXISTING FISH HABITAT CONDITIONS SUMMARY TABLE**

Waterbody ID	Date	Flow	Thermal Regime	Fish Habitat*	Substrate Type	Channel Morphology	Vegetation	Constraints & Opportunities	Significant Fish Habitat	Fish Community Sampling Results
SC-01A Boucher Drain	To Be Completed	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	N/A
SC-01 Unnamed Trib to Boucher Drain 001	May 10, 2022	Ephemeral	Unknown	Indirect	Silt, Sand	N/A – Dry at the time of assessment	Terrestrial Grasses	Expand riparian area	None	N/A
SC-02 Thilbert Drain	Apr 27, 2022	Permanent	Warm <sup>1</sup>	Direct <sup>1</sup>	Silt, sand, gravel	Flats(50%), Run (30%), Pool (20%)	No vegetation was present at the time of inspection	Expand riparian area, waste removal, add morphology structures	None	None
SC-03 Tremblay Creek Drain / Tilbury Creek)	Apr 27, 2022	Permanent	Warm <sup>1</sup>	Direct <sup>1</sup>	Silt, cobble, gravel	Run (100%)	No vegetation was present at the time of inspection	Stabilize right bank, Expand riparian area, Low flows could present a seasonal barrier to fish habitat	None	Emerald Shiner (36) Creek Chub (16) Yellow Bullhead (4) Pumpkinseed (1) Black Bullhead (1) Johnny Darter (1) Spottail Shiner (1) Yellow Perch (1)
SC-04 Unnamed Non-Flowing Waterbody 001	May 10, 2022	Ephemeral	Unknown	Not fish habitat	Detritus, silt, sand	Pool (100%)	Terrestrial grasses, Phragmites	Seasonal flows, expand riparian area, Remove phragmites	None	N/A

Waterbody ID	Date	Flow	Thermal Regime	Fish Habitat*	Substrate Type	Channel Morphology	Vegetation	Constraints & Opportunities	Significant Fish Habitat	Fish Community Sampling Results
SC-05 Unnamed Trib to Malott Diversion Drain 001	May 10, 2022	Intermittent	Unknown	Indirect	Silt Sand	N/A - Dry at the time of assessment	Terrestrial grasses, Phragmites	Create/Expand riparian area, seasonal low flows restrict passage	None	N/A
SC-06 Unnamed Trib to Malott Diversion Drain 002	May 10, 2022	Ephemeral	Unknown	Indirect	Silt Sand	N/A - Dry at the time of assessment	Terrestrial grasses, Phragmite	Create/Expand riparian area, seasonal low flows restrict passage	None	N/A
SC-07 Unnamed Non-Flowing Waterbody 002	Apr 27, 2022	Permanent	Unknown	Direct	Silt, sand	Flats (100%)	Unidentified floating vegetation present	Expand riparian buffer, improve morphology, remove phragmites	Lilliput mussels	Goldfish (3)
SC-08 Unnamed Non-Flowing Waterbody 003	Apr 27, 2022	Ephemeral	Unknown	Not Fish Habitat	Detritus, silt, sand	Pool (100%)	Algae, floating aquatic vegetation	Improve connectivity, Expand riparian buffer	None	N/A
SC-09 Thompson-Paulus Drain	April 27, 2022	Permanent	Unknown	Direct	Silt, Sand	Flat (100%)	Floating aquatic vegetation, some phragmites	Expand riparian buffer, improve morphology	None	None
SC-10 King and Whittle Drain	Apr 27, 2022	Permanent	Unknown	Direct	Gravel, sand, silt, cobble	Run (95%) Pool (5%)	Algae, grasses	Expand riparian area. Low flows could be a seasonal	Clean gravel bottom,	None

Waterbody ID	Date	Flow	Thermal Regime	Fish Habitat*	Substrate Type	Channel Morphology	Vegetation	Constraints & Opportunities	Significant Fish Habitat	Fish Community Sampling Results
								barrier to fish habitat.		
SC-11 Gagnier Drain	Apr 27, 2022	Permanent	Unknown	Direct	Silt, sand, gravel	Run (100%)	Algae, phragmites	Remove phragmites; low flows could present a seasonal barrier to fish habitat.	None	None
SC-12 Powell Drain	Apr 27, 2022	Permanent	Unknown	Direct	Silt (80%), gravel (10%), cobble (10%)	Run (40%) Riffle (40%) Pool (20%)	No vegetation was present at the time of inspection	Expand/ create riparian buffer	None	Emerald Shiner (1)
SC-13 Unnamed Trib to King and Whittle Drain 001	Apr 27, 2022	Intermittent	Unknown	Indirect	Silt, Sand	Run (100%)	Terrestrial grasses	Expand/ create a riparian buffer; enhance channel morphology; improve connectivity to main channel; the drop in elevation to the main channel could create a seasonal barrier to fish passage	None	None
SC-14 Iverson Drain	Apr 27, 2022	Permanent	Unknown	Indirect	Cobble (30%), gravel (10%), sand	Run (50%) Riffle (50%)	No vegetation was present at the time of inspection	Seasonal "waterfall" to main channel; remove	None	None

Waterbody ID	Date	Flow	Thermal Regime	Fish Habitat*	Substrate Type	Channel Morphology	Vegetation	Constraints & Opportunities	Significant Fish Habitat	Fish Community Sampling Results
					(30%), silt (30%)			phragmites; expand/ create riparian buffer		
SC-15 King and Whittle Drain	May 10, 2022	Permanent	Unknown	Direct	Gravel, sand, silt, cobble	Flat (100%)	Instream aquatic vegetation	Expand riparian area, improve downstream connectivity at low flows (barrier to quillback present), improve upstream water quality	Quillback and Largemouth bass spawning	Did not complete due to staging Quillback
SC-16 Anesser Drain	May 10, 2022	Permanent	Unknown	Indirect	Silt, Sand, Cobble	Run (95%), Riffle (5%)		Create / Expand riparian buffer, improve connectivity to downstream	None	None
SC-17 Unnamed Trib to King and Whittle Drain 002	Apr 27, 2022	Intermittent	Unknown	Indirect	Silt, Detritus	Flats (100%)	Algae, grasses	Clean up garbage Low flows could pose a seasonal barrier to fish	None	N/A
SC-18 King and Whittle Drain	May 10, 2022	Permanent	Unknown	Direct	Silt, Sand	Flats (100%)	Phragmites	Phragmites Removal, Create/Expand riparian buffer, Water Quality	Quillback Spawning	Did not complete due to staging Quillback

Waterbody ID	Date	Flow	Thermal Regime	Fish Habitat*	Substrate Type	Channel Morphology	Vegetation	Constraints & Opportunities	Significant Fish Habitat	Fish Community Sampling Results
								Upstream Improvement		
SC-19 Baptiste Creek	Apr 27, 2022	Permanent <sup>1</sup>	Warm <sup>1</sup>	Direct <sup>1</sup>	Did not assess	Run (100%)	No vegetation was present at the time of inspection	Stabilize vulnerable banks; plant riparian trees/shrubs	Lilliput (END), Spotted Sucker (SC), Silver Lamprey (SC), Mapleleaf (SC)	Did not complete due to SAR presence
SC-20 Unnamed Trib to Johnston Drain 001	May 11, 2022	Intermittent	Unknown	Indirect	Detritus, Silt, Clay	Flats (100%)	Terrestrial grasses	Create/Expand riparian buffer, improve connectivity	None	N/A
SC-21 Unnamed Trib to Johnston Drain 002	Apr 27, 2022	Permanent	Unknown	Direct	Silt, clay	Flats (100%)	Phragmites, unidentified submergent vegetation	Plant riparian trees or shrubs to create a buffer; low flows could cause seasonal barriers to fish passage	None	None
SC-22 Unnamed Trib to Johnston Drain 003	Apr 27, 2022	Intermittent	Unknown	Indirect	Silt (100%)	Flats (100%)	Terrestrial Grasses	Plant riparian trees or shrubs to create a riparian buffer; low flows could cause seasonal barrier to fish passage	None	N/A

Waterbody ID	Date	Flow	Thermal Regime	Fish Habitat*	Substrate Type	Channel Morphology	Vegetation	Constraints & Opportunities	Significant Fish Habitat	Fish Community Sampling Results
SC-23 Olds Drain	Apr 27, 2022	Permanent	Unknown	Direct	Silt, gravel, sand	Run (100%)	No vegetation was present at the time of inspection	Plant riparian trees or shrubs; enhance channel morphology (eg add refuge pools and meanders)	None	None
SC-24 Unnamed Trib to Olds Drain 001	Apr 27, 2022	Ephemeral	Unknown	Not fish habitat	Silt, sand	N/A (dry)	Adjacent terresatrial grasses, some terrestrial grasses in channel	Not fish habitat	None	N/A
SC-25 Forbes Internal Drain	April 27, 2022	Permanent	Unknown	Direct	Silt, Sand	Flats (100%)	No vegetation was present at the time of inspection	Bank Stabilization, expand riparian buffer	None	Did not complete due to safety concerns (steep slope)
SC-26 Unnamed Non-Flowing Waterbody 004	May 10, 2022	Intermittent	Unknown	Not fish habitat	Detritus, Silt, Sand	Pool (100%)	Phragmites	Phragmites Removal, Connectivity improvements	N/A – not fish habitat	N/A
SC-27 Jeannettes Creek	Apr 26, 2022	Permanent <sup>1</sup>	Warm <sup>1</sup>	Direct <sup>1</sup>	Did not assess	Flats (100%)	No vegetation was present at the time of inspection	Remove phragmites, shore stabilization measures, plant additional trees/shrubs to enhance Riparian zone	Silver Lamprey (SC); Spotted Sucker (SC);	Did not complete due to SAR presence

Waterbody ID	Date	Flow	Thermal Regime	Fish Habitat*	Substrate Type	Channel Morphology	Vegetation	Constraints & Opportunities	Significant Fish Habitat	Fish Community Sampling Results
SC-28 Peltier Drain	Apr 26, 2022	Permanent	Unknown	Direct	Silt (80%), Detritus (20%)	Flats (100%)	Duckweed	plant additional trees/shrubs to enhance Riparian zone	None	Goldfish (3)
SC-29 Thames River	Apr 26, 2022	Permanent <sup>1</sup>	Warm <sup>1</sup>	Direct <sup>1</sup>	Silt, sand (along shoreline at crossing)	Flats (100%)	Algae (close to shore) phragmites	Remove phragmites	DFO Critical Habitat: Fawnsfoot  DFO SAR: Hickorynut (END), Fawnsfoot (END), Threehorn Wartyback (THR), Silver Chub (END), Round Hickorynut (END), Black Redhorse (THR), Silver Shiner (THR), Eastern Sand Darter (THR), Northern Madtom (END), Pugnose	Did not complete due to SAR presence

Waterbody ID	Date	Flow	Thermal Regime	Fish Habitat*	Substrate Type	Channel Morphology	Vegetation	Constraints & Opportunities	Significant Fish Habitat	Fish Community Sampling Results
									Minnow (THR), Silvery Lamprey (SC), Northern Sunfish (SC), Spotted Sucker (SC), Mapleleaf (SC), River Redhorse (SC)	
SC-30 Unnamed Trib to Thames River 001	Apr 26, 2022	Permanent	Unknown	Direct	Detritus, Silt, Muck	Flats (100%)	Duckweed, phragmites	Remove phragmites; old rail line is providing a permanent barrier to the Thames River; low flows could cause seasonal barriers to fish passage	Iron staining present which could be an indication of groundwater inputs.  DFO SAR: Lake Chubsucker (END)	Did not complete due to SAR presence
SC-31 Unnamed Non-Flowing Waterbody 005	April 26, 2022	Intermittent	Unknown	Not fish habitat	Detritus, Silt, Sand	Pool (100%)	Phragmites	Remove Phragmites	N/A – Not fish habitat	N/A



Waterbody ID	Date	Flow	Thermal Regime	Fish Habitat*	Substrate Type	Channel Morphology	Vegetation	Constraints & Opportunities	Significant Fish Habitat	Fish Community Sampling Results
SC-32 Myers Pump Works Drain	May 10, 2022	Intermittent	Unknown	Not fish habitat	Detritus, Silt, Sand	Pool (100%)	Phragmites	Remove Phragmites	N/A – Not fish habitat	N/A
SC-33 Myers Pump Works Drain	Apr 26, 2022	Permanent <sup>1</sup>	Unknown	Direct <sup>1</sup>	Silt, Muck	Flats (100%)	Duckweed, Phragmites, Grasses	Remove phragmites; Remove berm that is restricting flows, enhance channel morphology (e.g. add refuge pools and meanders)	DFO SAR: Lake Chubsucker (END)	Did not complete due to SAR presence
SC-34 Unnamed Trib to Myers Pump Works Drain 001	Apr 26, 2022	Permanent	Unknown	Direct	Silt, muck	Flats (100%)	Phragmites, grasses	Remove phragmites; plant additional trees/shrubs to enhance Riparian zone; low flows could cause seasonal barrier to fish passage	DFO SAR: Lake Chubsucker (END)	Did not complete due to SAR presence
SC-35 Unnamed Trib to Myers Pump Works Drain 002	Apr 26, 2022	Permanent <sup>1</sup>	Unknown	Direct	Silt, sand	Flats (100%)	Duckweed	Plant riparian trees or shrubs to create a riparian buffer; vines growing off of exposed pipe downstream of	DFO Sar: Lake Chubsucker (END)	Did not complete due to SAR presence

Waterbody ID	Date	Flow	Thermal Regime	Fish Habitat*	Substrate Type	Channel Morphology	Vegetation	Constraints & Opportunities	Significant Fish Habitat	Fish Community Sampling Results
								the crossing are causing a debris jam which could cause a seasonal barrier to fish passage		
SC-36 Unnamed Trib to Myers Pump Works Drain 003	Apr 26, 2022	Permanent	Unknown	Direct <sup>2</sup>	Silt (100%)	Flats (100%)	Duckweed, grasses	Plant riparian trees or shrubs to create a riparian buffer	DFO Sar: Lake Chubsucker (END)	Did not complete due to SAR presence
PSC-37 Unnamed Trib to Myers Pump Works Drain 004	Apr 26, 2022	Permanent	Unknown	Direct <sup>2</sup>	Silt (100%)	Flats (100%)	Phragmites, duckweed	Remove phragmites; Plant riparian trees or shrubs to create a riparian buffer	DFO SAR: Lake Chubsucker (END)	Did not complete due to SAR presence
SC-38 Unnamed Trib to Myers Pump Works Drain 005	Apr 26, 2022	Permanent <sup>1</sup>	Unknown	Direct	Silt (100%)	Flats (100%)	No vegetation was present at the time of inspection.	Remove phragmites that is present downstream; fix CSPs/drain outlets; create a riparian buffer	None	Goldfish (4)
SC-39 Unnamed Trib to Myers	Apr 25, 2022	Permanent <sup>1</sup>	Unknown	Direct	Sand (30%), silt (40%), cobbles (30%)	Flats (100%)	Duckweed, phragmites, grasses	Increase riparian buffer; Remove phragmites	None	Central Mudminnow (1)

Waterbody ID	Date	Flow	Thermal Regime	Fish Habitat*	Substrate Type	Channel Morphology	Vegetation	Constraints & Opportunities	Significant Fish Habitat	Fish Community Sampling Results
Pump Works Drain 006										
SC-40 Unnamed Trib to Jacks Creek Drain / McFarlane Relief Drain	Apr 25, 2022	Permanent <sup>1</sup>	Warm <sup>1</sup>	Direct <sup>1,2</sup>	Silt, gravel	Flats (100%)	Phragmites	Remove phragmites; fix or remove gate on Balmoral Line Bridge; create a riparian buffer	DFO Sar species: Lake Chubsucker (END), Mapleleaf (SC)	Did not complete due to SAR presence
SC-41 McFarlane Relief Drain / Unnamed Trib to McFarlane Relief Drain	Apr 25, 2022	Intermittent	Unknown	Not Fish Habitat	Silt (70%), Clay (20%), Detritus (10%)	Feature was dry at the time of inspection	Terrestrial grasses	Clean up garbage; enhance channel morphology	N/A – Not fish habitat	N/A

\* Fish habitat is defined in subsection 2(1) of the Fisheries Act to include all waters frequented by fish and any other areas upon which fish depend directly or indirectly to carry out their life processes. The types of areas that can directly or indirectly support life processes include but are not limited to: spawning grounds and nursery, rearing, food supply and migration areas.

<sup>1</sup>NDMNRF, 2022: Ontario GeoHub – Aquatic resource area line segment. Accessed May 2022 from: <https://geohub.lio.gov.on.ca/datasets/aquatic-resource-area-line-segment/explore?location=42.229647%2C-82.439743%2C11.33>.

<sup>2</sup> DFO, 2022: Aquatic Species at Risk Map. Accessed May 2022 from: <https://www.dfo-mpo.gc.ca/species-especes/sara-lep/map-carte/index-eng.html>.

**Table Description:**

Waterbody ID	Name of waterbody and Crossing # / Station
Date	Insert date field investigations occurred (DD/MM/YYYY), as applicable
Flow	Ephemeral, Intermittent, Permanent
Thermal Regime	Warm, Cool, Cold
Fish Habitat	Direct, Indirect, Not Fish Habitat
Substrate Type	Boulder, cobble, rubble, gravel, sand, muck, etc.
Channel Morphology	E.g. Riffles, runs, pools, undercut banks, etc.
Vegetation	Riparian & In-stream species; emergent, submergent and floating aquatic vegetation

Constraints and Opportunities	E.g. Perched culvert, eroding bank, fish passage barrier, undersized CSP
Significant Fish Habitat	E.g. specialized habitat that supports critical life functions, areas contributing to fisheries productivity, etc.

# Attachment **B**

## **Leamington Existing Fish Habitat Summary**

**TEMPLATE D2A: EXISTING FISH HABITAT CONDITIONS SUMMARY TABLE**

<b>Waterbody ID</b>	<b>Date</b>	<b>Flow</b>	<b>Thermal Regime</b>	<b>Direct Fish Habitat*</b>	<b>Substrate Type</b>	<b>Channel Morphology</b>	<b>Vegetation</b>	<b>Constraints &amp; Opportunities</b>	<b>Significant Fish Habitat</b>	<b>Fish Community Sampling Results</b>
<b>LSC-01</b> previously (LSC-02)	April 27, 2022	Intermittent	Unknown	No	Silt Sand	Flat (100%)	Phrag / Cattail (100%)	Agricultural and Road inputs  Development of a Riparian Buffer, Phragmites Removal, Debris Removal	None	N/A
<b>SC-02</b> previously (LSC-04)	April 27, 2022	Intermittent	Unknown	No	Silt Sand	Flat (100%)	Terrestrial Grasses (30%), Cattail (40%)	Garbage Removal  Development of a Riparian Buffer, Stream Shading	None	N/A
<b>LSC-03</b> Previously (LSC-05)	April 27, 2022	Permanent	Warmwater	Yes	Silt, Sand, Cobble Gravel	Run (60%), Pool (20%), Riffle (20%)	None	Improve Riparian Buffer and Slope Stability	Potential spawning Catostomus sp.	Creek Chub (11) Bluntnose Minnow (14) White Sucker (11) Yellow Bullhead (3) Common Shiner (60) Spotfin Shiner (7) Blackside Darter (4) Fathead Minnow (2) Round Goby (2)

Waterbody ID	Date	Flow	Thermal Regime	Direct Fish Habitat*	Substrate Type	Channel Morphology	Vegetation	Constraints & Opportunities	Significant Fish Habitat	Fish Community Sampling Results
<b>LSC-04</b> Previously (LSC-06)	April 27, 2022	Permanent	Warmwater	Yes	Silt Sand Cobble Gravel	Run (50%), Pool (20%), Riffle (30%)	Submergent (10%), Overhanging Veg (10%)	Improve Riparian Buffer and Slope Stability	None	Creek Chub (12) Common Shiner (19) Bluntnose Minnow (55) Green Sunfish (2) Fathead Minnow (6) Johnny Darter (18)
<b>LSC-05</b> Previously (LSC-06B)	April 27, 2022	Ephemeral	Unknown	No	Silt Sand	Pool (100%)	Terrestrial Grass (70%)	Develop Riparian Buffer	None	N/A
<b>LSC-06</b> Previously (LSC-06C)	April 27, 2022	Intermittent	Unknown	No	Silt Sand	Flat (100%)	Phragmites / Terrestrial Grasses (100%)	Remove Phragmites, Develop Riparian Buffer	None	N/A
<b>LSC-07</b> Previously (LSC-07)	April 27, 2022	Permanent	Unknown	Yes	Silt Sand	Flat (100%)	Phragmites (30%)	Develop Riparian Buffer, Remove Phragmites	None	None
<b>LSC-08</b> Previously (LSC-08)	April 27, 2022	Permanent	Unknown	Yes	Silt Sand	Flat (90%) Pool (10%)	None	Develop Riparian Buffer, Remove Phragmites	None	Creek Chub (51) Green Sunfish (20) Bluntnose Minnow (4) Yellow Bullhead (1) Fathead Minnow (2) Common Shiner (1) Spottfin Shiner (1)
<b>LSC-09</b> Previously (LSC-08A or 09A)	April 27, 2022	Intermittent	Unknown	No	Silt Sand	Flat (100%)	Phragmites (100%)	Develop Riparian Buffer, Remove Phragmites	None	N/A

Waterbody ID	Date	Flow	Thermal Regime	Direct Fish Habitat*	Substrate Type	Channel Morphology	Vegetation	Constraints & Opportunities	Significant Fish Habitat	Fish Community Sampling Results
LSC-10 Previously (LSC-09B)	April 27, 2022	Intermittent	Unknown	No	Silt Sand	Flat (100%)	Phragmites (70%)	Develop Riparian Buffer, Remove Phragmites	None	N/A
LSC-11 Previously (LSC-09)	April 27, 2022	Permanent	Warmwater	Yes	Silt Sand	Run (80%), Pool (20%)	Submergent algae (20%)	Improve Riparian Buffer and Slope Stability	None	Creek Chub (34) Fathead Minnow (21) Bluntnose Minnow (18) Spotfin Shiner (7) Bluegill (1) Round Goby (2) Johnny Darter (1)

\* Fish habitat is defined in subsection 2(1) of the Fisheries Act to include all waters frequented by fish and any other areas upon which fish depend directly or indirectly to carry out their life processes. The types of areas that can directly or indirectly support life processes include but are not limited to: spawning grounds and nursery, rearing, food supply and migration areas.

<sup>1</sup>NDMNRF, 2022: Ontario GeoHub – Aquatic resource area line segment. Accessed May 2022 from: <https://geohub.lio.gov.on.ca/datasets/aquatic-resource-area-line-segment/explore?location=42.229647%2C-82.439743%2C11.33>.

<sup>2</sup> DFO, 2022: Aquatic Species at Risk Map. Accessed May 2022 from: <https://www.dfo-mpo.gc.ca/species-especes/sara-lep/map-carte/index-eng.html>.

**Table Description:**

Waterbody ID	Name of waterbody and Crossing # / Station
Date	Insert date field investigations occurred (DD/MM/YYYY), as applicable
Flow	Ephemeral, Intermittent, Permanent
Thermal Regime	Warm, Cool, Cold
Fish Habitat	Direct, Indirect, Not Fish Habitat
Substrate Type	Boulder, cobble, rubble, gravel, sand, muck, etc.
Channel Morphology	E.g. Riffles, runs, pools, undercut banks, etc.
Vegetation	Riparian & In-stream species; emergent, submergent and floating aquatic vegetation



Constraints and Opportunities	E.g. Perched culvert, eroding bank, fish passage barrier, undersized CSP
Significant Fish Habitat	E.g. specialized habitat that supports critical life functions, areas contributing to fisheries productivity, etc.

# Attachment **C**

## Plant List

### Attachment C: Vascular Plant List

Botanical Name										Plant Species Information								ELC ID#:	1	2	3	4	5	6	7	8
Common Name	Scientific Name	Family	CC	CW	Native Status	Invasive (Y/N)	SRANK	SARO	CK	ELC Code:	FOD2-2	FOD8-1	FOD9-4	MAS2-9a	MAS2-9b	CUP1	CUH/CUM1-1P	CUH/CUM1-1L								
Manitoba Maple	<i>Acer negundo</i>	Aceraceae	0	0	N	Y	S5		X		X						X	X								
( <i>Acer rubrum</i> X <i>Acer saccharinum</i> )	<i>Acer x freemanii</i>	Aceraceae	6	0	N	N	SNA		0			X					X	X								
Bentgrass sp.	<i>Agrostis</i> sp.	Poaceae																X								
Water-plantain sp.	<i>Alisma</i> sp.	Alismataceae												X												
Garlic Mustard	<i>Alliaria petiolata</i>	Brassicaceae	0	0	I	Y	SE5		IX								X	X								
Common Ragweed	<i>Ambrosia artemisiifolia</i>	Asteraceae	0	3	N	N	S5		X									X								
Great Ragweed	<i>Ambrosia trifida</i>	Asteraceae	0	0	N	N	S5		X								X	X								
Canada Anemone	<i>Anemonastrum canadense</i>	Ranunculaceae	3	-3	N	N	S5		R								X									
Hemp Dogbane	<i>Apocynum cannabinum</i>	Apocynaceae	3	0	N	N	S5		0								X									
Common Burdock	<i>Arctium minus</i>	Asteraceae	0	3	I	N	SE5		IX		X						X	X								
Swamp Milkweed	<i>Asclepias incarnata</i>	Asclepiadaceae	6	-5	N	N	S5		X			X														
Common Milkweed	<i>Asclepias syriaca</i>	Apocynaceae	0	5	N	N	S5		X						X		X	X								
Garden Asparagus	<i>Asparagus officinalis</i>	Liliaceae	0	3	I	N	SE5		IX								X	X								
Beggarticks sp.	<i>Bidens</i> sp.	Asteraceae									X															
Smooth Brome	<i>Bromus inermis</i>	Poaceae	0	5	I	Y	SE5		IX		X							X								
Downy Brome	<i>Bromus tectorum</i>	Poaceae	0	5	I	N	SE5		IX								X									
Flowering-rush	<i>Butomus umbellatus</i>	Butomaceae	0	-5	I	Y	SE5		IX					X			X	X								
Woodland Sedge	<i>Carex blanda</i>	Cyperaceae	3	0	N	N	S5		X			X														
Canada Moonseed	<i>Menispermum canadense</i>	Menispermaceae	7	0	N	N	S4		X								X									
Crested Sedge	<i>Carex cristatella</i>	Cyperaceae	3	-3	N	N	S5		X								X									
Limestone Meadow Sedge	<i>Carex granularis</i>	Cyperaceae	3	-3	N	N	S5		X								X									
Gray's Sedge	<i>Carex grayi</i>	Cyperaceae	8	-3	N	N	S4		X			X														
Grey Sedge	<i>Carex grisea</i>	Cyperaceae	8	0	N	N	S4		X			X														
Shoreline Sedge	<i>Carex hyalinolepis</i>	Cyperaceae	4	-5	N	N	S4		R									X								
Inland Sedge	<i>Carex interior</i>	Cyperaceae	6	-5	N	N	S5		R			X														
Troublesome Sedge	<i>Carex molesta</i>	Cyperaceae	5	0	N	N	S4S5		X								X	X								
Necklace Sedge	<i>Carex projecta</i>	Cyperaceae	5	-3	N	N	S5		R			X														
Rosy Sedge	<i>Carex rosea</i>	Cyperaceae	2	5	N	N	S5		X			X														
Emory's Sedge	<i>Carex emoryi</i>	Cyperaceae	8	-5	N	N	S4		X								X									
Spiked Sedge	<i>Carex spicata</i>	Cyperaceae	0	3	I	N	SE5		IX								X									
Awl-fruited Sedge	<i>Carex stipata</i>	Cyperaceae	3	-5	N	N	S5		X								X									
Swan's Sedge	<i>Carex swanii</i>	Cyperaceae	7	3	N	N	S4		R																	
Fox Sedge	<i>Carex vulpinoidea</i>	Cyperaceae	3	-5	N	N	S5		X			X					X									
Sedge sp. 1	<i>Carex</i> sp. 1	Cyperaceae															X									
Sedge sp. 2	<i>Carex</i> sp. 2	Cyperaceae															X									
Eastern Redbud	<i>Cercis canadensis</i>	Fabaceae	8	3	N	N	SX		0						X											
Common Lamb's-quarters	<i>Chenopodium album</i>	Chenopodiaceae	0	3	I	N	SE5		IX								X									
Wild Chicory	<i>Cichorium intybus</i>	Asteraceae	0	3	I	N	SE5		IX									X								
Broad-leaved Enchanter's Nightshade	<i>Circaea canadensis</i>	Onagraceae	2	3	N	N	S5		X			X					X									
Canada Thistle	<i>Cirsium arvense</i>	Asteraceae	0	3	I	Y	SE5		IX								X	X								
Bull Thistle	<i>Cirsium vulgare</i>	Asteraceae	0	3	I	N	SE5		IX		X						X									
Field Bindweed	<i>Convolvulus arvensis</i>	Convolvulaceae	0	5	I	N	SE5		IX								X	X								
Silky Dogwood	<i>Cornus obliqua</i>	Cornaceae	2	-3	N	N	S5		X		X						X									
Grey Dogwood	<i>Cornus racemosa</i>	Cornaceae	2	0	N	N	S5		X						X		X	X								
Cockspur Hawthorn	<i>Crataegus crus-galli</i>	Rosaceae	4	0	N	N	S4		X						X		X									
Hawthorn sp.	<i>Crataegus</i> sp.	Rosaceae																X								
English Hawthorn	<i>Crataegus monogyna</i>	Rosaceae	0	3	I	Y	SE4		IR								X									
Canada Honewort	<i>Cryptotaenia canadensis</i>	Apiaceae	5	0	N	N	S5		X									X								
Orchard Grass	<i>Dactylis glomerata</i>	Poaceae	0	3	I	N	SE5		IX								X	X								
Wild Carrot	<i>Daucus carota</i>	Apiaceae	0	5	I	N	SE5		IX		X						X	X								
Swamp Loosestrife	<i>Decodon verticillatus</i>	Lythraceae	7	-5	N	N	S5		R				X													
Flixweed	<i>Descurainia sophia</i>	Brassicaceae	0	5	I	N	SE5		IX								X									
Common Teasel	<i>Dipsacus fullonum</i>	Dipsacaceae	0	3	I	Y	SE5		IX								X	X								
Spikerush sp.	<i>Eleocharis</i> sp.	Cyperaceae												X			X									
Quackgrass	<i>Elymus repens</i>	Poaceae	0	3	I	N	SE5		IX		X							X								
Field Horsetail	<i>Equisetum arvense</i>	Equisetaceae	0	0	N	N	S5		X								X	X								
Canada Horseweed	<i>Erigeron canadensis</i>	Asteraceae	0	3	N	N	S5		X								X									
Philadelphia Fleabane	<i>Erigeron philadelphicus</i>	Asteraceae	1	-3	N	N	S5		X		X							X								
Fleabane sp.	<i>Erigeron</i> sp.	Asteraceae															X									
Wormseed Wallflower	<i>Erysimum cheiranthoides</i>	Brassicaceae	0	3	N	N	S5		IX									X								
Running Strawberry-bush	<i>Euonymus obovatus</i>	Celastraceae	6	3	N	N	S4		X			X														
Wild Strawberry	<i>Fragaria virginiana</i>	Rosaceae	2	3	N	N	S5		X								X									
Red Ash	<i>Fraxinus pennsylvanica</i>	Oleaceae	3	-3	N	N	S4		X		X						X	X								
Common Bedstraw	<i>Galium aparine</i>	Rubiaceae	4	3	N	N	S5		X			X					X									
Canada Avens	<i>Geum canadense</i>	Rosaceae	3	0	N	N	S5		X			X														
Honey Locust	<i>Gleditsia triacanthos</i>	Fabaceae	8	0	N	N	S2?		R								X									
Fowl Mannagrass	<i>Glyceria striata</i>	Poaceae	3	-5	N	N	S5		X			X														
Dame's Rocket	<i>Hesperis matronalis</i>	Brassicaceae	0	3	I	Y	SE5		IX								X	X								
Swamp Rose-mallow	<i>Hibiscus moscheutos</i>	Malvaceae	9	-5	N	N	S3	SC	X				X													
Foxtail Barley	<i>Hordeum jubatum</i>	Poaceae	0	0	N	N	S5?		0								X									
European Frog-bit	<i>Hydrocharis morsus-ranae</i>	Hydrocharitaceae	0	-5	I	Y	SE5		IR				X													
Virginia Waterleaf	<i>Hydrophyllum virginianum</i>	Hydrophyllaceae	6	0	N	N	S5		X			X														

## Attachment C: Vascular Plant List

Common Name	Scientific Name	Family	CC	CW	Native Status	Invasive (Y/N)	SRANK	SARO	CK	ELC Code:	FOD2-2	FOD8-1	FOD9-4	MAS2-9a	MAS2-9b	CUP1	CUH/CUM1-1P	CUH/CUM1-1L
Spotted Jewelweed	<i>Impatiens capensis</i>	Balsaminaceae	4	-3	N	N	S5		X		X	X				X		X
Harlequin Blue Flag	<i>Iris versicolor</i>	Iridaceae	5	-5	N	N	S5		X								X	
Black Walnut	<i>Juglans nigra</i>	Juglandaceae	5	3	N	N	S4?		X							X		X
Dudley's Rush	<i>Juncus dudleyi</i>	Juncaceae	1	-3	N	N	S5		X		X					X		
Eastern Red Cedar	<i>Juniperus virginiana</i>	Cupressaceae	4	3	N	N	S5		X							X		X
Small Duckweed	<i>Lemna minor</i>	Lemnaceae	5	-5	N	N	S5?		X		X			X		X		
Field Peppergrass	<i>Lepidium campestre</i>	Brassicaceae	0	5	I	N	SE5		IX		X							
Butter-and-eggs	<i>Linaria vulgaris</i>	Scrophulariaceae	0	5	I	N	SE5		IX								X	
Meadow Ryegrass	<i>Lolium pratense</i>	Poaceae	0	3	I	N	SE5		IX		X						X	X
Morrow's Honeysuckle	<i>Lonicera morrowii</i>	Caprifoliaceae	0	3	I	Y	SE3		0								X	
Tatarian Honeysuckle	<i>Lonicera tatarica</i>	Caprifoliaceae	0	3	I	Y	SE5		IX								X	
Garden Bird's-foot Trefoil	<i>Lotus corniculatus</i>	Fabaceae	0	3	I	Y	SE5		IX									X
American Water-horehound	<i>Lycopus americanus</i>	Lamiaceae	4	-5	N	N	S5		X		X							
Common Apple	<i>Malus pumila</i>	Rosaceae	0	5	I	N	SE4		IX								X	
Common Mallow	<i>Malva neglecta</i>	Malvaceae	0	5	I	N	SE5		IX									X
Black Medick	<i>Medicago lupulina</i>	Fabaceae	0	3	I	N	SE5		IX									X
Yellow Sweet-clover	<i>Mellilotus officinalis</i>	Fabaceae	0	3	I	Y	SE5		IX									X
White Mulberry	<i>Morus alba</i>	Moraceae	0	0	I	Y	SE5		IX								X	X
Fragrant Water-lily	<i>Nymphaea odorata</i>	Nymphaeaceae	5	-5	N	N	S5		R					X				
Evening-primrose sp.	<i>Oenothera sp.</i>	Onagraceae															X	
Thicket Creeper	<i>Parthenocissus vitacea</i>	Vitaceae	4	3	N	N	S5		X		X	X				X		X
Wild Parsnip	<i>Pastinaca sativa</i>	Apiaceae	0	5	I	Y	SE5		IX								X	
Virginia Smartweed	<i>Persicaria virginiana</i>	Polygonaceae	6	0	N	N	S4		X			X						
Reed Canarygrass	<i>Phalaris arundinacea</i>	Poaceae	0	-3	N	Y	S5		X		X						X	X
European Reed	<i>Phragmites australis ssp. australis</i>	Poaceae	0	-3	I	Y	SE5		IC					X			X	X
Norway Spruce	<i>Picea abies</i>	Pinaceae	0	5	I	N	SE3		IX								X	
English Plantain	<i>Plantago lanceolata</i>	Plantaginaceae	0	3	I	N	SE5		IX								X	X
Rugel's Plantain	<i>Plantago rugelii</i>	Plantaginaceae	1	0	N	N	S5		X								X	
Sycamore	<i>Platanus occidentalis</i>	Platanaceae	8	-3	N	N	S4		X							X		
Canada Bluegrass	<i>Poa compressa</i>	Poaceae	0	3	I	N	SE5		IX								X	
Kentucky Bluegrass	<i>Poa pratensis</i>	Poaceae	0	3	N	N	S5		0							X		X
May-apple	<i>Podophyllum peltatum</i>	Berberidaceae	5	3	N	N	S5		X			X						
Rough Avenas	<i>Geum laciniatum</i>	Rosaceae	4	-3	N	N	S4		R								X	X
Eastern Cottonwood	<i>Populus deltoides</i>	Salicaceae	4	0	N	N	S5		0		X						X	
Large-toothed Aspen	<i>Populus grandidentata</i>	Salicaceae	5	3	N	N	S5		X		X							
Curly-leaved Pondweed	<i>Potamogeton crispus</i>	Potamogetonaceae	0	-5	I	Y	SE5		IX									X
Pondweed sp.	<i>Potamogeton sp.</i>	Potamogetonaceae													X			
Canada Plum	<i>Prunus nigra</i>	Rosaceae	4	3	N	N	S4		R								X	
Shagbark Hickory	<i>Carya ovata</i>	Juglandaceae	6	3	N	N	S5		X		X	X					X	
Black Cherry	<i>Prunus serotina</i>	Rosaceae	3	3	N	N	S5		X								X	
Chokecherry	<i>Prunus virginiana</i>	Rosaceae	2	3	N	N	S5		X			X					X	
Swamp White Oak	<i>Quercus bicolor</i>	Fagaceae	8	-3	N	N	S4		X			X						X
Bur Oak	<i>Quercus macrocarpa</i>	Fagaceae	5	3	N	N	S5		X		X	X			X		X	
Swamp Pin Oak	<i>Quercus palustris</i>	Fagaceae	9	-3	N	N	S4		R			X				X		
Northern Red Oak	<i>Quercus rubra</i>	Fagaceae	6	3	N	N	S5		X			X				X		X
Kidney-leaved Buttercup	<i>Ranunculus abortivus</i>	Ranunculaceae	2	0	N	N	S5		X			X						
Cursed Buttercup	<i>Ranunculus sceleratus</i>	Ranunculaceae	2	-5	N	N	S5		0								X	
Smooth Sumac	<i>Rhus glabra</i>	Anacardiaceae	7	5	N	N	S5		R								X	
Staghorn Sumac	<i>Rhus typhina</i>	Anacardiaceae	1	3	N	N	S5		X		X						X	X
Eastern Prickly Gooseberry	<i>Ribes cynosbati</i>	Grossulariaceae	4	3	N	N	S5		X			X						
Dog Rose	<i>Rosa canina</i>	Rosaceae	0	5	I	N	SE2		IX								X	
Multiflora Rose	<i>Rosa multiflora</i>	Rosaceae	0	3	I	Y	SE5		IX		X						X	
Red Raspberry	<i>Rubus idaeus</i>	Rosaceae	2	3	N	N	S5		0		X	X	X				X	X
Black Raspberry	<i>Rubus occidentalis</i>	Rosaceae	2	5	N	N	S5		X								X	
Curled Dock	<i>Rumex crispus</i>	Polygonaceae	0	0	I	N	SE5		IX		X						X	X
Broad-leaved Arrowhead	<i>Sagittaria latifolia</i>	Alismataceae	4	-5	N	N	S5		X				X				X	
Sandbar Willow	<i>Salix interior</i>	Salicaceae	1	-3	N	N	S5		X						X		X	
(Salix alba X Salix euixina)	<i>Salix x fragilis</i>	Salicaceae	0	0	I	N	SNA		hyb		X						X	
Common Elderberry	<i>Sambucus canadensis</i>	Caprifoliaceae	5	-3	N	N	S5		X								X	
Dark-green Bulrush	<i>Scirpus atrovirens</i>	Cyperaceae	3	-5	N	N	S5		X								X	
Common Ragwort	<i>Senecio vulgaris</i>	Asteraceae	0	5	I	N	SE5		IX								X	
Bittersweet Nightshade	<i>Solanum dulcamara</i>	Solanaceae	0	0	I	Y	SE5		IX								X	
Tall Goldenrod	<i>Solidago altissima</i>	Asteraceae	1	3	N	N	S5		0							X	X	
Canada Goldenrod	<i>Solidago canadensis</i>	Asteraceae	1	3	N	N	S5		0							X		
Goldenrod sp.	<i>Solidago sp.</i>	Asteraceae										X				X	X	X
Sow-thistle sp.	<i>Sonchus sp.</i>	Asteraceae															X	
New England Aster	<i>Symphotrichum novae-angliae</i>	Asteraceae	2	-3	N	N	S5		X								X	
Aster sp.	<i>Symphotrichum sp.</i>	Asteraceae												X			X	
Common Lilac	<i>Syringa vulgaris</i>	Oleaceae	0	5	I	Y	SE5		0								X	
Common Dandelion	<i>Taraxacum officinale</i>	Asteraceae	0	3	I	N	SE5		IX								X	X
Field Pennycress	<i>Thlaspi arvense</i>	Brassicaceae	0	5	I	N	SE5		IX								X	X
Eastern White Cedar	<i>Thuja occidentalis</i>	Cupressaceae	4	-3	N	N	S5		0								X	
Basswood	<i>Tilia americana</i>	Tiliaceae	4	3	N	N	S5		X			X				X		
Poison Ivy	<i>Toxicodendron radicans</i>	Anacardiaceae	2	0	N	N	S5		0		X	X					X	X
Purple Goatsbeard	<i>Tragopogon porrifolius</i>	Asteraceae	0	5	I	N	SE4?		0									X

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Common Name	Scientific Name	Family	CC	CW	Native Status	Invasive (Y/N)	SRANK	SARO	CK	ELC Code:	FOD2-2	FOD8-1	FOD9-4	MAS2-9a	MAS2-9b	CUP1	CUH/CUM1-1P	CUH/CUM1-1L
Meadow Goatsbeard	Tragopogon pratensis	Asteraceae	0	5	I	N	SE5		IX								X	X
Red Clover	Trifolium pratense	Fabaceae	0	3	I	N	SE5		IX								X	X
Broad-leaved Cattail	Typha latifolia	Typhaceae	1	-5	N	N	S5		X						X			
(Typha angustifolia X Typha latifolia)	Typha x glauca	Typhaceae		-5	N	Y	SNA		0								X	
White Elm	Ulmus americana	Ulmaceae	3	-3	N	N	S5		X		X	X				X	X	X
Moth Mullein	Verbascum blattaria	Scrophulariaceae	0	3	I	N	SE5		IX									X
Common Mullein	Verbascum thapsus	Scrophulariaceae	0	5	I	N	SE5		IX								X	
Wingstem	Verbesina alternifolia	Asteraceae	5	-3	N	N	S3		X		X							
Cranberry Viburnum	Viburnum opulus	Caprifoliaceae	5	-3	N	N	S5		0								X	
Tufted Vetch	Vicia cracca	Fabaceae	0	5	I	Y	SE5		IX								X	X
Riverbank Grape	Vitis riparia	Vitaceae	0	0	N	N	S5		X		X					X	X	X
Common Prickly-ash	Zanthoxylum americanum	Rutaceae	3	3	N	N	S5		X	X		X					X	

Floristic Summary and Analysis for Entire Study Area Summary			
Total Species:	159	N/A	
Native Species:	94	59%	
Introduced Species:	52	33%	
Invasive Species:	23	14%	
ESA Status			
END	0	0%	
THR	0	0%	
SC	1	1%	
COSEWIC Status			
END	0	0%	
THR	0	0%	
SC	1	1%	
Provincially Rare (S-rank of S1-S3)			
S1	0	0%	
S1?	0	0%	
S1S2	0	0%	
S1S3	0	0%	
S2	0	0%	
S2?	1	1%	
S2S3	0	0%	
S2S4	0	0%	
S3	2	1%	
S3?	0	0%	
S3S4	0	0%	
<b>Total S1-S3:</b>	<b>3</b>	<b>2%</b>	
Local Rank			
0	18	11%	
hyb	1	1%	
IC	1	1%	
IR	2	1%	
IX	46	29%	
R	12	8%	
X	67	42%	
Co-efficient of Conservatism and Floral Quality Index			
Co-efficient of Conservatism (CC) (average):	<b>36.25</b>		
CC 0 to 3	lowest sensitivity	97	103%
CC 4 to 6	moderate sensitivity	35	37%
CC 7 to 8	high sensitivity	11	12%
CC 9 to 10	highest sensitivity	2	2%
Floral Quality Index (FQI)			
FQI:	<b>351.46</b>		
Presence of Wetland Species			
Wetness Value (CW) (average):	<b>29.2</b>		
upland	5	23	14%
facultative upland	2 to 4	52	33%
facultative	1 to -1	27	17%
facultative wetland	-2 to -4	23	14%
obligate wetland	-5	21	13%
Physiognomy			
Plant Form	No. of Total Species	% of Total Species	
Fern	1	1%	
Forb	65	45%	
Grass	11	8%	
RU	1	1%	
Sedge	16	11%	
Shrub	23	16%	
Trees	22	15%	

Floristic Summary and Analysis Per ELC Summary									
Total Species:	5	31	34	6	9	17	105	58	
Native Species:	5	19	33	5	3	15	58	26	
Introduced Spe	0	11	0	1	2	0	40	29	
Invasive Specie	0	5	0	1	2	0	18	13	
ESA Status									
END	0	0	0	0	0	0	0	0	0
THR	0	0	0	0	0	0	0	0	0
SC	0	0	0	1	0	0	0	0	0
COSEWIC Status									
END	0	0	0	0	0	0	0	0	0
THR	0	0	0	0	0	0	0	0	0
SC	0	0	0	1	0	0	0	0	0
Provincially Rare (S-rank of S1-S3)									
S1	0	0	0	0	0	0	0	0	0
S1?	0	0	0	0	0	0	0	0	0
S1S2	0	0	0	0	0	0	0	0	0
S1S3	0	0	0	0	0	0	0	0	0
S2	0	0	0	0	0	0	0	0	0
S2?	0	0	0	0	0	0	1	0	0
S2S3	0	0	0	0	0	0	0	0	0
S2S4	0	0	0	0	0	0	0	0	0
S3	0	1	0	1	0	0	0	0	0
S3?	0	0	0	0	0	0	0	0	0
S3S4	0	0	0	0	0	0	0	0	0
<b>Total S1-S3:</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>
Local Rank									
0	1	4	3	0	1	3	13	5	
hyb	0	1	0	0	0	0	0	1	
IC	0	0	0	0	0	0	1	1	
IR	0	0	0	1	0	0	1	0	
IX	0	9	0	0	1	0	35	28	
R	0	0	4	2	0	1	5	2	
X	4	16	25	3	3	10	42	19	
Co-efficient of Conservatism and Floral Quality Index									
Co-efficient of (	<b>3.6</b>	<b>1.633333333</b>	<b>4.484848485</b>	<b>5.16666667</b>	<b>1.4</b>	<b>3.733333333</b>	<b>1.793814433</b>	<b>1.181818182</b>	
CC 0 to 3	3	23	13	1	4	7	74	45	
CC 4 to 6	2	7	15	3	1	5	19	9	
CC 7 to 8	0	0	4	1	0	2	4	1	
CC 9 to 10	0	0	1	1	0	1	0	0	
Floral Quality Index (FQI)									
FQI:	<b>8.05</b>	<b>7.12</b>	<b>11.55</b>	<b>2.42</b>	<b>14.46</b>	<b>13.66</b>	<b>6.03</b>		
Presence of Wetland Species									
Wetness Value	<b>1.8</b>	<b>0.1</b>	<b>0.393939394</b>	<b>-5</b>	<b>-4.2</b>	<b>1.533333333</b>	<b>0.959183673</b>	<b>1.327272727</b>	
upland	0	3	1	0	0	1	18	8	
facultative upla	4	9	14	0	0	9	34	24	
facultative	0	7	8	0	0	2	20	12	
facultative wetl.	1	8	8	0	2	3	16	8	
obligate wetlan	0	3	2	6	3	0	10	3	

## Attachment C: Vascular Plant List

Common Name	Scientific Name	Family	CC	CW	Native Status	Invasive (Y/N)	SRANK	SARO	CK	ELC Code:	FOD2-2	FOD8-1	FOD9-4	MAS2-9a	MAS2-9b	CUP1	CUH/CUM1-1P	CUH/CUM1-1L	
Vine		2																	
Woody Vine		5																	
(blank)																			
<b>Grand Total</b>		<b>146</b>																	<b>100%</b>

# Glossary

SARO Status	
RANK	DEFINITION
EXP	<b>Extirpated</b> - A species that no longer exists in the wild in Ontario but still occurs elsewhere.
END	<b>Endangered</b> - A species facing imminent extinction or extirpation in Ontario.
THR	<b>Threatened</b> - A species that is at risk of becoming endangered in Ontario if limiting factors are not reversed.
SC	<b>Special Concern</b> - A species with characteristics that make it sensitive to human activities or natural events.

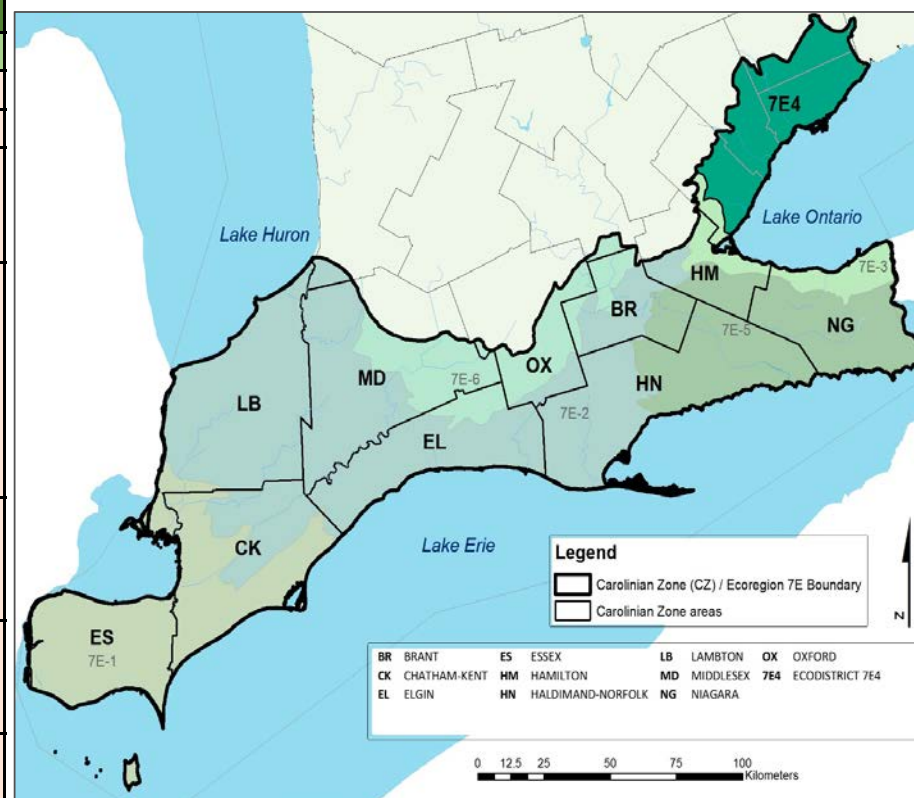
National (N) and Subnational (S) Conservation Status Ranks	
RANK	DEFINITION
NX	<b>Presumed Extirpated</b> - Species or ecosystem is believed to be extirpated from the jurisdiction (i.e., nation, or state/province). Not located despite intensive searches of historical sites and other appropriate habitat, and virtually no likelihood that it will be rediscovered. [equivalent to "Regionally Extinct" in IUCN Red List terminology]
SX	
NH	<b>Possibly Extirpated</b> - Known from only historical records but still some hope of rediscovery. There is evidence that the species or ecosystem may no longer be present in the jurisdiction, but not enough to state this with certainty. Examples of such evidence include (1) that a species has not been documented in approximately 20-40 years despite some searching and/or some evidence of significant habitat loss or degradation; (2) that a species or ecosystem has been searched for unsuccessfully, but not thoroughly enough to presume that it is no longer present in the jurisdiction.
SH	
N1	<b>Critically Imperiled</b> - At very high risk of extirpation in the jurisdiction due to very restricted range, very few populations or occurrences, very steep declines, severe threats, or other factors.
S1	
N2	<b>Imperiled</b> - At high risk of extirpation in the jurisdiction due to restricted range, few populations or occurrences, steep declines, severe threats, or other factors.
S2	
N3	<b>Vulnerable</b> — At moderate risk of extirpation in the jurisdiction due to a fairly restricted range, relatively few populations or occurrences, recent and widespread declines, threats, or other factors.
S3	
N4	<b>Apparently Secure</b> - At a fairly low risk of extirpation in the jurisdiction due to an extensive range and/or many populations or occurrences, but with possible cause for some concern as a result of local recent declines, threats, or other factors.
S4	
N5	<b>Secure</b> - At very low or no risk of extirpation in the jurisdiction due to a very extensive range, abundant populations or occurrences, with little to no concern from declines or threats.
S5	

Variant National and Subnational Conservation Status Ranks	
RANK	DEFINITION
N#	<b>Range Rank</b> - A numeric range rank (e.g., S2S3 or S1S3) is used to indicate any range of uncertainty about the status of the species or ecosystem. Ranges cannot skip more than two ranks (e.g., SU is used rather than S1S4).
S#	

<b>NU</b>	<b>Unrankable</b> - Currently unrankable due to lack of information or due to substantially conflicting information about status or trends.
<b>SU</b>	
<b>NNR</b>	<b>Unranked</b> - National or subnational conservation status not yet assessed.
<b>SNR</b>	
<b>NNA</b>	<b>Not Applicable</b> - A conservation status rank is not applicable because the species or ecosystem is not a suitable target for conservation activities (e.g., long distance aerial and aquatic migrants, hybrids without conservation value, and non-native species or ecosystems (see Master et al. 2012, Appendix A, pg 70 for further details).
<b>SNA</b>	
<b>Not Provided</b>	Species or ecosystem is known to occur in this nation or state/province. Contact the appropriate NatureServe network program for assignment of conservation status.

Rank Qualifier	
RANK	DEFINITION
<b>N#?</b>	<b>Inexact Numeric Rank</b> - Denotes inexact numeric rank; this should not be used with any of the Variant National or Subnational Conservation Status Ranks, or NX, SX, NH, or SH.
<b>S#?</b>	

Carolinian Status	
REGION	DEFINITION
<b>CZ</b>	<b>CZ status</b> (see below)
<b>RANK</b>	<b>DEFINITION</b>
<b>H</b>	<b>Historic.</b> Native in all Carolinian Zone areas and no known records for at least 30 years in all areas where native and ranked (i.e. not X). Occasionally used for a native species known to be extirpated from its only known Carolinian Zone location(s).
<b>R</b>	<b>Rare.</b> Native to the Carolinian Zone and (a) rare (as defined in source lists; sometimes including "very uncommon") or historic (no records in $\geq 30$ years) in more than half of the Carolinian Zone areas ( $\geq 6$ ) in which it is native and ranked (i.e. not X); or (b) if rare or historic in $< 6$ areas it must be uncommon or common in no more than one area.
<b>U</b>	<b>Uncommon.</b> Native in the Carolinian Zone and (a) listed as common in no more than one Carolinian Zone area; and (b) not rare or historic in more than half of the Carolinian Zone areas ( $\geq 6$ ) in which it is native and ranked (i.e. not X).
<b>C</b>	<b>Common.</b> Native in the Carolinian Zone and (a) common in at least two Carolinian Zone areas; and (b) not rare or historic in more than half of the Carolinian Zone areas ( $\geq 6$ ) in which it is native and ranked (i.e. not X).
<b>X</b>	<b>No status.</b> Present and native in the Carolinian Zone but no status assigned because of lack of information, often due to confusion with similar species.
<b>note</b>	In a few cases, based on professional opinion, Carolinian Zone status ranks departed from the above criteria, particularly if the species is not ranked (i.e. X) in at least four Carolinian Zone areas.
<b>CZ RESTR</b>	restricted in Ontario as a native species to CZ (=CZ) or nearly restricted (approximately 90%+ records) in Ontario as a native species to CZ (=cz)
<b>CK</b>	Municipality of Chatham-Kent County





RANK	DEFINITION
I	introduced, thought to have been present in the Carolinian Zone or individual CZ area prior to European settlement; believed to be deliberately or inadvertently introduced to the CZ by humans (followed by a status below)
C	common
U	uncommon
R	rare
H	historic records only (generally >30 years)
X	present; status unknown or not specified in source lists
?	unconfirmed report
hyb	hybrid

Plant Form or Type Codes		
CODE	FORM	DESCRIPTION
<b>FE</b>	Fern	non-flowering, vascular plant, reproducing by spores - Pteridophytes. Including the fern allies such as horsetail, club-moss and quillwort.
<b>FO</b>	Forb	herbaceous broad-leaved plant
<b>GR</b>	Grass	graminoid plants in the Poaceae
<b>RU</b>	Rush	graminoid plants in the Juncaceae
<b>SE</b>	Sedge	graminoid plants in the Cyperaceae
<b>SH</b>	Shrub	plants with erect, reclining or prostrate woody stems (usually with more than one stem)
<b>TR</b>	Tree	woody perennial plant having a single (1-3) stem, usually with an elongate main stem (trunk)
<b>VI</b>	Vine	herbaceous plant that trail, cling, or twine, and requires support to grow vertically
<b>VW</b>	Woody Vine	a vine with a perennial woody stem

Coefficient of Wetness				
CW VALUE	ABBRV.	INDICATOR STATUS	% OCCUR. IN WETLANDS	DEFINITION
-5	<b>OBL</b>	Obligate Wetland	99	Almost always occur in wetlands. With few exceptions, these plants (herbaceous or woody) are found in standing water or seasonally saturated soils (14 or more consecutive days) near the surface.
-4	<b>FACW+</b>			
-3	<b>FACW</b>	Facultative Wetland	67-99	Usually occur in wetlands, but may occur in non-wetlands. These plants predominately occur with hydric soils, often in geomorphic settings where water saturates the soils or floods the soil surface at least seasonally.
-2	<b>FACW-</b>			
-1	<b>FAC+</b>			
<b>0</b>	<b>FAC</b>	Facultative	34-66	Occur in wetlands and nonwetlands. These plants can grow in hydric, mesic, or xeric habitats. The occurrence of these plants in different habitats represents responses to a variety of environmental variables other than just hydrology, such as shade tolerance, soil pH, and

				elevation, and they have a wide tolerance of soil moisture conditions.
<b>1</b>	<b>FAC-</b>			
<b>2</b>	<b>FACU+</b>			
<b>3</b>	<b>FACU</b>	Facultative Upland	1-33	Usually occur in non-wetlands, but may occur in wetlands. These plants predominately occur on drier or more mesic sites in geomorphic settings where water rarely saturates the soils or floods the soil surface seasonally.
<b>4</b>	<b>FACU-</b>			
<b>5</b>	<b>UPL</b>	Obligate Upland	1	Almost never occur in wetlands. These plants occupy mesic to xeric non-wetland habitats. They almost never occur in standing water or saturated soils. Typical growth forms include herbaceous, shrubs, woody vines, and trees.
<p>"+" or "-" signs have been attached to the three Facultative categories to express exaggerated tendencies for those species. The "+" sign denotes that the species generally has a greater estimated probability of occurring in wetlands than species having the general indicator category, but a lesser estimated probability of occurring in wetlands than those having the next higher general indicator. The "-" sign denotes that the species generally has a lesser estimated probability of occurring in wetlands than those having the general indicator status, but a greater estimated probability of occurring in wetlands than those having the next lowest general indicator.</p>				

# Attachment **D**

## **Significant Wildlife Habitat Assessment**

## SWH Ecoregion 7E Criterion Schedule

**Table 1.1 Seasonal Concentration Areas of Animals.**

Wildlife Habitat	Wildlife Species	CANDIDATE SWH		CONFIRMED SWH	Candidate Habitat Present Within the Study Area		Confirmed Habitat Found Within the Study Area	
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	Panhandle	Leamington	Panhandle	Leamington
<p><b>Waterfowl Stopover and Staging Areas (Terrestrial)</b></p> <p><u>Rationale:</u> Habitat important to migrating waterfowl.</p>	American Black Duck Northern Pintail Gadwall Blue-winged Teal Green-winged Teal American Wigeon Northern Shoveler Tundra Swan	CUM1 CUT1 Plus, evidence of annual spring flooding from melt water or run-off within these Ecosites.  Fields with waste grain in the Long Point, Rondeau, Lk. St. Clair, Grand Bend and Pt. Pelee areas may be important to Tundra Swans.	Fields with sheet water during Spring (mid- March to May). <ul style="list-style-type: none"> <li>Fields flooding during spring melt and run-off provide important invertebrate foraging habitat for migrating waterfowl.</li> <li>Agricultural fields with waste grains are commonly used by waterfowl, these are not considered SWH unless they have spring sheet water available.</li> </ul> <p><u>Information Sources</u></p> <ul style="list-style-type: none"> <li>Anecdotal information from the landowner, adjacent landowners or local naturalist clubs may be good information in determining occurrence.</li> <li>Reports and other information available from Conservation Authorities (CAs)</li> <li>Sites documented through waterfowl planning processes (e.g., EHJV implementation plan)</li> <li>Field Naturalist Clubs</li> <li>Ducks Unlimited Canada</li> <li>Natural Heritage Information Centre (NHIC) Waterfowl Concentration Area</li> </ul>	Studies carried out and verified presence of an annual concentration of any listed species, evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects" <sup>ccxi</sup> <ul style="list-style-type: none"> <li>Any mixed species aggregations of 100.</li> <li>or more individuals required.</li> <li>The area of the flooded field ecosite habitat plus a 100-300 m radius buffer dependant on local site conditions and adjacent land use is the significant wildlife habitat<sup>cxlviii</sup>.</li> <li>Annual use of habitat is documented from information sources or field studies (annual use can be based on studies or determined by past surveys with species numbers and dates).</li> <li>SWHMIST<sup>cxlix</sup> Index #7 provides development effects and mitigation measures.</li> </ul>	No;	No;	No;	No;
<p><b>Waterfowl Stopover and Staging Areas (Aquatic)</b></p> <p><u>Rationale:</u> Important for local and migrant</p>	Northern Shoveler American Wigeon Gadwall Green-winged Teal Blue-winged Teal Hooded Merganser Common Merganser Lesser Scaup Greater Scaup Long-tailed Duck	MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 SWD1 SWD2 SWD3 SWD4	<p><u>Information Sources</u></p> <ul style="list-style-type: none"> <li>Environment Canada</li> <li>Naturalist clubs often are aware of staging/stopover areas.</li> <li>OMNRF Wetland Evaluations indicate presence of locally and regionally significant waterfowl staging.</li> <li>Sites documented through waterfowl planning processes (e.g.,</li> </ul>	Studies carried out and verified presence of: <ul style="list-style-type: none"> <li>Aggregations of 100 or more of listed species for 7 days, results in &gt; 700 waterfowl use days.</li> <li>Areas with annual staging of ruddy ducks, canvasbacks, and redheads are SWH<sup>cxlix</sup></li> <li>The combined area of the</li> </ul>	No;	No;	No;	No;

Wildlife Habitat	Wildlife Species	CANDIDATE SWH		CONFIRMED SWH	Candidate Habitat Present Within the Study Area		Confirmed Habitat Found Within the Study Area	
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	Panhandle	Leamington	Panhandle	Leamington
waterfowl populations during the spring or fall migration or both periods combined. Sites identified are usually only one of a few in the eco-district.	Surf Scoter White-winged Scoter Black Scoter Ring-necked duck Common Goldeneye Bufflehead Redhead Ruddy Duck Red-breasted Merganser Brant Canvasback Ruddy Duck	SWD5 SWD6 SWD7	EHJV implementation plan) • Ducks Unlimited projects • Element occurrence specification by Nature Serve: <a href="http://www.natureserve.org">http://www.natureserve.org</a> • Natural Heritage Information Centre (NHIC) Waterfowl Concentration Area	ELC ecosites and a 100m radius area is the SWH <sup>cxlviii</sup> • Wetland area and shorelines associated with sites identified within the SWHTG <sup>cxlviii</sup> Appendix K <sup>cxlix</sup> are significant wildlife habitat. • Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects” <sup>ccxi</sup> . • Annual Use of Habitat is Documented from Information Sources or Field Studies (Annual can be based on completed studies or determined from past surveys with species numbers and dates recorded). • SWH MIST <sup>cxlix</sup> Index #7 provides development effects and mitigation measures.				
<b>Shorebird Migratory Stopover Area</b>  <b>Rationale:</b> High quality shorebird stopover habitat is extremely rare and typically has a long history of use.	Greater Yellowlegs Lesser Yellowlegs Marbled Godwit Hudsonian Godwit Black-bellied Plover American Golden-Plover Semipalmated Plover Solitary Sandpiper Spotted Sandpiper Semipalmated Sandpiper Pectoral Sandpiper White-rumped Sandpiper Baird’s Sandpiper Least Sandpiper Purple Sandpiper Stilt Sandpiper Short-billed Dowitcher Red-necked Phalarope Whimbrel Ruddy Turnstone Sanderling Dunlin	BBO1 BBO2 BBS1 BBS2 BBT1 BBT2 SDO1 SDS2 SDT1 MAM1 MAM2 MAM3 MAM4 MAM5	Shorelines of lakes, rivers, and wetlands, including beach areas, bars, and seasonally flooded, muddy and un-vegetated shoreline habitats. Great Lakes coastal shorelines, including groynes and other forms of armour rock lakeshores, are extremely important for migratory shorebirds in May to mid-June and early July to October. Sewage treatment ponds and storm water ponds do not qualify as a SWH,  <u>Information Sources</u> • Western hemisphere shorebird reserve network. • Canadian Wildlife Service (CWS) Ontario Shorebird Survey. • Bird Studies Canada • Ontario Nature • Local birders and naturalist clubs	Studies confirming: • Presence of 3 or more of listed species and > 1000 shorebird use days during spring or fall migration period (shorebird use days are the accumulated number of shorebirds counted per day over the course of the fall or spring migration period). • Whimbrel stop briefly (<24 hrs) during spring migration, any site with >100 Whimbrel used for 3 years, or more is significant. • The area of significant shorebird habitat includes the mapped ELC shoreline ecosites plus a 100 m radius area <sup>cxlviii</sup> . • Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects” <sup>ccxi</sup> . • SWH MIST <sup>cxlix</sup> Index #8	<b>No;</b>  No suitable ecosites were identified within the Study Area.	<b>No;</b>  No suitable ecosites were identified within the Study Area.	<b>No;</b>  Candidate habitat was not identified.	<b>No;</b>  Candidate habitat was not identified.

Wildlife Habitat	Wildlife Species	CANDIDATE SWH		CONFIRMED SWH	Candidate Habitat Present Within the Study Area		Confirmed Habitat Found Within the Study Area	
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	Panhandle	Leamington	Panhandle	Leamington
			<ul style="list-style-type: none"> <li>NHIC Shorebird Migratory Concentration Area</li> </ul>	provides development effects and mitigation measures.				
<p><b>Raptor Wintering Area</b></p> <p><u>Rationale:</u> Sites used by multiple species, a high number of individuals and used annually are most significant</p>	<p>Rough-legged Hawk Red-tailed Hawk Northern Harrier American Kestrel Snowy Owl</p> <p><u>Special Concern:</u> Short-eared Owl Bald Eagle</p>	<p><b>Hawks/Owls</b> Combination of ELC Community Series; need to have present one Community Series from each land class; Forest: FOD, FOM, FOC.  Upland: CUM, CUT, CUS, CUW.</p> <p><b>Bald Eagle:</b> Forest community Series: FOD, FOM, FOC, SWD, SWM or SWC on shoreline areas adjacent to large rivers or lakes with open water (hunting areas).</p>	<p>The habitat provides a combination of fields and woodlands that provide roosting, foraging and resting habitats for wintering raptors. Raptor wintering(hawk/owl) sites need to be &gt; 20 ha <sup>cxlviii, cxlix</sup> with a combination of forest and upland <sup>xvi, xvii, xviii, xix, xx, xxi</sup>.</p> <p>Least disturbed sites, idle/fallow, or lightly grazed field/meadow (&gt;15 ha) with adjacent woodlands <sup>cxlix</sup>. Field area of the habitat is to be wind swept with limited snow depth or accumulation. Eagle sites have open water and large trees and snags available for roosting.</p> <p><u>Information Sources:</u></p> <ul style="list-style-type: none"> <li>OMNR Ecologist or Biologist</li> <li>Naturalist club</li> <li>Natural Heritage Information Center (NHIC) Raptor Winter Concentration Area</li> <li>Data from Bird Studies Canada, most notably for Short-eared Owls.</li> <li>Results of Christmas Bird Counts.</li> <li>Reports and other information available from Conservation Authorities.</li> </ul>	<p>Studies confirm the use of these habitats by:</p> <ul style="list-style-type: none"> <li>One or more Short-eared Owls or; One of more Bald Eagles or; At least 10 individuals and two of listed hawk/owl species.</li> <li>To be significant a site must be used regularly (3 in 5 years) <sup>cxlix</sup> for a minimum of 20 days by the above number of birds.</li> <li>The habitat area for an Eagle winter site is the shoreline forest ecosites directly adjacent to the prime hunting area.</li> <li>Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects” <sup>ccxi</sup>.</li> <li>SWH MIST <sup>cxlix</sup> Index #10 and #11 provides development effects and mitigation measures.</li> </ul>	No;  No suitable ecosites were identified within the Study Area of sufficient size.	No;  No suitable ecosites were identified within the Study Area of sufficient size.	No;  Candidate habitat was not identified.	No;  Candidate habitat was not identified.
<p><b>Bat Hibernacula</b></p> <p><u>Rationale:</u> Bat hibernacula are rare habitats in all Ontario landscapes.</p>	<p>Big Brown Bat Tri-colored Bat</p>	<p>Bat Hibernacula may be found in these ecosites: CCR1 CCR2 CCA1 CCA2 (Note: buildings are not considered to be SWH)</p>	<p>Hibernacula may be found in caves, mine shafts, underground foundations, and Karsts. Active mine sites should not be considered as SWH. The locations of bat hibernacula are relatively poorly known.</p> <p><u>Information Sources</u></p> <ul style="list-style-type: none"> <li>OMNR for possible locations and contact for local experts</li> <li>Natural Heritage Information Center (NHIC) Bat Hibernaculum</li> </ul>	<ul style="list-style-type: none"> <li>All sites with confirmed hibernating bats are SWH.</li> <li>The area includes 200m radius around the entrance of the hibernaculum <sup>cxlviii, ccvii</sup> for most development types and 1000 m for wind farms.</li> <li>Studies are to be conducted during the peak swarming period (Aug. – Sept.). Surveys should be conducted following methods outlined in the “Guideline for Wind Power</li> </ul>	No;  No suitable ecosites were identified within the Study Area.	No;  No suitable ecosites were identified within the Study Area.	No;  Candidate habitat was not identified.	No;  Candidate habitat was not identified.

Wildlife Habitat	Wildlife Species	CANDIDATE SWH		CONFIRMED SWH	Candidate Habitat Present Within the Study Area		Confirmed Habitat Found Within the Study Area	
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	Panhandle	Leamington	Panhandle	Leamington
			<ul style="list-style-type: none"> <li>Ministry of Northern Development and Mines for location of mine shafts.</li> <li>Clubs that explore caves (e.g., Sierra Club)</li> <li>University Biology Departments with bat experts.</li> </ul>	<p>Projects Potential Impacts to Bats and Bat Habitats”<sup>ccv</sup>.</p> <ul style="list-style-type: none"> <li>SWH MIST<sup>cxlix</sup> Index #1 provides development effects and mitigation measures.</li> </ul>				
<p><b>Bat Maternity Colonies</b></p> <p><u>Rationale:</u> Known locations of forested bat maternity colonies is extremely rare in all Ontario landscapes.</p>	<p>Big Brown Bat Silver-haired Bat</p>	<p>Maternity colonies considered SWH are found in forested Ecosites.</p> <p>All ELC Ecosites in ELC Community Series: FOD FOM SWD SWM</p>	<p>Maternity colonies can be found in tree cavities, vegetation and often in buildings<sup>xxii, xxv, xxvi, xxvii, xxxi</sup> (buildings are not considered to be SWH). Maternity roosts are not found in caves and mines in Ontario<sup>xxii</sup>.</p> <ul style="list-style-type: none"> <li>Maternity colonies located in Mature deciduous or mixed forest stands<sup>ccix, ccx</sup> with &gt;10/ha large diameter (&gt;25 cm dbh) wildlife trees<sup>ccvii</sup></li> <li>Female Bats prefer wildlife tree (snags) in early stages of decay, class 1-3<sup>ccxiv</sup> or class 1 or 2<sup>ccxii</sup>.</li> <li>Silver-haired Bats prefer older mixed or deciduous forest and form maternity colonies in tree cavities and small hollows. Older forest areas with at least 21 snags/ha are preferred<sup>ccx</sup></li> </ul> <p><u>Information Sources</u></p> <ul style="list-style-type: none"> <li>OMNR for possible locations and contact for local experts</li> <li>University Biology Departments with bat experts.</li> </ul>	<ul style="list-style-type: none"> <li>Maternity Colonies with confirmed use by;                             <ul style="list-style-type: none"> <li>&gt;10 Big Brown Bats<sup>l</sup></li> <li>&gt;5 Adult Female Silver-haired Bats<sup>l</sup></li> </ul> </li> <li>The area of the habitat includes the entire woodland, or the forest stand ELC Ecosite containing the maternity colonies.</li> <li>Evaluation methods for maternity colonies should be conducted following methods outlined in the “Bats and Bat Habitats: Guidelines for Wind Power Projects”<sup>ccv</sup>.</li> <li>SWH MIST<sup>cxlix</sup> Index #12 provides development effects and mitigation measures.</li> </ul>	<p><b>Yes;</b></p> <p>Suitable deciduous forest community are present within the Study Area (i.e., FOD8-1 along both banks of the Thames River).</p>	<p><b>Yes;</b></p> <p>Suitable deciduous forest community are present within the Study Area (i.e., FOD2-2, FOD9-4)</p>	<p><b>Candidate;</b></p> <p>A full bat habitat assessment was not completed as the FOD8-1 community is not expected to be impacted by the trenchless crossing methods proposed at the Thames River.</p>	<p><b>Candidate;</b></p> <p>The FOD9-4 had a density of 47 snags/ha. A full bat habitat assessment was not completed within the FOD2-2 as the community id not expected to be impacted by proposed works.</p>
<p><b>Turtle Wintering Areas</b></p> <p><u>Rationale:</u> Generally, sites are the only known sites in the area. Sites with the highest number of individuals are most</p>	<p>Midland Painted Turtle</p> <p><u>Special Concern:</u> Northern Map Turtle Snapping Turtle</p>	<p>Snapping and Midland Painted turtles; ELC Community Classes; SW, MA, OA, and SA. ELC Community Series; FEO and BOO</p> <p>Northern Map Turtle - Open Water areas</p>	<p>For most turtles, wintering areas are in the same general area as their core habitat. Water must be deep enough not to freeze and have soft mud substrates.</p> <ul style="list-style-type: none"> <li>Over-wintering sites are permanent water bodies, large wetlands, and bogs or fens with adequate Dissolved Oxygen<sup>ci, cx, cxviii</sup>.</li> <li>Man-made ponds such as sewage lagoons or storm water ponds should not be considered SWH.</li> </ul>	<ul style="list-style-type: none"> <li>Presence of 5 over-wintering Midland Painted Turtles is significant.</li> <li>One or more Northern Map Turtle or Snapping Turtle over-wintering within a wetland is significant<sup>l</sup>.</li> <li>The mapped ELC ecosite area with the over wintering turtles is the SWH. If the hibernation site is within a stream or river, the deep-water pool where the turtles are over wintering is the SWH.</li> </ul>	<p><b>Yes;</b></p> <p>Suitable habitat is present within the Study Area at crossings with natural aquatic features such as Thames River, Baptiste</p>	<p><b>No;</b></p> <p>Agricultural drains provide suitable habitat, however, they are man-made and therefore do not qualify as SWH.</p>	<p><b>Candidate;</b></p> <p>A turtle overwintering habitat assessment was not completed, however, candidate habitat was observed during field investigations.</p>	<p><b>No;</b></p> <p>Candidate habitat was not identified.</p>



Wildlife Habitat	Wildlife Species	CANDIDATE SWH		CONFIRMED SWH	Candidate Habitat Present Within the Study Area		Confirmed Habitat Found Within the Study Area	
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	Panhandle	Leamington	Panhandle	Leamington
significant.		such as deeper rivers or streams and lakes with current can also be used as over-wintering habitat.	<u>Information Sources</u> <ul style="list-style-type: none"> <li>EIS studies carried out by Conservation Authorities.</li> <li>Field Naturalist Clubs</li> <li>OMNRF Ecologist or Biologist</li> <li>Natural Heritage Information Center (NHIC)</li> </ul>	<ul style="list-style-type: none"> <li>Over wintering areas may be identified by searching for congregations (Basking Areas) of turtles on warm, sunny days during the fall (Sept. – Oct.) or spring (Mar. – May) <sup>cvii</sup>. Congregation of turtles is more common where wintering areas are limited and therefore significant <sup>cix, cx, cxi, cxii</sup>.</li> <li>SWH MIST <sup>cxlix</sup> Index #28 provides development effects and mitigation measures for turtle wintering habitat.</li> </ul>	Creek, and Jeanettes Creek.			
<b>Reptile Hibernaculum</b>  <u>Rationale:</u> Generally sites are the only known sites in the area. Sites with the highest number of individuals are most significant.	<u>Snakes:</u> Eastern Gartersnake Northern Watersnake Northern Red-bellied Snake Northern Brownsnake Smooth Green Snake Northern Ring-necked Snake  <u>Special Concern:</u> Milksnake Eastern Ribbonsnake	For all snakes, habitat may be found in any ecosite other than very wet ones. Talus, Rock Barren, Crevice and Cave, and Alvar sites may be directly related to these habitats.  Observations of congregations of snakes on sunny warm days in the spring or fall is a good indicator.	For snakes, hibernation takes place in sites located below frost lines in burrows, rock crevices and other natural or naturalized locations. The existence of features that go below frost line, such as rock piles or slopes, old stone fences, and abandoned crumbling foundations assist in identifying candidate SWH. Areas of broken and fissured rock are particularly valuable since they provide access to subterranean sites below the frost line <sup>xliv, l, li, lii, cxii</sup> . Wetlands can also be important over-wintering habitat in conifer or shrub swamps and swales, poor fens, or depressions in bedrock terrain with sparse trees or shrubs with sphagnum moss or sedge hummock ground cover.  <u>Information Sources</u> <ul style="list-style-type: none"> <li>In spring, local residents or landowners may have observed the emergence of snakes on their property (e.g., old dug wells).</li> <li>Reports and other information available from Conservation Authorities.</li> <li>Field Naturalist Clubs</li> <li>University herpetologists.</li> <li>Natural Heritage Information Center (NHIC)</li> </ul>	Studies confirming: <ul style="list-style-type: none"> <li>Presence of snake hibernacula used by a minimum of five individuals of a snake sp. or individuals of two or more snake spp.</li> <li>Congregations of a minimum of five individuals of a snake sp. <u>or</u>; individuals of two or more snake spp. near potential hibernacula (e.g., foundation or rocky slope) on sunny warm days in Spring (Apr/May) and Fall (Sept/Oct).</li> <li><u>Note:</u> If there are Special Concern Species present, then site is SWH</li> <li><u>Note:</u> Sites for hibernation possess specific habitat parameters (e.g., temperature, humidity, etc.) and consequently are used annually, often by many of the same individuals of a local population [i.e., strong hibernation site fidelity.]. Other critical life processes (e.g., mating) often take place in close proximity to hibernacula. The feature in which the hibernacula is located plus a 30 m buffer is the SWH</li> <li>SWH MIST <sup>cxlix</sup> Index #13 provides development effects</li> </ul>	<b>Yes;</b>  Candidate Habitat may be present within the Study Area.	<b>No;</b>  Candidate Habitat not identified within the Study Area.	<b>Candidate;</b>  Burrows within identified during field surveys in Study Area provide Candidate Habitat.	<b>No;</b>  Candidate habitat was not identified.

Wildlife Habitat	Wildlife Species	CANDIDATE SWH		CONFIRMED SWH	Candidate Habitat Present Within the Study Area		Confirmed Habitat Found Within the Study Area	
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	Panhandle	Leamington	Panhandle	Leamington
				and mitigation measures for snake hibernacula.				
<p><b>Colonially - Nesting Bird Breeding Habitat (Bank and Cliff)</b></p> <p><b>Rationale:</b> Historical use and number of nests in a colony make this habitat significant. An identified colony can be very important to local populations. All swallow population are declining in Ontario.</p>	Cliff Swallow Northern Rough-winged Swallow (this species is not colonial but can be found in Cliff Swallow colonies).	<p>Eroding banks, sandy hills, borrow pits, steep slopes, and sand piles, cliff faces, bridge abutments, silos, barns (Cliff Swallows).</p> <p>Habitat found in the following ecosites: CUM1 CUT1 CUS1 BLO1 BLS1 BLT1 CLO1 CLS1 CLT1</p>	<ul style="list-style-type: none"> <li>Any site or areas with exposed soil banks, undisturbed or naturally eroding that is not a licensed/permitted aggregate area.</li> <li>Does not include man-made structures (bridges or buildings) or recently (2 years) disturbed soil areas, such as berms, embankments, soil, or aggregate stockpiles.</li> <li>Does not include a licensed/permitted Mineral Aggregate Operation.</li> </ul> <p><u>Information Sources</u></p> <ul style="list-style-type: none"> <li>Reports and other information available from Conservation Authorities</li> <li>Ontario Breeding Bird Atlas <sup>ccv</sup>.</li> <li>Bird Studies Canada; <i>NatureCounts</i> <a href="http://www.birdscanada.org/birdmon/">http://www.birdscanada.org/birdmon/</a></li> <li>Field Naturalist Clubs.</li> </ul>	<p>Studies confirming:</p> <ul style="list-style-type: none"> <li>Presence of 1 or more nesting sites with 8 <sup>cxlvix</sup> or more cliff swallow pairs and/or rough-winged swallow pairs during the breeding season.</li> <li>A colony identified as SWH will include a 50 m radius habitat area from the peripheral nests <sup>ccvii</sup>.</li> <li>Field surveys to observe and count swallow nests are to be completed during the breeding season (May-June). Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects" <sup>ccxi</sup>.</li> <li>SWH MIST <sup>cxlix</sup> Index #4 provides development effects and mitigation measures.</li> </ul>	<b>Yes;</b>  Candidate Habitat may be present within the Study Area.	<b>Yes;</b>  Candidate Habitat may be present within the Study Area.	<b>Candidate;</b>  Candidate habitat may be present along the banks of the aquatic features; however, targeted surveys were not completed.	<b>Candidate;</b>  Candidate habitat was identified during field investigations as evidenced by soil slumping from a bank along an unnamed tributary; however, targeted surveys were not completed.
<p><b>Colonially - Nesting Bird Breeding Habitat (Tree/Shrubs)</b></p> <p><b>Rationale:</b> Large colonies are important to local bird population, typically sites are only known colony in area and are used annually.</p>	Great Blue Heron Black-crowned Night-Heron Great Egret Green Heron	<p>SWM2 SWM3 SWM5 SWM6 SWD1 SWD2 SWD3 SWD4 SWD5 SWD6 SWD7 FET1</p>	<ul style="list-style-type: none"> <li>Nests in live or dead standing trees in wetlands, lakes, islands, and peninsulas. Shrubs and occasionally emergent vegetation may also be used.</li> <li>Most nests in trees are 11 to 15 m from ground, near the top of the tree.</li> </ul> <p><u>Information Sources</u></p> <ul style="list-style-type: none"> <li>Ontario Breeding Bird Atlas <sup>ccv</sup>, colonial nest records.</li> <li>Ontario Heronry Inventory 1991 available from Bird Studies Canada or NHIC (OMNRF).</li> <li>Natural Heritage Information Center (NHIC) Mixed Wader Nesting Colony</li> <li>Aerial photographs can help identify large heronries.</li> </ul>	<p>Studies confirming:</p> <ul style="list-style-type: none"> <li>Presence of 2 or more active nests of Great Blue Heron or other listed species.</li> <li>The habitat extends from the edge of the colony and a minimum 300 m radius or extend of the Forest Ecosite containing the colony or any island &lt;15.0ha with a colony is the SWH <sup>cc, ccvii</sup>.</li> <li>Confirmation of active heronries are to be achieved through site visits conducted during the nesting season (April to August) or by evidence such as the presence of fresh guano, dead young and/or eggshells</li> <li>SWH MIST <sup>cxlix</sup> Index #5</li> </ul>	<b>No;</b>  No suitable ecosites were identified within the Study Area.	<b>No;</b>  No suitable ecosites were identified within the Study Area.	<b>No;</b>  No colony sites were observed during field investigations.	<b>No;</b>  No colony sites were observed during field investigations.

Wildlife Habitat	Wildlife Species	CANDIDATE SWH		CONFIRMED SWH	Candidate Habitat Present Within the Study Area		Confirmed Habitat Found Within the Study Area	
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	Panhandle	Leamington	Panhandle	Leamington
			<ul style="list-style-type: none"> <li>• Reports and other information available from Conservation Authorities</li> <li>• MNRF District Offices.</li> <li>• Local naturalist clubs.</li> </ul>	provides development effects and mitigation measures.				
<p><b>Colonially - Nesting Bird Breeding Habitat (Ground)</b></p> <p><b>Rationale:</b> Colonies are important to local bird population, typically sites are only known colony in area and are used annually.</p>	<p>Herring Gull Great Black-backed Gull Little Gull Ring-billed Gull Common Tern Caspian Tern Brewer's Blackbird</p>	<p>Any rocky island or peninsula (natural or artificial) within a lake or large river (two-lined on a 1:50,000 NTS map).</p> <p>Close proximity to watercourses in open fields or pastures with scattered trees or shrubs (Brewer's Blackbird)</p> <p>MAM1-6 MAS1-3 CUM CUT CUS</p>	<ul style="list-style-type: none"> <li>• Nesting colonies of gulls and terns are on islands or peninsulas associated with open water or in marshy areas.</li> <li>• Brewers Blackbird colonies are found loosely on the ground in or in low bushes in close proximity to streams and irrigation ditches within farmlands.</li> </ul> <p><u>Information Sources</u></p> <ul style="list-style-type: none"> <li>• Ontario Breeding Bird Atlas <sup>ccv</sup>, rare/colonial species records.</li> <li>• Canadian Wildlife Service</li> <li>• Reports and other information available from Conservation Authorities</li> <li>• Natural Heritage Information Center (NHIC) Colonial Waterbird Nesting Area</li> <li>• MNRF District Offices.</li> <li>• Field Naturalist Clubs.</li> </ul>	<p>Studies confirming:</p> <ul style="list-style-type: none"> <li>• Presence of &gt; 25 active nests for Herring Gulls or Ring-billed Gulls, &gt;5 active nests for Common Tern or &gt;2 active nests for Caspian Tern.</li> <li>• Presence of 5 or more pairs for Brewer's Blackbird.</li> <li>• Any active nesting colony of one or more Little Gull, and Great Black-backed Gull is significant.</li> <li>• The edge of the colony and a minimum 150 m radius area of habitat, or the extent of the ELC ecosites containing the colony or any island &lt;3.0 ha with a colony is the SWH <sup>cc, ccvii</sup>.</li> <li>• Studies would be done during May/June when actively nesting. Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects" <sup>ccxi</sup>.</li> <li>• SWH MIST <sup>cxlix</sup> Index #6 provides development effects and mitigation measures.</li> </ul>	<b>Yes;</b> Candidate Habitat may be present within the Study Area for Brewer's Blackbird.	<b>Yes;</b> Candidate Habitat may be present within the Study Area for Brewer's Blackbird.	<b>No;</b> No colony sites were observed during field investigations.	<b>No;</b> No colony sites were observed during field investigations.
<p><b>Migratory Butterfly Stopover Areas</b></p> <p><b>Rationale:</b> Butterfly stopover areas are extremely rare habitats and are biologically important for butterfly</p>	<p>Painted Lady Red Admiral</p> <p><b>Special Concern:</b> Monarch</p>	<p>Combination of ELC Community Series; need to have present one Community Series from each landclass:</p> <p><u>Field:</u> CUM CUT CUS</p>	<p>A butterfly stopover area will be a minimum of 10 ha in size with a combination of field and forest habitat present and will be located within 5 km of Lake Erie and Ontario <sup>cxlix</sup>.</p> <ul style="list-style-type: none"> <li>• The habitat is typically a combination of field and forest and provides the butterflies with a location to rest prior to their long migration south <sup>xxxii, xxxiii, xxxiv, xxxv, xxxvi</sup>.</li> <li>• The habitat should not be disturbed, fields/meadows with</li> </ul>	<p>Studies confirm:</p> <ul style="list-style-type: none"> <li>• The presence of Monarch Use Days (MUD) during fall migration (Aug/Oct) <sup>xliii</sup>. MUD is based on the number of days a site is used by Monarchs, multiplied by the number of individuals using the site. Numbers of butterflies can range from 100-500/day<sup>xxxvii</sup>, significant variation can occur between years and multiple years of sampling should occur <sup>xl, xlii</sup>.</li> </ul>	<b>No;</b> The Study Area is more than 5 km from the Great Lakes.	<b>No;</b> The site is more than 5 km from Lake Ontario and Lake Erie.	<b>No;</b> Candidate habitat was not identified.	<b>No;</b> Candidate habitat was not identified.

Wildlife Habitat	Wildlife Species	CANDIDATE SWH		CONFIRMED SWH	Candidate Habitat Present Within the Study Area		Confirmed Habitat Found Within the Study Area	
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	Panhandle	Leamington	Panhandle	Leamington
species that migrate south for the winter.		<p><u>Forest:</u> FOC FOD FOM CUP</p> <p>Anecdotally, a candidate sight for butterfly stopover will have a history of butterflies being observed.</p>	<p>an abundance of preferred nectar plants and woodland edge providing shelter are requirements for this habitat <sup>cxlviii, cxlix</sup>.</p> <ul style="list-style-type: none"> <li>Stopover areas usually provide protection from the elements and are often spits of land or areas with the shortest distance to cross the Great Lakes <sup>xxxvii, xxxviii, xxxix, xl, xli</sup>.</li> </ul> <p><u>Information Sources</u></p> <ul style="list-style-type: none"> <li>MNRF district Offices</li> <li>Natural Heritage Information Center (NHIC)</li> <li>Agriculture Canada in Ottawa may have list of butterfly experts.</li> <li>Field Naturalist Clubs</li> <li>Toronto Entomologists Association</li> <li>Conservation Authorities</li> </ul>	<ul style="list-style-type: none"> <li>Observational studies are to be completed and need to be done frequently during the migration period to estimate MUD</li> <li>MUD of &gt;5000 or &gt;3000 with the presence of Painted Ladies or Red Admiral's is to be considered significant.</li> <li>SWH MIST <sup>cxlix</sup> Index #16 provides development effects and mitigation measures.</li> </ul>				
<p><b>Landbird Migratory Stopover Areas</b></p> <p><u>Rationale:</u> Sites with a high diversity of species as well as high numbers are most significant.</p>	<p>All migratory songbirds.</p> <p>Canadian Wildlife Service Ontario website: <a href="http://www.ec.gc.ca/nature/default.asp?lang=En&amp;n=421B7A9D-1">http://www.ec.gc.ca/nature/default.asp?lang=En&amp;n=421B7A9D-1</a></p> <p>All migrant raptors species:</p> <p>Ontario Ministry of Natural Resources: Fish and Wildlife Conservation Act, 1997. Schedule 7: Specially Protected Birds (Raptors)</p>	<p>All Ecosites associated with these ELC Community Series; FOC FOM FOD SWC SWM SWD</p>	<p>Woodlots need to be &gt;5 ha in size and within 5 km <sup>iv, v, vi, vii, viii, ix, x, xi, xii, xiii, xiv, xv</sup> of Lake Ontario and Erie. If woodlands are rare in an area of shoreline, woodland fragments 2-5ha can be considered for this habitat.</p> <ul style="list-style-type: none"> <li>If multiple woodlands are located along the shoreline those Woodlands &lt;2 km from Lake Erie and Lake Ontario are more significant <sup>cxlix</sup>.</li> <li>Sites have a variety of habitats; forest, grassland, and wetland complexes <sup>cxlix</sup>.</li> <li>The largest sites are more significant <sup>cxlix</sup>.</li> <li>Woodlots and forest fragments are important habitats to migrating birds <sup>ccxviii</sup>, these features located along the shore and located within 5km of Lake Erie and Lake Ontario are Candidate SWH <sup>cxlviii</sup>.</li> </ul> <p><u>Information Sources</u></p>	<p>Studies confirm:</p> <ul style="list-style-type: none"> <li>Use of the woodlot by &gt;200 birds/day and with &gt;35 spp recorded on at least 5 different survey dates. This abundance and diversity of migrant bird species is considered above average and significant.</li> <li>Studies should be completed during spring (March to May) and fall (Aug to Oct) migration using standardized assessment techniques. Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects" <sup>ccxi</sup></li> <li>SWH MIST <sup>cxlix</sup> Index #9 provides development effects and mitigation measures.</li> </ul>	<p><b>No;</b></p> <p>The site is more than 5 km from Lake Ontario and Lake Erie.</p>	<p><b>No;</b></p> <p>The site is more than 5 km from Lake Ontario and Lake Erie.</p>	<p><b>No;</b></p> <p>Candidate habitat was not identified.</p>	<p><b>No;</b></p> <p>Candidate habitat was not identified.</p>

Wildlife Habitat	Wildlife Species	CANDIDATE SWH		CONFIRMED SWH	Candidate Habitat Present Within the Study Area		Confirmed Habitat Found Within the Study Area	
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	Panhandle	Leamington	Panhandle	Leamington
			<ul style="list-style-type: none"> <li>Bird Studies Canada</li> <li>Ontario Nature</li> <li>Local birders and naturalist club</li> <li>Ontario Important Bird Areas (IBA) Program</li> </ul>					
<p><b>Deer Winter Congregation Areas</b></p> <p><u>Rationale:</u> Deer movement during winter in the southern areas of Ecoregion 7E are not constrained by snow depth, however deer will annually congregate in large numbers in suitable woodlands to reduce or avoid the impacts of winter conditions <sup>cxlviii</sup>.</p>	White-tailed Deer	<p>All Forested Ecosites with these ELC Community Series; FOC FOM FOD SWC SWM SWD</p> <p>Conifer plantations much smaller than 50 ha may also be used.</p>	<ul style="list-style-type: none"> <li>Woodlots &gt;100 ha in size or if large woodlots are rare in a planning area, woodlots &gt;5 0 ha.</li> <li>Deer movement during winter in the southern areas Ecoregion 7E are not constrained by snow depth, however deer will annually congregate in large numbers in suitable woodlands <sup>cxlviii</sup>.</li> <li>Large woodlots &gt; 100 ha and up to 1500 ha are known to be used annually by densities of deer that range from 0.1-1.5 deer/ha <sup>ccxxiv</sup>.</li> <li>Woodlots with high densities of deer due to artificial feeding are not significant.</li> </ul> <p><u>Information Sources</u></p> <ul style="list-style-type: none"> <li>MNRF District Offices.</li> <li>LIO/NRVIS</li> </ul>	<p>Studies confirm:</p> <ul style="list-style-type: none"> <li>Deer management is an MNRF responsibility, deer winter congregation areas considered significant will be mapped by MNRF <sup>cxlviii</sup>.</li> <li>Use of the woodlot by white-tailed deer will be determined by MNRF, all woodlots exceeding the area criteria are significant, unless determined not to be significant by MNRF.</li> <li>Studies should be completed during winter (Jan/Feb) when &gt;20 cm of snow is on the ground using aerial survey techniques <sup>ccxxiv</sup>, ground or road surveys, or a pellet count deer density survey <sup>ccxxv</sup>.</li> <li>SWH MIST <sup>cxlix</sup> Index #2 provides development effects and mitigation measures.</li> </ul>	<b>No;</b> There are no yarding areas identified within the Study Area.	<b>No;</b> There are no yarding areas identified within the Study Area.	<b>No;</b> Candidate habitat was not identified.	<b>No;</b> Candidate habitat was not identified.

**Table 1.2 Rare Vegetation Communities.**

Rare Vegetation Community	CANDIDATE SWH			CONFIRMED SWH	Candidate Habitat within the Study Area		Confirmed Habitat within the Study Area	
	ELC Ecosite Code	Habitat Description	Detailed Information and Sources	Defining Criteria	Panhandle	Leamington	Panhandle	Leamington
<p><b>Cliffs and Talus Slopes</b></p> <p><b>Rationale:</b> Cliffs and Talus Slopes are extremely rare habitats in Ontario.</p>	<p>Any ELC Ecosite within Community Series:</p> <p>TAO TAS TAT CLO CLS CLT</p>	<p>A Cliff is vertical to near vertical bedrock &gt;3 m in height.</p> <p>A Talus Slope is rock rubble at the base of a cliff made up of coarse rocky debris</p>	<p>Most cliff and talus slopes occur along the Niagara Escarpment.</p> <p><u>Information Sources</u></p> <ul style="list-style-type: none"> <li>The Niagara Escarpment Commission has detailed information on location of these habitats.</li> <li>OMNRF Districts</li> <li>Natural Heritage Information Center (NHIC) has location information available their website</li> <li>Field Naturalist Clubs</li> <li>Conservation Authorities</li> </ul>	<ul style="list-style-type: none"> <li>Confirm any ELC Vegetation Type for Cliffs or Talus Slopes <sup>lxxviii</sup>.</li> <li>SWH MIST <sup>cxlix</sup> Index #21 provides development effects and mitigation measures.</li> </ul>	<p><b>No;</b></p> <p>No Cliff and Talus slope ecosites were identified within the Study Area.</p>	<p><b>No;</b></p> <p>No Cliff and Talus slope ecosites were identified within the Study Area.</p>	<p><b>No;</b></p> <p>Candidate habitat was not identified.</p>	<p><b>No;</b></p> <p>Candidate habitat was not identified.</p>
<p><b>Sand Barren</b></p> <p><b>Rationale:</b> Sand barrens are rare in Ontario and support rare species. Most Sand Barrens have been lost due to cottage development and forestry</p>	<p>ELC Ecosites:</p> <p>SBO1 SBS1 SBT1</p> <p>Vegetation cover varies from patchy and barren to continuous meadow (SBO1), thicket-like (SBS1), or more closed and treed (SBT1). Tree cover always ≤60%.</p>	<p>Sand Barrens typically are exposed sand, generally sparsely vegetated and caused by lack of moisture, periodic fires, and erosion. Usually located within other types of natural habitat such as forest or savannah. Vegetation can vary from patchy and barren to tree covered but less than 60%.</p>	<p>A sand barren area &gt;0.5ha in size.</p> <p><u>Information Sources</u></p> <ul style="list-style-type: none"> <li>OMNRF Districts.</li> <li>Natural Heritage Information Center (NHIC) has location information available on their website</li> <li>Field Naturalist Clubs</li> <li>Conservation Authorities</li> </ul>	<ul style="list-style-type: none"> <li>Confirm any ELC Vegetation Type for Sand Barrens <sup>lxxviii</sup></li> <li>Site must not be dominated by exotic or introduced species (&lt;50% vegetative cover exotics).</li> <li>SWHMIST <sup>cxlix</sup> Index #20 provides development effects and mitigation measures.</li> </ul>	<p><b>No;</b></p> <p>No Sand Barren ecosites were identified within the Study Area.</p>	<p><b>No;</b></p> <p>No Sand Baren ecosites were identified within the Study Area.</p>	<p><b>No;</b></p> <p>Candidate habitat was not identified.</p>	<p><b>No;</b></p> <p>Candidate habitat was not identified.</p>
<p><b>Alvar</b></p> <p><b>Rationale:</b> Alvars are extremely rare habitats in Ecoregion 7E.</p>	<p>ALO1 ALS1 ALT1 FOC1 FOC2 CUM2 CUS2 CUT2-1 CUW2</p> <p><b>Five Alvar Indicator Species:</b></p> <p>1) <i>Carex crawei</i> 2) <i>Panicum</i></p>	<p>An alvar is typically a level, mostly unfractured calcareous bedrock feature with a mosaic of rock pavements and bedrock overlain by a thin veneer of soil. The hydrology of alvars is complex, with alternating periods of inundation and drought. Vegetation cover varies from sparse lichen-moss</p>	<p>An Alvar site &gt; 0.5 ha in size <sup>lxxv</sup>. Alvar is particularly rare in Ecoregion 7E where the only known sites are found in the western islands of Lake Erie. <sup>cxix</sup></p> <p><u>Information Sources</u></p> <ul style="list-style-type: none"> <li>Alvars of Ontario (2000), Federation of Ontario Naturalists <sup>lxxvi</sup>.</li> <li>Ontario Nature – Conserving Great Lakes Alvars <sup>ccviii</sup>.</li> <li>Natural Heritage Information Center (NHIC) has location information available on their website</li> <li>OMNRF Staff.</li> <li>Field Naturalist Clubs.</li> <li>Conservation Authorities.</li> </ul>	<p>Field studies identify four of the five <b>Alvar Indicator Species</b> <sup>lxxv</sup> at a Candidate Alvar site is Significant.</p> <ul style="list-style-type: none"> <li>Site must not be dominated by exotic or introduced species (&lt;50% vegetative cover exotics).</li> <li>The alvar must be in excellent condition and fit in with surrounding landscape with few conflicting land uses <sup>lxxv</sup>.</li> <li>SWH MIST <sup>cxlix</sup> Index #17 provides development effects and mitigation measures.</li> </ul>	<p><b>No;</b></p> <p>No Alvar ecosites were identified within the Study Area.</p>	<p><b>No;</b></p> <p>No Alvar ecosites were identified within the Study Area.</p>	<p><b>No;</b></p> <p>Candidate habitat was not identified.</p>	<p><b>No;</b></p> <p>Candidate habitat was not identified.</p>

Rare Vegetation Community	CANDIDATE SWH			CONFIRMED SWH	Candidate Habitat within the Study Area		Confirmed Habitat within the Study Area	
	ELC Ecosite Code	Habitat Description	Detailed Information and Sources	Defining Criteria	Panhandle	Leamington	Panhandle	Leamington
	<p><i>philadelphicum</i> 3) <i>Elocharis compressa</i> 4) <i>Scutellaria parvula</i> 5) <i>Trichostema brachiatum</i></p> <p>These indicator species are very specific to Alvars within Ecoregion 7E.</p>	<p>associations to grasslands and shrublands and comprising a number of characteristic or indicator plant. Undisturbed alvars can be phyto- and zoogeographically diverse, supporting many uncommon or relict plant and animal species. Vegetation cover varies from patchy to barren with a less than 60% tree cover <sup>lxxviii</sup>.</p>						
<p><b>Old Growth Forest</b></p> <p><b>Rationale:</b> Due to historic logging practices and land clearance for agriculture, old growth forest is rare in Ecoregion 7E.</p>	<p>Forest Community Series: FOD FOC FOM SWD SWC SWM</p>	<p>Old-growth forests are characterized by heavy mortality or turnover of over-storey trees resulting in mosaic of gaps that encourage development of multi-layered canopy and an abundance of snags and downed woody debris.</p>	<ul style="list-style-type: none"> <li>Woodland area is &gt;0.5 ha.</li> </ul> <p><u>Information Sources</u></p> <ul style="list-style-type: none"> <li>OMNRF Forest Resource Inventory mapping</li> <li>OMNRF Districts.</li> <li>Field Naturalist Clubs</li> <li>Conservation Authorities</li> <li>Sustainable Forestry Licence (SFL) companies will possibly know locations through field operations.</li> <li>Municipal forestry departments</li> </ul>	<p>Field Studies will determine:</p> <ul style="list-style-type: none"> <li>If dominant trees species of the ecosite are &gt;140 years old, then area containing these trees is Significant Wildlife Habitat <sup>cxlviii</sup>.</li> <li>The forested area containing the old growth characteristics will have experienced no recognizable forestry activities (cut steps will not be present)</li> <li>The area of forest ecosites combined or an eco-element within an ecosite that contain the old growth characteristics is the SWH.</li> <li>Determine ELC vegetation types for the forest area containing the old growth characteristics <sup>lxxviii</sup>.</li> <li>SWH MIST <sup>cxlix</sup> Index #23 provides development effects and mitigation measures.</li> </ul>	<p><b>No;</b></p> <p>No Old Growth Forest communities were identified within the Study Area.</p>	<p><b>No;</b></p> <p>No Old Growth Forest communities were identified within the Study Area.</p>	<p><b>No;</b></p> <p>Candidate habitat was not identified.</p>	<p><b>No;</b></p> <p>Candidate habitat was not identified.</p>
<p><b>Savannah</b></p> <p><b>Rationale:</b> Savannahs are extremely rare habitats in Ontario.</p>	<p>TPS1 TPS2 TPW1 TPW2 CUS2</p>	<p>A Savannah is a tallgrass prairie habitat that has tree cover between 25 – 60%.</p> <p>In ecoregion 7E, known Tallgrass Prairie and savannah remnants are scattered between Lake Huron and Lake</p>	<p>No minimum size to site Site must be restored or a natural site. Remnant sites such as railway right of ways are not considered to be SWH.</p> <p><u>Information Sources</u></p> <ul style="list-style-type: none"> <li>Natural Heritage Information Center (NHIC) has location data available on their website.</li> <li>OMNRF Districts.</li> <li>Field Naturalists Clubs.</li> <li>Conservation Authorities.</li> </ul>	<p>Field studies confirm one or more of the Savannah indicator species listed in <sup>lxxv</sup> Appendix N should be present. Note: Savannah plant spp. list from Ecoregion 7E should be used</p> <ul style="list-style-type: none"> <li>Area of the ELC Ecosite is the SWH.</li> <li>Site must not be dominated by exotic or introduced species (&lt;50% vegetative cover exotics).</li> <li>SWH MIST <sup>cxlix</sup> Index #18 provides</li> </ul>	<p><b>No;</b></p> <p>No Savannah ecosites were identified within the Study Area.</p>	<p><b>No;</b></p> <p>No Savannah ecosites were identified within the Study Area.</p>	<p><b>No;</b></p> <p>Candidate habitat was not identified.</p>	<p><b>No;</b></p> <p>Candidate habitat was not identified.</p>

Rare Vegetation Community	CANDIDATE SWH			CONFIRMED SWH	Candidate Habitat within the Study Area		Confirmed Habitat within the Study Area	
	ELC Ecosite Code	Habitat Description	Detailed Information and Sources	Defining Criteria	Panhandle	Leamington	Panhandle	Leamington
		Erie, near Lake St. Clair, north of and along the Lake Erie shoreline, in Brantford and in the Toronto area (north of Lake Ontario).		development effects and mitigation measures.				
<b>Tallgrass Prairie</b>  <b>Rationale:</b> Tallgrass Prairies are extremely rare habitats in Ontario.	TPO1 TPO2	A Tallgrass Prairie has ground cover dominated by prairie grasses. An open Tallgrass Prairie habitat has < 25% tree cover.  In ecoregion 7E, known Tallgrass Prairie and savannah remnants are scattered between Lake Huron and Lake Erie, near Lake St. Clair, north of and along the Lake Erie shoreline, in Brantford and in the Toronto area (north of Lake Ontario). <sup>cc</sup>	No minimum size to site (E). Site must be restored or a natural site. Remnant sites such as railway right of ways are not considered to be SWH.  <u>Information Sources</u> <ul style="list-style-type: none"> <li>• OMNRF Districts.</li> <li>• Natural Heritage Information Center (NHIC) has location data available on their website.</li> <li>• Field Naturalists Clubs.</li> <li>• Conservation Authorities</li> </ul>	Field studies confirm one or more of the Prairie indicator species listed in <sup>lxxv</sup> Appendix N should be present. Note: Prairie plant spp. list from Ecoregion 7E should be used <ul style="list-style-type: none"> <li>• Area of the ELC Ecosite is the SWH</li> <li>• Site must not be dominated by exotic or introduced species (&lt;50% vegetative cover exotics).</li> <li>• SWH MIST <sup>cxlix</sup> Index #19 provides development effects and mitigation measures.</li> </ul>	<b>No;</b>  No Tallgrass Prairie ecosites were identified within the Study Area.	<b>No;</b>  No Tallgrass Prairie ecosites were identified within the Study Area.	<b>No;</b>  Candidate habitat was not identified.	<b>No;</b>  Candidate habitat was not identified.
<b>Other Rare Vegetation Communities</b>  <b>Rationale:</b> Plant communities that often contain rare species which depend on the habitat for survival.	Provincially Rare S1, S2 and S3 vegetation communities are listed in Appendix M of the SWHTG <sup>cxlviii</sup> . Any ELC Ecosite Code that has a possible ELC Vegetation Type that is Provincially Rare is Candidate SWH.	Rare Vegetation Communities may include beaches, fens, forest, marsh, barrens, dunes, and swamps.	ELC Ecosite codes that have the potential to be a rare ELC Vegetation Type as outlined in appendix M <sup>cxlviii</sup>  The OMNRF/NHIC will have up to date listing for rare vegetation communities.  <u>Information Sources</u> <ul style="list-style-type: none"> <li>• OMNRF Districts.</li> <li>• Natural Heritage Information Center (NHIC) has location data available on their website.</li> <li>• Field Naturalists Clubs.</li> <li>• Conservation Authorities</li> </ul>	Field studies should confirm if an ELC Vegetation Type is a rare vegetation community based on listing within Appendix M of SWHTG <sup>cxlviii</sup> . <ul style="list-style-type: none"> <li>• Area of the ELC Vegetation Type polygon is the SWH.</li> <li>• SWH MIST <sup>cxlix</sup> Index #37 provides development effects and mitigation measures.</li> </ul>	<b>No;</b>  No Rare Vegetation Communities were identified within the Study Area.	<b>No;</b>  No Rare Vegetation Communities were identified within the Study Area	<b>No;</b>  Candidate habitat was not identified.	<b>No;</b>  Candidate habitat was not identified.



**Table 1.3 Specialized Habitats of Wildlife considered SWH.**

Specialized Wildlife Habitat	Wildlife Species	CANDIDATE SWH		CONFIRMED SWH	Candidate Habitat within the Study Area		Confirmed Habitat within the Study Area	
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	Panhandle	Leamington	Panhandle	Leamington
<p><b>Waterfowl Nesting Area</b></p> <p><b>Rationale:</b> Important to local waterfowl populations, sites with greatest number of species and highest number of individuals are significant.</p>	<p>American Black Duck Northern Pintail Northern Shoveler Gadwall Blue-winged Teal Green-winged Teal Wood Duck Hooded Merganser Mallard</p>	<p>All upland habitats located adjacent to these wetland ELC Ecosites are Candidate SWH: MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 SWT1 SWT2 SWD1 SWD2 SWD3 SWD4</p> <p><b>Note: includes adjacency to Provincially Significant Wetlands</b></p>	<p>A waterfowl nesting area extends 120 m <sup>cxlix</sup> from a wetland (&gt; 0.5 ha) or a wetland (&gt;0.5 ha) within 120 m or a cluster of 3 or more small (&lt;0.5 ha) wetlands within 120 m of each individual wetland where waterfowl nesting is known to occur <sup>cxlix</sup>.</p> <ul style="list-style-type: none"> <li>Upland areas should be at least 120 m wide so that predators such as racoons, skunks, and foxes have difficulty finding nests.</li> <li>Wood Ducks and Hooded Mergansers utilize large diameter trees (&gt;40 cm dbh) in woodlands for cavity nest sites.</li> </ul> <p><u>Information Sources</u></p> <ul style="list-style-type: none"> <li>Ducks Unlimited staff may know the locations of particularly productive nesting sites.</li> <li>OMNRF Wetland Evaluations for indication of significant waterfowl nesting habitat.</li> <li>Reports and other information available from Conservation Authorities</li> </ul>	<p>Studies confirmed:</p> <ul style="list-style-type: none"> <li>Presence of 3 or more nesting pairs for listed species excluding Mallards, or presence of 10 or more nesting pairs for listed species including Mallards.</li> <li>Any active nesting site of an American Black Duck is considered significant.</li> <li>Nesting studies should be completed during the spring breeding season (April - June). Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects" <sup>ccxi</sup></li> <li>A field study confirming waterfowl nesting habitat will determine the boundary of the waterfowl nesting habitat for the SWH, this may be greater or less than 120 m <sup>cxlviii</sup> from the wetland and will provide enough habitat for waterfowl to successfully nest.</li> <li>SWH MIST <sup>cxlix</sup> Index #25 provides development effects and mitigation measures.</li> </ul>	<p><b>Yes;</b></p> <p>MA communities were identified within the Study Area.</p>	<p><b>No;</b></p> <p>No suitable ecosites were identified within the Study Area.</p>	<p><b>Candidate;</b></p> <p>Confirmed habitat was not observed during field investigations; however, targeted surveys were not completed.</p>	<p><b>No;</b></p> <p>Candidate habitat was not identified.</p>
<p><b>Bald Eagle and Osprey Nesting, Foraging and Perching Habitat</b></p> <p><b>Rationale:</b> Nest sites are fairly uncommon in Ecoregion 7E and are used annually by these species. Many suitable nesting locations may</p>	<p>Osprey</p> <p><b>Special Concern:</b> Bald Eagle</p>	<p>ELC Forest Community Series: FOD, FOM, FOC, SWD, SWM and SWC directly adjacent to riparian areas – rivers, lakes, ponds, and wetlands</p>	<p>Nests are associated with lakes, ponds, rivers or wetlands along forested shorelines, islands, or on structures over water.</p> <ul style="list-style-type: none"> <li>Osprey nests are usually at the top a tree whereas Bald Eagle nests are typically in super canopy trees in a notch within the tree's canopy.</li> <li>Nests located on man-made objects are not to be included as SWH (e.g., telephone poles and constructed nesting platforms).</li> </ul> <p><u>Information Sources</u></p> <ul style="list-style-type: none"> <li>Natural Heritage Information Center (NHIC) compiles all known nesting sites for Bald Eagles in Ontario.</li> </ul>	<p>Studies confirm the use of these nests by:</p> <ul style="list-style-type: none"> <li>One or more active Osprey or Bald Eagle nests in an area <sup>cxlviii</sup>.</li> <li>Some species have more than one nest in a given area and priority is given to the primary nest with alternate nests included within the area of the SWH.</li> <li>For an Osprey, the active nest and a 300 m radius around the nest or the contiguous woodland stand is the SWH <sup>ccvii</sup>, maintaining undisturbed shorelines with large trees within this area is important <sup>cxlviii</sup>.</li> <li>For a Bald Eagle the active nest</li> </ul>	<p><b>Yes;</b></p> <p>The FOD8-1 community along the Thames River may provide suitable nesting habitat.</p>	<p><b>No;</b></p> <p>No suitable ecosites were identified within the Study Area.</p>	<p><b>Candidate;</b></p> <p>A juvenile Bald Eagle was observed flying overhead during field studies; however, targeted surveys were not completed.</p>	<p><b>No;</b></p> <p>Candidate habitat was not identified.</p>

Specialized Wildlife Habitat	Wildlife Species	CANDIDATE SWH		CONFIRMED SWH	Candidate Habitat within the Study Area		Confirmed Habitat within the Study Area	
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	Panhandle	Leamington	Panhandle	Leamington
be lost due to increasing shoreline development pressures and scarcity of habitat.			<ul style="list-style-type: none"> <li>MNR values information (LIO/NRVIS) will list known nesting locations, Note: data from NRVIS is provided as a point and does not represent all the habitat.</li> <li>Nature Counts, Ontario Nest Records Scheme data.</li> <li>OMNRF Districts.</li> <li>Check the Ontario Breeding Bird Atlas <sup>ccv</sup> or Rare Breeding Birds in Ontario for species documented</li> <li>Reports and other information available from Conservation Authorities</li> <li>Field naturalist Clubs</li> </ul>	<p>and a 400-800 m radius around the nest is the SWH <sup>cvi, ccvii</sup>. Area of the habitat from 400-800 m is dependent on site lines from the nest to the development and inclusion of perching and foraging habitat <sup>cvi</sup></p> <ul style="list-style-type: none"> <li>To be significant a site must be used annually. When found inactive, the site must be known to be inactive for <math>\geq 3</math> years or suspected of not being used for &gt;5 years before being considered not significant. <sup>ccvii</sup></li> <li>Observational studies to determine nest site use, perching sites and foraging areas need to be done from mid March to mid August.</li> <li>Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects" <sup>ccxi</sup>.</li> <li>SWH MIST <sup>cxlix</sup> Index #26 provides development effects and mitigation measures</li> </ul>				
<p><b>Woodland Raptor Nesting Habitat</b></p> <p><u>Rationale:</u> Nests sites for these species are rarely identified; these area sensitive habitats are often used annually by these species.</p>	<p>Northern Goshawk Cooper's Hawk Sharp-shinned Hawk Red-shouldered Hawk Barred Owl Broad-winged Hawk</p>	<p>May be found in all forested ELC Ecosites.</p> <p>May also be found in SWC, SWM, SWD and CUP3</p>	<p>All natural or conifer plantation woodland/forest stands combined &gt;30ha or with &gt;4 ha of interior habitat <sup>lxxxviii, lxxxix, xc, xci, xciii, xciv, xcv, xcvi, cxxxiii</sup>. Interior habitat determined with a 200m buffer <sup>cxlviii</sup></p> <ul style="list-style-type: none"> <li>Stick nests found in a variety of intermediate-aged to mature conifer, deciduous or mixed forests within tops or crotches of trees. Species such as Coopers hawk nest along forest edges sometimes on peninsulas or small offshore islands.</li> <li>In disturbed sites, nests may be used again, or a new nest will be in close proximity to old nest.</li> </ul> <p><u>Information Sources</u></p> <ul style="list-style-type: none"> <li>OMNRF Districts.</li> <li>Check the Ontario Breeding Bird Atlas <sup>ccv</sup> or Rare Breeding Birds in Ontario for species documented.</li> <li>Check data from Bird Studies Canada.</li> <li>Reports and other information available from Conservation</li> </ul>	<p>Studies confirm:</p> <ul style="list-style-type: none"> <li>Presence of 1 or more active nests from species list is considered significant <sup>cxlviii</sup>.</li> <li>Red-shouldered Hawk and Northern Goshawk – A 400 m radius around the nest or 28 ha habitat area would be applied where optimal habitat is irregularly shaped around the nest) <sup>ccvii</sup>.</li> <li>Barred Owl – A 200 m radius around the nest is the SWH <sup>ccvii</sup>.</li> <li>Broad-winged Hawk and Coopers Hawk, – A 100 m radius around the nest is the SWH <sup>ccvii</sup>.</li> <li>Sharp-Shinned Hawk – A 50m radius around the nest is the SWH <sup>ccvii</sup>.</li> <li>Conduct field investigations from mid-March to end of May. The use of call broadcasts can help in locating territorial (courting/nesting) raptors and facilitate the discovery of nests by narrowing down the search area.</li> <li>SWH MIST <sup>cxlix</sup> Index #27 provides</li> </ul>	<p><b>No;</b></p> <p>No suitable ecosites were identified within the Study Area of sufficient size.</p>	<p><b>No;</b></p> <p>No suitable ecosites were identified within the Study Area of sufficient size.</p>	<p><b>No;</b></p> <p>Candidate habitat was not identified.</p>	<p><b>No;</b></p> <p>Candidate habitat was not identified.</p>

Specialized Wildlife Habitat	Wildlife Species	CANDIDATE SWH		CONFIRMED SWH	Candidate Habitat within the Study Area		Confirmed Habitat within the Study Area	
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	Panhandle	Leamington	Panhandle	Leamington
			Authorities	development effects and mitigation measures.				
<b>Turtle Nesting Areas</b>  <b>Rationale:</b> These habitats are rare and when identified will often be the only breeding site for local populations of turtles.	Midland Painted Turtle  <b>Special Concern:</b> Northern Map Turtle Snapping Turtle	Exposed mineral soil (sand or gravel) areas adjacent (<100 m) <sup>cxlviii</sup> or within the following ELC Ecosites: MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 BOO1 FEO1	<ul style="list-style-type: none"> <li>Best nesting habitat for turtles are close to water and away from roads and sites less prone to loss of eggs by predation from skunks, raccoons, or other animals.</li> <li>For an area to function as a turtle-nesting area, it must provide sand and gravel that turtles are able to dig in and are located in open, sunny areas. Nesting areas on the sides of municipal or provincial road embankments and shoulders are not SWH.</li> <li>Sand and gravel beaches adjacent to undisturbed shallow weedy areas of marshes, lakes, and rivers are most frequently used.</li> </ul> <p><u>Information Sources</u></p> <ul style="list-style-type: none"> <li>Use Ontario Soil Survey reports and maps to help find suitable substrate for nesting turtles (well-drained sands and fine gravels).</li> <li>Check the Ontario Herpetofaunal Atlas records (or other similar atlases) for uncommon turtles; location information may help to find potential nesting habitat for them.</li> <li>Natural Heritage Information Center (NHIC)</li> <li>Field Naturalist Clubs</li> </ul>	Studies confirm: <ul style="list-style-type: none"> <li>Presence of 5 or more nesting Midland Painted Turtles.</li> <li>One or more Northern Map Turtle or Snapping Turtle nesting is a SWH.</li> <li>The area or collection of sites within an area of exposed mineral soils where the turtles nest, plus a radius of 30-100 m around the nesting area dependent on slope, riparian vegetation and adjacent land use is the SWH <sup>cxlviii</sup>.</li> <li>Travel routes from wetland to nesting area are to be considered within the SWH as a part of the 30-100 m area of habitat. <sup>cxlix</sup></li> <li>Field investigations should be conducted in prime nesting season typically late spring to early summer. Observational studies observing the turtles nesting is a recommended method.</li> <li>SWH MIST <sup>cxlix</sup> Index #28 provides development effects and mitigation measures for turtle nesting habitat.</li> </ul>	<b>Yes;</b>  Suitable ecosites may be present within the Study Area.	<b>No;</b>  No suitable ecosites were identified within the Study Area.	<b>Candidate;</b>  Evidence of turtle nesting was observed during field investigations; however, no targeted surveys were completed.	<b>No;</b>  Candidate habitat was not identified.
<b>Seeps and Springs</b>  <b>Rationale:</b> Seeps/Springs are typical of headwater areas and are often at the source of coldwater streams.	Wild Turkey Ruffed Grouse Spruce Grouse White-tailed Deer Salamander spp.	Seeps/Springs are areas where ground water comes to the surface. Often, they are found within headwater areas within forested habitats. Any forested Ecosite within the headwater areas of a stream could have seeps/springs.	Any forested area (with <25% meadow/field/pasture) within the headwaters of a stream or river system <sup>cxvii, cxlix</sup> . <ul style="list-style-type: none"> <li>Seeps and springs are important feeding and drinking areas especially in the winter will typically support a variety of plant and animal species <sup>cxix, cxx, cxxi, cxxii, cxiii, cxiv</sup>.</li> </ul> <p><u>Information Sources</u></p> <ul style="list-style-type: none"> <li>Topographical Map.</li> <li>Thermography.</li> <li>Hydrological surveys conducted by Conservation Authorities and MOE.</li> </ul>	Field Studies confirm: <ul style="list-style-type: none"> <li>Presence of a site with 2 or more seeps/springs should be considered SWH.</li> <li>The area of a ELC forest ecosite or ecoelement within ecosite containing the seeps/springs is the SWH. The protection of the recharge area considering the slope, vegetation, height of trees and groundwater condition need to be considered in delineation the habitat <sup>cxlviii</sup>.</li> <li>SWH MIST <sup>cxlix</sup> Index #30 provides development effects and mitigation</li> </ul>	<b>No;</b>  No suitable ecosites were identified within the Study Area.	<b>No;</b>  No suitable ecosites were identified within the Study Area.	<b>No;</b>  Candidate habitat was not identified.	<b>No;</b>  Candidate habitat was not identified.

Specialized Wildlife Habitat	Wildlife Species	CANDIDATE SWH		CONFIRMED SWH	Candidate Habitat within the Study Area		Confirmed Habitat within the Study Area	
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	Panhandle	Leamington	Panhandle	Leamington
			<ul style="list-style-type: none"> <li>Field Naturalists Clubs and landowners.</li> <li>Municipalities and Conservation Authorities may have drainage maps and headwater areas mapped.</li> </ul>	measures				
<b>Amphibian Breeding Habitat (Woodland).</b>  <b>Rationale:</b> These habitats are extremely important to amphibian biodiversity within a landscape and often represent the only breeding habitat for local amphibian populations	Eastern Newt Blue-spotted Salamander Spotted Salamander Gray Treefrog Spring Peeper Western Chorus Frog Wood Frog	All Ecosites associated with these ELC Community Series; FOC FOM FOD SWC SWM SWD  Breeding pools within the woodland or the shortest distance from forest habitat are more significant because they are more likely to be used due to reduced risk to migrating amphibians	<ul style="list-style-type: none"> <li>Presence of a wetland, pond, or woodland pool (including vernal pools) &gt;500 m<sup>2</sup> within or adjacent (within 120 m) to a woodland (no minimum size) <sup>clxxxii, lxiii, lxxv, lxvi, lxvii, lxviii, lxxix, lxxx</sup>. Some small wetlands may not be mapped and may be important breeding pools for amphibians.</li> <li>Woodlands with permanent ponds or those containing water in most years until mid-July are more likely to be used as breeding habitat <sup>cxlviii</sup>.</li> </ul> <p><u>Information Sources</u></p> <ul style="list-style-type: none"> <li>Ontario Herpetofaunal Summary Atlas (or other similar atlases) for records</li> <li>Local landowners may also provide assistance as they may hear spring-time choruses of amphibians on their property.</li> <li>OMNRF Districts and wetland evaluations</li> <li>Field Naturalist Clubs</li> <li>Canadian Wildlife Service Amphibian Road Call Survey</li> <li>Ontario Vernal Pool Association: <a href="http://www.ontariovernalpools.org">http://www.ontariovernalpools.org</a></li> </ul>	Studies confirm; <ul style="list-style-type: none"> <li>Presence of breeding population of 1 or more of the listed salamander species or 2 or more of the listed frog species with at least 20 individuals (adults, juveniles, eggs/larval masses) <sup>lxxi</sup> or 2 or more of the listed frog species with Call Level Codes of 3.</li> <li>A combination of observation study and call count survey will be required during the spring (March-June) when amphibians are concentrated around suitable breeding habitat within or near the woodland/wetlands.</li> <li>The habitat is the wetland area plus a 230 m radius of area. If a wetland area is adjacent to a woodland, a travel corridor connecting the wetland to the woodland is to be included in the habitat.</li> <li>SWH MIST <sup>cxlix</sup> Index #14 provides development effects and mitigation measures.</li> </ul>	<b>No;</b>  No suitable ecosites were identified within the Study Area.	<b>No;</b>  No suitable ecosites were identified within the Study Area.	<b>No;</b>  Candidate habitat was not identified.	<b>No;</b>  Candidate habitat was not identified.
<b>Amphibian Breeding Habitat (Wetlands)</b>  <b>Rationale:</b> Wetlands supporting breeding for these amphibian species are extremely important and	Eastern Newt American Toad Spotted Salamander Four-toed Salamander Blue-spotted Salamander Gray Treefrog Western Chorus Frog Northern Leopard Frog Pickerel Frog Green Frog Mink Frog Bullfrog	ELC Community Classes SW, MA, FE, BO, OA and SA.  Typically, these wetland ecosites will be isolated (>120m) from woodland ecosites, however larger wetlands containing predominantly	Wetlands >500 m <sup>2</sup> (about 25 m diameter <sup>ccvii</sup> ), supporting high species diversity are significant; some small or ephemeral habitats may not be identified on MNR mapping and could be important amphibian breeding habitats <sup>clxxxii</sup> . <ul style="list-style-type: none"> <li>Presence of shrubs and logs increase significance of pond for some amphibian species because of available structure for calling, foraging, escape and concealment from predators.</li> <li>Bullfrogs require permanent water</li> </ul>	Studies confirm: <ul style="list-style-type: none"> <li>Presence of breeding population of 1 or more of the listed newt/salamander species or 2 or more of the listed frog/toad species with at least 20 individuals (adults or eggs masses) <sup>lxxi</sup> or 2 or more of the listed frog/toad species with Call Level Codes of 3. or; Wetland with confirmed breeding Bullfrogs are significant.</li> </ul>	<b>Yes;</b>  MA communities were identified within the study area.	<b>No;</b>  No suitable ecosites were identified within the Study Area.	<b>Candidate;</b>  Confirmed habitat was not observed during field investigations; however, targeted surveys were not completed.	<b>No;</b>  Candidate habitat was not identified.

Specialized Wildlife Habitat	Wildlife Species	CANDIDATE SWH		CONFIRMED SWH	Candidate Habitat within the Study Area		Confirmed Habitat within the Study Area	
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	Panhandle	Leamington	Panhandle	Leamington
fairly rare within Central Ontario landscapes.		aquatic species (e.g., Bull Frog) may be adjacent to woodlands.	bodies with abundant emergent vegetation.  <u>Information Sources</u> <ul style="list-style-type: none"> <li>Ontario Herpetofaunal Summary Atlas (or other similar atlases)</li> <li>Canadian Wildlife Service Amphibian Road Surveys and Backyard Amphibian Call Count.</li> <li>OMNRF Districts and wetland evaluations.</li> <li>Reports and other information available from Conservation Authorities.</li> </ul>	<ul style="list-style-type: none"> <li>The ELC ecosite wetland area and the shoreline are the SWH.</li> <li>A combination of observational study and call count surveys cviii will be required during the spring (March-June) when amphibians are concentrated around suitable breeding habitat within or near the wetlands.</li> <li>If a SWH is determined for Amphibian Breeding Habitat (Wetlands) then Movement Corridors are to be considered as outlined in Table 1.4.1 of this Schedule.</li> <li>SWH MIST cxlix Index #15 provides development effects and mitigation measures.</li> </ul>				

**Table 1.4 Habitats of Species of Conservation Concern considered SWH.**

Wildlife	Species	CANDIDATE SWH		CONFIRMED SWH	Candidate Habitat within the Study Area		Confirmed Habitat within the Study Area	
		ELC Ecosite	Habitat Criteria and Information Sources	Defining Criteria	Panhandle	Leamington	Panhandle	Leamington
<p><b>Woodland Area-Sensitive Bird Breeding Habitat</b></p> <p><b>Rationale:</b> Large, natural blocks of mature woodland habitat within the settled areas of Southern Ontario are important habitats for area sensitive interior forest songbirds.</p>	<p>Yellow-bellied Sapsucker Red-breasted Nuthatch Veery Blue-headed Vireo Northern Parula Black-throated Green Warbler Blackburnian Warbler Black-throated Blue Warbler Ovenbird Scarlet Tanager Winter Wren Pileated Woodpecker</p> <p><b>Special Concern:</b> Cerulean Warbler Canada Warbler</p>	<p>All Ecosites associated with these ELC Community Series; FOC FOM FOD SWC SWM SWD</p>	<ul style="list-style-type: none"> <li>Habitats where interior forest breeding birds are breeding, typically large mature (&gt;60 yrs old) forest stands or woodlots &gt;30 ha <sup>cv, cxxx1, cxxx2, cxxxiii, cxxxiv, cxxxv, cxxxvi, cxxxvii, cxxxviii, cxxxix, cxl, cxli, cxlii, cxliii, cxliv, cxlv, cxlvi, cl, cli, clii, cliii, cliv, clv, clvi, clvii, clviii, clix</sup>.</li> <li>Interior forest habitat is at least 200 m from forest edge habitat <sup>clxiv</sup>.</li> </ul> <p><u>Information Sources</u></p> <ul style="list-style-type: none"> <li>Local birder clubs.</li> <li>Canadian Wildlife Service (CWS) for the location of forest bird monitoring.</li> <li>Bird Studies Canada conducted a 3-year study of 287 woodlands to determine the effects of forest fragmentation on forest birds and to determine what forests were of greatest value to interior species</li> <li>Reports and other information available from Conservation Authorities</li> </ul>	<p>Studies confirm:</p> <ul style="list-style-type: none"> <li>Presence of nesting or breeding pairs of 3 or more of the listed wildlife species.</li> <li>Note: any site with breeding Cerulean Warblers or Canada Warbler is to be considered SWH.</li> <li>Conduct field investigations in spring and early summer when birds are singing and defending their territories.</li> <li>Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects” <sup>ccxi</sup>.</li> <li>SWH MIST <sup>cxlix</sup> Index #34 provides development effects and mitigation measures.</li> </ul>	<p><b>No;</b></p> <p>No suitable ecosites were identified within the Study Area.</p>	<p><b>No;</b></p> <p>No suitable ecosites were identified within the Study Area.</p>	<p><b>No;</b></p> <p>Candidate habitat was not identified.</p>	<p><b>No;</b></p> <p>Candidate habitat was not identified.</p>
<p><b>Marsh Breeding Bird Habitat</b></p> <p><b>Rationale:</b> Wetlands for these bird species are typically productive and fairly rare in Southern Ontario landscapes.</p>	<p>American Bittern Virginia Rail Sora Common Moorhen American Coot Pied-billed Grebe Marsh Wren Sedge Wren Common Loon Green Heron Trumpeter Swan</p> <p><b>Special Concern:</b> Black Tern Yellow Rail</p>	<p>MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 SAS1 SAM1 SAF1 FEO1 BOO1</p> <p>For Green Heron: All SW, MA and CUM1 sites.</p>	<p>Nesting occurs in wetlands. All wetland habitat is to be considered as long as there is shallow water with emergent aquatic vegetation present <sup>cxxiv</sup>.</p> <ul style="list-style-type: none"> <li>For Green Heron, habitat is at the edge of water such as sluggish streams, ponds and marshes sheltered by shrubs and trees. Less frequently, it may be found in upland shrubs or forest a considerable distance from water.</li> </ul> <p><u>Information Sources</u></p> <ul style="list-style-type: none"> <li>OMNRF District and wetland evaluations.</li> <li>Field Naturalist clubs</li> <li>Natural Heritage Information Centre (NHIC) Records.</li> <li>Reports and other information available from Conservation Authorities.</li> <li>Ontario Breeding Bird Atlas.</li> </ul>	<p>Studies confirm:</p> <ul style="list-style-type: none"> <li>Presence of 5 or more nesting pairs of Sedge Wren or Marsh Wren <b>or</b> breeding by any combination of 4 or more of the listed species.</li> <li>Note: any wetland with breeding of 1 or more Black Terns, Trumpeter Swan, Green Heron or Yellow Rail is SWH.</li> <li>Area of the ELC ecosite is the SWH.</li> <li>Breeding surveys should be done in May/June when these species are actively nesting in wetland habitats.</li> <li>Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”</li> <li>SWH MIST Index #35 provides development effects and mitigation measures</li> </ul>	<p><b>Yes;</b></p> <p>MA communities were identified within the study area.</p>	<p><b>No;</b></p> <p>No suitable ecosites were identified within the Study Area.</p>	<p><b>Candidate;</b></p> <p>Confirmed habitat was not observed during field investigations. however, targeted surveys were not completed.</p>	<p><b>No;</b></p> <p>Candidate habitat was not identified.</p>
<p><b>Open Country Bird Breeding Habitat</b></p> <p><b>Rationale:</b> This wildlife habitat is declining throughout</p>	<p>Upland Sandpiper Grasshopper Sparrow Vesper Sparrow Northern Harrier Savannah Sparrow</p> <p><b>Special Concern:</b> Short-eared Owl</p>	<p>CUM1 CUM2</p>	<p>Large grassland areas (includes natural and cultural fields and meadows) &gt;30 ha <sup>clx, clxi, clxii, clxiii, clxiv, clxv, clxvi, clxvii, clxviii, clxix</sup>.</p> <ul style="list-style-type: none"> <li>Grasslands not Class 1 or 2 agricultural lands, and not being actively used for farming (i.e., no row cropping or intensive hay or livestock pasturing in the last 5 years).</li> </ul>	<p>Studies confirm:</p> <ul style="list-style-type: none"> <li>Presence of nesting or breeding of 2 or more of the listed species.</li> <li>A field with 1 or more breeding Short-eared Owls is to be considered SWH.</li> <li>The area of SWH is the contiguous ELC ecosite field areas.</li> <li>Conduct field investigations of the most</li> </ul>	<p><b>No;</b></p> <p>No suitable ecosites were identified within the Study Area of sufficient size.</p>	<p><b>No;</b></p> <p>No suitable ecosites were identified within the Study Area of sufficient size.</p>	<p><b>No;</b></p> <p>Candidate habitat was not identified.</p>	<p><b>No;</b></p> <p>Candidate habitat was not identified.</p>

Wildlife	Species	CANDIDATE SWH		CONFIRMED SWH	Candidate Habitat within the Study Area		Confirmed Habitat within the Study Area	
		ELC Ecosite	Habitat Criteria and Information Sources	Defining Criteria	Panhandle	Leamington	Panhandle	Leamington
Ontario and North America. Species such as the Upland Sandpiper have declined significantly the past 40 years based on CWS (2004) trend records.			<ul style="list-style-type: none"> <li>Grassland sites considered significant should have a history of longevity, either abandoned fields, mature hayfields and pasturelands that are at least 5 years or older.</li> <li>The indicator bird species are area sensitive requiring larger grassland areas than the common grassland species.</li> </ul> <p><u>Information Sources:</u></p> <ul style="list-style-type: none"> <li>Agricultural land classification maps, Ministry of Agriculture.</li> <li>Local bird clubs.</li> <li>Ontario Breeding Bird Atlas</li> <li>EIS Reports and other information available from Conservation Authorities.</li> </ul>	likely areas in spring and early summer when birds are singing and defending their territories. <ul style="list-style-type: none"> <li>Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects” ccxi.</li> <li>SWH MIST <sup>cxlix</sup> Index #32 provides development effects and mitigation measures.</li> </ul>				
<p><b>Shrub/Early Successional Bird Breeding Habitat</b></p> <p><u>Rationale:</u> This wildlife habitat is declining throughout Ontario and North America. The Brown Thrasher has declined significantly over the past 40 years based on CWS (2004) trend records <sup>cxci</sup>.</p>	<p><u>Indicator Spp:</u> Brown Thrasher Clay-coloured Sparrow</p> <p><u>Common Spp:</u> Field Sparrow Black-billed Cuckoo Eastern Towhee Willow Flycatcher</p> <p><u>Special Concern:</u> Yellow-breasted Chat Golden-winged Warbler</p>	CUT1 CUT2 CUS1 CUS2 CUW1 CUW2  Patches of shrub ecosites can be complexed into a larger habitat for some bird species	Large field areas succeeding to shrub and thicket habitats >10 ha <sup>clxiv</sup> in size. <ul style="list-style-type: none"> <li>Shrub land or early successional fields, not class 1 or 2 agricultural lands, not being actively used for farming (i.e., no row-cropping, haying or live-stock pasturing in the last 5 years).</li> <li>Shrub thicket habitats (&gt;10 ha) are most likely to support and sustain a diversity of these species <sup>clxxiii</sup>.</li> <li>Shrub and thicket habitat sites considered significant should have a history of longevity, either abandoned fields or pasturelands.</li> </ul> <p><u>Information Sources</u></p> <ul style="list-style-type: none"> <li>Agricultural land classification maps, Ministry of Agriculture.</li> <li>Local bird clubs.</li> <li>Ontario Breeding Bird Atlas</li> <li>Reports and other information available from Conservation Authorities.</li> </ul>	Studies confirm: <ul style="list-style-type: none"> <li>Presence of nesting or breeding of 1 of the indicator species and at least 2 of the common species.</li> <li>A habitat with breeding Yellow-breasted Chat or Golden-winged Warbler is to be considered as Significant Wildlife Habitat.</li> <li>The area of the SWH is the contiguous ELC ecosite field/thicket area.</li> <li>Conduct field investigations of the most likely areas in spring and early summer when birds are singing and defending their territories</li> <li>Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects” <sup>ccxi</sup>.</li> <li>SWH MIST</li> <li>cxlix Index #33 provides development effects and mitigation measures.</li> </ul>	<b>No;</b> No suitable ecosites were identified within the Study Area of sufficient size.	<b>No;</b> No suitable ecosites were identified within the Study Area of sufficient size.	<b>No;</b> Candidate habitat was not identified.	<b>No;</b> Candidate habitat was not identified.
<p><b>Terrestrial Crayfish;</b></p> <p><u>Rationale:</u> Terrestrial Crayfish are only found within SW Ontario in Canada and their habitats</p>	Chimney or Digger Crayfish; ( <i>Creaserinus fodiens</i> )  Devil Crawfish or Meadow Crayfish; ( <i>Lacunambarus nebrascensis</i> )	MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 MAS1 MAS2 MAS3 SWD SWT	Wet meadow and edges of shallow marshes (no minimum size) should be surveyed for terrestrial crayfish. <ul style="list-style-type: none"> <li>Constructs burrows in marshes, mudflats, meadows; they can’t be found far from water.</li> <li>Both species are a semi-terrestrial burrower which spends most of its life within burrows consisting of a network of tunnels. Usually, the soil is not too moist so that the tunnel is well formed.</li> </ul>	Studies Confirm: <ul style="list-style-type: none"> <li>Presence of 1 or more individuals of species listed or their chimneys (burrows) in suitable meadow marsh, swamp, or moist terrestrial sites <sup>cci</sup></li> <li>Area of ELC ecosite or a Habitat ecoelement area of meadow marsh or swamp within the larger ecosite area is the SWH.</li> <li>Surveys should be done April to August in temporary or permanent water. Note</li> </ul>	<b>Yes;</b> MA communities were identified within the study area.	<b>No;</b> No suitable ecosites were identified within the Study Area.	<b>Candidate;</b> Confirmed habitat was not observed during field investigations. however, targeted surveys were not completed.	<b>No;</b> Candidate habitat was not identified.

Wildlife	Species	CANDIDATE SWH		CONFIRMED SWH	Candidate Habitat within the Study Area		Confirmed Habitat within the Study Area	
		ELC Ecosite	Habitat Criteria and Information Sources	Defining Criteria	Panhandle	Leamington	Panhandle	Leamington
are very rare. <sup>ccii</sup>		SWM	<u>Information Sources</u> <ul style="list-style-type: none"> <li>Information sources from “Conservation Status of Freshwater Crayfishes” by Dr. Premek Hamr for the WWF and CNF March 1998</li> </ul>	the presence of burrows or chimneys are often the only indicator of presence, observance or collection of individuals is very difficult <sup>cci</sup> . <ul style="list-style-type: none"> <li>SWH MIST <sup>cxlix</sup> Index #36 provides development effects and mitigation measures.</li> </ul>				
<b>Special Concern and Rare Wildlife Species</b>  <u>Rationale:</u> These species are quite rare or have experienced significant population declines in Ontario.	All Special Concern and Provincially Rare (S1-S3, SH) plant and animal species. Lists of these species are tracked by the Natural Heritage Information Centre (NHIC).	All plant and animal element occurrences (EO) within a 1 or 10 km grid.  Older element occurrences were recorded prior to GPS being available, therefore location information may lack accuracy	<ul style="list-style-type: none"> <li>When an element occurrence is identified within a 1 or 10 km grid for a Special Concern or provincially Rare species; linking candidate habitat on the site needs to be completed to ELC Ecosites <sup>lxviii</sup>.</li> </ul> <u>Information Sources</u> <ul style="list-style-type: none"> <li>Natural Heritage Information Centre (NHIC) will have Special Concern and Provincially Rare (S1-S3, SH) species lists with element occurrences data.</li> <li>NHIC Website “Get Information”: <a href="http://nhic.mnr.gov.on.ca">http://nhic.mnr.gov.on.ca</a></li> <li>Ontario Breeding Bird Atlas•</li> <li>Expert advice should be sought as many of the rare spp. have little information available about their requirements.</li> </ul>	Studies Confirm: <ul style="list-style-type: none"> <li>Assessment/inventory of the site for the identified special concern or rare species needs to be completed during the time of year when the species is present or easily identifiable.</li> <li>The area of the habitat to the finest ELC scale that protects the habitat form and function is the SWH, this must be delineated through detailed field studies. The habitat needs be easily mapped and cover an important life stage component for a species e.g., specific nesting habitat or foraging habitat.</li> <li>SWH MIST Index #37 provides development effects and mitigation measures</li> </ul>	<b>Yes;</b>  26 SOCC have been identified as potentially present within the Study Areas.	<b>Yes;</b>  26 SOCC have been identified as potentially present within the Study Areas.	<b>Confirmed;</b>  Swamp rose-mallow was identified in the MAS2-9 community.  Wingstem was identified in the FOD8-1 community.  Midland Painted Turtle and Snapping Turtle were observed in multiple aquatic features.	<b>Confirmed;</b>  Snapping Turtle was observed during field investigation.



**Table 1.5 Animal Movement Corridors.**

Habitat	Species	CANDIDATE SWH		CONFIRMED SWH	Candidate Habitat Present Within the Study Area		\Confirmed Habitat Present within the Study Area	
		ELC Eco-sites	Habitat Criteria and Information Sources	Defining Criteria	Panhandle	Leamington	Panhandle	Leamington
<p><b>Amphibian Movement Corridors</b></p> <p><u>Rationale:</u> Movement corridors for amphibians moving from their terrestrial habitat to breeding habitat can be extremely important for local populations.</p>	<p>Eastern Newt American Toad Spotted Salamander Four-toed Salamander Blue-spotted Salamander Gray Treefrog Western Chorus Frog Northern Leopard Frog Pickerel Frog Green Frog Mink Frog Bullfrog</p>	<p>Corridors may be found in all ecosites associated with water.</p> <ul style="list-style-type: none"> <li>Corridors will be determined based on identifying the significant breeding habitat for these species in Table 1.1</li> </ul>	<p>Movement corridors between breeding habitat and summer habitat <sup>clxxiv, clxxv, clxxvi, clxxvii, clxxviii, clxxix, clxxx, clxxxi</sup>.</p> <p>Movement corridors must be determined when Amphibian breeding habitat is confirmed as SWH from Table 1.2.2 (Amphibian Breeding Habitat – Wetland) of this Schedule.</p> <p><u>Information Sources</u></p> <ul style="list-style-type: none"> <li>MNRF District Office.</li> <li>Natural Heritage Information Centre (NHIC).</li> <li>Reports and other information available from Conservation Authorities.</li> <li>Field Naturalist Clubs.</li> </ul>	<ul style="list-style-type: none"> <li>Field Studies must be conducted at the time of year when species are expected to be migrating or entering breeding sites.</li> <li>Corridors should consist of native vegetation, with several layers of vegetation. Corridors unbroken by roads, waterways or bodies, and undeveloped areas are most significant <sup>cxlix</sup>.</li> <li>Corridors should have at least 15 m of vegetation on both sides of waterway <sup>cxlix</sup> or be up to 200m wide <sup>cxlix</sup> of woodland habitat and with gaps &lt;20 m <sup>cxlix</sup>.</li> <li>Shorter corridors are more significant than longer corridors, however amphibians must be able to get to and from their summer and breeding habitat <sup>cxlix</sup>.</li> <li>SWH MIST <sup>cxlix</sup> Index #40 provides development effects and mitigation measures</li> </ul>	<p><b>No;</b></p> <p>No suitable ecosites were identified within the Study Area of sufficient size.</p>	<p><b>No;</b></p> <p>No suitable ecosites were identified within the Study Area of sufficient size.</p>	<p><b>No;</b></p> <p>Candidate habitat was not identified, however, targeted surveys were not completed.</p>	<p><b>No;</b></p> <p>Candidate habitat was not identified, however, targeted surveys were not completed.</p>

**Table 1.6 Significant Wildlife Habitat Exceptions for Ecodistricts within Eco-Region 7E**

Habitat	Species	CANDIDATE SWH		CONFIRMED SWH	Candidate Habitat Present Within the Study Area		Confirmed Habitat Present within the Study Area	
		ELC Eco-sites	Habitat Criteria and Information Sources	Defining Criteria	Panhandle	Leamington	Panhandle	Leamington
<b>7E-2 Bat Migratory Stopover Area</b>  <b>Rationale:</b> Stopover areas for long distance migrant bats are important during fall migration.	Hoary Bat Eastern Red Bat Silver-haired Bat	No specific ELC types.	<ul style="list-style-type: none"> <li>Long distance migratory bats typically migrate during late summer and early fall from summer breeding habitats throughout Ontario to southern wintering areas. Their annual fall migration may concentrate these species of bats at stopover areas.</li> <li>This is the only known bat migratory stopover habitats based on current information.</li> </ul> <p><u>Information Sources</u></p> <ul style="list-style-type: none"> <li>OMNRF for possible locations and contact for local experts</li> <li>University of Waterloo, Biology Department</li> </ul>	<ul style="list-style-type: none"> <li>Long Point (42°35'N, 80°30'E, to 42°33'N, 80°03'E) has been identified as a significant stop-over habitat for fall migrating Silver-haired Bats, due to significant increases in abundance, activity and feeding that was documented during fall migration <sup>ccxv</sup>.</li> <li>The confirmation criteria and habitat areas for this SWH are still being determined.</li> <li>SWH MIST <sup>cxlix</sup> Index #38 provides development effects and mitigation measures.</li> </ul>	<b>No;</b>  The study area does not include Long Point.	<b>No;</b>  The study area does not include Long Point.	<b>No;</b>  Candidate habitat was not identified.	<b>No;</b>  Candidate habitat was not identified.

# Attachment **E**

## **Species at Risk Habitat Assessment**

Taxonomy	Species	ESA Status	SARA Status	COSEWIC Status	Preferred Habitat <sup>1,2</sup>	Associated ELC Communities	Known Species Range <sup>1,2</sup>	Source Identifying Species Record	Suitable Habitat Identified During Background Review - Panhandle Regional Expansion	Species/Suitable Habitat Identified During Field Investigations - Panhandle	Suitable Habitat Identified During Background Review - Lemington Interconnect	Species/Suitable Habitat Identified During Field Investigations - Leamington
Birds	Bank Swallow <i>Riparia riparia</i>	THR	THR Schedule +E16:116	THR	Bank Swallows nest in burrows in natural and human-made settings where there are vertical faces in silt and sand deposits. Many nests are on banks of rivers and lakes, but they are also found in active sand and gravel pits or former ones where the banks remain suitable. The birds breed in colonies ranging from several to a few thousand pairs.  The Bank Swallow breeds in a wide variety of natural and artificial sites with vertical banks, including riverbanks, lake and ocean bluffs, aggregate pits, road cuts, and stock piles of soil. Sand-silt substrates are preferred for excavating nest burrows. Breeding sites tend to be somewhat ephemeral due to the dynamic nature of bank erosion. Breeding sites are often situated near open terrestrial habitat used for aerial foraging (e.g., grasslands, meadows, pastures, and agricultural cropland). Large wetlands are used as communal nocturnal roost sites during post-breeding, migration, and wintering periods.		The Bank Swallow is found all across southern Ontario, with sparser populations scattered across northern Ontario. The largest populations are found along the Lake Erie and Lake Ontario shorelines, and the Saugeen River (which flows into Lake Huron).  In North America, it breeds widely across the northern two-thirds of the U.S., north to the treeline. It breeds in all Canadian provinces and territories, except perhaps Nunavut.	Leamington Study Area - OBBA Panhandle Study Area - OBBA	Yes  The banks of the constructed drains and watercourses present within the Study Area may provide suitable nesting habitat for Bank Swallow.	No  Neither species nor suitable was identified during field investigations.	Yes  The banks of the agricultural drains present within the Study Area may provide suitable nesting habitat for Bank Swallow.	No  Suitable habitat identified at crossing LSC-11, though Bank Swallows were not observed.
Birds	Barn Owl <i>Tyto alba</i>	END	END Schedule 1	END	The Barn Owl cannot tolerate severe winter temperatures, and southern Ontario is the northern limit of its range. Breeding sites in Ontario seem to be restricted to areas with the moderating effects of the Great Lakes (within 50 kilometres of the lakes). In southern Ontario, this adaptable owl nests and roosts in barns and abandoned buildings. It may also use natural cavities in trees or holes in cliff faces, as it did before the arrival of Europeans in North America. It lives year round at its nest site and hunts for rodents over orchards, and grasslands such as farmlands, fallow fields, and meadows.  Barn Owls prefer low-elevation, open country, where their small rodent prey are more abundant. In Canada, they are often associated with agricultural lands, especially pasture. Nests are located in buildings, hollow trees, and cavities in cliffs. In Canada, most nests are found on man-made structures, especially those which are abandoned or unused.	<b>TPO, TPS, CUM, CUS and CUW</b> where suitable nesting habitat is present.	In the Western Hemisphere, the Barn Owl is found from extreme southern Canada to southern South America and the West Indies. In Canada, the Barn Owl is at the northern limit of its range, and breeds only locally in southern British Columbia, southern Ontario, and possibly in southern Quebec. Barn Owl numbers in Ontario and Quebec were probably never very large, although the species possibly inhabited oak-savannah vegetation adjacent to tall grass prairie prior to European settlement. Colonization of southern Canada is attributed to clearance of forests for agriculture, which created open habitats supporting high rodent populations. In Ontario, Barn Owls may potentially breed on the Niagara Peninsula, in adjacent Halimand-Norfolk, in the Thousands Island area of Kingston, at Long Point, and in several other localities in the southwestern part of the province. Today, there are fewer than five pairs of Barn Owls in Ontario.	Panhandle Study Area - OBBA	Yes  Buildings (i.e. barns) and trees within the Study Area may provide suitable nesting habitat for Barn Owl. Agricultural fields may also provide suitable nesting habitat for this species.	No  Neither species nor suitable was identified during field investigations, however, targeted surveys were not conducted.	No  Species was not identified through the background review.	No  Neither species nor suitable was identified during field investigations, however, targeted surveys were not conducted.
Birds	Barn Swallow <i>Hirundo rustica</i>	THR	THR Schedule 1	THR	Barn Swallows often live in close association with humans, building their cup-shaped mud nests almost exclusively on human-made structures such as open barns, under bridges, and in culverts. The species is attracted to open structures that include ledges where they can build their nests, which are often re-used from year to year. They prefer unpainted, rough-cut wood, since the mud does not adhere as well to smooth surfaces.  Before European colonization, Barn Swallows nested mostly in caves, holes, crevices, and ledges in cliff faces. Following European settlement, they shifted largely to nesting in and on artificial structures, including barns and other outbuildings, garages, houses, bridges, and road culverts. Barn Swallows prefer various types of open habitats for foraging, including grassy fields, pastures, various kinds of agricultural crops, lake and river shorelines, cleared rights-of-way, cottage areas and farmyards, islands, wetlands, and subarctic tundra.	<b>TPO, CUM1, MAM, MAS, OAO, SAS1, SAM1, SAF1;</b> containing or adjacent structures that are suitable for nesting.	The Barn Swallow may be found throughout southern Ontario and can range as far north as Hudson Bay, wherever suitable locations for nests exist.  The Barn Swallow has become closely associated with human rural settlements. It breeds across much of North America south of the treeline, south to central Mexico. In Canada, it is known to breed in all provinces and territories.	Leamington Study Area - OBBA Panhandle Study Area - NHIC, OBBA	Yes  Antropogenic stuctures such as buildings, culverts and bridges may provide suitable nesting habitat for this species.	Yes  Species confirmed nesting under Mint Line Bridge over SC19 and Balmoral Line Bridge over SC40.	Yes  Antropogenic stuctures such as buildings, culverts and bridges may provide suitable nesting habitat for this species.	No  Although species was observed, no nests were identified during field investigations.
Birds	Bobolink <i>Dolichonyx oryzivorus</i>	THR	THR Schedule 1	THR	Historically, Bobolinks lived in North American tallgrass prairie and other open meadows. With the clearing of native prairies, Bobolinks moved to living in hayfields. Bobolinks often build their small nests on the ground in dense grasses. Both parents usually tend to their young, sometimes with a third Bobolink helping.  Most of this prairie was converted to agricultural land over a century ago, and at the same time the forests of eastern North America were cleared to hayfields and meadows that provided habitat for the birds. Since the conversion of the prairie to cropland and the clearing of the eastern forests, the Bobolink has nested in forage crops (e.g., hayfields and pastures dominated by a variety of species, such as clover, Timothy, Kentucky Bluegrass, and broadleaved plants). The Bobolink also occurs in various grassland habitats including wet prairie, graminoid peatlands, and abandoned fields dominated by tall grasses, remnants of uncultivated virgin prairie (tall-grass prairie), no-till cropland, small-grain fields, restored surface mining sites, and irrigated fields in arid regions. It is generally not abundant in short-grass prairie, Alfalfa fields, or in row crop monocultures (e.g., corn, soybean, wheat), although its use of Alfalfa may vary with region.	<b>TPO, TPS, CUM1 and MAM2.</b>	The Bobolink breeds across North America. In Ontario, it is widely distributed throughout most of the province south of the boreal forest, although it may be found in the north where suitable habitat exists.  The breeding range of the Bobolink in North America includes the southern part of all Canadian provinces from British Columbia to Newfoundland and Labrador and south to the northwestern, north-central and northeastern U.S.	Leamington Study Area - OBBA Panhandle Study Area - NHIC, OBBA	Yes  The Study Area is dominated by agricultural fields which may consist of hayfields.	Yes  Species observed in winter wheat fields within the Study Area.	Yes  The Study Area is dominated by agricultural fields which may consist of hayfields.	Yes  Species observed in winter wheat fields within the Study Area.
Birds	Chimney Swift <i>Chaetura pelagica</i>	THR	THR Schedule 1	THR	Before European settlement, Chimney Swifts mainly nested on cave walls and in hollow trees or tree cavities in old growth forests. However, due to the land clearing associated with colonization, hollow trees became increasingly rare, which led Chimney Swifts to move into house chimneys. Today, they are more likely to be found in and around urban settlements where they nest and roost (rest or sleep) in chimneys and other manmade structures. It is likely that a small portion of the population continues to use hollow trees. They also tend to stay close to water as this is where the flying insects they eat congregate.  The Chimney Swift spends the major part of the day in flight feeding on insects. In the northern part of the breeding range, the Chimney Swift favours sites where the ambient temperature is relatively stable.	<b>TPO, CUM1, MAM, MAS, OAO, SAS1, SAM1, SAF1</b> containing or adjacent structures with suitable nesting habitat (i.e. chimneys).	The Chimney Swift breeds in eastern North America, possibly as far north as southern Newfoundland. In Ontario, it is most widely distributed in the Carolinian zone in the south and southwest of the province, but has been detected throughout most of the province south of the 49th parallel.  The Chimney Swift breeds mainly in eastern North America, from southern Canada down to Texas and Florida. The species breeds in east central Saskatchewan, southern Manitoba, southern Ontario, southern Quebec, New Brunswick, Nova Scotia, and possibly in Prince Edward Island and southwestern Newfoundland.	Leamington Study Area - OBBA Panhandle Study Area - OBBA	Yes  Buildings present within the Study Area may provide suitable nesting habitat for this species.	No  Neither species nor suitable was identified during field investigations, however, targeted surveys were not conducted.	Yes  Buildings present within the Study Area may provide suitable nesting habitat for this species.	No  Neither species nor suitable was identified during field investigations, however, targeted surveys were not conducted.
Birds	Eastern Meadowlark <i>Sturnella magna</i>	THR	THR Schedule 1	THR	Eastern Meadowlarks breed primarily in moderately tall grasslands, such as pastures and hayfields, but are also found in alfalfa fields, weedy borders of croplands, roadsides, orchards, airports, shrubby overgrown fields, or other open areas. Small trees, shrubs, or fence posts are used as elevated song perches.  Eastern Meadowlarks prefer grassland habitats, including native prairies and savannahs, as well as non-native pastures, hayfields, weedy meadows, herbaceous fencerows, and airfields.	<b>TPO, TPS, CUM1, CUS, and MAM2</b> with elevated song perches.	In Ontario, the Eastern Meadowlark is primarily found south of the Canadian Shield but it also inhabits the Lake Nipissing, Timiskaming, and Lake of the Woods areas.  Including all subspecies, the Eastern Meadowlark's global breeding range extends from central and eastern North America, south through parts of South America. However, there is only one subspecies in Canada and the neighbouring northeastern U.S. In Canada, the bulk of the population breeds in southern Ontario.	Leamington Study Area - OBBA Panhandle Study Area - NHIC, OBBA	Yes  The Study Area is dominated by agricultural fields which may consist of pastures or hayfields.	No  Suitable habitat identified within the Study Area and presence is assumed though Eastern Meadowlarks were not observed.	Yes  The Study Area is dominated by agricultural fields which may consist of pastures or hayfields.	No  Suitable habitat identified within the Study Area and presence is assumed though Eastern Meadowlarks were not observed.

Taxonomy	Species	ESA Status	SARA Status	COSEWIC Status	Preferred Habitat <sup>1,2</sup>	Associated ELC Communities	Known Species Range <sup>1,2</sup>	Source Identifying Species Record	Suitable Habitat Identified During Background Review - Panhandle Regional Expansion	Species/Suitable Habitat Identified During Field Investigations - Panhandle	Suitable Habitat Identified During Background Review - Lemmington Interconnect	Species/Suitable Habitat Identified During Field Investigations - Leamington
Birds	Henslow's Sparrow <i>Centronyx henslowii</i>	END	END Schedule 1	END	In Ontario, the Henslow's Sparrow lives in open fields with tall grasses, flowering plants, and a few scattered shrubs. It has also been found in abandoned farm fields, pastures, and wet meadows. It tends to avoid fields that have been grazed, burned, or are crowded with trees and shrubs. It prefers extensive, dense, tall grasslands where it can more easily conceal its small ground nest.  Henslow's Sparrows occupy open fields. The vegetation of these areas includes tall grasses that are interspersed with tall herbaceous plants, or shrubby species. It prefers undisturbed areas with dense living grasses and a dense thatch of dead grasses. The species may occupy hayfields, but if the hay is cut early, the nests are destroyed and the resulting losses are severe. Only areas that remain undisturbed for several years appear to be more successfully colonized. The precise amount of remaining suitable habitat in Ontario is unknown.	<b>TPO, CUM, and MAM</b> that are a minimum of 30 ha in size with vegetation that is over 30cm in height with a thick thatch layer and a lack of emergent woody vegetation.	The Henslow's Sparrow breeds in the northeastern and east-central United States, and reaches its northeastern limit in Ontario. It was once fairly common in scattered areas of suitable habitat south of the Canadian Shield. However, steep declines since the 1960s have all but wiped this bird out as a breeding species in Ontario. A few are still seen each spring at migration hotspots such as Point Pelee National Park, and a few may breed at selected locations.  In Canada, it now occurs in southern Ontario. Historical information indicates that the species probably occurred in natural prairie areas and that forest clearing in the 1800s probably lead to an expanded range for a time. In addition to southern Ontario, the Henslow's Sparrow used to occur in southwestern and eastern Ontario.	Panhandle Study Area NHIC	<b>No</b>  Grasslands of sufficient size (i.e. >30 ha) are not anticipated within the Study Area.	<b>No</b>  Neither species nor suitable was identified during field investigations, however, targeted surveys were not conducted.	<b>No</b>  Species was not identified through the background review.	<b>No</b>  Neither species nor suitable was identified during field investigations, however, targeted surveys were not conducted.
Birds	King Rail <i>Rallus elegans</i>	END	END Schedule 1	END	King Rails are found in densely vegetated freshwater marshes with open shallow water that merges with shrubby areas. They are sometimes found in smaller isolated marshes but most seem to prefer larger, coastal wetlands. Its nest is a dinner plate-sized platform made of plant material, placed just above the water in shrubs or clumps of other marsh plants.  King Rails are found in a variety of freshwater marshes and marsh-shrub swamp habitats. The species occurs in areas where wild rice grows, but also in sedge and cattail marshes. Most importantly, the species requires large marshes with open shallow water that merges with shrubby areas. In fact, birds only return in successive years to large marshes that are not overgrown with cattails. Originally, the best habitat for King Rails was in southwestern Ontario, but most of these wetlands have since been eliminated. Only 10% of the original pre-European settlement marshes remain in the one area of Ontario where the largest component of the species occurs. The quality of the remaining habitat is also deteriorating.	<b>MAS, SWT, and MAM.</b>	King Rails reach their northern limit in southern Ontario, where they are quite rare. Recent province-wide surveys suggest there are only about 30 pairs left, the majority of which are in the large wetlands bordering Lake St. Clair. Most of the remainder are found in several key coastal marshes along Lakes Erie and Ontario.  In Canada, the species breeds only in the extreme southern part of Ontario. It is thought that the King Rail was quite common in some southern Ontario marshes, although there is no early information on population numbers and the area occupied.	Panhandle Study Area NHIC, OBBA	<b>Yes</b>  The St. Clair Marsh Complex Provincially Significant Wetland (PSW) may provide suitable nesting habitat for this species.	<b>No</b>  Suitable habitat was identified during field investigations though the species was not observed, however, targeted surveys were not conducted.	<b>No</b>  Species was not identified through the background review.	<b>No</b>  Neither species nor suitable was identified during field investigations, however, targeted surveys were not conducted.
Birds	Least Bittern <i>Ixobrychus exilis</i>	THR	THR Schedule 1	THR	In Ontario, the Least Bittern is found in a variety of wetland habitats, but strongly prefers cattail marshes with a mix of open pools and channels. This bird builds its nest above the marsh water in stands of dense vegetation, hidden among the cattails. The nests are almost always built near open water, which is needed for foraging. This species eats mostly frogs, small fish, and aquatic insects.  The Least Bittern breeds strictly in marshes dominated by emergent vegetation surrounded by areas of open water. Most breeding grounds in Canada are dominated by cattails, but breeding also occurs in areas with other robust emergent plants and in shrubby swamps. The presence of stands of dense vegetation is essential for nesting because the nests of Least Bittern sit on platforms of stiff stems. The nests are almost always within 10 m of open water. Open water is also needed for foraging, because Least Bitterns forage by ambushing their prey in shallow water near marsh edges, often from platforms that they construct out of bent vegetation. Access to clear water is essential for the birds to see their prey. This small heron prefers large marshes that have relatively stable water levels throughout the nesting period. Adults can raise nests somewhat to deal with rising waters, but persistent or sudden increases will flood nests. Conversely, drops in water level can reduce foraging opportunities and increase the species' exposure to predators. Needs for wintering habitat are less specific, and appear to be met by a wide variety of wetlands—not only emergent marshes like those used for breeding, but also brackish and saline swamps. Habitat use during migration is poorly known, but presumably is similar to breeding and wintering habitat.	<b>MAS2-1, MAS3-1, SA and OAO.</b>	In Ontario, the Least Bittern is mostly found south of the Canadian Shield, especially in the central and eastern part of the province. Small numbers also breed occasionally in northwest Ontario. This species has disappeared from much of its former range, especially in southwestern Ontario, where wetland loss has been most severe.  The Least Bittern breeds from southern Canada to South America. In Canada, the Least Bittern has been observed in every province, but most individuals occur in Ontario. The species breeds primarily in southern Ontario.	Panhandle Study Area NHIC, OBBA	<b>Yes</b>  Marsh communities associated with the St. Clair Marsh Complex PSW, Baptiste Creek, Jeannettes Creek and the Thames River may provide suitable nesting habitat for this species.	<b>No</b>  Suitable habitat was identified during field investigations though the species was not observed, however, targeted surveys were not conducted.	<b>No</b>  Species was not identified through the background review.	<b>No</b>  Neither species nor suitable was identified during field investigations, however, targeted surveys were not conducted.
Birds	Prothonotary Warbler <i>Protonotaria citrea</i>	END	END Schedule 1	END	The Prothonotary is the only warbler in eastern North America that nests in tree cavities, where it typically lays four to six eggs on a cushion of moss, leaves, and plant fibres.  In Canada, this species breeds only in deciduous swamp forests or riparian floodplain forests. The forests it occupies are typically dominated by Silver Maple, ash, and Yellow Birch. The species nests in naturally formed tree cavities or cavities excavated by other species, mainly Downy Woodpeckers and chickadees. It favours small, shallow holes situated at low heights in dead or dying trees, in which it builds a nest lined with moss. Nests are typically situated over standing or slow-moving water. Artificial nest boxes are also readily accepted and perhaps even preferred. Males often build one or more incomplete "dummy" nests. Females usually select one of these to complete, but they may also build an entirely new nest on their own. In any case, several suitable cavities appear to be required in each territory to accommodate all of these nests.	<b>FOD and SWD</b> with standing water.	In Canada, the Prothonotary Warbler is only known to nest in southwestern Ontario, primarily along the north shore of Lake Erie. Over half of the small and declining population is found in Rondeau Provincial Park. In Ontario, the Prothonotary Warbler is found in the warmer climate of the Carolinian deciduous forests.  This species is very rare in Canada, but is actively monitored by a combination of amateurs and professionals. Many occupied sites are prone to blinking on and off. This level of annual fluctuation makes it difficult to ascertain whether there has been a true change in occupied range, but such a change seems unlikely. Fewer than 10 locations are occupied in Canada in any given year (e.g., no more than 8 in 2015).	Panhandle Study Area NHIC, OBBA	<b>No</b>  Suitable deciduous swamps or riparian floodplain forests for nesting were not identified within the Study Area through the background review.	<b>No</b>  Neither species nor suitable was identified during field investigations, however, targeted surveys were not conducted.	<b>No</b>  Species was not identified through the background review.	<b>No</b>  Neither species nor suitable was identified during field investigations, however, targeted surveys were not conducted.

Taxonomy	Species	ESA Status	SARA Status	COSEWIC Status	Preferred Habitat <sup>1,2</sup>	Associated ELC Communities	Known Species Range <sup>1,2</sup>	Source Identifying Species Record	Suitable Habitat Identified During Background Review - Panhandle Regional Expansion	Species/Suitable Habitat Identified During Field Investigations - Panhandle	Suitable Habitat Identified During Background Review - Lemmington Interconnect	Species/Suitable Habitat Identified During Field Investigations - Leamington
Fish	Eastern Sand Darter (Ontario populations) <i>Ammocrypta pellucida</i>	END	THR Schedule 1	THR	The Eastern Sand Darter prefers shallow habitats in lakes, streams, and rivers with clean, sandy bottoms. It often buries itself completely in the sand. It feeds on aquatic insects, but due to its small mouth is limited in the size of prey it can eat.  The preferred habitat of the Eastern Sand Darter is sand-bottomed areas in streams and rivers, and sandy shoals in lakes. Spawning has not been observed in nature but, in the laboratory, Eastern Sand Darter spawned on a mixed sand and gravel substrate. Eastern Sand Darter habitats in Canada have been extensively impacted by land clearing, intensive agriculture, urban development, impoundments, and stream channel modifications.	OAO with sandy bottoms.	In Ontario, the Eastern Sand Darter is found in Lake St. Clair, Lake Erie, West Lake, Big Creek, and in the Grand, Sydenham, Thames, and Detroit rivers. The species may have disappeared from several other rivers in southwestern Ontario. In 2008 it was rediscovered in Big Creek after an absence of more than 50 years.  The Eastern Sand Darter occurs in the Ohio River basin (Ohio, Indiana, Illinois, Kentucky, West Virginia, Pennsylvania), a portion of the lower Great Lakes drainage (Lake Huron, Lake St. Clair and Lake Erie drainages in Michigan, Ohio, New York, Pennsylvania, and Ontario), and farther east in the St. Lawrence River and Lac Champlain drainages (Québec, Vermont, New York). In Ontario, populations have been found in seven southwestern Ontario watersheds as well as lakes Erie and St. Clair.	Panhandle Study Area DFO	Yes  DFO records indicate that this species is present within the Thames River.	No  Species was not identified during field investigations, however, targeted surveys were not conducted within the Thames River; suitable habitat identified and presence should be assumed.	No  Species was not identified through the background review.	No  Neither species nor suitable was identified during field investigations, however, targeted surveys were not conducted.
Fish	Lake Chubsucker <i>Erimyzon sucetta</i>	THR	END Schedule 1	END	In Ontario, the Lake Chubsucker lives in marshes and lakes with clear, still, warmer water and plenty of aquatic plants. This habitat is found in bays, channels, ponds, and coastal wetlands. During the breeding season, from April to early June in Ontario, adults move into marshes where eggs are laid among vegetation in shallower water. The chubsucker eats algae, plankton, molluscs, and aquatic insects.  Lake Chubsuckers prefer clear, still waters with abundant aquatic plants such as marshes, stagnant bays, floodplain lakes, and drainage ditches. Their preferred substrates include gravel, sand, and silt mixed with organic debris.	OAO, SAS, SAM, and SAF with clear, still warm water and an abundance of aquatic plants.	In Canada, the Lake Chubsucker is found at several sites in the Ausable River, Lake St. Clair, Lake Erie, and the Niagara river drainage in southern Ontario.  The Lake Chubsucker is primarily a species of the southeastern United States, but it has two main centers of distribution; the lower coastal plain (Gulf and southeastern Atlantic states), and the southern Great Lakes basin. In Canada, it is known only from the drainages of the Niagara River, and lakes Erie, St. Clair, and Huron in southwestern Ontario.	Panhandle Study Area DFO, NHIC	Yes  DFO records indicate that this species is present within the Thames River, McFarlane Relief Drain, Myers Pump Works Drain and the St. Clair Marsh Complex PSW. The PSW is considered critical habitat for this species.	No  Species was not identified during field investigations, however, suitable habitat was identified and presence should be assumed.	No  Species was not identified through the background review.	No  Neither species nor suitable was identified during field investigations, however, targeted surveys were not conducted.
Fish	Lake Sturgeon (Great Lakes-Upper St. Lawrence River populations) <i>Acipenser fulvescens</i>	END	No Status	THR	The Lake Sturgeon lives almost exclusively in freshwater lakes and rivers with soft bottoms of mud, sand, or gravel. They are usually found at depths of five to 20 metres. They spawn in relatively shallow, fast-flowing water (usually below waterfalls, rapids, or dams) with gravel and boulders at the bottom. However, they will spawn in deeper water where habitat is available. They also are known to spawn on open shoals in large rivers with strong currents.  The species occupies a wide variety of aquatic ecosystem types (e.g., stepped-gradient Boreal Shield rivers, low-gradient meandering Prairie rivers, low gradient Hudson lowland rivers, Great Lakes and associated tributaries). Lake Sturgeon requires a variety of habitats to complete its lifecycle, and the species has evolved to exploit typical upstream to downstream hydraulic and substrate gradients. Hatch is contingent on aeration by flowing water, after which larvae apparently require gravel substrate in which to bury and remain while development continues. Once the yolk sac is absorbed, larvae drift downstream via water currents. Habitat requirements at the age-0 stage are not well understood, but may not be as strict as previously assumed. Aside from the requirement of adequate benthic prey items, the habitat requirements for middle to later life stages (juveniles and adults) are not particularly narrow. Habitat trends vary across the species' range. In some areas, the construction of dams has ceased but, in other areas, it is expected to continue into the foreseeable future. Sediment and water quality has improved in many areas formerly impacted by pollution from the pulp-and-paper industry.	OAO. Large lakes/rivers > 20m deep with soft mud, sand, or gravel bottoms required.	In North America, Lake Sturgeon can be found from Alberta to the St. Lawrence drainage of Quebec and from the southern Hudson Bay to the lower Mississippi. In Ontario, the Lake Sturgeon is found in the rivers of the Hudson Bay basin, the Great Lakes basin, and their major connecting waterways, including the St. Lawrence River. There are three distinct populations in Ontario: Great Lakes - Upper St. Lawrence, Saskatchewan - Nelson River, and Southern Hudson Bay - James Bay.	Panhandle Study Area NHIC	Yes  NHIC records indicate that suitable habitat for this species may be present in the Thames River and Jeannettes Creek.	No  Species was not identified during field investigations, however, suitable habitat was identified and presence should be assumed.	No  Species was not identified through the background review.	No  Neither species nor suitable was identified during field investigations, however, targeted surveys were not conducted.
Fish	Pugnose Minnow <i>Opsopoeodus emiliae</i>	THR	THR Schedule 1	THR	The Pugnose Minnow prefers coastal wetlands, and slow-moving rivers and streams with clear, warm water, little or no current, and abundant vegetation.  In Canada, Pugnose Minnows prefer clear, slow-moving rivers, lakes and stream with abundant aquatic vegetation, but are not necessarily excluded from more turbid waters. Some minnows have been recorded in water bodies with moderately clear to very silty water with substrates of clay, silt, or mud, moderate to abundant vegetation, and little or no current. One specimen was even found in turbid water devoid of vegetation.		The Pugnose Minnow lives in central North America in the rivers and streams of the Mississippi River basin. In Canada, it is at the northern limit of its range and is only found in extreme southwestern Ontario with small populations in Lake St. Clair and the Detroit River.	Panhandle Study Area DFO	Yes  DFO records indicate that this species is present within the Thames River.	No  Species was not identified during field investigations, however, suitable habitat was identified and presence should be assumed.	No  Species was not identified through the background review.	No  Neither species nor suitable was identified during field investigations, however, targeted surveys were not conducted.
Fish	Pugnose Shiner <i>Notropis anogenus</i>	THR	THR Schedule 1	THR	The Pugnose Shiner is found in lakes and calm areas of rivers and creeks having clear water and bottoms of sand, mud, or organic matter. It prefers water bodies with plenty of aquatic vegetation, particularly stonewort ( <i>Chara</i> sp.). Aquatic plants provide hiding places, food, and breeding habitat. The Pugnose Shiner eats aquatic plants, green algae, plankton, and some aquatic insects.  The Pugnose Shiner is usually found over sand and mud in slow-moving, clear, vegetated streams and lakes. It is found in sheltered ponds, wetlands, stagnant channels, and protected bays adjacent to larger waterbodies.	OAO with abundant aquatic vegetation in rivers and creeks with clear water with sand, mud, or organic substrate.	In North America, the Pugnose Shiner is found in several tributaries of the upper Mississippi River, in the upper Red River drainage, and in the Great Lakes drainage. In Canada, the Pugnose Shiner is found only at a few sites in southern Ontario, including the Teeswater River, the old Ausable Channel, the Trent River, and a few coastal wetlands in Lake St. Clair (and some tributaries), Lake Erie, lower Lake Huron, Lake Ontario, and the St. Lawrence River.  The range of the Pugnose Shiner extends from Ontario, south to Illinois, and west to North Dakota. The species has a disjunct distribution and it is often absent from theoretically suitable habitat within its range. In Canada, this species has only been found in four main areas of Ontario: 1) southern Lake Huron drainage; 2) Lake St. Clair; 3) Lake Erie; and 4) eastern Lake Ontario/upper St. Lawrence River drainage. It is assumed to be extirpated from Point Pelee and Rondeau Bay.	Panhandle Study Area NHIC	Yes  DFO records indicate that this species is present within the St. Clair Marsh Complex PSW. The PSW is also considered critical habitat for this species.	No  Species was not identified during field investigations, however, suitable habitat was identified and presence should be assumed.	No  Species was not identified through the background review.	No  Neither species nor suitable was identified during field investigations, however, targeted surveys were not conducted.
Mammals	Eastern Small-footed Myotis <i>Myotis leibii</i>	END	N/A	N/A	In the spring and summer, Eastern Small-footed Bats will roost in a variety of habitats, including in or under rocks, in rock outcrops, in buildings, under bridges, or in caves, mines, or hollow trees. These bats often change their roosting locations every day. At night, they hunt for insects to eat, including beetles, mosquitos, moths, and flies. In the winter, these bats hibernate, most often in caves and abandoned mines. They seem to choose colder and drier sites than similar bats and will return to the same spot each year.		The Eastern Small-footed Bat has been found from south of Georgian Bay to Lake Erie and east to the Pembroke area. There are also records from the Bruce Peninsula, the Espanola area, and Lake Superior Provincial Park. Most documented sightings are of bats in their winter hibernation sites.	Bat Conservation International (BCI)	Yes  Buildings present within the Study Area may provide suitable roosting habitat.	No  Species was not identified during field investigations, however, suitable habitat was identified.	Yes  The proposed pipeline passes through a woodlot that may contain suitable roosting habitat. Buildings present within the Study Area may provide suitable roosting habitat.	No  Species was not identified during field investigations, however, suitable habitat was identified.

Taxonomy	Species	ESA Status	SARA Status	COSEWIC Status	Preferred Habitat <sup>1,2</sup>	Associated ELC Communities	Known Species Range <sup>1,2</sup>	Source Identifying Species Record	Suitable Habitat Identified During Background Review - Panhandle Regional Expansion	Species/Suitable Habitat Identified During Field Investigations - Panhandle	Suitable Habitat Identified During Background Review - Lemmington Interconnect	Species/Suitable Habitat Identified During Field Investigations - Leamington
Mammals	Little Brown Myotis <i>Myotis lucifugus</i>	END	END Schedule 1	END	Bats are nocturnal. During the day they roost in trees and buildings. They often select attics, abandoned buildings, and barns for summer colonies where they can raise their young. Bats can squeeze through very tiny spaces (as small as six millimetres across) and this is how they access many roosting areas. Little Brown Bats hibernate from October or November to March or April, most often in caves or abandoned mines that are humid and remain above freezing.  Their specific physiological requirements limit the number of suitable sites for overwintering. In the east, large numbers (i.e., >3000 bats) of several species typically overwinter in relatively few hibernacula. In the west, there are fewer known hibernacula, and numbers appear lower per site. Females establish summer maternity colonies, often in buildings or large-diameter trees. Foraging occurs over water, along waterways, and forest edges. Large open fields or clearcuts generally are avoided. In autumn, bats return to hibernacula, which may be hundreds of kilometres from their summering areas, swarm near the entrance, mate, and then enter that hibernaculum, or travel to different hibernacula to overwinter.		The Little Brown Bat is widespread in southern Ontario and found as far north as Moose Factory and Favourable Lake.  In Canada, <i>Myotis lucifugus</i> occurs from Newfoundland to British Columbia, and northward to near the treeline in Labrador, Northwest Territories and Yukon.	BCI	Yes  Buildings present within the Study Area may provide suitable roosting habitat.	No  Species was not identified during field investigations, however, suitable habitat was identified.	Yes  The proposed pipeline passes through a woodlot that may contain suitable roosting habitat. Buildings present within the Study Area may provide suitable roosting habitat.	Yes  Species detected during targeted surveys in suitable habitat.
Mammals	Northern Myotis <i>Myotis septentrionalis</i>	END	END Schedule 1	END	Northern Long-eared Bats are associated with boreal forests, choosing to roost under loose bark and in the cavities of trees. These bats hibernate from October or November to March or April.  The Northern Long-eared Bat overwinters in cold and humid hibernacula (caves/mines). Their specific physiological requirements limit the number of suitable sites for overwintering. In the east, large numbers (i.e., >3000 bats) of several species typically overwinter in relatively few hibernacula. In the west, there are fewer known hibernacula, and numbers appear lower per site. Females establish summer maternity colonies in buildings or large-diameter trees. Foraging occurs along waterways, forest edges, and in gaps in the forest. Large open fields or clearcuts generally are avoided. In autumn, bats return to hibernacula, which may be hundreds of kilometres from their summering areas, swarm near the entrance, mate, and then enter that hibernaculum, or travel to different hibernacula to overwinter.	<b>FOC, FOM, FOD, SWC, SWM, and SWD</b> where suitable roosting (i.e. cavity trees and trees with loose bark) habitat is available.	The Northern Long-eared Bat is found throughout forested areas in southern Ontario, to the north shore of Lake Superior and occasionally as far north as Moosonee, and west to Lake Nipigon.  In Canada, <i>Myotis septentrionalis</i> occurs from Newfoundland to British Columbia, and northward to near the treeline in Labrador, Northwest Territories, and Yukon.	BCI, Ministry of Environment, Conservation and Parks (MECP)	Yes  Buildings present within the Study Area may provide suitable roosting habitat.	No  Species was not identified during field investigations, however, suitable habitat was identified.	Yes  The proposed pipeline passes through a woodlot that may contain suitable roosting habitat. Buildings present within the Study Area may provide suitable roosting habitat.	No  Species was not identified during field investigations, however, suitable habitat was identified.
Mammals	Tri-colored Bat <i>Perimyotis subflavus</i>	END	END Schedule 1	END	During the summer, the Tri-colored Bat is found in a variety of forested habitats. It forms day roosts and maternity colonies in older forest and occasionally in barns or other structures. They forage over water and along streams in the forest. Tri-colored Bats eat flying insects and spiders gleaned from webs. At the end of the summer they travel to a location where they swarm; it is generally near the cave or underground location where they will overwinter. They overwinter in caves where they typically roost by themselves rather than part of a group.  The Tri-colored Bat overwinters in cold and humid hibernacula (caves/mines). Their specific physiological requirements limit the number of suitable sites for overwintering. In the east, large numbers (i.e., >3000 bats) of several species typically overwinter in relatively few hibernacula. In the west, there are fewer known hibernacula, and numbers appear lower per site. Females establish summer maternity colonies in buildings or large-diameter trees. Foraging occurs over water, along waterways, and forest edges. Large open fields or clearcuts generally are avoided. In autumn, bats return to hibernacula, which may be hundreds of kilometres from their summering areas, swarm near the entrance, mate, and then enter that hibernaculum, or travel to different hibernacula to overwinter.		This bat is found in southern Ontario and as far north as Espanola near Sudbury. Because it is very rare, it has a scattered distribution. It is also found from eastern North America down to Central America.  In Canada, <i>Perimyotis subflavus</i> occurs in Nova Scotia, New Brunswick, Quebec, and Ontario.	BCI	Yes  Buildings present within the Study Area may provide suitable roosting habitat.	No  Species was not identified during field investigations, however, suitable habitat was identified.	Yes  The proposed pipeline passes through a woodlot that may contain suitable roosting habitat. Buildings present within the Study Area may provide suitable roosting habitat.	Yes  Species detected during targeted surveys in suitable habitat.
Molluscs	Fawnsfoot <i>Truncilla donaciformis</i>	END	END Schedule 1	END	The Fawnsfoot inhabits medium and large rivers with moderate to slow flowing water. It usually inhabits shallow waters (1 to 5 metres deep) with gravel, sand, or muddy bottoms.  The Fawnsfoot is generally found in the lower portions of medium to large rivers.		Fawnsfoot is only found in North America, where it primarily occurs in the Great Lakes and Mississippi drainages. In Canada, this species is limited to tributaries of the Great Lakes. In most areas where Fawnsfoot occurs, it has a patchy distribution and is limited to the lower portions of large rivers.  The Fawnsfoot is widely distributed throughout central North America, occurring in 23 American states and one Canadian province. Historically, this mussel was reported in lakes Huron, St. Clair, and Erie and some of their tributaries. Currently, its distribution is restricted to the lower Thames River and to single sites in the St. Clair delta, Muskrat Creek (Saugeen River drainage), lower Sydenham River, and lower Grand River. At two of these sites, only a single specimen has been found.	Panhandle Study Area - DFO, NHIC	<b>Yes</b>  DFO records indicate that this species is present within the Thames River. The Thames River is also considered critical habitat for this species.	No  Species was not identified during field investigations, however, suitable habitat was identified and presence should be assumed.	No  Species was not identified through the background review.	No  Neither species nor suitable was identified during field investigations, however, targeted surveys were not conducted.
Molluscs	Hickorynut <i>Obovaria olivaria</i>	END	END Schedule 1	END	Hickorynuts live on the sandy beds in large, wide, deep rivers – usually more than 2 or 3 metres deep – with a moderate to strong current. Mussels filter water to find food, such as bacteria and algae. Mussel larvae must attach to a fish, called a host, where they consume nutrients from the fish body until they transform into juvenile mussels and then drop off. In Canada, the fish host of the Hickorynut is the Lake Sturgeon. Presence of the fish host is one of the key features determining whether a body of water can support a healthy Hickorynut population.		The Hickorynut is found within the Great Lakes – St. Lawrence basin and the Mississippi River basin. In Canada, the Hickorynut is found in sporadic locations within the Great Lakes and St. Lawrence basin, from Lake Huron to Quebec City. In Ontario, it is found in the Mississagi River and the Ottawa River.  Historically, the Hickorynut was widely distributed along the large river bottoms of the Mississippi River drainage system and the Great Lakes-St. Lawrence basin. In Canada, current populations are now only found in certain rivers and their tributaries within the Great Lakes-St. Lawrence drainage system, from Lake Huron in southern Ontario to Quebec City in the east. Rivers include the Mississagi River, Ottawa River, St. Lawrence River, and the Saint Francois River.	Panhandle Study Area - DFO	<b>Yes</b>  DFO records indicate that this species is present within the Thames River.	No  Species was not identified during field investigations, however, suitable habitat was identified and presence should be assumed.	No  Species was not identified through the background review.	No  Neither species nor suitable was identified during field investigations, however, targeted surveys were not conducted.

Taxonomy	Species	ESA Status	SARA Status	COSEWIC Status	Preferred Habitat <sup>1,2</sup>	Associated ELC Communities	Known Species Range <sup>1,2</sup>	Source Identifying Species Record	Suitable Habitat Identified During Background Review - Panhandle Regional Expansion	Species/Suitable Habitat Identified During Field Investigations - Panhandle	Suitable Habitat Identified During Background Review - Lemmington Interconnect	Species/Suitable Habitat Identified During Field Investigations - Leamington
Molluscs	Lilliput <i>Toxolasma parvum</i>	THR	END Schedule 1	END	Unlike many at-risk mussels, Lilliput are found in a variety of soft river bottoms, such as mud, sand, and silt. Lilliputs burrow in these soft materials to filter-feed. This mussel is very sensitive to changes in water quality. Like most mussels, Lilliput females expel their larvae in the gills of host fish, where they live as parasites before forming into free-living mussels. Likely hosts are Johnny Darter, White Crappie, Bluegill, and Green Sunfish.  Lilliput is found in a variety of habitats, from small to large rivers to wetlands and the shallows of lakes, ponds, and reservoirs. It prefers to burrow in soft substrates (river and lake bottoms) made of mud, sand, silt, or fine gravel.		This mussel is found in a small number of rivers flowing into Lake St. Clair, Lake Erie, and Lake Ontario, as well as two wetlands near the western end of Lake Ontario.  Lilliput is only found in North America, where it is widely distributed from the Gulf of Mexico to the Great Lakes basin. In Canada, Lilliput was historically found in southern Ontario in the drainages of lakes St. Clair, Erie, and Ontario. No longer found in over 40 percent of its historical range, Lilliput is now restricted to the Sydenham River, lower Thames River (Baptiste Creek), Ruscom River, Belle River, Grand River, Welland River, 20 Mile Creek (Jordan Harbour), and Hamilton Harbour (Sunfish Pond, Cootes Paradise, and Grindstone Creek).	Panhandle Study Area - NHIC	<b>Yes</b>  DFO records indicate that this species is present within Baptiste Creek.	<b>Yes</b>  Several Lilliput shells observed at margin of Unnamed Non-Flowing Waterbody 002 (SC-07).	No  Species was not identified through the background review.	No  Neither species nor suitable was identified during field investigations, however, targeted surveys were not conducted.
Plants	Dense Blazing Star <i>Liatris spicata</i>	THR	THR Schedule 1	THR	In Ontario, Dense Blazing Star grows in moist prairies, grassland savannahs, wet areas between sand dunes, and abandoned fields. This plant does not do well in the shade and is usually found in areas that are kept open and sunny by fire, floods, drought, or grazing.  Dense Blazing Star is a plant of open tallgrass prairies. It can grow in a range of moisture regimes from dry to very moist.	TPO2, TPS2, SDO, and CUM with moist soils.	Dense Blazing Star is found only in North America. In Canada, it occurs naturally only in southwest Ontario, mainly in the area between Lake St. Clair, Lake Huron, and Lake Erie. There are believed to be 11 to 13 populations in the province with six populations known to have been lost.  Over 90% of all native Dense Blazing Star plants in Canada grow at Walpole Island First Nation (WIFN), with another large population in Windsor. There are ten extant populations in Ontario.	Panhandle Study Area - NHIC	<b>No</b>  Suitable tall grass prairies or cultural meadows were not identified through the background review.	No  Species was not identified during botanical inventory.	No  Species was not identified through the background review.	No  Species was not identified during botanical inventory.
Reptiles	Blanding's Turtle (Great Lakes / St. Lawrence population) <i>Emydoidea blandingii</i>	THR	THR Schedule 1	END	Blanding's Turtles live in shallow water, usually in large wetlands and shallow lakes with lots of water plants. It is not unusual, though, to find them hundreds of metres from the nearest water body, especially while they are searching for a mate or traveling to a nesting site. Blanding's Turtles hibernate in the mud at the bottom of permanent water bodies from late October until the end of April.  In the Great Lakes/St. Lawrence population, Blanding's Turtles are often observed using clear water, eutrophic wetlands. Blanding's Turtles have strong site fidelity but may use several connected water bodies throughout the active season. Females nest in a variety of substrates including sand, organic soil, gravel, cobblestone, and soil-filled crevices of rock outcrops. Adults and juveniles overwinter in a variety of water bodies that maintain pools averaging about 1 m in depth; however, hatchling turtles have been observed hibernating terrestrially during their first winter. Reported mean home ranges generally fall between 10-60 ha (maximum 382 ha) or 1000-2500 m (maximum 7000 m); however, most studies likely underestimate Blanding's Turtle home range size because few have utilized GPS loggers to track daily movements throughout one or more entire active seasons.	SWT2, SWT3, SWD, SWM, MAS2, SAS1, SAM1, where open water is present.	The Blanding's Turtle is found in and around the Great Lakes Basin, with isolated populations elsewhere in the United States and Canada. In Canada, the Blanding's Turtle is separated into the Great Lakes-St. Lawrence population and the Nova Scotia population. Blanding's Turtles can be found throughout southern, central, and eastern Ontario.  In its Canadian range, the Great Lakes/St. Lawrence population of the Blanding's Turtle occurs primarily in southern Ontario (with isolated reports as far north as Timmins) and southern Québec (with isolated reports occurring as far north as the Abitibi-Témiscamingue region and as far east as the Capitale-Nationale region in Québec). Across the North American range, Blanding's Turtles mainly occur in small, isolated subpopulations that maintain a few dozen to approximately 100 turtles.	Panhandle Study Area - NHIC, ORAA	Yes  Marsh and open water communities associated with the St. Clair Marsh Complex PSW, Baptiste Creek, Jeannettes Creek and the Thames River may provide suitable habitat.	No  Species was not identified during field investigations, however, suitable habitat was identified and presence should be assumed.	No  Species was not identified through the background review.	No  Neither species nor suitable was identified during field investigations.
Reptiles	Common Five-lined Skink (Five-lined Skink; Carolinian population) <i>Plestiodon fasciatus</i>	END	END Schedule 1	END	Common Five-lined Skinks like to bask on sunny rocks and logs to maintain a preferred body temperature (28-36°C). During the winter, they hibernate in crevices among rocks or buried in the soil. There are two populations of Common Five-lined Skink in Ontario and they each occupy different types of habitat.  The habitat of the Five-lined Skink varies from region to region and includes rocky outcrops, dunes, fields, and deciduous forests. This species is generally associated with relatively open environments that provide a sufficient covering of debris for shelter. Carolinian populations inhabit the forests around Lakes Erie, St. Clair, and Huron. Five-lined Skinks primarily inhabit clearings such as stabilized sand dunes, open forest areas, and wetlands where they find shelter, most often under plant debris, such as decomposing tree trunks. They also use other items for shelter, including artificial objects such as construction materials, utility poles, and wooden boardwalks. The availability of objects that provide shelter is vital to the Five-lined Skink so it can protect itself against extreme temperatures and desiccation. Since the Five-lined Skink is prone to dehydration, its habitat must include a permanent water body.	SDO, SDS, SDT, TPS, CUS, CUW, FOM, FOD, and MAM where suitable cover and basking habitat is present.	In North America, the Common Five-lined Skink occurs throughout hardwood forests from the Atlantic seaboard to Texas and Minnesota and from southern Ontario to the Gulf of Mexico.  There are two known populations of Five-lined Skinks in Ontario: the Carolinian population, which concentrates near Lakes Erie, St. Clair, and Huron in southwestern Ontario; and the Great Lakes/St. Lawrence population, which occurs along the southern edge of the Canadian Shield, from Georgian Bay to Leeds and Greenville County in south-central Ontario. Between 1995 and 2004, four or five small distinct populations were reported in the Carolinian region, namely those of Point Pelee National Park, Rondeau Provincial Park, Pinery Provincial Park, Oxley Poison Sumac Swamp, and, possibly, Walpole Island.	Panhandle Study Area - NHIC, ORAA	<b>No</b>  Suitable habitat was not identified through the background review.	No  Neither species nor suitable was identified during field investigations, however, targeted surveys were not conducted.	No  Species was not identified through the background review.	No  Neither species nor suitable was identified during field investigations, however, targeted surveys were not conducted.
Reptiles	Eastern Foxsnake (Carolinian population) <i>Pantherophis gloydi</i>	END	END Schedule 1	END	Eastern Foxsnakes in the Carolinian population are usually found in old fields, marshes, along hedgerows, drainage canals, and shorelines. Females lay their eggs in rotting logs, manure, or compost piles, which naturally incubate the eggs until they hatch. During the winter, Eastern Foxsnakes hibernate in groups in deep cracks in the bedrock and in some man-made structures.  Eastern Foxsnakes in the Essex-Kent and Haldimand-Norfolk regions use mainly unforested, early successional vegetation communities (e.g., old field, prairie, marsh, dune-shoreline) as habitat during the active season. Hedgerows bordering farm fields and riparian zones along drainage canals are regularly used. In some areas of intensive farming, these linear habitat strips likely make up the bulk of habitat available for foxsnakes.		The Eastern Foxsnake is only found in Ontario, Michigan, and Ohio. Ontario contains 70% of their range in two distinct populations: the Carolinian population in southwestern Ontario and the eastern Georgian Bay population.  Within Ontario, the species' distribution is highly disjunct, occupying three discrete regions along the Lake Erie-Lake Huron waterway shoreline. The three regional populations from south to north are (1) Essex-Kent, (2) Haldimand-Norfolk, and (3) Georgian Bay Coast.	Leamington Study Area - ORAA Panhandle Study Area - ORAA	<b>Yes</b>  Riparian habitat associated with the St. Clair Marsh Complex PSW, Baptiste Creek, Jeannettes Creek, the Thames River and agricultural drains as well as the various hedgerows present with the Study Area may provide suitable habitat.	<b>Yes</b>  Multiple individuals were observed in suitable habitat.	<b>Yes</b>  Suitable habitat may be present within the strips of riparian vegetation present within the Study Area.	No  Species was not identified during field investigations, however, suitable habitat was identified and presence should be assumed.



Taxonomy	Species	ESA Status	SARA Status	COSEWIC Status	Preferred Habitat <sup>1,2</sup>	Associated ELC Communities	Known Species Range <sup>1,2</sup>	Source Identifying Species Record	Suitable Habitat Identified During Background Review - Panhandle Regional Expansion	Species/Suitable Habitat Identified During Field Investigations - Panhandle	Suitable Habitat Identified During Background Review - Lemmington Interconnect	Species/Suitable Habitat Identified During Field Investigations - Leamington
Reptiles	Massasauga (Carolinian population) <i>Sistrurus catenatus</i>	END	END Schedule 1	END	<p>Massasaugas live in different types of habitats throughout Ontario, including tallgrass prairie, bogs, marshes, shorelines, forests, and alvars. Within all of these habitats, Massasaugas require open areas to warm themselves in the sun. Pregnant females are most often found in open, dry habitats such as rock barrens or forest clearings where they can more easily maintain the body temperature required for the development of their offspring. Non-pregnant females and males forage and mate in lowland habitats such as grasslands, wetlands, bogs, and the shorelines of lakes and rivers. Massasaugas hibernate underground in crevices in bedrock, sphagnum swamps, tree root cavities, and animal burrows where they can get below the frost line but stay above the water table.</p> <p>The Massasauga's habitat varies from wet prairie, sedge meadows, and old fields, to peatlands, bedrock barrens, and coniferous forest; however, each habitat provides physical similarities to meet the species' habitat requirements. Massasaugas require a semi-open habitat to provide both cover from predators and opportunities for thermoregulation (i.e. basking). Hibernation sites are often damp or water-saturated, suggesting that moisture content is a key variable in successful hibernation. Both quantity and quality of Massasauga habitat in Ontario have declined, and in many places continue to decline, due to human encroachment.</p>	TP, BO, MA, FO, AL, RB, and CUM with open areas.	<p>In Canada, the Massasauga is found only in Ontario, primarily along the eastern side of Georgian Bay and on the Bruce Peninsula. Two small populations are also found in the Wainfleet Bog on the northeast shore of Lake Erie and near Windsor. The Massasauga was once more widespread in southwestern Ontario, especially along the shores of the Great Lakes.</p> <p>In Canada, populations of this snake are restricted to four geographically distinct regions within Ontario. The Wainfleet and Ojibway populations in southwestern Ontario are small and completely isolated. It is thought probable that they shared a continuous distribution with Massasaugas in the Bruce Peninsula and eastern Georgian Bay.</p>	Panhandle Study Area - ORAA	No	Neither species nor suitable was identified during field investigations.	Species was not identified through the background review.	Neither species nor suitable was identified during field investigations.
Reptiles	Queensnake <i>Regina septemvittata</i>	END	END Schedule 1	END	<p>The Queensnake is an aquatic species that is seldom found more than a few metres from the water. It prefers rivers, streams, and lakes with clear water, rocky or gravel bottoms, lots of places to hide, and an abundance of crayfish. Queensnakes will often hibernate in groups with other snakes, amphibians, and even crayfish. Suitable hibernation sites (called hibernacula) include abutments of old bridges and crevices in bedrock.</p> <p>Queensnakes are most commonly associated with rocky streams and rivers, but are also occasionally found in marsh, pond, and lake shore habitats. This highly aquatic species is usually found within 3 m of the shoreline and only at sites where there is an abundance of crayfish, its primary food source.</p>	OAO with clear water and rocky or gravel bottoms with lots of places to hide and abundance of crayfish.	<p>In Ontario, the Queensnake is found only in the southwest in Middlesex, Brant, Huron, and Essex counties, and on the Bruce Peninsula. There are fewer than 25 sites where it is known to occur in these areas. The extremely specialized habitat requirements of the Queensnake restrict this species to particular areas, with large gaps of unfavourable habitat in between populations. The snake's home range is quite small, making Queensnakes less likely to move into new areas or areas where it was historically found.</p> <p>The Queensnake is relatively widespread in eastern North America, ranging from southeastern Pennsylvania, western New York and southwestern Ontario, west to southeastern Wisconsin, and south to the Gulf Coast from the Florida panhandle to eastern Mississippi. The Queensnake occurs west of the Niagara Escarpment, from the northern portion of the Bruce Peninsula, south to Lake Erie, and west to Essex County.</p>	Panhandle Study Area - ORAA	Yes	Species was not identified during field investigations, however, suitable habitat was identified and presence should be assumed.	Species was not identified through the background review.	Neither species nor suitable was identified during field investigations, however, targeted surveys were not conducted.
Reptiles	Spiny Softshell <i>Apalone spinifera</i>	END	END Schedule 1	END	<p>Spiny Softshells are highly aquatic turtles that rarely travel far from water. They are found primarily in rivers and lakes but also in creeks and even ditches and ponds near rivers. Key habitat requirements are open sand or gravel nesting areas, shallow muddy or sandy areas to bury in, deep pools for hibernation, areas for basking, and suitable habitat for crayfish and other food species. These habitat features may be distributed over an extensive area, as long as the intervening habitat doesn't prevent the turtles from traveling between them.</p> <p>Spiny Softshell inhabits a wide variety of aquatic habitats, including rivers, marshy creeks, oxbows, lakes, and impoundments. Common habitat features include a soft bottom with sparse aquatic vegetation, as well as sandbars or mudflats. Overwintering sites are generally in well oxygenated lakes and rivers.</p>	OAO characterized as rivers with nearby open sand or gravel nesting areas, shallow muddy or sandy substrates, deep pools, basking areas and suitable habitat for food species.	<p>In Canada, the Spiny Softshell is found only in Quebec and southwestern Ontario in the Lake St. Clair, Lake Erie, and western Lake Ontario watersheds. The majority of Spiny Softshells in Ontario are found in the Thames and Sydenham rivers and at two sites in Lake Erie. The size of the home range of this turtle depends on availability of habitat features such as nesting and hibernation sites. Some turtles travel up to 30 kilometres in a year from one part of their home range to another.</p> <p>Globally, the Spiny Softshell occurs in eastern North America from the New England states through extreme southern Quebec and Ontario, west to Nebraska, south to Texas, and across the Gulf states to the Atlantic. The Canadian population is divided into two geographically distinct subpopulations: a Great Lakes/St. Lawrence subpopulation in southern Quebec and a Carolinian subpopulation in southern Ontario.</p>	Panhandle Study Area - NHIC	Yes	Species was not identified during field investigations, however, suitable habitat was identified and presence should be assumed.	Species was not identified through the background review.	Neither species nor suitable was identified during field investigations, however, targeted surveys were not conducted.
Reptiles	Timber Rattlesnake <i>Crotalus horridus</i>	EXP	EXP Schedule 1	EXP	The preferred habitats for Timber Rattlesnakes in the northern parts of their range are forested areas with rocky outcrops for denning and basking. Granitic escarpments and ledges with accumulations of talus (rock debris) are common characteristics of the communal den within which the snakes hibernate.		<p>This rattlesnake was found along the Niagara Escarpment, primarily in the Niagara area. The most recent confirmed records of this rattlesnake in Ontario are from the Niagara Gorge in the 1940s. This species occurs throughout the eastern and central United States, although it is locally extirpated in many areas.</p> <p>It has not been found anywhere else in Canada since then, and is therefore considered extirpated from Canada.</p>	Panhandle Study Area - NHIC	No	Species is considered extirpated from Ontario.	Species was not identified through the background review.	Species was not identified through the background review.

## Glossary

EXP	ESA - Extirpated - a species that no longer exists in the wild in Ontario but still occurs elsewhere. SARA - Extirpated - a wildlife species that no longer exists in the wild in Canada, but exists elsewhere in the wild.
END	ESA - Endangered - a species facing imminent extinction or extirpation in Ontario which is a candidate for regulation under Ontario's Endangered Species Act. SARA - Endangered - a wildlife species that is facing imminent extirpation or extinction.
THR	ESA - Threatened - a species that is at risk of becoming endangered in Ontario if limiting factors are not reversed. SARA - Threatened - a wildlife species that is likely to become endangered if nothing is done to reverse the factors leading to its extirpation or extinction.
SC	ESA - Special Concern (formerly Vulnerable) - a species with characteristics that make it sensitive to human activities or natural events. SARA - Special Concern - a wildlife species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats.
OMNR	Ontario Ministry of Natural Resources
ESA	Endangered Species Act
SARA	Species at Risk Act (Federal)
Schedule 1	The official list of species that are classified as extirpated, endangered, threatened, and of special concern.
Schedule 2	Species listed in Schedule 2 are species that had been designated as endangered or threatened, and have yet to be re-assessed by COSEWIC using revised criteria. Once these species have been re-assessed, they may be considered for inclusion in Schedule 1.
Schedule 3	Species listed in Schedule 3 are species that had been designated as special concern, and have yet to be re-assessed by COSEWIC using revised criteria. Once these species have been re-assessed, they may be considered for inclusion in Schedule 1.
COSEWIC	Committee on the Status of Endangered Wildlife in Canada - a committee of experts that assesses and designates which wild species are in some danger of disappearing from Canada.

## References

- 1 - Species at Risk . Ontario Ministry of Natural Resources. <http://www.mnr.gov.on.ca/en/Business/Species/index.html>. © Queens Printer For Ontario, 2013.
- 2 - Species at Risk Status Reports. Committed on the Status of Endangered Wildlife in Canada. Ottawa.  
[http://www.sararegistry.gc.ca/search/advSearchResults\\_e.cfm?stype=doc&docID=18](http://www.sararegistry.gc.ca/search/advSearchResults_e.cfm?stype=doc&docID=18).

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Three Fires Group ("TFG")

INTERROGATORY

References:

Environmental Report, Section 4.3.2.1, pp. 30-31

Preamble:

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

Question:

- a) Does Enbridge acknowledge that "unevaluated" wetlands are often the result of research gaps, and do not always indicate a lack of ecological importance or value?
- b) Will Enbridge commit to surveying and mitigating effects on both PSWs (classified through the OWES), as well as "unevaluated" wetlands?

Response

- a) Yes.
- b) Yes. Please also see the response to Exhibit I.TFG.6, part d).

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Three Fires Group ("TFG")

INTERROGATORY

References:

Environmental Report, Section 4.3.2.2.2, pp. 32

Preamble:

The Environmental Report notes that one woodlot on County Road 8 will be crossed by the pipeline, which may result in some tree clearing.

Question:

- a) Please provide information on EGI's additive effects for woodlot cover losses due to tree clearing for pipeline construction, operation, and maintenance.
- b) Please explain why the additive effects of woodlot cover losses due to tree clearing for pipeline construction, operation, and maintenance were not included in the Environmental Report, as per OEB Environmental Guidelines?
- c) Please discuss whether there are any plans to identify species of interest and transplant vegetation accordingly? If no, please explain why not.
- d) Will EGI commit to replacing the loss of trees through its Tree Replacement Program? Please explain what age and species of trees will be removed and what age and species of trees will be replanted.

Response

- a) Potential effects to woodlots and associated impacts are outlined in Section 4.3 and 5.3.2 of the ER. Enbridge Gas will avoid clearing trees to the extent feasible. In consultation with directly impacted landowners, Enbridge Gas will restore the lands to a state similar to pre-existing conditions with the exception of woodlands and trees within the permanent easement. In these instances, Enbridge Gas is committed to implementing a tree replacement program that replants woodland removed with seedlings of native species that are guaranteed until they reach free to grow status. This program was planned at a ratio of 2:1 for the woodland areas removed and will now be increased to 3:1 based on input from Indigenous

communities (trees to be replaced on a 3:1 area basis at 1000 tree seedlings per acre).

- b) Tree clearing for pipeline construction and operations is anticipated to be minor considering the limited woodlots within the construction footprint. With the implementation of the tree replacement program described in part a) above, additive effects of woodlot removal are not anticipated and thus were not outlined in the cumulative effects assessment.
- c) Although not identified during the 2022 field investigations, a number of plant species of conservation concern (either Special concern provincially or federally, or with a sub-national rank of S3 or lower) were identified to have the potential to occur within the study area (e.g., cup plant, field thistle etc.). See Section 4.3.3.1 of the ER.

If previously unidentified rare plants or ecological communities are discovered during construction, a Plant Species and Ecological Communities of Concern Discovery plan will be followed and will be implemented as part of the Environmental Protection Plan.

- d) Yes, see part a) above. Trees likely to be removed as a result of the Leamington project are largely less than 25 cm diameter at breast height (DBH) with the occasional tree between 25 and 50 cm DBH. Tree species to be removed include mostly shagbark hickory, with some elm, swamp oak and Freeman's maple. The project will attempt to limit tree removal to the greatest extent possible.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Three Fires Group ("TFG")

INTERROGATORY

References:

Environmental Report, Section 4.4.7, pp. 45-46

Preamble:

The Panhandle Loop and Leamington Interconnect are proposed to be constructed looping existing pipeline infrastructure (Panhandle Loop) or adjacent to or within existing road allowances on public or private property (Leamington Interconnect).

Question:

- a) Has EGI evaluated the impacts of controlled vehicle access routes on surrounding communities, many of which contain Three Fires First Nation band members who live off reserve? If no, please explain why not.

**Response**

- a) Yes, Enbridge Gas has evaluated traffic impacts as part of the ER in Section 4.4.4. Enbridge Gas has also been consulting with the relevant municipalities to develop road access requirements and crossing methods to limit impacts to traffic.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Three Fires Group ("TFG")

INTERROGATORY

References:

Environmental Report, Table 5-4, p. 57

Preamble:

The Environmental Report notes that if the pipeline route or an adjacent farm field is identified as having SCN all equipment and boots should be properly cleaned before moving to an area that has not shown to be impacted by SCN. This may involve thorough washing before moving equipment from an impacted field to non-impacted field.

Question:

- a) Please explain how Enbridge is testing for SCN along the pipeline route and adjacent farm field(s)?
- b) Does Enbridge have a SCN-specific best practice protocol? Are Enbridge contractors/consultants trained specifically in mitigating SCN spread?
- c) Where does "thorough washing" occur, to prevent field contamination?
- d) Please explain how potential downstream impacts are mitigated from washing contaminated equipment (including boots) with SCN?

Response

- a) As noted in Table 5.1 Potential Impacts and Recommended Mitigation and Protective Measures of the Environmental Report, Enbridge Gas has conducted pre-construction soil-sampling program to determine the presence of soybean cyst nematode ("SCN") on agricultural lands along the pipeline right of way. Samples were taken from each field through a series of grab samples based on sample area. The samples are then submitted to a lab for confirmation of soybean cyst nematodes and eggs. If SCN is found, best management practices will be developed in consultation with landowners and with consideration of local management practices. Local management practices may include pressure washing of equipment upon

leaving an infested field and/or topsoil stripping of infested fields. Any imported topsoil will also be analyzed for SCN prior to placement.

- b) Yes, Enbridge Gas has developed a number of best management practices for mitigating the spread of SCN. In general, these practices are developed with the affected landowners but typically include establishment of on-site pressure washing equipment upon leaving an infested field and/or topsoil stripping of infested fields and avoiding importing topsoil infected with SCN.

Yes, Enbridge Gas trains all field personnel (including contractors) regarding environmental mitigation measures required during construction, including measures to limit the spread of SCN.

- c) Thorough washing involves setting up wash stations at the edge of an infested field so that clean equipment can exit the wash station on a non-infested field/property. Wash stations are designed in accordance with Table 5.5 of the ER to avoid the potential for field and surface water contamination.
- d) Wash stations are designed in accordance with Table 5.5 of the ER to avoid the potential for field and surface water contamination.



ENBRIDGE GAS INC.

Answer to Interrogatory from  
Three Fires Group ("TFG")

INTERROGATORY

References:

Environmental Report, Table 5-5, pp. 59-60

Preamble:

The Environmental Report notes EGI should restrict construction equipment to designated controlled vehicle access routes to minimize the potential contamination and that it should control quantity and quality of stormwater discharge using best management practices.

Question:

- a) Please explain why dewatering mitigation measures were excluded from this Table?
- b) What mitigation measures will be taken (throughout the project's lifecycle), to maintain the biophysical features of the surface water whilst dewatering occurs?
- c) If surface water quality and/or quantity is altered post-dewatering, please explain how fish and invertebrate habitat will be restored.
- d) Please provide all vehicle routes for construction sites along bodies of water (rivers, streams, wetlands, etc.).
- e) Please provide a clear, visual map for all construction sites.
- f) Please provide information on EGI's stormwater discharge best management practices, in part, as it relates to changes in surface water quality and quantity.

Response

- a) Mitigation measures for dewatering are outlined in Section 5.3.1.2 & Table 5-3 of the ER with additional mitigation measures pertaining to stormwater best management practices presented in Table 5-5.
- b) and f)

Dewatering will only occur during construction. Mitigation measures for dewatering are outlined in Section 5.3.1.2 & Table 5-3 of the ER with additional mitigations pertaining to stormwater best management practices presented in Table 5-5. Some examples of mitigation measures identified in the ER include the use of erosion and sediment control measures, filtration tubs, sediment bags, discharge being setback a minimum of 30 metres from a waterbody, and oversight from a full-time environmental inspector.

- c) A full-time Environmental Inspector (“EI”) will be designated for the project. The EI will be responsible for monitoring water taking/discharge for any potential erosion and sediment control issues that may affect the quality and quantity of surface water. In the unlikely event that water quality or quantity are affected to a point that impacts to fish and invertebrate habitat occur, Enbridge Gas would work with DFO and other applicable agencies / Indigenous communities to create a plan in accordance with the EPP and DFO requirements.
- d) and e)  
Please see Attachment 1 to this response.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Three Fires Group ("TFG")

Due to size, the attachment to this response can be found electronically by accessing the link below and will be filed with the OEB under separate cover.

<https://www.enbridgegas.com/about-enbridge-gas/projects/panhandle-regional-expansion>

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Three Fires Group ("TFG")

INTERROGATORY

References:

Environmental Report, Section 5.3.2.2, p. 61

Preamble:

The Environmental Report notes that a field investigation of each watercourse crossing will be conducted to determine if fish and/or fish habitat is present.

Question:

- a) Please provide information on EGI's field investigation protocol for determining fish and fish habitat, including accounting for various watercourses.

**Response**

- a) Qualified aquatic biologists have completed ecological field investigations to determine if fish and/or fish habitats are present. The proposed pipeline right-of-way, plus 25 m upstream and downstream of the right-of-way limits, were assessed for the presence of fish and/or fish habitat. Visual aquatic habitat assessments within these limits were completed at each of the watercourse crossings. Investigations included an assessment of morphology, approximate channel dimensions, substrates, aquatic vegetation, and SAR habitat suitability as well as identifying potential enhancement opportunities for the watercourse. Watercourses that did not contain SAR also underwent fish community assessments using backpack electrofishing equipment to determine community makeup and potentially identify any unmapped SAR fish presence.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Three Fires Group ("TFG")

INTERROGATORY

References:

Environmental Report, Table 5-13, p. 76

Preamble:

The Environmental Report provides obtaining any municipal approvals required for land restrictions and haul routes as a proposed mitigation measure.

Question:

- a) Please share land restriction locations. If EGI has not determined the location of restricted lands, please explain when these lands will be identified.

**Response**

- a) Enbridge Gas engaged in early consultation with municipalities regarding haul routes, to assess whether they have construction projects of their own on proposed roads. This early engagement was also conducted to ensure roads are adequate for construction loads.

Enbridge Gas has consulted with all municipalities and confirmed their agreement with Enbridge Gas' proposed haul routes.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Three Fires Group ("TFG")

INTERROGATORY

References:

Exhibit A, Tab 2, Schedule 1, Attachment 1, p. 1

Preamble:

Section 94 of the Act requires applicants for an order granting leave under the relevant part to file a map showing the general location of the proposed work and the municipalities, highways, railways, utility lines and navigable waters through, under, over, upon or across which the proposed work is to pass.

Question:

- a) Please indicate whether there are any navigable waters impacted by the Project. If yes, please provide details and all analysis undertaken by EGI with respect to the impacts on navigable waters by the Project.

**Response**

- a) Yes, the project crosses the Thames River, which is considered a navigable waterway under the Canadian Navigable Waters Act schedule for navigable waters. All major watercourse crossings for the project, including the Thames River, are proposed to be undertaken using trenchless installation methods, which will mitigate any potential impacts on the navigational use of the watercourses.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Three Fires Group (“TFG”)

INTERROGATORY

References:

- Enbridge Inc. Indigenous Peoples Policy (the IPP), provided at Exhibit H, Tab 1, Schedule 2, Attachment 5
- National Inquiring into Missing and Murdered Indigenous Women and Girls (“MMWIG”) “Calls for Justice”<sup>5</sup>
- Truth and Reconciliation Commission of Canada (“TRCC”) “Calls to Action”, see Appendix C<sup>6</sup>
- United Nations Declaration on the Rights of Indigenous Peoples (“UNDRIP”), see Appendix D<sup>7</sup>

Preamble:

The IPP provides that Enbridge Inc. recognizes “the importance of [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.”

The IPP notes that “[p]ositive 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 Inc. has committed to pursuing sustainable relationships with Indigenous Nations and groups and that it engages in forthright and sincere consultation with Indigenous Peoples about projects and operations through processes that seek to achieve early and meaningful engagement so the input of Indigenous Nations can help define projects that may occur on lands traditionally used by Indigenous Peoples.

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<sup>5</sup> MMIWG “Calls for Justice” (June 2019), available online at: [https://www.mmiwg-ffada.ca/wp-content/uploads/2019/06/Calls\\_for\\_Justice.pdf](https://www.mmiwg-ffada.ca/wp-content/uploads/2019/06/Calls_for_Justice.pdf).

<sup>6</sup> TRCC “Calls to Action” (29 March 2016), available online at: <https://crc-canada.org/wp-content/uploads/2016/03/trc-calls-to-action-english.pdf>.

<sup>7</sup> UN General Assembly, United Nations Declaration on the Rights of Indigenous Peoples: resolution / adopted by the General Assembly (2 October 2007), A/RES/61/295, available online at: [https://www.un.org/development/desa/indigenouspeoples/wp-content/uploads/sites/19/2018/11/UNDRIP\\_E\\_web.pdf](https://www.un.org/development/desa/indigenouspeoples/wp-content/uploads/sites/19/2018/11/UNDRIP_E_web.pdf).

Section 4(a) of the United Nations Declaration on the Rights of Indigenous Peoples Act, 6 affirms UNDRIP as a universal international human rights instrument with application in Canadian law.

UNDRIP requires that Indigenous Peoples are consulted in good faith in order to obtain their free, prior and informed consent (“FPIC”) (i) before measures are adopted that affect them (article 19) or (ii) when undertaking a project that affect their rights to land, territory and resources (article 32).

The TRCC’s Call to Action #92 calls upon the corporate sector in Canada to adopt UNDRIP as a reconciliation framework and to apply its principles, norms, and standards to corporate policy and core operational activities involving Indigenous peoples and their lands and resources.

Question:

- a) Please explain EGI’s position on whether current industrial development – including this Project – continues to have destructive impacts on the social and economic wellbeing of Indigenous peoples.
- b) How does EGI identify common goals? Please explain how EGI navigates times when EGI’s goals are not the same as a First Nation’s goals.
- c) How does EGI determine constructive outcomes? Please explain whether EGI works with Indigenous nations to identify constructive outcomes and explain how EGI navigates times when EGI’s preferred outcome is not the preferred outcome of the Indigenous nation.
- d) How does EGI’s gas expansion across southwestern Ontario respect previous Indigenous generations and benefit future Indigenous generations?
- e) What has EGI learned specifically as it relates to relationship building with Indigenous communities and the proposed Panhandle Expansion?
- f) What is EGI’s definition of sustainability?
- g) Please explain how EGI plans to adopt and implement the TRCC Calls to Action and MMIWG Calls to Justice.
- h) Will EGI commit to the MMIWG Calls to Justice for Extraction and Development Industries in relation to the safety and security of Indigenous women, girls, and 2SLGBTQQIA people during all stages of the Project?
- i) Will EGI commit to the MMIWG Calls to Justice for Extraction and Development Industries in relation to providing increased social infrastructure to meet the needs of CKSPFN and CFN?
- j) Will EGI commit to full implementation of TRCC #92 “Business and Reconciliation”, including adopting the United Nations Declaration on the Rights of Indigenous Peoples as a reconciliation framework and to apply its principles, norms, and standards to corporate policy and core operational activities involving Indigenous peoples and their lands and resources. If yes, please explain how



EGL has met each of i. through iii. under TRCC #92, specifically as it relates to the Project. If no, please explain why EGL is not willing to fully implement TRCC #92 in relation to the Project.

- k) How has EGL included provisions in this project to address its impacts on vulnerable groups, including Indigenous women and girls?
- l) Please explain the contents of EGL's Indigenous awareness programs and who facilitated these programs.
- m) What agreements, authorizations, and or approvals with and/or from First Nation governments, including the Three Fires First Nations, does EGL envision needing or entering into to support the Project?
- n) Please discuss and provide any updates, as it pertains to each of the Three Fires First Nations, to the "Indigenous Consultation Report; Log and Project Correspondence" in tabular format.
- o) Did EGL provide a description to potentially impacted First Nations of other provincial or federal approvals that may be required for the Project to proceed?
- p) Please provide details of any analysis undertaken by EGL to assess and determine the impacts on Treaty lands, generally, and on the Treaty lands of each of the Three Fires First Nations as part of the (i) Application, generally, and (ii) the Environmental Report. Did EGL perform any analysis prior to contacting potentially impacted First Nations and Indigenous customers? If no analysis was performed, please explain why not.
- q) Please discuss whether section 3 of the Standard Conditions of Approval, includes the requirement to obtain the FPIC of affected Indigenous communities. If no, please explain whether EGL's determination that FPIC is not a "necessary approvals, permits, licences, certificates, agreements and rights required to construct, operate and maintain the project" is consistent with the IPP and the TRCC's Call to Action #92.

## **Response**

- a) Potential Project impacts on socio-economic features are outlined in Section 5.3.3 of the ER and align with the OEB's Environmental Guidelines for the Location, Construction and Operation of Hydrocarbon Pipelines and Facilities in Ontario (2016).

Enbridge Gas is committed to working with every potentially affected Indigenous group to avoid or mitigate any potential impacts the Project may have on their rights and interests.

- b) As outlined in the Exhibit H, Tab 1, Schedule 1, Attachment 1, Enbridge Gas, as per MOE directive, consults with potentially affected Indigenous groups, in part, to understand the goals of the Nations with which we are engaging. Through dialogue,

information sharing and relationship building, Enbridge Gas attempts to align common goals among all parties.

- c) Enbridge Gas recognizes that long-term relationships are built on trust and respect and are critical to creating sustainable and mutually beneficial outcomes. Enbridge Gas has applied a lifecycle approach to its engagement, which recognizes the need for continual engagement with Indigenous groups located in proximity to our proposed and existing assets—not just during the project design and approval stage, but throughout the project lifecycle.

Enbridge Gas determines constructive outcomes based on the feedback of the Nations with which we engage. When Enbridge Gas and Indigenous Nations do not experience alignment on common goals or are not in agreement, Enbridge Gas maintains communication and dialogue and is committed to achieving mutually beneficial and agreed upon outcomes to the best of our ability. Enbridge Gas understands that relationships require long-term commitment and ongoing engagement.

- d) Enbridge Gas expansion programs take into consideration potential impacts of proposed projects on Aboriginal and Treaty Rights, with a view to effectively mitigating any impacts. Enbridge Gas consults with Nations, with a view to understanding traditional and historical practices in the area of proposed expansion and welcomes Indigenous traditional knowledge.

Enbridge Gas' gas expansion across southwestern Ontario ensures that customers, including on and off reserve customers, have access to reliable, clean and affordable natural gas.

- e) Enbridge Gas has been engaging and consulting with Indigenous communities for decades. Over this time and based on advancements and refinements, we have updated our Indigenous Peoples Policy to reflect the changing requirements and expectations of engagement and consultation. Enbridge engages with over 300 Nations enterprise wide and continues to learn best practices through our experiences and through our relationships with Indigenous Peoples.

As an example of a best practice, Enbridge has implemented a “Lifecycle Approach” to relationships and engagement. Enbridge is committed to building respectful, constructive and enduring relationships that foster trust with and generate benefits for Indigenous groups over the lifecycle of our assets—from project proposals and design through construction, operations, maintenance and, to ultimately and safely removing a pipeline from service at the end of its useful life. We recognize consistency and continuity are important to developing and maintaining positive relationships. Long-term relationships are built on trust and respect and are critical to creating sustainable and mutually beneficial outcomes. We have come to recognize

the need for continual engagement—not just when we’re actively working in an area or during a project, but constantly and consistently with all those in proximity to our operating assets.

More information on how Enbridge builds relationship can be found in our [Our 2022 report: Continuing our Path to Reconciliation: Indigenous engagement and inclusion — An update.](#)<sup>8</sup>

In terms of discussion and consultation with potentially affected Indigenous groups as it relates to the Project, we have learned that capacity to engage on multiple Enbridge Gas projects is challenging. Enbridge Gas has offered and provided capacity funding to help address this issue. As demonstrated in the response to Exhibit I.STAFF.22, part a) above, through ongoing consultation with Nations about the Project, we have learned of Nations’ questions and concerns regarding the Project and have tried to address those questions and concerns, providing further information or committing to further action as appropriate. Enbridge Gas has proposed or adapted mitigation measures to address these concerns.

- f) Sustainability means that our business strategies are aligned with societal and environmental goals. How well we perform as a steward of our environment, a safe operator of essential energy infrastructure, a good neighbor and a diverse employer is inextricably linked to our business success and our ability to create long-term value for all stakeholders.
- g) Enbridge Gas is working toward meeting TRCC #92 through the following:
- Enbridge Gas endeavors to engage as early as possible in the Project planning stage, taking into account the scale and scope of the Project, by sharing Project related information with potentially affected Indigenous groups, and meeting with Indigenous groups as per their interest to obtain their input and guidance as to how any potential impacts the Project may have on Aboriginal rights and interests can be avoided or mitigated, as appropriate. This includes, for example, seeking and responding to comments on Project-related environmental or archaeological reports, inclusion in monitoring, consideration of Project changes and potential business or employment opportunities. Through its engagement, Enbridge Gas aims to secure the free, prior and informed consent of potentially impacted Indigenous groups, to the greatest degree possible (recognizing, that legally consent is not required except in certain circumstances).
  - Enbridge Inc. has implemented an Indigenous supply chain management program which requires contractors to abide by instructions presented in the Socio-Economic Requirement of Contractors (“SERC”) and to develop an

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<sup>8</sup>[https://www.enbridge.com/~/\\_media/Enb/Documents/Reports/ENB\\_Path\\_to\\_Reconciliation\\_Progress\\_Report.pdf#page=8](https://www.enbridge.com/~/_media/Enb/Documents/Reports/ENB_Path_to_Reconciliation_Progress_Report.pdf#page=8)

Indigenous participation & inclusion plan which is evaluated in the bid review process and contract managed when implemented.

- As part of a suite of Enbridge Inc.'s ESG goals, by 2025, Enbridge Inc. is striving to achieve 3.5% representation within our workforce of Indigenous people and is undertaking specific recruitment and retention efforts in this regard.
- As part of Enbridge Inc.'s ESG goals, by the end of 2022, Enbridge Inc. has targeted completion of Indigenous awareness training by 100% of its workforce (i.e., employees and contractors) to enhance our understanding and knowledge of Indigenous culture and rights. Enbridge Inc. contributes to supporting Indigenous education and training efforts through community investment initiatives corporately and locally. In Ontario alone, in 2022, Enbridge Inc. will contribute approximately \$200,000 towards Indigenous community investment.

Through its lifecycle engagement program, Enbridge Gas enters into long term relationship agreements designed to support operational engagement, provide capacity funding as needed, and offers Project-related agreements when appropriate.

- h) Enbridge Gas is a public utility and does not generally involve a long term, large, transient workforce. Enbridge Inc. has implemented a number of measures corporately to address MMIWG.
- Enbridge Inc.'s Statement on Business Conduct specifically states that Enbridge Inc. will not tolerate human rights abuses, including human trafficking.
  - Enbridge Inc. has a working group that is in the process of developing an enterprise-wide approach to human trafficking prevention (HTP).
  - Enbridge Inc. is developing the governance structure for an approach specific to human trafficking prevention which will be part of the overall human rights program.
  - Enbridge Inc.'s internal audit group has recommended that all projects have some element of human trafficking awareness messaging or training. The HTP working group is beginning development of the awareness program.

For this Project, there would be an average of approximately 100 contractor employees working directly on the pipeline segments over the span of the 2 0km pipeline portion of the Project. The Project will not have any work camps. The Project workers will primarily be drawn from union halls in the areas governing the physical geography of the work. Any contractor that is a part of this Project must comply with, at minimum, Enbridge Gas's policies, which include Enbridge Inc.'s Statement on Business Conduct, which addresses conduct expectations.

- i) While no significant adverse residual effects on community services and infrastructure are anticipated, in the event that such effects materialized, Enbridge Gas would work in consultation with the Indigenous community to mitigate those impacts.

Indigenous communities are able to apply for funding through Enbridge Inc.'s corporate citizenship program. Enbridge Gas would be happy to discuss this program with all Indigenous communities and has provided the link to the application for funding:

<https://www.enbridge.com/About-Us/Our-Values/Corporate-citizenship/Apply-For-Funding.aspx>

In addition, through its lifecycle engagement program, Enbridge Gas enters into long term relationship agreements designed to support operational engagement, provide capacity funding as needed, and offers Project-related agreements when appropriate.

Should TFG have further suggestions based on local and regional experiences and best practices, Enbridge Gas encourages information sharing in this regard.

- j) Please see response to part f) above.
- k) Enbridge Gas's suppliers, which includes contractors and subcontractors, are required to follow Enbridge Inc.'s policies including the Supplier Code of Conduct, which outlines Enbridge Inc. requirements regarding the ethical standards and business conduct of its suppliers. The Supplier Code of Conduct states "Enbridge believes that each individual with whom we come in contact deserves to be treated fairly, honestly, and with dignity. We do not condone any form of harassment, discrimination, or inappropriate actions or language of any kind." Drug & Alcohol Programs, Respectful Workplace Training and Indigenous Peoples Awareness Training are required and specific to the Construction Contractor(s) that will construct the Project.
- l) While Indigenous awareness training has generally been a part of Enbridge Inc.'s approach since 2018, Enbridge Inc. has advanced this training over time to provide increased exposure, experiences and relevant information to build a deeper understanding of and appreciation for Indigenous Peoples, including:
- i. an overview of key concepts, including government laws and policies and their effects on Indigenous Peoples;
  - ii. the protection and restoration of treaty rights; and
  - iii. raising of awareness of the historical injustices and lasting impacts of the treatment of Indigenous Peoples.

Specific topics addressed in the training include:

- i. pre-contact and post-contact experiences of Indigenous peoples;
- ii. the Canadian constitution as it relates to Indigenous Peoples;
- iii. the history and impact of the Indian Act;
- iv. the history and impact of Residential Schools;
- v. the United Nations Declaration on the Rights of Indigenous Peoples;
- vi. the Truth and Reconciliation Commission Report; and
- vii. Missing and Murdered Indigenous Women.

The Enbridge Inc. Indigenous Awareness Training Program, which applies to Enbridge Gas, was developed through a partnership with a respected 100% Indigenous owned Training Company, a First Nations Enbridge Inc. employee who was a former College Professor in Indigenous Programming and a working group of Indigenous and non-indigenous employees.

Beginning in 2021, all new employees are required to complete the training as part of their onboarding and all employees and contractors are expected to complete the training by the end of 2022. As of September 13, 2022, at least 87% of Enbridge Inc. employees have completed the mandatory Indigenous Awareness online training program. We would be happy to discuss possible opportunities for TFG (CKSPFN/CFN) to provide Indigenous awareness training in the region.

Additionally, in person training opportunities are regularly offered by Indigenous employees and local Indigenous cultural representatives in the various regions Enbridge Gas operates.

- m) As the proposed Project does not traverse reserve land, it is not anticipated that formal First Nation approval or authorizations will be necessary. Enbridge Gas has offered capacity funding to all Indigenous groups identified as being potentially impacted by the Project and has entered into a number of capacity funding agreements to support engagement on the Project. Specific information cannot be shared due to confidentiality of these agreements.
- n) Please see the response to Exhibit I.STAFF.22 part a).
- o) Enbridge Gas outlined the provincial and federal approvals that may be required for the Project to proceed in the proposed Project notification letter sent to CKSPFN on October 15, 2021 and February 8, 2022 (set out at Exhibit H, Tab 1, Schedule 1, Attachment 7). The Environmental Report, which was provided to Indigenous communities, contains further details of such approvals within Table 1.1 (Exhibit F, Tab 1, Schedule 1, Attachment 1).

- p) Enbridge Gas completed an analysis of the potential Project impacts on physical, bio-physical and socio-economic environmental features, which would include features within lands that are the subject of Treaties. This analysis includes recommended mitigation and protective measures. This information can be found in Section 5 of the Environmental Report (Exhibit F, Tab 1, Schedule 1, Attachment 1).

Enbridge Gas remains committed to engagement with the TFG to further understand any specific concerns regarding potential impacts the Project may have on Treaty lands and how these impacts can be avoided or mitigated as appropriate.

- q) It is Enbridge Gas's understanding that the referenced phrasing in section 3 of the Standard Conditions of Approval is not referring to FPIC. In Enbridge Gas' view, the manner in which Enbridge Gas approaches consultation and engagement with Indigenous groups is consistent with both its IPP and the TRCC's Call to Action. Please also see response to part g) above.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Three Fires Group ("TFG")

INTERROGATORY

References:

Environmental Guidelines - Section 3.3 Indigenous Consultation

Preamble:

The Environmental Guidelines provide that the procedural aspects of the duty to consult generally include, among others, "responding to questions and concerns raised by Indigenous communities and keeping the Crown apprised of rights assertions by communities"

Question:

- a) Has EGI responded to the questions and concerns submitted directly to EGI by CKSPFN on July 5, 2022?
- b) Has EGI kept the Crown apprised of CKSPFN's Declaration to the Waterways and Lakebeds within its Traditional Territory (Appendix A)? If not, why not.
- c) Please explain EGI's understanding of the CKSPFN's Declaration to the Waterways and Lakebeds within its Traditional Territory, specifically as it relates to any approvals EGI may need to obtain from CKSPFN in order to cross water within the treaty territory.

Response

- a) Yes, on August 18, 2022, Enbridge Gas provided its responses to the comments on the ER received from CKSPFN on July 5, 2022.
- b) Enbridge Gas provided CKSFPN's Declaration to the Waterways and Lakebeds within its Traditional Territory to the Crown on July 25, 2022.
- c) Enbridge Gas has reviewed CKSPFN's Declaration to the Waterways and Lakebeds within its Traditional Territory and understands CKSPFN has asserted rights to the Waterways and Lakebeds within its Traditional Territory. As stated in response b) above, Enbridge Gas has notified the MOE of CKSPFN's Declaration and



understands that CKSPFN may be in discussions with various levels of government regarding this matter. Enbridge Gas is of the view that CKSPFN's consent is not legally required at this time; however, a goal of Enbridge Gas's engagement is to aim to secure consent and avoid or mitigate any potential impacts the Project may have on CKSPFN's rights, including its asserted rights to the Waterways and Lakebeds within its Traditional Territory.

Enbridge Gas has proposed mitigation measures on the waterways and lakebeds as set out in the environmental report to avoid or mitigate any potential impacts on rights. Should CKSPFN have any additional specific information on how its asserted rights could be potentially impacted by the Project, Enbridge Gas will work with the CKSPFN to mitigate those impacts as appropriate.

ENBRIDGE GAS INC.

Answer to Interrogatory from  
Three Fires Group ("TFG")

INTERROGATORY

References:

Exhibit A, Tab 2, Schedule 1, p. 3

Preamble:

EGL notes that parties affected by the Application include the (i) owners of lands, government agencies and municipalities over which the pipeline will be constructed and (ii) customers resident or located in the municipalities, police villages, Indigenous communities and Métis organizations served by EGL, together with those to whom EGL sells gas, or on whose behalf EGL distributes, transmits, or stores gas. [emphasis added]

Question:

- a) Please file any and all analysis EGL has performed, that is not already provided in the Application, in connection with how the Application will, or is anticipated to, affect residents and members, including off-reserve members, of each of the Three Fires First Nations:
  - i. that EGL serves;
  - ii. to which EGL sells gas; and
  - iii. on whose behalf EGL distributes, transmits, or stores gas.
- b) Please indicate whether EGL recognizes that the following groups are also affected by this application:
  - i. Indigenous nations whose Aboriginal and Treaty Rights are impacted by the continued expansion of gas infrastructure across Treaty territory and directly impacted by the increased ground level ozone caused by fugitive emissions; and
  - ii. current and future generations who will face the challenges of accelerated anthropogenic climate change.

**Response**

- a) There is no additional analysis available regarding impacts to residents and members of each of the Three Fires First Nations.
- b) Enbridge Gas has been engaging with the Indigenous groups identified by the MOE in relation to the Project, which includes those who may have constitutionally protected Aboriginal or Treaty rights that may be adversely affected by the Project.

Enbridge Gas recognizes the importance of addressing fugitive emissions and climate change. In 2020, Enbridge committed to eliminate GHG emissions from our business on a net basis (net zero) by 2050 with an interim goal to reduce the emissions intensity of GHG emissions from our operations 35% by 2030. Please see the response to Exhibit I.TFG.9 part c), for further information regarding the measurement and management of fugitive emissions.

ENBRIDGE GAS INC.

Undertaking Response to EP

To consider a response to Mr. Ladany's inquiry about conditions precedent to the contract and to respond as EGI is able; if EGI cannot, to explain why not.

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**Response:**

The conditions precedent set out within the Brighton Beach Generation Station distribution contract that apply in the case that the OEB does not approve the proposed Project can be found at Section 2.01 of the T2 Contract template provided at Exhibit I.PP.5 Attachment 1, p. 52.

There are no additional conditions precedent that apply in the case that the OEB does not approve the proposed Project.

- d) What will the future demand mix be with: (i) current forecasts; and (ii) the potential demand that is not included in the application over the next decade?

**Response**

- a) and b)

Enbridge Gas is aware of an increased demand for natural gas in the Panhandle Market via local economic development organizations and recent publications:

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- March 2023: “Drawings, details of new hospital revealed during virtual town hall” – <https://windsorstar.com/news/local-news/drawings-details-of-new-hospital-revealed-during-virtual-town-hall>
- April 2023: “Windsor-Essex being eyed for billions in new industrial investment” – <https://windsorstar.com/news/Windsor-essex-being-eyed-for-billions-in-new-industrial-investment>
- June 2023: “New Interchange Connecting Lauzon Parkway To 401 'Highest Priority' Says Ford” – <https://www.iheartradio.ca/am800/news/new-interchange-connecting-lauzon-parkway-to-401-highest-priority-says-ford-1.19736147>
- July 2023: “Windsor lands another big EV auto supply chain company” – <https://windsorstar.com/news/Windsor-lands-another-big-ev-auto-supply-chain-company>
- August 2023: “Windsor inching closer to landing another major foreign investment” – <https://windsorstar.com/news/Windsor-inching-closer-to-landing-another-major-foreign-investment>

Please also see a recent Globe and Mail article which includes commentary from the greenhouse industry:

- August 2023: “Southern Ontario’s greenhouse operators warn lack of infrastructure is slowing growth in booming sector” – <https://www.theglobeandmail.com/business/article-windsor-greenhouse-growers-infrastructure/>

- c)

- i) By Winter 2030/2031, General Service demands are estimated to account for 35% of the total firm Panhandle System Market, and Firm Contract demands are estimated to account for 65% of the total firm Panhandle System Market.
- ii) By Winter 2033/2034, General Service demands are estimated to account for 34% of the total firm Panhandle System Market, and Firm Contract demands are estimated to account for 66% of the total firm Panhandle System Market.

/U

ENBRIDGE GAS INC.

Undertaking Response to PP

To provide EGI's definitions for transmission line and distribution line

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**Response:**

Consistent with the definition set out within the OEB's Natural Gas Facilities Handbook,<sup>1</sup> Enbridge Gas generally defines transmission pipelines as those pipelines where no distribution customers are directly connected.

Enbridge Gas defines distribution pipelines as those pipelines in a gas distribution system that convey gas to individual (customer) service lines or other distribution lines.

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<sup>1</sup> EB-2022-0081, OEB Natural Gas Facilities Handbook, pp. 27-28

ENBRIDGE GAS INC.

Undertaking Response to IGUA

Enbridge to explain why it did not make a proposal to enable seeking of a contribution for the capacity sought.

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**Response:**

The proposed Project is a transmission project (please also see the response at Exhibit JT1.2 for Enbridge Gas's definitions of transmission and distribution pipelines) that will increase capacity on the Panhandle System to meet forecast demand within a large area of benefit.<sup>1</sup> While the demand underpinning the need for the proposed Project is informed by customer demand throughout the area of benefit, there will be no customers directly connecting to the proposed Project (Panhandle Loop and Leamington Interconnect).

Distribution projects, in comparison, generally provide customer premises with direct access to natural gas. In the case of distribution projects, it can be appropriate to seek a financial contribution from customers whose premises will be directly benefiting from the project. These financial contributions can minimize cross-subsidisation by customers who will not benefit from the distribution facilities.

It is not appropriate to seek a financial contribution from specific customers for the proposed transmission Project because, as a transmission system, the Panhandle System transports natural gas for the benefit of all customers within the Panhandle Market – rather than individual or specific customers. Once in service, the proposed Project will serve all customers, whether or not they participated in the expression of interest. The proposed Project addresses system bottlenecks, which once relieved, will improve the reliability of service for existing customers, and will allow for growth from existing and new customers.

It should be noted that the Company's approach is consistent with previous Enbridge Gas applications to the OEB seeking leave to construct, including the Kingsville Transmission Reinforcement Project ("KTRP") (EB-2018-0013). Within the OEB's Decision in the KTRP leave to construct proceeding, the OEB found that the Company "appropriately followed the OEB's E.B.O. 134 test for transmission projects" and confirmed that "currently there is no mechanism to have these parties make a contribution to the costs."<sup>2</sup>

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<sup>1</sup> Exhibit B, Tab 1, Schedule 1, p. 5, Figure 1

<sup>2</sup> EB-2018-0013, OEB Decision and Order (September 20, 2018), pp. 5-6

The Company's approach is also in alignment with the OEB's Decision (less than two years ago) on Enbridge Gas's Application for Approval of a System Expansion Surcharge ("SES"), a Temporary Connection Surcharge ("TCS"), and an Hourly Allocation Factor ("HAF"), specifically:

"The OEB approves the use of HAF for projects that are primarily distribution and if there is a minor component of transmission then the OEB would still accept the use of HAF. For exclusively transmission projects, the OEB has not agreed to the application of HAF."<sup>3</sup>

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<sup>3</sup> EB-2020-0094, OEB Decision and Order (November 5, 2020), p. 20



ENBRIDGE GAS INC.

Undertaking Response to OGVG

To reproduce Exhibit E, Tab 1, Schedule 4 just showing the distribution margin, on a best-efforts basis.

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**Response:**

Please see Attachment 1.

**Calculation of Revenue (Distribution Margins)**

**PREP - Panhandle Regional Expansion Project**

**InService Date: Nov-01-2024**

Line	Project Year	(\$000's)	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>
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Distribution costs are recovered from Contract rate classes based on Firm Contract Demand (CD)

The deemed incremental revenue is based on the capacity created by the Project

**Contract Methodology: Total CD \* 12 \* Distribution Margin**

1	Distribution Margin \$/M3 / month	0.097333										
2	Contract Demand 10 <sup>3</sup> m <sup>3</sup> /month		1,623	2,762	3,087	3,412	3,737	4,003	4,003	4,003	4,003	4,003
3	Distribution Margin		\$1,895	\$3,227	\$3,606	\$3,985	\$4,364	\$4,676	\$4,676	\$4,676	\$4,676	\$4,676

**General Service Distribution Margin = Volumes \* Distribution Margin**

4	Distribution Margin \$ / M3 consumed	0.118892										
5	Volume 10 <sup>3</sup> M <sup>3</sup>		2,218	6,610	10,912	15,092	19,120	23,000	24,906	24,906	24,906	24,906
6	Distribution Margin		\$264	\$786	\$1,297	\$1,794	\$2,273	\$2,735	\$2,961	\$2,961	\$2,961	\$2,961
7	Total Distribution Margin		\$2,159	\$4,012	\$4,903	\$5,779	\$6,638	\$7,410	\$7,637	\$7,637	\$7,637	\$7,637

The Distributions margins are Jan 2023 rates

ENBRIDGE GAS INC.

Undertaking Response to OGVG

To provide a high-level estimate of the cost of distribution-related infrastructure Enbridge believes will be necessary in order to connect customers, connected to the transmission project, on a best-efforts basis.

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**Response:**

Incremental distribution-related infrastructure costs are outside of the scope of the Project and are not known at this time. Subject to the timing and location of where future customers are connecting to the natural gas distribution network, Enbridge Gas estimates (at a high-level and on a best-efforts basis) potentially \$48 million of additional future distribution infrastructure costs related to the incremental capacity provided by the proposed Project.

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ENBRIDGE GAS INC.

Undertaking Response to TFG

To file the Enbridge indigenous peoples policy and the indigenous reconciliation action plan.

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**Response:**

Enbridge Inc.'s Indigenous Peoples Policy can be found at Exhibit H, Tab 1, Schedule 1, Attachment 5.

Enbridge's Indigenous Reconciliation Action Plan ("IRAP") can be found at: <https://www.enbridge.com/irap>. Enbridge's IRAP was released on September 20, 2022. It was developed in recognition of the Truth and Reconciliation Commission of Canada's Call to Action #92,<sup>1</sup> the United Nations Declaration on the Rights of Indigenous Peoples ("UNDRIP"), and with respect for and acknowledgement of Indigenous rights and title, treaties, and sovereignty. Enbridge's IRAP builds on the enterprise-wide progress reported in the Continuing our Path to Reconciliation update report (February 2022),<sup>2</sup> an Indigenous discussion paper (June 2018) and Enbridge's annual sustainability reports from 2018 to 2021.

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<sup>1</sup> <https://www.rcaanc-cirnac.gc.ca/eng/1524506030545/1557513309443>

<sup>2</sup> <https://www.enbridge.com/~/link.aspx?id=631DB901D00944E0BBFFC24CD7B20301&z=z>

ENBRIDGE GAS INC.

Undertaking Response to TFG

To provide the current percentage blend for RNG.

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**Response:**

In 2021, Ontario RNG producers injected 6,391  $10^3\text{m}^3$  of RNG into Enbridge Gas's system. The total annual throughput for 2021 was 25,304,590  $10^3\text{m}^3$  of natural gas, therefore, RNG represents 0.025% of throughput in Enbridge Gas's system.

In 2022, Enbridge Gas has purchased and delivered 1,000 GJ (25,750  $\text{m}^3$ ) of RNG to satisfy demand from its Opt-Up program. With an assumed annual throughput of 25,000,000  $10^3\text{m}^3$  of natural gas delivered in 2022, the RNG blend percentage based on the Opt-Up program specifically will be approximately 0.0001%.

ENBRIDGE GAS INC.

Undertaking Response to TFG

To provide current information for an equivalent number for the entire system percentage blend of hydrogen

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**Response:**

The Low Carbon Energy Project (EB-2019-0294) began delivering hydrogen into Enbridge Gas's distribution system on October 1, 2021. Between October 1, 2021, and September 31, 2022, 101,500 m<sup>3</sup> (1,289 GJ) of hydrogen was injected. With an assumed annual throughput of 25,000,000 10<sup>3</sup>m<sup>3</sup> of natural gas, hydrogen represents 0.0004% of gas in Enbridge Gas's system.

ENBRIDGE GAS INC.

Undertaking Response to TFG

To advise the differences that pass a de minimus standard.

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**Response:**

Renewable natural gas (“RNG”) injected into Enbridge Gas’s distribution system must meet pipeline gas quality standards and therefore there is no difference in the Company’s integrity measures for RNG.

ENBRIDGE GAS INC.

Undertaking Response to TFG

To file internal documents that provide an overview either of the indigenous supply chain management program or the intended benefits to indigenous economies in general.

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**Response:**

As indicated by Ms. Pennington during the technical conference, Enbridge Gas is providing the information that is publicly available regarding the socio-economic requirements of contractors.<sup>1</sup>

An overview of the Company's approach to Indigenous economic engagement can be found on the Enbridge Inc. website at the following link:

<https://www.enbridge.com/about-us/our-values/indigenous-communities/indigenous-economic-engagement>

Specifically, in 2017, Enbridge Inc. introduced the Socio-Economic Requirements of Contractors ("SERC") process. The SERC guides Enbridge Inc. contractors on how the Company expects them to include Indigenous businesses in the execution of their work, as well as efforts to increase the use of Indigenous businesses as general contractors working directly for Enbridge Inc. A fact sheet about the SERC can be found at Attachment 1 to this response.

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<sup>1</sup> Technical Conference, Day 1 Transcript, p. 115





## SUPPLY CHAIN MANAGEMENT AND INDIGENOUS INCLUSION

# Socio-Economic Requirements of Contractors

**Enbridge has implemented an Indigenous Peoples Policy which directs the company's methods to develop mutually beneficial relations with Indigenous communities close to, or potentially affected by, Enbridge operations.**

To support the Indigenous Peoples Policy, Enbridge has committed to a series of socio-economic requirements that all contractors must follow (SERC). These activities will support existing relationships and mutually beneficial partnerships with Indigenous communities in all of Enbridge's Major Projects and Operations. Additionally, it will provide economic participation of Indigenous owned businesses and community members. These commitments are a **shared responsibility involving employees, contractors and affiliates.**

### The Policy

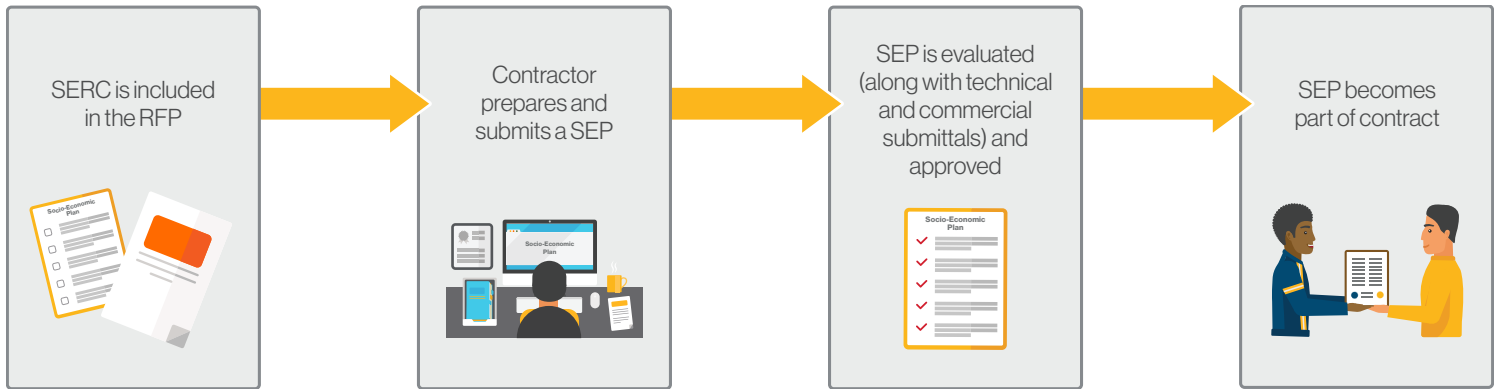
- Promotes the understanding of, and sensitivity to, Indigenous peoples and the issues that are important to them;
- Is designed to ensure a consistent, thorough approach to consultation and engagement with Indigenous groups; and
- Commits to working with Indigenous people to achieve benefits resulting from Enbridge's projects and operations, including opportunities in **training, education, employment** and **community economic development.**

### Requirements of a Socio-Economic Plan (SEP)

When bidding on major project work with Enbridge, all potential contractors must develop a SEP. This includes:

- Collection of information about the Indigenous businesses the contractor intends to use on the project and the relationship the contractor has with those businesses;
- Any commitments the contractor has made in the proposal to Indigenous owned businesses (supplier or subcontractor);
- If an Indigenous business was considered but not chosen, reasons why the decision was made;
- Estimate of the value of businesses or service opportunities dedicated to Indigenous or local businesses;
- Information about Indigenous workers, such as:
  - Plans to train Indigenous members within the contractor's organization; and,
  - Estimate of total workforce to be recruited from Indigenous or local communities for the project.





### How a Socio-Economic Plan is Evaluated

- Clear understanding of the company’s socio-economic requirements and how these contribute to the success of the project;
- Quality and quantity of subcontracting opportunities provided to Indigenous owned businesses;
- Anticipated percentage of Indigenous hired workers;
- Education, training and other skill development initiatives directed at Indigenous workers, implemented or planned; and
- Creative and innovative approaches to supporting successful socio-economic outcomes.

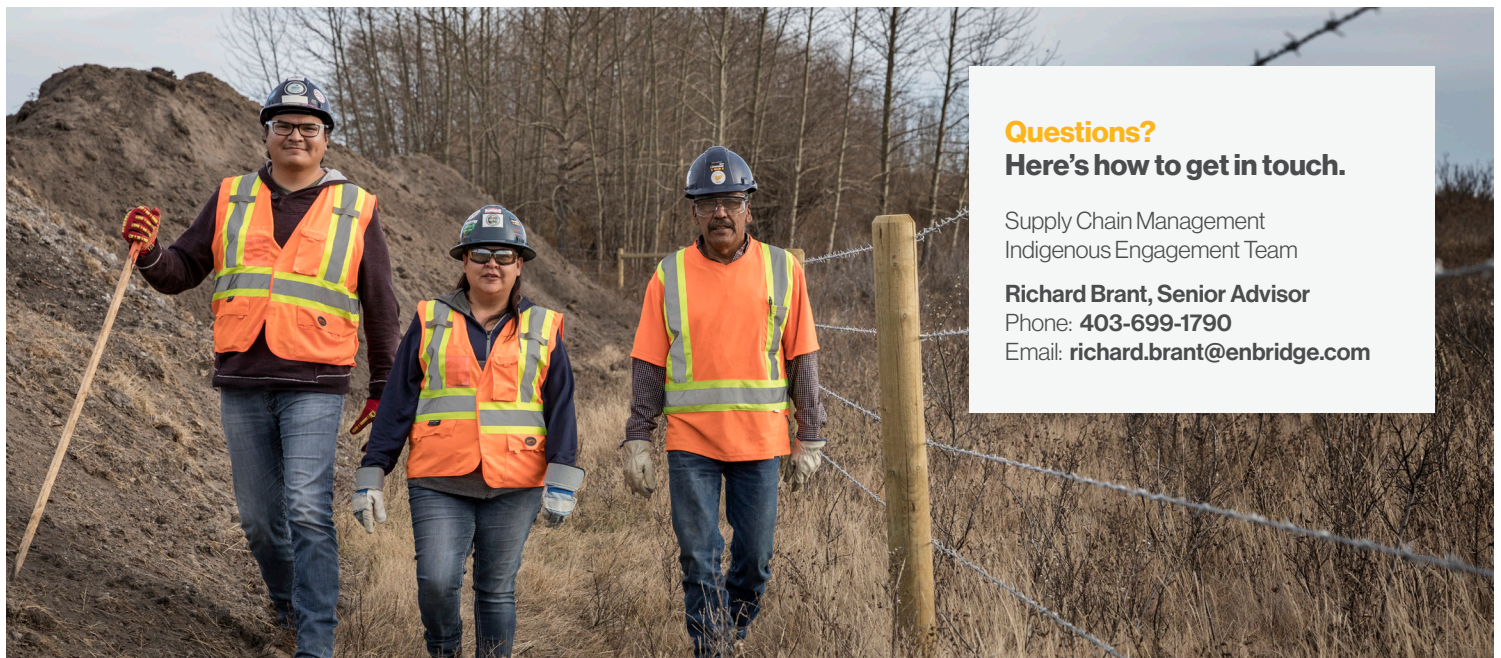
### Becoming an Enbridge Direct Contractor

As an Indigenous business in proximity to an Enbridge work opportunity, we will work with you to ensure you have opportunities to compete for work as either an Enbridge direct-award contractor or as a subcontractor to one of our general contractors. To be awarded a direct contract to Enbridge, the

business will first need to pre-qualify for the type of work it wishes to perform. After a preliminary assessment by Enbridge’s Supply Chain Management Team, a candidate may enter the pre-qualification process. Once successfully pre-qualified, the business will be placed on suitable work opportunity competitive bid lists.

Pre-qualifying with Enbridge means your business is aligned with Enbridge’s commitment to execute construction and maintenance projects with the highest standards in safety, environmental protection, community engagement and governance. Enbridge’s prequalification process involves a quality and technical review and, if necessary, an on-site audit of your business’s practices and procedures. It also requires that you register your business and have your safety program and safety records reviewed and verified by ISNetworkworld (ISN), a global resource that certifies suppliers as safe and reliable.

Though pre-qualification with Enbridge does not guarantee work, it does mean that the business is qualified to be invited to bid on Enbridge work as a potential Enbridge direct contractor.



#### Questions?

**Here’s how to get in touch.**

Supply Chain Management  
Indigenous Engagement Team

**Richard Brant, Senior Advisor**

Phone: **403-699-1790**

Email: **richard.brant@enbridge.com**

ENBRIDGE GAS INC.

Undertaking Response to TFG

Re: TFG 6b, (a) to advise whether there was a retainer letter, or RFP equivalent; (b) to consider privilege issues with counsel; (c) to produce such documents, barring any concerns; to advise what the concerns are.

---

**Response:**

Enbridge Gas's instructions to its consultant who completed the environmental work in relation to the project are contained in the Request for Quote ("RFQ") provided at Attachment 1 of this response. AECOM Canada was awarded the work in accordance with its Master Service Agreement with the Company and was issued a Service Release Order confirming the scope of work as per the RFQ.

## REQUEST FOR QUOTATION

Environmental, Cumulative Effects, Stage I & II Archaeological  
Assessment, Cultural Heritage Assessment and Species at Risk  
Panhandle Regional Expansion Project  
Enbridge Gas Inc. ("Enbridge" or "EGI")  
July 5, 2021

### **RFQ Instructions and Terms and Conditions**

1. Not a Tender. This Request for Quotation (the "**RFQ**") is solely for Enbridge's information and planning purposes and does not constitute a tender process or solicitation or any offer or commitment to purchase goods or services. Enbridge is in no manner committed or obligated to select, pre-qualify or enter into a contract with any recipient of this RFQ (a "**Recipient**"). No contract or other binding obligation on Enbridge will be implied (by law or otherwise) unless and until Enbridge and Recipient have executed a definitive agreement on terms and conditions acceptable to Enbridge.
2. Costs. Any and all costs, expenses, losses or damages (collectively the "**Costs**") incurred in responding to this RFQ or any related demonstrations or presentations or other activities are the sole responsibility of the Recipient. Recipient irrevocably and unconditionally waives any claims against Enbridge relating to Costs incurred by Recipient. This RFQ may be withdrawn at any time and Enbridge shall not be liable for any Costs incurred or suffered as a result of such withdrawal.
3. Confidentiality. As a condition of receiving the RFQ, the Recipient executed a confidentiality agreement with Enbridge (the "**Confidentiality Agreement**"). This RFQ and all associated communications and discussions constitute Confidential Information as defined in the Confidentiality Agreement.
4. Monetary Amounts/Governing Law. All monetary amounts in the Recipient's response to this RFQ (a "**Proposal**") are to be expressed in Canadian dollars, unless otherwise requested. The relationship of Recipient and Enbridge will be governed by the laws of the Province of Ontario and the laws of Canada applicable therein.
5. Masters Services Agreement (MSA). The Proposals shall also meet all terms and conditions of the MSA set out between Enbridge and the Recipient.
6. Proposal Due Date. Enbridge must receive the Recipient's complete Proposal by 12:01 PM EST on July 26<sup>th</sup>, 2021. Proposals must be received by electronic mail to Evan Tomek who will act as the primary contact for all Recipient inquiries and responses arising from this RFQ:

Evan Tomek  
Sr Analyst Environment  
CELL: (226) 229-9598  
evan.tomek@enbridge.com

50 Keil Drive North, Chatham, ON N7M 5M1

All inquiries will be responded to within five (5) business days, At Enbridge's discretion, inquiries from one Recipient may be shared with all Recipients.

7. Proposal Content and Review. Recipient should provide all information requested as noted in this RFQ. Following receipt and review of a Proposal, Enbridge may, at its sole option, enter into discussions and negotiations with a Recipient with a view to negotiating an agreement for delivery of requested services. Enbridge's consulting services agreement will be the agreement that will be used for purposes of these negotiations.

### **Project Summary, Scope of Work and Required Deliverables**

Refer to the Terms of Reference, a copy of which is attached to this RFQ as Appendix A.

### **Schedule**

Upon selection of the successful Recipient, this agreement will form the basis for settlement of a new Schedule under the Masters Services Agreement (Enbridge Inc).

APPENDIX A  
TERMS OF REFERENCE



ENVIRONMENTAL, CUMULATIVE EFFECTS, STAGE I & II ARCHAEOLOGICAL  
ASSESSMENT, CULTURAL HERITAGE ASSESSMENT AND SPECIES AT RISK

TERMS OF REFERENCE

PANHANDLE REGIONAL EXPANSION PROJECT

**1. INTRODUCTION**

To increase capacity and accommodate additional demand for affordable and reliable natural gas, including in the fast-growing greenhouse sector in the Kingsville, Leamington, and Wheatley areas, Enbridge Gas is proposing to increase the capacity of the Panhandle Transmission System, which serves residential and business customers in Windsor, Essex County, and western Chatham-Kent. The Panhandle Regional Expansion Project (the Project) includes the construction of the following:

- A natural gas transmission pipeline that will be up to 42 inches in diameter and approximately 23 km in length. The pipeline will loop the existing NPS 20 Panhandle Pipeline and will commence at the Enbridge Gas Dover Transmission Station on Townline Road in Chatham-Kent and will terminate at the Comber Transmission Station on Rochester Townline in Lakeshore.
- A transmission lateral that will be approximately 5 km of Nominal Pipe Size (NPS) 16 that will connect the NPS 12 Leamington North Loop Pipeline with the NPS 8 Leamington Reinforcement Pipeline in the Mersea Road 11 road allowance.
- A transmission lateral that will be approximately 10 km of NPS 16 that will loop the existing NPS 4 pipeline from the NPS 20 Panhandle Pipeline on Wheatley Road to the Wheatley Road Station in the road allowance.

Please see the attached map in Section 7.

In support of this project, Enbridge is seeking the services of an environmental consultant to perform an Environmental Assessment, including an environmental, cumulative effects and stage I archaeology assessment of the proposed work, as well as, prepare an Environmental Report documenting all findings and recommended mitigation measures. This report must satisfy the Ontario Energy Board's (OEB) Environmental Guidelines for the Location, Construction and Operation for Hydrocarbon Pipelines and Facilities in Ontario, 7<sup>th</sup> ed. 2016 and the Canadian Environmental Assessment Act (CEAA) (if applicable).

The report will become part of evidence to be filed with the OEB. Enbridge will file a Leave-to-Construct application for this pipeline with the OEB.

Also in support of this project, Enbridge is seeking the services of an environmental consultant to perform a Stage II Archaeological Assessment, Cultural Heritage Assessment and field surveys supporting the review for Species at Risk.

It is anticipated that the new pipeline will generally follow the existing NPS 20 Panhandle Transmission Pipeline, and the transmission laterals will be located in the road allowance - please refer to the attached map in Section 7 for a general overview of the potential pipeline routes. It is expected that the successful consultant will evaluate the proposed area and potential pipeline routes to ensure the final route meets project objectives.

An integrated public consultation program will also be required throughout the period of this study. This program should include affected government agencies, Indigenous groups, interest groups, landowners and other interested parties. The proposal should include a description of the consultant's public consultation program.

## **SELECTION OF THE PREFERRED PIPELINE**

### ***Phase I Selection of Pipeline Route Alternatives and Preliminary Preferred Route***

The consultant will complete an environmental inventory of the selected study area. This will include desktop studies, site visits, and personal contact with local, provincial, and federal government agencies.

As part of this study, the selected consultant will be required to ensure that the local environmental interest groups, directly and indirectly affected landowners and the public and private sector are notified and kept informed about the project and the Study findings. The contact list and comment tracking shall be documented in the Environmental Report. The consultant will be responsible for responding to general inquiries, where more project specific or technical questions arise, the consultant shall direct them to the Enbridge team for response. Enbridge's own Indigenous Engagement Advisor will complete the Indigenous consultation but it is expected that the consultant will support in this engagement, which could include identifying Indigenous groups within the study area, providing project details, logging consultation, etc.

Based on the environmental information collected, together with the technical requirements for construction, the consultant will be expected to define a study area and potential micro routing for the proposed pipeline.

A public information session should be held to seek public input and preferences for the alternate routes and preliminary preferred route identified. It should be clear to the public participants how the information gathered at this meeting is to be used and how the environmentally preferred route for the pipeline will be selected in principle. In order that all potential stakeholders in the proposed pipeline are made aware of the meeting, a mail drop for residents within the study area is required. The consultant will be expected to make all arrangements for this meeting including preparation of any newspaper advertisements, virtual visual displays, questionnaires, etc. Costs associated with the placement of newspaper ads will be the responsibility of the consultant as well as the arrangement for placement of these ads. Based on the length of the proposed route, Enbridge suggests two in person information sessions one at each end of the project or one virtual open house should Covid 19 restrictions still be in place. The successful consultant will be expected to provide costs for these sessions.

In order to aid in the collection of stakeholder comments, please include the development of a project specific e-mail.

## **Phase II      Environmental Considerations of Preferred Route**

As part of this study, the selected consultant will be expected to develop criteria by which to evaluate the proposed routes. The criteria will be based on the information received from the government agencies and from the environmental data compiled. Applying this criterion, the consultant will be expected to select the Preferred Route. This evaluation must be objective, replicable and defensible.

It is expected that the consultant will extract relevant environmental information including, but not limited to:

1. geological resources (including depth to bedrock)
2. soil resources
3. wetlands (in accordance with the current Policy Statement)
4. surface and groundwater conditions
5. aquatic resources
6. heritage resources
7. seismic activity (if applicable)
8. vegetation
9. wildlife habitat (including vulnerable, threatened and endangered species)
10. waste management areas (open and closed)
11. social and cultural features, including identifying which route has the most working space
12. cumulative effects

Other relevant environmental information on mineral resources, land uses, recreational areas, and municipal zoning may also be required.

Having selected the Preferred Route, the consultant will be expected to focus on refining and collecting further environmental and socio-economic information in more detail along the Preferred Route and developing mitigation and monitoring (if applicable) plans for this route.

It is expected that this detailed environmental information will be transposed to appropriate maps (i.e. figures, tables, alignment sheets, etc.) to be included in the Environmental Report and will also provide the basis for predicting the environmental impacts of the Preferred Route. The consultant will also be expected to provide advice on suitable mitigation measures to manage those impacts during construction and operation of the pipeline. Mitigation measures and suggested remediation should comply with accepted industry practice and Enbridge's Construction Specifications. Should the Preferred Route cross any environmentally sensitive areas, more detailed site specific maps will be required to indicate the proposed site specific mitigative measures.

## **2.      OUTSIDE CONTACTS AND MEETINGS**

Enbridge shall be notified of all meetings, contacts with provincial, regional and local government representatives, indigenous groups, interest groups, associations and other knowledgeable individuals that the Consultant may use in completing the required work. This may be achieved by providing Enbridge with a list of agencies to be contacted at the beginning of the study.



The Consultant shall maintain an updated contact list of names, titles, addresses and phone numbers of all individuals and agencies contacts, the method of contact as well as the subject matter discussed. This may be accomplished through the use of Enbridge's standard contact form, or an equivalent. An annotated list shall be submitted to Enbridge with the draft and final versions of the Environmental Report.

### 3. ARCHAEOLOGY ASSESSMENT

The Stage I Archaeology Assessment ("Stage I AA") will include a background review of the entire study area on surficial geology, post-glacial landscape evolution, historical and present land uses and will also review available data from the Ministry of Heritage, Sport, Tourism and Culture Industries (MHSTCI). Based on the results of the Stage I AA, recommendations will be made for a Stage II Archaeology Assessment. All aspects of the Stage I AA will meet requirements set out by the MHSTCI.

A Stage II Archaeology Assessment along with Indigenous Participation should also be included for the Project.

### 4. CULTURAL HERITAGE ASSESSMENT

The Cultural Heritage Assessment will include a review of the study area for known and potential cultural heritage resources, as well as a description of potential impacts of the Project and mitigation strategies to minimize such impacts. The study methodology should be consistent with guidelines provided by the MHSTCI.

### 5. SPECIES AT RISK

A field program using standard protocols to characterize existing terrestrial natural heritage conditions and to identify the presence of species at risk and their habitats should be included with the proposal along with Indigenous participation.

### 6. SCHEDULING

The work will commence as soon as the contract is awarded. The consultant will be required to attend a kick-off meeting prior to the commencement of work. The following is a draft schedule. Please indicate any proposed variations to this schedule in your proposal, with a brief discussion of the change(s).

Please note that Enbridge would like to have this pipeline in-service as early as Fall 2023 so timelines are critical.

Key Project Phase	Date Required
Proposal Due	July 26 <sup>th</sup> , 2021
Award of Contract	August 3 <sup>rd</sup> , 2021
Kick-Off Meeting	August 9 <sup>th</sup> , 2021
Public Open Houses	October 2021 – January 2022

Submission of Draft Report to Company	March 2022
Final Report	Within 7 days of receiving one compiled list of comments

## 7. PROJECT PROPOSAL

The following information should be included in the Proposal:

1. A detailed outline of the proposed study approach indicating all tasks to be undertaken (i.e. route generation, background research, site visits, route evaluation, consultation program, impact assessment, mitigation/monitoring, Stage I and II Archaeology Assessment, etc.) and assumptions used in the work plan.
2. The work schedule for all tasks and final report preparation. Included in this, should be the assumptions used for the number of meetings required between Enbridge and the selected Recipient. The Recipient should assume that the kick-off meeting scheduled for the week of August 9<sup>th</sup>, 2021 would take place virtually via Microsoft Teams. Any variations from the proposed schedule should be identified in the proposal, including a rationale for doing so.
3. Estimates for all costs incurred including, but not limited to (fees and expenses to be broken out separately):
  - Professional fees
  - Mapping to support the MENDM Duty to Consult Letter
  - Data gathering
  - Field visits
  - Disbursements
  - Stage I and II Archaeological Assessment
  - Cultural Heritage Assessment
  - Species at Risk/Natural Heritage
  - Direct mailing supporting the open house(s) (alternate routes)
4. Estimates for all maps and the types of maps proposed to be used for displaying the environmental information. The Recipient should also indicate the scales of the maps that are intended to be used.
5. Organizing, and providing suitable visual, virtual materials for community information meetings. This cost should also include an estimated cost for preparing mail drops, preparing the newspaper advertisements (please include 2 newspaper advertisements), questionnaires, and the names of the proposed newspapers in which the adverts will be placed.
6. Estimated costs associated with the preparation of the draft and final copy of the report in Adobe Acrobat or Microsoft Word format. The draft report shall be in a format that is easy to review and edit (i.e. track changes). Costs shall include 8 copies of a final report including all maps. Four of these copies must be un-redacted while 4 copies must be redacted. The final report must be in a format suitable for immediate distribution to agencies and include redacted and un-redacted versions. The consultant should also include any assumptions

used in reviewing the draft report. In addition, one copy of the report, including all graphics, should be provided in a format suitable for copying.

7. A table providing the people involved in the project, their title, rate as per the MSA and their percent involved in the project. Also, their qualifications should be provided. The use of any sub-consultants, if required should also be specified. If similar project experience is listed, please indicate the function of current proposed project team members during those projects, if any.
8. A schedule of per diem professional fees for attendance at additional meetings and for testifying at the OEB, if required.
9. Recipient must prepare a communication strategy for the project which includes public, agency and Indigenous consultation (i.e. stakeholder list, consultation log, etc.).

## **6. GENERAL**

### ***Payment***

The selected Recipient shall invoice in accordance with the approved payment schedule set out in the Proposal as well as the MSA. Extra report copies, meeting or hearing exhibits, maps etc. not specifically included in the lump sum cost submitted with Recipient's Proposal, will be considered an extra. Enbridge must approve all extras in writing. Attendance at meetings, preparation of evidence and expert witness testimony, if required, shall be charged on a per diem schedule of fees plus expenses. The selected Recipient shall not undertake any additional fieldwork or sampling not specified in this proposal without the prior approval of Enbridge.

### ***Confidentiality***

All information provided by Enbridge and all material generated during this assignment is and shall remain the property of Enbridge and shall remain confidential unless specific written authorization by Enbridge provides otherwise.

### ***Performance***

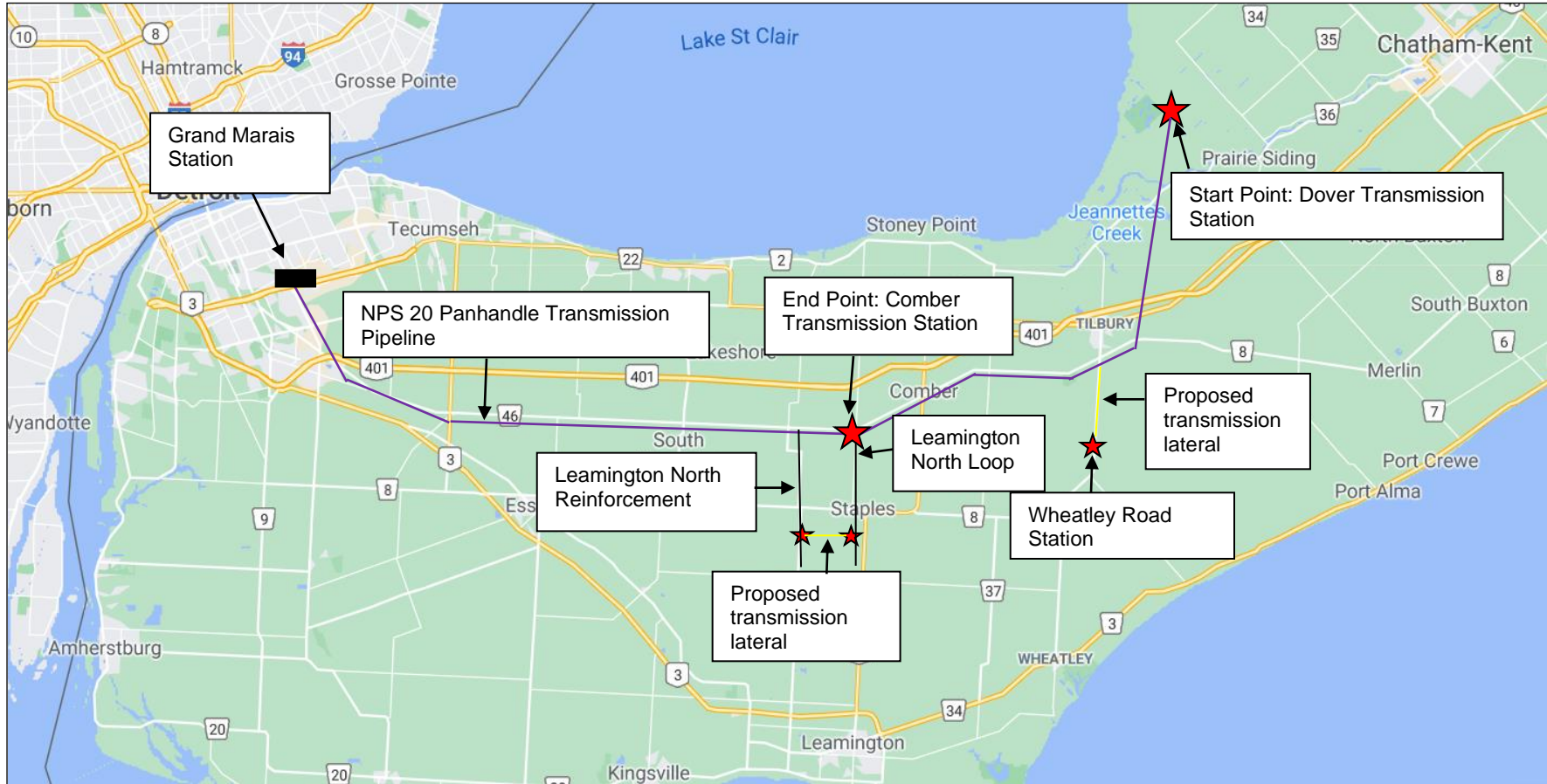
The selected Recipient, in performing their duties, shall at all times act in the best interests of Enbridge and exercise a degree of skill, care and diligence required by customarily accepted professional practices and procedures normally provided in the performance of such services.

### ***Government Contacts***

In undertaking this assignment, the selected Recipient may wish to contact municipal, provincial or federal agencies for the purpose of obtaining existing environmental data. The selected Recipient shall provide prior notice of all intended contacts to Enbridge.

### 7. PROPOSED PIPELINE ROUTE(S)

#### Proposed Start Points and End Points:



ENBRIDGE GAS INC.

Undertaking Response to TFG

1. **Exhibit JT1.11.** EGI's response to this undertaking provides details concerning the retainer of its external consultant and includes its Request for Quote (the **RFQ**) as an attachment.
  - a. Please produce AECOM Canada's (**AECOM's**) response to the RFQ, along with any related communications between AECOM and EGI.
  - b. Please confirm whether the Master Service Agreement and Service Release Order have been produced in this proceeding and, if they have not, please produce them.
2. **Exhibit JT1.11, Attachment 1, p. 4:** The **RFQ** identifies EGI's Indigenous Engagement Advisor as the lead on Indigenous consultations and references the expectation that the selected consultant will provide support in Indigenous consultations.
  - a. Please describe any information outside of the information set out in AECOM's report that EGI and/or its Indigenous Engagement Advisor provided to AECOM concerning (i) Indigenous consultations, (ii) concerns raised by Indigenous partners, and/or (iii) Indigenous communities in general. Please produce any related documents that pass a *de minimis* threshold in terms of relevance.
  - b. Please describe any support outside of the support described in AECOM's report that AECOM provided to EGI and/or its Indigenous Engagement Advisor in the context of EGI's Indigenous consultations. Please produce any related documents that pass a *de minimis* threshold in terms of relevance
  - c. Please confirm whether EGI's instructions to AECOM concerning Indigenous engagement were ever altered from the instructions set out in the document and, if so, please provide details and any relevant documents.
3. **Exhibit JT1.11, Attachment 1, p. 5:** The RFQ includes the requirement for the consultant to inform EGI of all meetings with Indigenous groups, both at the beginning and throughout the project.
  - a. Please provide the details of any such updates not already referenced in AECOM's report.

4. **Exhibit JT1.11, Attachment 1, p. 6:** The RFQ requires an Indigenous Participation document in relation to (i) the archaeology assessment and (ii) the species at risk assessment.
    - a. Please produce the documents related to both (i) and (ii) above along with details of any related communications in each of the respective assessments that is not referenced in AECOM's report.
  
  5. **Exhibit JT1.11, Attachment 1, p. 8:** The RFQ requires the submission of a communication strategy for the project, which the RFQ stipulates shall include Indigenous participation.
    - a. Please produce that document along with details of any related communications.
- 

**Response:**

1.
  - a) Please see Attachment 1 to this response for AECOM's response to the RFQ. Enbridge Gas has redacted commercially sensitive information within Attachment 1 pertaining to the negotiated price for AECOM's services. Please see Attachment 2 to this response for all communications between AECOM and Enbridge Gas relevant to the RFQ for the Project.
  - b) Please see Attachment 3 to this response for the Master Service Agreement between AECOM and Enbridge Gas, and Attachment 4 to this response for the Service Release Order for the Project. Enbridge Gas has redacted commercially sensitive information within Attachments 3 and 4 pertaining to the negotiated price for AECOM's services.
  
2.
  - a) Please see Attachment 5 to this response which contains an email exchange between the Enbridge Gas Indigenous Engagement Advisor and AECOM regarding the email address for consultation for Kettle and Stoney Point First Nation. All other information that Enbridge Gas provided to AECOM concerning (i) Indigenous consultations, (ii) concerns raised by Indigenous partners, and/or (iii) Indigenous communities in general, is captured in the Environmental Report prepared by AECOM at Exhibit F, Tab 1, Schedule 1, Attachment 1 and the Indigenous Consultation Log at Exhibit H, Tab 1, Schedule 1, Attachment 7.
  - b) Aside from the support required by AECOM described in the Environmental Report, AECOM additionally provides support by responding to First Nations' comments and questions regarding the Environmental Report. Enbridge Gas filed a log of First Nation's comments on the Environmental Report and how Enbridge Gas has addressed or plans to address their respective comments at

Exhibit I.STAFF.22, Attachment 3. Following the interrogatory process, AECOM provided responses to comments from the Chippewas of the Thames First Nation, which were received by Enbridge Gas on July 28, 2022. Please see Attachment 6 to this response for a log of comments from Chippewas of the Thames First Nation and Enbridge Gas's responses.

AECOM also provides support by reaching out to Indigenous communities to request their interest in participating in environmental field studies. As indicated in Enbridge Gas's letter dated November 4, 2022, regarding the supplementary questions filed by Three Fires Group Inc. ("TFG"), all First Nation Communities identified in the delegation letter provided by the Ministry of Energy dated August 6, 2021, which is filed at Exhibit H, Tab 1, Schedule 1, Attachment 2, were invited to participate in environmental field studies. All communities with the exception of Oneida First Nation participated in archaeological surveys and only Oneida First Nation and Aamjiwnaang First Nation participated in ecological surveys.

- c) Enbridge Gas confirms that instructions to AECOM regarding Indigenous engagement were not altered from the instructions set out in the RFQ.
- 3.
- a) Enbridge Gas generally undertakes Indigenous engagement directly and not through AECOM. AECOM does, however, invite and coordinate First Nation communities' participation in field studies such as archaeology and species at risk surveys. See Attachment 7 to this response for the communications log between AECOM and First Nation communities regarding such activities.
- 4.
- a) Enbridge Gas clarifies that there is no requirement in the RFQ for an Indigenous Participation "document" as implied by TFG. Rather, the RFQ requires that Indigenous Participation *processes* be included as part of the archaeological and species at risk assessments. While Indigenous participation in field surveys has occurred as outlined in the response to part 2 c) above, Enbridge Gas has not required AECOM to prepare specific documentation regarding those processes.

To assist TFG, Enbridge Gas requested that AECOM produce a log of communication and outreach with respect to completing environmental field surveys. Please see Attachment 7 to this response for the communications log between AECOM and First Nation communities regarding the completion of environmental field surveys.

The Stage I archaeological assessment can be found in the Environmental Report at Exhibit F, Tab 1, Schedule 1, Attachment 1, Appendix E. The Stage II archaeology assessment is not yet complete; however, it will be provided to TFG

outside of this proceeding upon its completion when it is submitted to the Ministry of Heritage, Sport, Tourism and Culture Industries.

Please see Attachment 8 to this response for the species at risk assessment, titled *Natural Heritage Background Review and Field Investigations Technical Memorandum*.

5.
  - a) Enbridge Gas clarifies that while the RFQ requires the consultant to prepare a communications strategy for the Project, Enbridge Gas has not received from or required AECOM to prepare a specific or separate communication strategy *document* as implied by TFG. Rather, the communications strategy is reflected in the Environmental Report found at Exhibit F, Tab 1, Schedule 1, Attachment 1, Section 3: Consultation Program.



# Environmental, Cumulative Effects, Stage I & II Archaeology Assessment, Cultural Heritage Assessment and Species at Risk

Panhandle Regional Expansion Project

Enbridge Gas Inc.

July 2021



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

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www.aecom.com

Mr. Evan Tomek  
Sr. Analyst Environment  
Enbridge  
Submitted Via Email: [evan.tomek@enbridge.com](mailto:evan.tomek@enbridge.com)

July 27, 2021

**Subject: Environmental, Cumulative Effects, Stage I & II Archaeology Assessment, Cultural Heritage Assessment and Species at Risk – Panhandle Regional Expansion Project**

Dear Mr. Tomek:

AECOM Canada Ltd. (AECOM) is pleased to provide this proposal to support Enbridge Gas Inc. (Enbridge) with environmental, cumulative effects, species at risk and cultural and archaeological services on the Panhandle Regional Expansion Project (Project). We have carefully evaluated our submission to confirm that we have provided an experienced team, unique permitting solutions and a cost-effective offering for Enbridge. The following are highlights from our submission:

- **Safety is our priority.** We focus on the prevention of safety issues using our mature industry-leading safety program. If it is not safe, we will not do it. In 2020 and 2021, AECOM worked over 120,000 hours for Enbridge with no safety, property damage or environmental incidents.
- **Schedule-driven cost savings.** We understand that the permitting path poses a risk to the project schedule. Our approach advances the completion of the Environmental Report by 4 months and initial phases of ecological field work to allow for the greatest amount of time to design a route/construction methodology that saves Enbridge money.
- **Integration of Indigenous communities.** AECOM has designed our field work to maximize opportunities for Indigenous contractors to participate in our upfront ecological and archaeological field work programs. We have [REDACTED] embedded in our budget representing \$ [REDACTED] (or [REDACTED] percent of the total field work budget) in direct spending for local Indigenous communities.
- **Experience you can trust.** We have put forward a team who have local experience and relationships with regulators that will make the Project a success. The team will be led by Mark van der Woerd, Kristan Washburn and Adria Grant. AECOM has also partnered with Dave Hodgson from DBH Soil Services Inc. to support agricultural impact assessment/mitigation, as required.

A description of these services and corresponding cost estimate are provided below. Should the nature of the work change or if Enbridge would like us to revisit any elements of our proposal, please call Mark at (289) 439-9803.

Sincerely,  
AECOM Canada Ltd.

Mark van der Woerd, MES, EP  
Senior Environmental Planner  
(289) 439-9803  
[Mark.VanderWoerd@aecom.com](mailto:Mark.VanderWoerd@aecom.com)

Karin Wall, MCIP, RPP  
Vice President, Environment  
D. 905-390-2022 M. 289-237-8665  
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# 1. Why AECOM

## 1.1 Mitigating Schedule Risks

The Panhandle Regional Expansion Project as understood from the Terms of Reference and email updates from Evan Tomek on July 7 and 14, 2021 includes construction of the following:

- Up to 42 inch natural gas transmission pipeline, approximately 23 km in length, commencing at the Enbridge Gas Dover Transmission Station and terminating at the Comber Transmission Station.
- An NPS 16 lateral within the Mersea Road 11 road allowance that will connect the NPS 12 Leamington North Loop Pipeline with the NPS 8 Leamington Reinforcement Pipeline.
- An NPS 16 pipeline within the Wheatley Road Allowance that will loop the existing NPS 4 pipeline from the NPS 20 Panhandle Pipeline to the Wheatley Station off Goodreau Line.

The Panhandle Regional Expansion Project is important for helping Enbridge increase the capacity of the natural gas system in Southern Ontario. The Project will help accommodate additional demand for natural gas in the greenhouse sector locally while supporting future growth in southwestern Ontario. Given the nature, size, and location of the Project, many constraints arise that could impact the successful execution of the Project. Following our review of the Request For Quotation (RFQ), AECOM has identified several strategies for reducing schedule uncertainty and ultimately mitigating costly project delays. These strategies include the following:

- **Advanced Completion of the ER**

Our proposed schedule advances completion of the Environmental Report (ER) by 4 months. Working through the Ontario Energy Board (OEB) process for Enbridge we have seen that agencies rely on the ER as a screening tool for permitting. In order to give the team the greatest amount of time possible for permitting, we have amended the proposed schedule to advance both consultation and completion of the draft ER to late 2021.

- **Fall ELC / Habitat Assessments / Fish Habitat Assessments**

From our recent experience on the Sarnia 2021/2022 Storage Enhancement Pipeline and Corunna and Ladysmith A-1 Observation Well Drilling Projects, the Ministry of the Environment, Conservation and Parks (MECP) has expressed a desire to review Ecological Land Classification (ELC)/Habitat Assessments during the Ontario Pipeline Co-ordinating Committee (OPCC) review. To streamline their comments and aid with Species at Risk screening with the Ministry, AECOM proposed to prioritize ELC and Habitat Assessments in the Fall and integrate the results into the ER, provided property access can be granted in time to complete the field work.

- **Alternative Cultural Heritage Framework**

AECOM is proposing an alternative approach for the cultural heritage resources assessment. In our opinion it should not be necessary to complete a full Cultural Heritage Resources: Existing Conditions and Preliminary Impact Assessment report given that the infrastructure will be below ground and the land will be returned to existing conditions upon construction. Therefore, we propose to complete this screening memo and engaging with the Ministry of Heritage, Sport, Tourism and Culture Industries (MHSTCI) upon it's completion to streamline the review/approval process.

- **Species at Risk Screening and MECP Consultation**

The biggest risk to Enbridge's proposed in-service date is the potential need for Species at Risk (SAR) permitting. As noted above, AECOM has assumed that we will advance initial field work in Fall 2021. This positions our team to identify potential SAR habitats within the study area and present data from all of the required information sources as outlined in the MECP's *Client's Guide to Preliminary Screening for Species at Risk*. Presenting this information in a Pre-screening Memo early to MECP will allow AECOM to assess the potential need for targeted surveys and the development of mitigations measures to avoid needing permits, if possible. This approach also provides additional time for

consultation with MECP over the Winter of 2022 and giving contingency to complete further field work in Spring 2022, if necessary.

## 1.2 Advancing Enbridge Sustainability Goals

In 2021, AECOM launched our [Sustainable Legacies](#) strategy. This strategy is aligned to Enbridge's Sustainability and Environmental, Social and Governance (ESG) goals. It integrates four key pillars that will embed sustainable development and resilience across the company's work, improve social outcomes for communities, achieve net-zero carbon emissions and enhance governance.

This means that by working with AECOM, Enbridge will advance your ESG goals on the Panhandle Regional Expansion Project. Specifically, our approach aligns to your four ESG goals in the following ways (Enbridge goal in **bold**):



- **Zero Incidents, Injuries and Occupational Injuries**

We bring practical experience navigating Enbridge safety protocols and have a proven track record for working safely. In 2020 and 2021, AECOM worked more than 120,000 hours for Enbridge and had zero recordable safety incidents, zero incidents of property damage and no environmental incidents. Further, we will build on our experience within the area leading Indigenous contractors through the Enbridge safety training to ensure all work is completed safely.

- **Increasing Indigenous Representation**

AECOM is committed to advancing reconciliation efforts in Canada. AECOM will continue to nurture our positive relationship with local Indigenous communities on this Project. Our work plan has more than [REDACTED] hours embedded in our budget representing \$ [REDACTED] (or [REDACTED] percent of the total field work budget) in direct spending for local Indigenous communities. We are confident this approach will be a success as it builds on the success we have had on the Sarnia 2021/2022 Storage Enhancement Pipeline Project.

- **Strengthening Diversity**

AECOM has actively worked to advance the diversity amongst our teams. We are committed to increasing representation of diverse groups within our work force. An example of this is that the majority of our proposed team are women – representing more than 50 percent of our team.

- **Net Zero Greenhouse Gas Emissions**

AECOM has furthered our own carbon emissions goals by ensuring that the company will be operationally net-zero by the end of 2021. It has also committed to reach science-based net-zero carbon emissions by 2030 through:

- Setting new 1.5°C-aligned emissions reduction targets;
- Decarbonizing fleet vehicles and switching to renewable energy tariffs;
- Partnering with its suppliers to decarbonize and include carbon; considerations into its procurement processes;
- Implementing a 50% reduction in business travel; and
- Creating projects centred around using nature-based solutions to offset residual carbon.

## 1.3 Experienced, Dedicated Enbridge Team

Enbridge is a key client for AECOM. We have proven that we have the team to drive projects through all phases of a project life-cycle for Enbridge. Every AECOM team member assigned to the Project has worked for Enbridge on

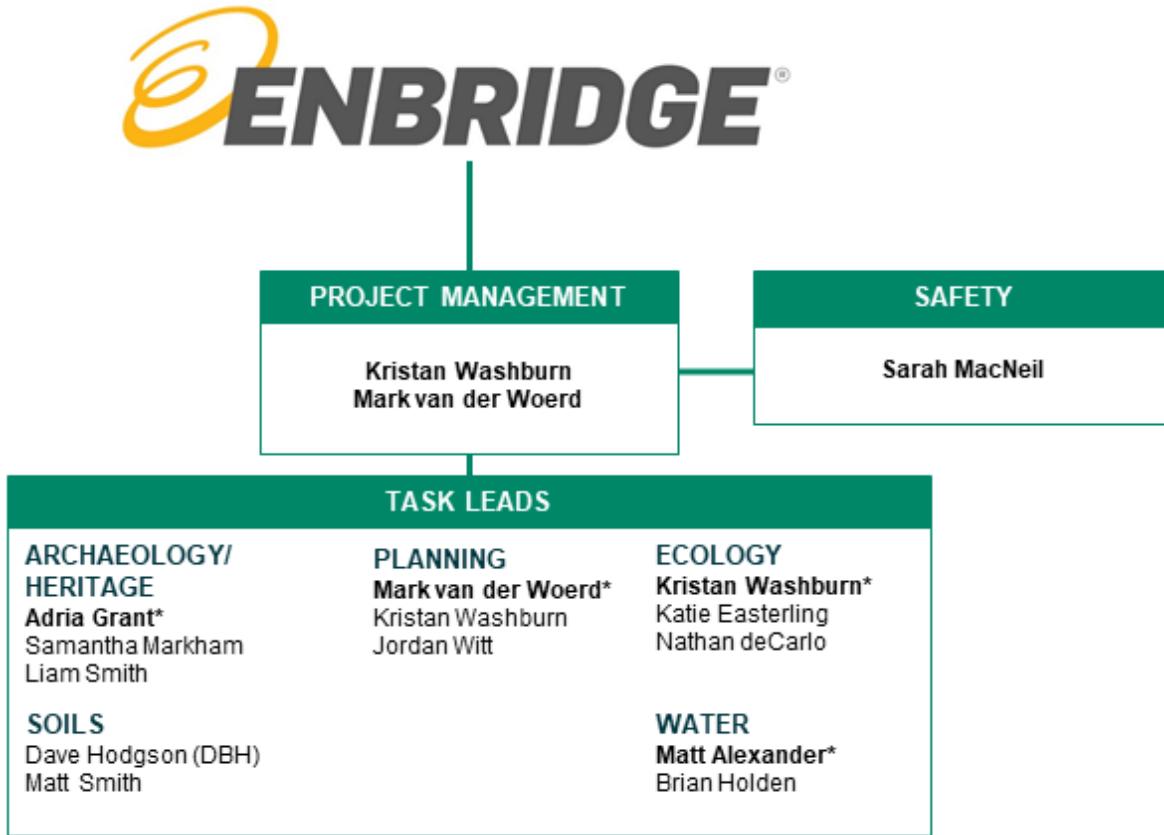
multiple assignments in the same capacity as proposed in our proposal. We are proud of our relationship with Enbridge and are grateful to have worked with your teams on the following recent projects:

- 2021/2022 Storage Enhancement Pipeline Project
- Corunna and Ladysmith A-1 Observation Well Drilling Project
- Ladysmith Integrity Dig Projects
- Kirkland Lake Lateral Project
- Owen Sound Phase 4 Reinforcement
- Owen Sound Section 4 Integrity Digs
- Northshore Lateral Replacement Project
- Coniston Station Integrity Dig
- Stratford Reinforcement Project
- Sudbury Lateral Replacement
- Community Expansion / Integrity Projects

## 2. Proposed Project Team

AECOM's proposed project team is identified in **Figure 1** below. **Appendix A** outlines the key team members involved in the Project, their title, qualifications, experience, rate as per the Master Service Agreement (MSA) and their percent involved in the Project.

**Figure 1: Proposed Project Team**



\*indicates leads

## 3. Technical Approach

### 3.1 Project Management

#### 3.1.1 Health and Safety

AECOM is committed to safety as the highest priority and joins Enbridge in ensuring all our staff are committed to safety. As of July 2021, AECOM is registered in ISNetworld with a current standing of 'Green'. Prior to the start of any field work, AECOM will also prepare a Project-specific Health and Safety Plan (HASP). As part of the preparation of the HASP, AECOM will lead a safety discussion at the kickoff meeting to identify additional potential health and safety risks for staff and develop concrete plans for mitigating those risks as part of the program.

#### 3.1.2 Project Management

Project planning is fundamental for successful program execution. At the start of the Project, AECOM will attend a virtual kick-off meeting with Enbridge to:

- Review background of the Project, confirm the schedule and confirm the Scope of Services;
- Outline outstanding information to be provided by Enbridge;
- Identify strategies for addressing potential Project challenges; and
- Review the program-specific Health and Safety items.

AECOM will maintain regular communication with Enbridge regarding key milestones and deliverables, budget management, driving of the schedule and any emerging Project challenges. AECOM will host ten bi-weekly update teleconference meetings (0.5 hour in length) with Enbridge until the ER is finalized in December 2021. These calls will be used to provide progress updates, discuss Project-related issues that may arise, and review the Project schedule and budget.

### 3.2 Baseline Review and Evaluation of Alternatives

#### 3.2.1 Study Area, Environmental Inventory and Pipeline Route Alternatives

AECOM will work with Enbridge to select a Project Study Area that encompasses the proposed general pipeline routes provided in the RFQ. Once the Project Study Area has been confirmed, AECOM will conduct an environmental inventory of potential environmental and social constraints through a desktop study, windshield survey (restricted to areas visible from the road) and information obtained from government agencies and, if available, Indigenous communities. Prior to engaging with stakeholders and government agencies, AECOM will provide Enbridge with a list of organizations to be contacted for information collection purposes.

A preliminary constraints map generally showing the Project area is attached as **Appendix B**. This information will be used to consider additional pipeline route alternatives using Project-specific routing criteria. Unless otherwise agreed upon with Enbridge, up to three (3) pipeline route alternatives, including micro-routing on the preliminary preferred route, may be considered for the Project.

### 3.2.2 Environmental Inventory and Desktop Analysis



AECOM will prepare a desktop analysis of existing conditions within the Project Study Area by leveraging information from online atlases and open source data, regulatory authorities, municipalities, agencies, and Indigenous communities. The background information will be used to guide the comparative evaluation of alternative routes and the development of mitigation measures to assist in avoiding and/or reducing potential impacts to the environment. To augment the desktop information, a windshield survey will document local features along the pipeline route alternatives; however, there will be a focus on verifying desktop information along the preliminary preferred route. Constraints and alternative mapping prepared will be at a scale of 1:25,000, while other mapping (e.g.,

environmental setting of the preferred route) will be at 1:10,000. Information gathered and assessed will include data on land use and socio-economic features, designated natural areas, vegetation, wildlife and wildlife habitat, aquatic resources, SAR, surficial water, soils, hydrological conditions, cultural heritage, and archaeological resources.

### 3.2.3 Effects Assessment and Selection of Preferred Route

AECOM will evaluate the pipeline route alternatives using the information collected to identify constraints. The information will be reviewed against evaluation criteria agreed upon with Enbridge to select the preferred route for the Project in an objective, replicable and defensible manner. The evaluation will consider natural (physical and bio-physical), socio-economic and technical criteria developed for the Project based on information received from government agencies and the environmental inventory.

Following the selection of the preferred route and PIS, AECOM will assess the potential effects of the preferred route on the physical, biophysical and socio-economic environment. This includes a high-level evaluation of potential cumulative effects that may result from interactions between the Project and other developments or projects planned in the area. As part of the assessment, AECOM will recommend mitigation measures to be implemented during construction and operation of the pipeline based on accepted industry practice and Enbridge's Construction Specifications. If necessary, site-specific maps will be prepared to identify mitigation that may be proposed at environmental sensitive areas.

## 3.3 Communications and Consultation Strategy

AECOM will undertake an integrated communications strategy and public consultation program for the Project that allows Indigenous communities, local landowners, and stakeholders to participate in the planning process. Potentially interested parties and agencies will be identified at the beginning of the study for inclusion in the Project Contact List. The Project Contact List will be provided to Enbridge at the beginning of the Project and will be updated as the Project advances.

The communications and consultation strategy for the Project will include the following:

- Prepare and issue Notice of Commencement and Public Information Sessions, which will be provided to residents within the study area via mail drop and advertised once in two (2) local newspapers (Chatham Voice [\$349 per advertisement] and Chatham Daily News [\$600 per advertisement] or Essex Free Press [\$223.44 per advertisement]). Direct mailings will occur for Indigenous communities, the OPCC and other key stakeholders and agencies;



- AECOM anticipates hosting two PISs in November on back to back evenings in Comber and Tilbury. The purpose of the PIS will be to seek public input and preferences on the alternative routes identified, to provide rationale for the selection of the preferred route and to confirm how public input will be used to complete the ER.
  - We have assumed that Mark, Kristan and a support person will attend at a PIS. AECOM will prepare poster boards (up to 20 panels) and supporting materials (e.g., questionnaires, names tags) for the Public Information Sessions. We will also arrange for light snacks and refreshments.
  - Note: should public health protocols not permit or if Enbridge does not want to proceed with in-person gatherings, AECOM will shift to a virtual public information session that mirrors Enbridge's current practice (i.e., dedicated project URL, virtual presentation with voiceover and use of online comment forms) at no additional cost;
- Following the PISs, AECOM will prepare a summary that will document the number of attendees, comments received, and responses provided, which will be appended to the ER.



A comment tracking table will be used to record Project communications from stakeholders until substantial construction is complete. To aid in receipt and response to comments, a project-specific email will be used and maintained for the duration of the Project. AECOM will update and provide this table to Enbridge when needed to support agency or municipal consultation associated with the Project.

AECOM will also support Enbridge's Indigenous Engagement Advisor as needed with engagement of local communities for the Project. AECOM is available to assist with consultation tracking and preparing Indigenous-specific Notice of Commencement letters, Project details and location of consultation.

### 3.4 Completion of the Environmental Report

Following the PISs, AECOM will prepare an ER that documents the findings of the above listed tasks in a manner that satisfies the OEB Environmental Guidelines (7<sup>th</sup> Edition). The purpose of the report is to communicate, in a transparent and traceable manner, the generation and assessment of the pipeline route alternatives. An integral component of this report is the description of consultation undertaken.

AECOM will provide a Draft ER (Adobe Acrobat and/or Microsoft Word format) to Enbridge for review and comment in December 2021. After addressing one round of input from Enbridge, the finalized report will be provided to Enbridge in a format suitable for immediate distribution to agencies. The finalized report will be submitted within seven (7) days of receipt of compiled comments provided there are no comments requiring substantial updates to the documentation. It is assumed that either Enbridge or AECOM will circulate the ER to the OPCC virtually to notify interested/affected stakeholders that the ER has been prepared.

AECOM has included time to support Enbridge with responses to agencies and stakeholders during the OPCC review. We have also included budget for IR response and for Mark to testify at a hearing, should it be required.

## 3.5 Archaeology and Cultural Heritage Assessments

### 3.5.1 Stage 1 Archaeological Assessment

AECOM will conduct all archaeological assessments to meet the requirements of the MHSTCI Standards and Guidelines for Consultant Archaeologists in accordance with the *Ontario Heritage Act*, R.S.O. 1990, c. 0.18. The Stage 1 background study will identify known archaeological sites, areas subject to previous assessments and will evaluate the potential for archaeological resources to be present on undisturbed land according to provincial criteria.

As part of the Stage 1 research AECOM intends to complete a comprehensive property inspection of the entire corridor. The intent of this inspection is to identify and delineate all disturbance within the municipal Right-of-Ways (ROWs) to clear these areas to the greatest extent possible from requiring any further work. The Stage 1 archaeological assessment will provide Enbridge with clear direction early on in the design process, to site infrastructure accordingly to minimize Stage 2 archaeological assessment costs.



### 3.5.2 Stage 2 Archaeological Assessment

The Stage 2 archaeological field investigation will consist of the physical inspection of the land to be impacted by the development that was identified in the Stage 1 archaeological assessment as having potential for archaeological resources to be present. It is our understanding that the NPS 42 line from Comber Station to Dover Station is entirely in greenfield. The easement is 23 km in length and 30 m wide, consisting of approximately 170 acres of land requiring assessment of which approximately 12 acres is land that cannot be ploughed, and the remaining is agricultural field. For the NPS 16 portions along Mersea Road and Wheatley Road, AECOM has assumed that 5 metres of the construction area will occur within the municipal road allowance with the other 5 metres located on private property. From our desktop review, AECOM assumes that the 5 metre portion within the road allowance will be deemed “pre-disturbed”. The 5 metre portion on private property will require further assessment by test pit assessment. If any land can be ploughed in advance of assessment this would result in a cost saving for Enbridge.

Based off the location of the study area and current condition of the land, the Stage 2 field investigation will consist of a combination of pedestrian survey and the standard test pit survey, both at 5 m intervals. Agricultural fields need to be ploughed and weathered to achieve 80% ground surface visibility for the MHSTCI to accept our results, and test pits will be shovel width in diameter and excavated approximately 30 cm deep.

This budget includes time to engage with three First Nations groups during the Stage 2 archaeological assessment. AECOM will co-ordinate with each group to share information and facilitate the participation of field liaisons to work alongside the archaeological crew. AECOM’s team has great, long standing relationships with local First Nations groups in the study area.

To develop the scope of work for field work we have assumed:

- Enbridge will co-ordinate land access and field conditions preparation and that there will be sufficient prepared fields for survey to allow the team to work a full week at a time.
- To increase efficiencies, Enbridge will co-ordinate with landowners to allow the archaeological team permission to use turbine access roads to reach the study area.
- Half of the NPS 16 work areas will be sited primarily within the disturbed municipal ROW, which will be cleared of requiring further work during the Stage 1 archaeological assessment. Stage 2 field investigation will be required for the Comber Station to Dover Station line and for 5 metres adjacent to the NPS 16 road allowance.
- This budget assumes 20 acres of additional temporary land on private property will require assessment via pedestrian survey.
- The laboratory level of effort is 25 hours to wash, analyze and catalogue artifacts; no more than 200 artifacts will be identified that require processing and analysis.
- This budget includes the cost to cover six (6) First Nations monitors to participate in field work.



### 3.5.3 Cultural Heritage Assessment

AECOM's Cultural Heritage team will complete a desktop Cultural Heritage Screening Memorandum to help understand the opportunities and constraints to infrastructure improvements for the Project. In our professional opinion it should not be necessary to complete a full Cultural Heritage Resources: Existing Conditions and Preliminary Impact Assessment report given that the infrastructure will be below ground and the land will be returned to existing conditions upon construction finishing.

The Cultural Heritage Screening Memorandum will summarize the results of a desktop review for the entire project area and will include a collection of background information, including a review of primary and secondary source material and historical maps. A review of federal, provincial, and municipal databases, including the municipal Heritage Registers, will be conducted in order to provide an inventory of properties that have been identified and/or designated as having cultural heritage value or interest. Using the MHTSCI *Criteria for Evaluating for Potential Built Heritage Resources and Cultural Heritage Landscapes*, the memo will determine if there are potential cultural heritage resources within the project area based off the desktop review. The Memo will provide high-level recommendations based on the results of the desktop review; upon its completion the MHSTCI will be consulted to determine if there is a need for any further heritage assessment while keeping the scope of any further reporting to the minimal required.



## 3.6 Ecological Assessments

### 3.6.1 Species at Risk

Based on a preliminary review of online resources the following terrestrial SAR have documented records within the general area of the proposed pipelines:

- Bank Swallow
- Barn Owl
- Barn Swallow
- Blanding's Turtle
- Bobolink
- Chimney Swift
- Common Five-lined Skink (Carolinian population)
- Dense Blazing- star
- Eastern Foxsnake (Carolinian Population)
- Eastern Meadowlark
- Eastern Small-footed Myotis
- Henslow's Sparrow
- Kentucky Coffee-tree
- King Rail
- Least Bittern
- Little Brown Myotis
- Northern Myotis
- Prothonotary Warbler
- Queensnake
- Spiny Softshell
- Tri-colored Bat

AECOM's Ecology team will complete field investigations to characterize existing terrestrial natural heritage conditions and identify potential SAR and SAR habitats that fall within the study area. The study area is assumed to be a 30 m buffer on either side of the preferred pipeline routes. With project award in August, AECOM is positioned to complete this work in the late summer/ fall for inclusion into the ER, assuming procurement of property access.

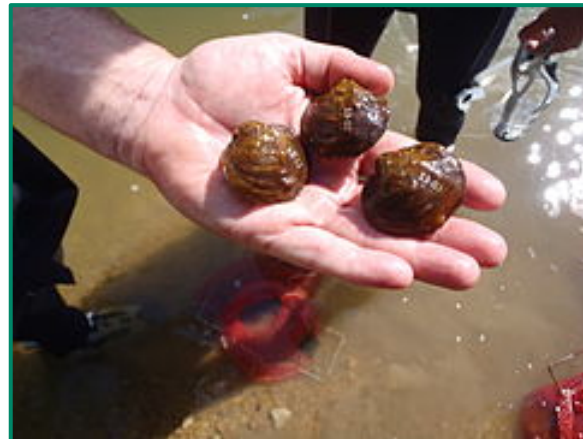


AECOM will complete the following investigations as part of this scope of work:

- Ecological Land Classification to categorize and delineate vegetation communities and document suitable agricultural fields for grassland SAR birds. These surveys will follow the protocols outlined in the Ecological Land Classification System for Southern Ontario (Lee *et al.*, 1998) to Vegetation Community Type and compile an incidental flora and fauna inventory. During these surveys, AECOM ecologists will document areas of suitable SAR bat roosting;
- Incidental observations of SAR;
- Infield SAR Screening to identify where suitable SAR habitats exist (e.g., crayfish chimneys, wetlands); and if additional targeted surveys may be required; and
- Participation of six (6) Indigenous monitors with the field crew.
- Should suitable SAR habitats be found as part of the above-identified work, we suggest that any targeted survey requirements be confirmed with MECP before completion. As such, we have not identified any additional targeted surveys as being required at this time. After consultation with MECP, additional targeted surveys may be identified as necessary, at which time AECOM can complete these surveys under a scope change.

### 3.6.2 Aquatic Resources, including SAR

A desktop review will be undertaken to identify, delineate and categorize the sensitivity of aquatic species and habitats in the study area. The review will include known habitat of aquatic species afforded protection under the *Species at Risk Act* (SARA) and *ESA*. According to the Department of Fisheries and Oceans Canada (DFO) Online Aquatic SAR Mapping, there are numerous fish and mussel species within the study area, including: Fawnsfoot, Hickorynut, Mapleleaf, Lilliput, Lake Chubsucker, Spotted Sucker, Silver Lamprey, Northern Sunfish and Eastern Sand Darter. Additionally, the Thames River has been classified as critical habitat for Fawnsfoot under SARA.



We have assumed all watercourse will be open-cut with the exception of the Thames River and Jeanette Creek. Considering the numerous fish and mussel SAR species identified through the preliminary background review, AECOM has scoped fish habitat assessments at all watercourses except the Thames River and Jeanette Creek. There are approximately 47 watercourses/ drains the Project will cross, approximately 15 of which have known records of aquatic SAR. To support potential *Fisheries Act* approvals and permits under *SARA* and the *ESA*, habitat assessments will be conducted at all watercourse crossings. The presence of aquatic SAR trigger the requirement for regulatory review under the *Fisheries Act* by DFO, as Enbridge's agreement with DFO does not cover work in watercourses with aquatic SAR. As such, DFO will likely want to review all aspects of the projects that have the potential to impact fish and fish habitat and will list the watercourses and activities in their approval. Field investigations will be completed within the pipeline RoW where property access is permitted. Investigations will include an assessment of morphology, approximate channel dimensions, substrates, aquatic vegetation, and SAR habitat suitability. We have assumed that all land access will be provided by Enbridge prior to mobilizing to the field and that six indigenous monitors will participate in the work.

### 3.6.3 SAR Permitting Strategy

If it is determined that SAR will be affected by the Project, it will be difficult to meet an in-service date of Fall 2023 without an *Endangered Species Act* permitting strategy in place. AECOM proposes that we complete the initial field surveys (at a minimum the windshield survey) identified in **Section 3.6.1 and 3.6.2** as soon as possible after award and procurement of access permissions from landowners. The intent of the field investigations will be to identify potential SAR and SAR habitats within the study area and present data from all of the required information sources as outlined in the MECP's *Client's Guide to Preliminary Screening for Species at Risk*. Presenting information from all the sources identified in this document (including field investigations) allows us to submit a Pre-screening Memo to MECP. In this Memo, AECOM will discuss what species may be affected by the Project, make preliminary suggestions towards Mitigation Advice (previously called Letter of Advice) instead of a permit and propose targeted surveys we consider warranted. MECP can then respond to our Pre-screening Memo by providing mitigation advice and confirmation that no permit is needed or confirmation of what targeted surveys may be required. We assume it will be unlikely to accomplish all the terrestrial and aquatic habitat assessments prior to the Spring of 2022, as it is unlikely that property access will be granted for all lands prior to early fall. Therefore, we have assumed one update to the Pre-screening Memo after completion of the field investigations in the Summer of 2022. To manage risk to project schedule, should a permit be required, we propose SAR-related activities follow the schedule outlined in **Table 1**.

**Table 1: SAR Permitting Schedule**

Activity	Targeted Dates
<b>Initial SAR Field Investigations (ELC, incidental and SAR Screening)</b>	August – November 2021
<b>Pre-screening Memo submission to MECP</b>	November 2021
<b>Meet with MECP to confirm field investigation requirements</b>	December 2021
<b>Field investigation results and additional field investigation requirements documented in the ER</b>	December 2021
<b>Additional Targeted Field Investigations</b>	April – July 2021
<b>Submission of Information Gathering Form (IGF) to MECP</b>	July 2021
<b>MECP response on IGF</b>	July-August 2021
<b>Submission of Alternative Avoidance Form and C-permit application to MECP (If needed)</b>	August 2021 – September 2021
<b>Permitting Approvals Timelines (If needed)</b>	September 2021 – January 2023
<b>Permit in Hand (If needed)</b>	January/February 2023

This strategy will support an expedited permitting timeline with MECP through the following means:

1. Submission of a Pre-screening Memo gets the Project into the system early and puts an MECP biologist on the file, which means a faster response when the IGF is submitted.
2. Confirming targeted field investigations means MECP agrees with the proposed surveys, and there will be no surprises when the IGF is submitted.
3. Submission of the Alternative Avoidance Form and C-Permit Application at the same time expedites review time for these documents.

Although we will complete the field investigations and Pre-screening Memo to support a tight permitting timeline, we will endeavour to obtain Mitigation Advice (previously Letter of Advice) from MECP and avoid a permit under the *Endangered Species Act* (ESA) wherever possible and warranted. As part of the initial work plan additional targeted surveys or permitting activities are required, this will be addressed under a scope change.

### 3.7 Agricultural Resources

When working in agricultural areas where soybean crops have been part of the crop rotation, EGI may want to consider completing analysis of the soil for Soybean Cyst Nematode (SCN). Although mitigation measures will be developed and implemented to prevent the spread of SCN, AECOM has assumed a budget for \$ [REDACTED] for sampling and laboratory analysis, should it be required.



### 3.8 Excess Soils

Excess soil management has been regulated in Ontario under O. Reg. 406/19 since January 1, 2021. The regulation is coming into effect in phases over the next several years. Starting on January 1, 2022, the Regulation requires that notice be filed in the Environmental Site Registry (The Registry) for any:

- “Project” that generates “Excess Soil” or
- Any “Reuse Site” where at least 10,000 m<sup>3</sup> of Excess Soil will be received.

The following documents must be generated and attached to the notice filed in the Registry for each Project:

1. Assessment of Past Uses
2. Sampling and Analysis Plan
3. Soil Characterization Report
4. Excess Soil Destination Assessment Report

All the above-noted documents must be completed by a Qualified Person (QP), as defined in Ontario Regulation 153/04 (O. Reg. 153/04) and referenced in O. Reg. 406/19.

As part of the proposed scope, AECOM has included a budget for the completion of the Assessment of Past Uses report and Sampling and Analysis Plan. Both documents will be completed in accordance with the MECP document entitled “*Rules for Soil Management and Excess Soil Quality Standards*”, dated 2020 (The Soil Rules).

The Assessment of Past Uses report will be used to develop a preliminary determination of the likelihood that one or more contaminants have affected soil or rock in a location where soil or crushed rock will be excavated within the project area. Areas of Potential Environmental Concern (APECs) will be identified within the project area that may have been affected by a Potentially Contaminating Activity (PCA). Associated contaminants of potential concern (COPCs) will also be identified for each APEC.

The assessment of past uses will consist of a records review, interview(s) with Enbridge personnel, a site reconnaissance, a review and evaluation of information and the preparation of a report.

The Sampling and Analysis Plan (SAP) will be based on the Assessment of Past Uses and will ensure the appropriate level of sampling and analysis is carried out to determine concentrations of contaminants in the excavated soil or crushed rock. The SAP will outline proposed sampling locations, proposed chemical analyses and sampling rationale.

### 3.9 Environmental Protection Plan

Prior to construction, AECOM will prepared an Environmental Protection Plan (EPP) and Environmental Alignment Sheets (EAS). These documents will identify the environmental mitigation to be in place during construction. A Draft EPP and EAS will be provided to Enbridge in the Summer of 2022. It is expected that finalization of the document and mapping will occur Fall 2022. We have assumed that digital copies of the EPP and EAS will be submitted to Enbridge. We recognize the EPP is a living document that may require updates during construction. Consequently, AECOM's budget has included time to update the EPP two (2) times following finalization. We have assumed the EPP will be provided digitally.

## 4. Schedule

AECOM understands the critical nature of the timelines outlined by Enbridge. As identified previously, we are proposing a compressed schedule, which provides deliverables to Enbridge ahead of the timelines identified in the RFQ. The schedule is outlined in **Table 2**.

**Table 2. Project Schedule**

Key Project Phase	Date
<b>Kick-Off Meeting</b>	August 9, 2021 (Following the kick-off meetings, 24 bi-weekly, 0.5 hr, meetings are assumed from August – Fall, 2022 with additional adhoc meetings booked, as needed)
<b>Windshield Survey</b>	Week of August 23, 2021
<b>Complete Information Requests</b>	September 6, 2021
<b>Baseline Review and ER Routing Analysis</b>	August - September, 2021
<b>Notice of Commencement and Public Information Session</b>	Week of October 11, 2021
<b>Details Terrestrial and Aquatic Habitat Assessments for SAR</b>	Fall 2021 (field work as land access permits)
<b>Stage 1 &amp; 2 Archaeological Assessment</b>	Fall 2021 (field work as land access permits)
<b>Cultural Heritage Assessment</b>	Fall 2021
<b>Public Information Session</b>	Week of November 1, 2021
<b>Public Comment Period</b>	November 8 – 26, 2021
<b>MECP SAR Pre-screening Memo</b>	November 10, 2021
<b>Meet with MECP and Confirm Targeted Field Investigation Requirements</b>	Week of December 1, 2021
<b>Draft Environmental Report</b>	December 10, 2021
<b>Final Environmental Report</b>	Within 7 days of receipt of consolidated comments from Enbridge
<b>Additional Terrestrial and Aquatic Field Investigations</b>	Spring- Summer 2022
<b>Updated SAR Pre-screening Memo with Aquatics Data</b>	August 2022
<b>Draft Environmental Protection Plan</b>	Summer 2022
<b>Final Environmental Protection Plan</b>	Fall 2022 (flexible but requires 2 months to complete)
<b>Assessment of Past uses and Soil Sampling Plan</b>	Fall 2022 (flexible but requires 2 months to complete)



## 5. Budget

The budget for the Scope of Services described above for the Panhandle Regional Expansion Pipeline Project is \$ [REDACTED]. A breakdown of the total hours, fees and expenses by task are provided in **Table 3** below. A schedule of per diem professional fees for attendance at additional meetings and for testifying at the OEB, if required, is provided in **Appendix C**.

**Table 3. Breakdown of total hours, fees and expenses by task.**

ID	Task Name	Hours	Fees	Expenses
<b>1</b>	<b>Project Management and Safety</b>			
1.1	Project Management	[REDACTED]	\$ [REDACTED]	\$ [REDACTED]
1.2	Safety Planning and Task Hazard Assessments	[REDACTED]	\$ [REDACTED]	\$ [REDACTED]
<b>2</b>	<b>Meetings with Enbridge</b>			
2.2	Kick-off Meeting	[REDACTED]	\$ [REDACTED]	\$ [REDACTED]
2.3	Progress Meetings	[REDACTED]	\$ [REDACTED]	\$ [REDACTED]
<b>3</b>	<b>Environmental Report</b>			
3.1	Background Review and Info Requests	[REDACTED]	\$ [REDACTED]	\$ [REDACTED]
3.2	Windshield Survey	[REDACTED]	\$ [REDACTED]	\$ [REDACTED]
3.3	Comparative Evaluation of Alternative Routes	[REDACTED]	\$ [REDACTED]	\$ [REDACTED]
3.4	Draft ER	[REDACTED]	\$ [REDACTED]	\$ [REDACTED]
3.5	Finalization of ER	[REDACTED]	\$ [REDACTED]	\$ [REDACTED]
<b>4</b>	<b>Stage 1 and 2 Archeology</b>			
4.1	Stage 1 Archaeology	[REDACTED]	\$ [REDACTED]	\$ [REDACTED]
4.2	Stage 2 Archaeology	[REDACTED]	\$ [REDACTED]	\$ [REDACTED]
4.3	Indigenous Monitors	[REDACTED]	\$ [REDACTED]	\$ [REDACTED]
<b>5</b>	<b>Species at Risk</b>			
5.1	Ecological Land Classification and Terrestrial SAR Screening	[REDACTED]	\$ [REDACTED]	\$ [REDACTED]
5.2	Panhandle Aquatic SAR Investigations	[REDACTED]	\$ [REDACTED]	\$ [REDACTED]
5.3	Leamington Loop Aquatic SAR Investigations	[REDACTED]	\$ [REDACTED]	\$ [REDACTED]
5.4	Wheatley Loop Aquatic SAR Investigations	[REDACTED]	\$ [REDACTED]	\$ [REDACTED]
5.5	Pre-screening Memo to MECP	[REDACTED]	\$ [REDACTED]	\$ [REDACTED]
5.6	Indigenous Monitors	[REDACTED]	\$ [REDACTED]	\$ [REDACTED]
<b>6</b>	<b>Cultural Heritage</b>			
6.1	Cultural Heritage Report and Checklist	[REDACTED]	\$ [REDACTED]	\$ [REDACTED]
<b>7</b>	<b>Communication Strategy</b>			
7.1	Contact List, Project-specific Email	[REDACTED]	\$ [REDACTED]	\$ [REDACTED]
7.2	Notice of Project and Public Information Session (PIS) (Notice, Letters, Newspaper Ads, Mail Drop)	[REDACTED]	\$ [REDACTED]	\$ [REDACTED]
7.3	Comment Tracking (2 hours each month for 20 months)	[REDACTED]	\$ [REDACTED]	\$ [REDACTED]
<b>8</b>	<b>Public Information Session</b>			
8.1	PIS Materials (Story Boards, Sign-in Sheets, Questionnaires, Name Tags)	[REDACTED]	\$ [REDACTED]	\$ [REDACTED]
8.2	PIS Attendance (Venue, Food, Summary Report)	[REDACTED]	\$ [REDACTED]	\$ [REDACTED]
<b>9</b>	<b>Environmental Protection Plan</b>			
9.1	EPP Document	[REDACTED]	\$ [REDACTED]	\$ [REDACTED]
9.2	Alignment Sheets	[REDACTED]	\$ [REDACTED]	\$ [REDACTED]
9.3	EPP Revisions	[REDACTED]	\$ [REDACTED]	\$ [REDACTED]
<b>10</b>	<b>OPCC Review/ Hearing</b>			
10.1	OPCC Review	[REDACTED]	\$ [REDACTED]	\$ [REDACTED]
10.2	IR Response	[REDACTED]	\$ [REDACTED]	\$ [REDACTED]
10.3	Hearing Support	[REDACTED]	\$ [REDACTED]	\$ [REDACTED]
<b>11</b>	<b>Soils</b>			
11.1	Assessment of Past Uses Report	[REDACTED]	\$ [REDACTED]	\$ [REDACTED]
11.2	Sampling and Analysis Plan	[REDACTED]	\$ [REDACTED]	\$ [REDACTED]
11.3	Soy Bean Nematode	[REDACTED]	\$ [REDACTED]	\$ [REDACTED]
<b>Subtotals (excluding HST)</b>		[REDACTED]	\$ [REDACTED]	\$ [REDACTED]
<b>Total Price</b> <i>(including Indigenous subcontractors, disbursements, excluding HST)</i>		[REDACTED]	\$ [REDACTED]	\$ [REDACTED]

### **5.1.1 Commercial Terms**

Should Enbridge wish to add, change or remove services as outlined in our proposed Scope of Services, our team will be happy to renegotiate the cost of services. Our proposal is valid for your acceptance for 30 days, after which time it may require a review of the assumptions provided. The terms and conditions for the work will align with our existing MSA.

If performance of the Services is affected by causes beyond AECOM's reasonable control ("Force Majeure"), the project schedule and the compensation shall be equitably adjusted to compensate AECOM for any reasonable increase in the time and costs necessary to perform the services. Force Majeure shall include, but not be limited to "acts of God", abnormal weather conditions or other natural catastrophes, war, terrorist attacks, sabotage, computer viruses, riots, strikes, lockouts or other industrial disturbances, pandemics, epidemics, health emergencies, viruses (e.g., SARS Cov-2), disease (e.g., COVID-19), plague, quarantine, travel restrictions, discovery of hazardous materials, differing or unforeseeable site conditions, acts of governmental agencies or authorities (whether or not such acts are made in response to other Force Majeure events).



# Appendix **A**

## Project Team Experience Table



Enbridge Gas Inc.

Environmental, Cumulative Effects, Stage I & II Archaeology Assessment, Cultural Heritage Assessment and Species at Risk  
Panhandle Regional Expansion Project

## Appendix A. Project Team Experience Table

AECOM's proposed project team is identified in the table below and outlines the key team member involved in the project, their title, qualifications, experience, rate as per the MSA and their percent involved in the project.

Name and Title	Qualifications	Enbridge Project Experience1	MSA Rate	Percent Involved (by discipline)
<b>Project Management</b>				
<b>Mark Van der Woerd</b> Senior Environmental Planner	MES, B.Sc., EP, IAP2	<ul style="list-style-type: none"> <li>■ 2021/2022 Storage Enhancement Pipeline Project</li> <li>■ Corunna and Ladysmith A-1 Observation Well Drilling Project</li> <li>■ Ladysmith Integrity Dig Projects</li> <li>■ Owen Sound Phase 4 Reinforcement</li> <li>■ Northshore Lateral Replacement Project</li> <li>■ Owen Sound Section 5 Integrity Digs</li> <li>■ Owen Sound Section 4 Integrity Digs</li> <li>■ Coniston Station Integrity Dig</li> <li>■ Stratford Reinforcement Project</li> <li>■ Sudbury Lateral Replacement</li> <li>■ Many additional Community Expansion / Integrity Projects.</li> </ul>	\$█	█
<b>Kristan Washburn</b> Senior Ecologist / Project Manager	MES, B.Sc., Env Tech. Dip.	<b>PM for the:</b> <ul style="list-style-type: none"> <li>■ 2021/2022 Storage Enhancement Pipeline Project</li> <li>■ Corunna and Ladysmith A-1 Observation Well Drilling Project</li> <li>■ Ladysmith Integrity Dig Projects</li> <li>■ Northshore; and</li> <li>■ Owen Sound Phase 4 Reinforcement pipeline projects.</li> </ul> <b>Ecology Lead for:</b> <ul style="list-style-type: none"> <li>■ 2021/2022 Storage Enhancement Pipeline Project</li> <li>■ Corunna and Ladysmith A-1 Observation Project</li> <li>■ Ladysmith Integrity Dig Projects</li> <li>■ Owen Sound Phase 4 Reinforcement</li> <li>■ Northshore Lateral Replacement Project</li> <li>■ Owen Sound Section 5 Integrity Digs</li> <li>■ Owen Sound Section 4 Integrity Digs</li> <li>■ Coniston Station Integrity Dig</li> <li>■ Stratford Reinforcement Project</li> <li>■ Sudbury Lateral Replacement</li> <li>■ Many additional Community Expansion / Integrity Projects.</li> </ul>	\$█	█
<b>Sarah MacNeil</b> Health and Safety Lead		<b>Safety lead of the:</b> <ul style="list-style-type: none"> <li>■ 2021/2022 Storage Enhancement Pipeline Project</li> </ul>	\$█	█

Enbridge Gas Inc.

Environmental, Cumulative Effects, Stage I & II Archaeology Assessment, Cultural Heritage Assessment and Species at Risk  
Panhandle Regional Expansion Project

Name and Title	Qualifications	Enbridge Project Experience <sup>1</sup>	MSA Rate	Percent Involved (by discipline)
		<ul style="list-style-type: none"> <li>■ Corunna and Ladysmith A-1 Observation Well Drilling Project</li> <li>■ Ladysmith Integrity Dig Projects</li> <li>■ Owen Sound Phase 4 Reinforcement pipeline projects.</li> </ul>		
<b>Heritage Resources (Archaeology and Built Heritage)</b>				
<b>Adria Grant</b> Archaeology and Heritage Lead	MA Archaeology	<b>Technical Lead of the:</b> <ul style="list-style-type: none"> <li>■ Line 10</li> <li>■ Milton Line Expansion</li> <li>■ 2021/2022 Storage Enhancement Pipeline Project</li> <li>■ Corunna and Ladysmith A-1 Observation Well Drilling Project</li> <li>■ Ladysmith Integrity Dig Projects</li> <li>■ Sudbury Lateral Replacement</li> <li>■ Stratford Reinforcement Project</li> <li>■ Owen Sound Phase 4 Reinforcement</li> <li>■ Oxford Reinforcement pipeline projects.</li> </ul>	\$█	█
<b>Samantha Markham</b> Archaeology Manager	MES Anthropology	<b>Project facilitator of the:</b> <ul style="list-style-type: none"> <li>■ Line 10</li> <li>■ Sudbury Lateral Replacement</li> <li>■ Stratford Reinforcement Project</li> <li>■ 2021/2022 Storage Enhancement Pipeline Project</li> <li>■ Corunna and Ladysmith A-1 Observation Well Drilling Project</li> <li>■ Ladysmith Integrity Dig Project</li> <li>■ Owen Sound pipeline projects.</li> </ul>	\$█	█
<b>Liam Smyth, BURPI</b> Heritage Co-ordinator	B.URPI	<b>Heritage Researcher for:</b> <ul style="list-style-type: none"> <li>■ City of Toronto, Ontario</li> <li>■ Ontario Ministry of Transportation</li> <li>■ Hydro One projects.</li> </ul>	\$█	█
<b>Archaeology Field Tech</b>		<b>Field technicians on:</b> <ul style="list-style-type: none"> <li>■ Sudbury Lateral Replacement</li> <li>■ 2021/2022 Storage Enhancement Pipeline Project</li> <li>■ Corunna and Ladysmith A-1 Observation Well Drilling Project</li> <li>■ Ladysmith Integrity Dig Projects</li> <li>■ Stratford Reinforcement Project</li> <li>■ Owen Sound Phase 4 Reinforcement</li> </ul>	\$█	█
<b>Indigenous Monitors</b>	N/A	<ul style="list-style-type: none"> <li>■ N/A</li> </ul>	\$█	█
<b>Ecology (Terrestrial and Aquatic)</b>				
<b>Katie Easterling</b> Senior Ecologist	H.B.Sc.	<b>Aquatic Ecology and Permit Lead for the:</b> <ul style="list-style-type: none"> <li>■ Lancaster Remediation at Fillion Drain</li> </ul>	\$█	█

Enbridge Gas Inc.

Environmental, Cumulative Effects, Stage I & II Archaeology Assessment, Cultural Heritage Assessment and Species at Risk  
Panhandle Regional Expansion Project

Name and Title	Qualifications	Enbridge Project Experience <sup>1</sup>	MSA Rate	Percent Involved (by discipline)
		<ul style="list-style-type: none"> <li>■ Panhandle Reinforcement Project - Dawn to Dover</li> <li>■ Bentpath Line Pipeline</li> <li>■ Hamilton to Milton Pipeline</li> <li>■ Burlington to Oakville Pipeline</li> <li>■ Brantford to Kirkwall Pipeline</li> <li>■ Dawn H Compressor Station</li> <li>■ Bright C Compressor Station</li> </ul>		
<b>Nathan DeCarlo</b> Ecologist	MES	<b>Aquatic and Terrestrial Support for:</b> <ul style="list-style-type: none"> <li>■ Owen Sound Phase 4 Reinforcement</li> <li>■ 2021/2022 Storage Enhancement Pipeline Project</li> <li>■ Corunna and Ladysmith A-1 Observation Well Drilling Project</li> <li>■ Ladysmith Integrity Dig Projects</li> <li>■ Beachville Expansion and Kingsville Reinforcement</li> <li>■ Sudbury Lateral Replacement</li> </ul>	\$ [REDACTED]	[REDACTED]
<b>Indigenous Monitors</b>	N/A	<ul style="list-style-type: none"> <li>■ N/A</li> </ul>	\$ [REDACTED]	[REDACTED]
<b>Water (Surface Water, Groundwater, Geology and Soils)</b>				
<b>Matt Alexander</b> Hydrogeology Manager	M.Sc., P.Geo.	<b>Water lead on the:</b> <ul style="list-style-type: none"> <li>■ Sudbury Lateral Replacement</li> <li>■ Stratford Reinforcement Project</li> <li>■ Hailey Lateral pipeline projects.</li> </ul> <b>Senior water support on the:</b> <ul style="list-style-type: none"> <li>■ Owen Sound Phase 4 Reinforcement</li> </ul>	\$ [REDACTED]	[REDACTED]
<b>Brian Holden</b> Professional Geoscientist	M.Sc., B.Sc. (Hons), P.Geo.	<b>Water support for:</b> <ul style="list-style-type: none"> <li>■ 2021/2022 Storage Enhancement Pipeline Project</li> <li>■ Corunna and Ladysmith A-1 Observation Well Drilling Project</li> </ul>	\$ [REDACTED]	[REDACTED]
<b>Planning (Socio-economic, Consultation and Environmental Report)</b>				
<b>Jordan Witt</b> Environmental Planner	MES, BA (Hons), EPt	<b>Planning Support for the:</b> <ul style="list-style-type: none"> <li>■ 2021/2022 Storage Enhancement Pipeline Project</li> <li>■ Corunna and Ladysmith A-1 Observation Well Drilling Project</li> <li>■ Ladysmith Integrity Dig Projects</li> <li>■ Owen Sound Phase 4 Reinforcement</li> <li>■ Stratford Reinforcement Project</li> </ul>	\$ [REDACTED]	[REDACTED]
<b>Soils</b>				
<b>David Hodgson</b> Senior Pedologist /Agrologist	B.Sc., P. Ag	<b>Soils support on:</b> <ul style="list-style-type: none"> <li>■ Kingsville</li> <li>■ Panhandle</li> <li>■ Hamilton to Milton</li> </ul>	\$ [REDACTED]	[REDACTED]
<b>Matt Smith</b>	P. Eng., QP	<b>Soils lead on:</b>	\$ [REDACTED]	[REDACTED]

**Enbridge Gas Inc.**

**Environmental, Cumulative Effects, Stage I & II Archaeology Assessment, Cultural Heritage Assessment and Species at Risk  
Panhandle Regional Expansion Project**

Name and Title	Qualifications	Enbridge Project Experience <sup>1</sup>	MSA Rate	Percent Involved (by discipline)
Senior Environmental Engineer		<ul style="list-style-type: none"> <li>■ 2021/2022 Storage Enhancement Pipeline Project</li> <li>■ Corunna and Ladysmith A-1 Observation Well Drilling Project</li> <li>■ Owen Sound Phase 4 Reinforcement</li> </ul>		

*Note: 1. CVs available upon request.*

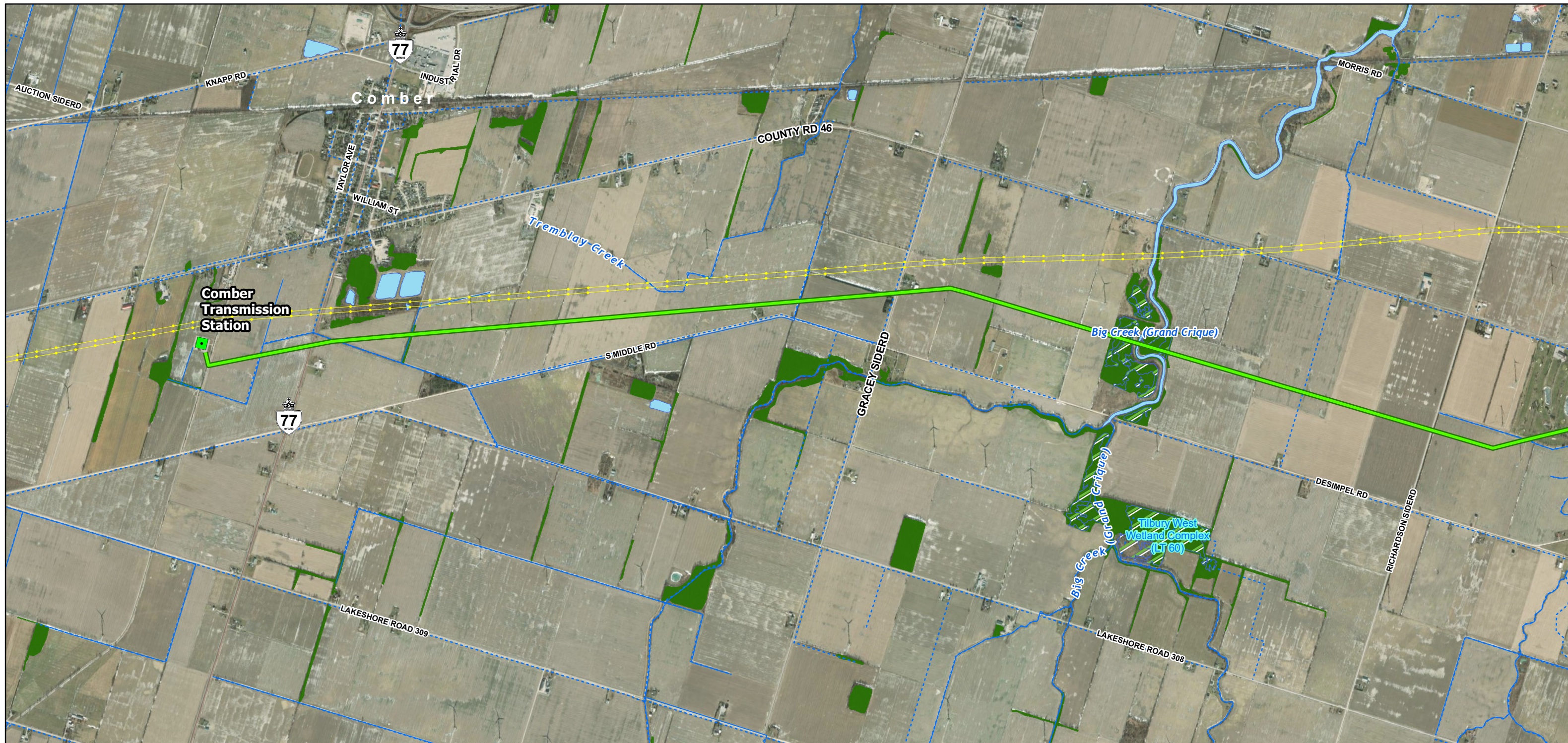


# Appendix **B**

## Constraints Map

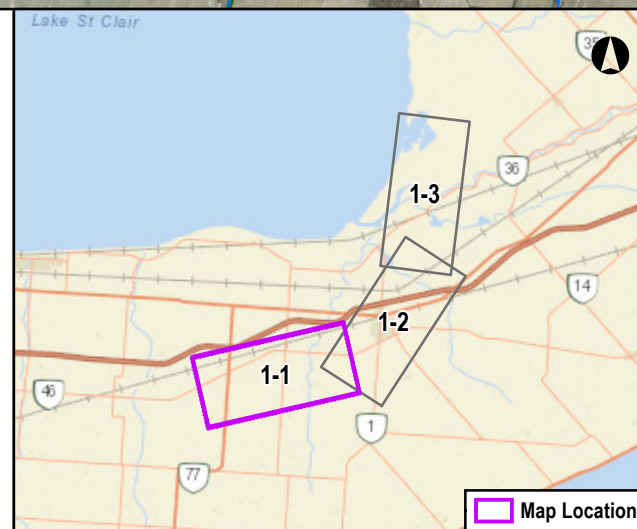






**Legend**

- Comber Transmission Station
- Dover Transmission Station
- NPS 20 Pipeline
- Hydro Line
- Railway
- Constructed Drain
- Permanent Stream
- Waterbody
- Provincially Significant Wetland
- Wooded Area
- ANSI, Life Science
- Municipal Boundary



**Enbridge Panhandle Regional Expansion**

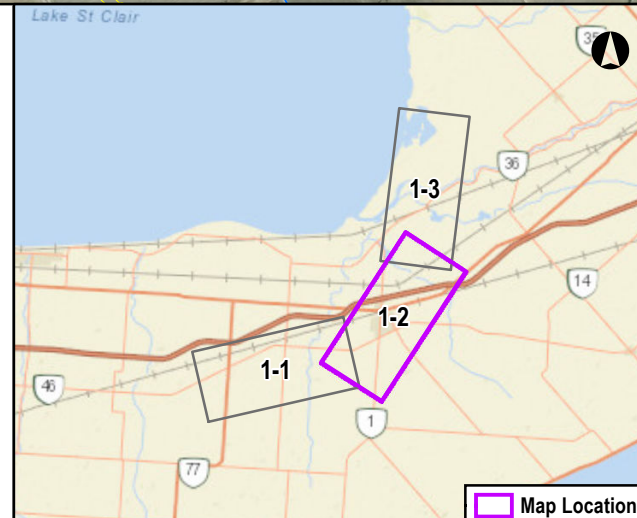
<b>Constraints Map</b>	
DATUM: NAD 1983 UTM Zone 17N	
July 2021	1:25,000 <small>* when printed 11"x17"</small>
P#:	V#:
<b>Figure 1-1</b>	
This drawing has been prepared for the use of AECOM's client and may not be used, reproduced or relied upon by third parties, except as agreed by AECOM and its client, as required by law or for use by governmental reviewing agencies. AECOM accepts no responsibility, and denies any liability whatsoever, to any party that modifies this drawing without AECOM's express written consent.	

Map location: \\na.aecomnet.com\AECOM\ENR\Nrbrener\CAKON\DCS\GIS\Proposals\04102022\_4014\_Enbridge\_Panhandle\Design\01\_Report\Proposals\Constraints\_EnbridgePanhandle.mxd Date saved: 7/26/2021 11:13:49 PM User: Name: caak



**Legend**

- Comber Transmission Station
- Dover Transmission Station
- NPS 20 Pipeline
- Hydro Line
- Railway
- Constructed Drain
- Permanent Stream
- Waterbody
- Provincially Significant Wetland
- Wooded Area
- ANSI, Life Science
- Municipal Boundary



**Enbridge Panhandle Regional Expansion**

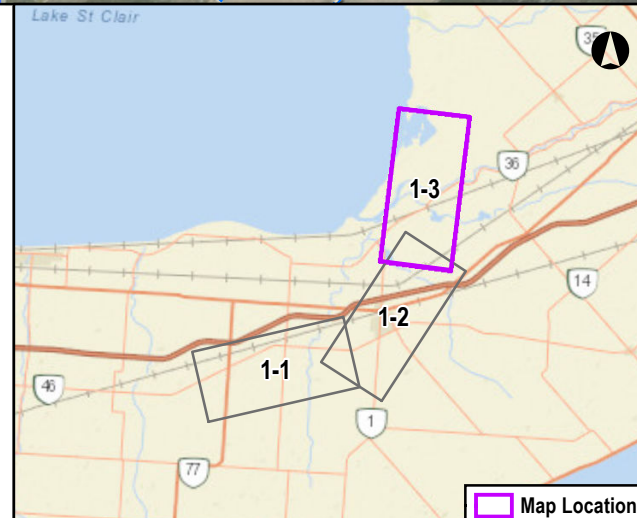
<b>Constraints Map</b>	
Meters DATUM: NAD 1983 UTM Zone 17N	
July 2021	1:25,000 <small>* when printed 11"x17"</small>
P#:	V#:
<b>AECOM</b>	
<b>Figure 1-2</b>	
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Map location: \\na.aecomnet.com\AEMER\Nbr\enbr-CAKON\DCS\GIS\Proposals\04102029\_4014\_Enbridge\_Panhandle\_Design\01\_Reports\Proposals\Constraints\_EnbridgePanhandle.mxd Date saved: 7/26/2021 10:15:49 PM User Name: cauld



**Legend**

- Comber Transmission Station
- Dover Transmission Station
- NPS 20 Pipeline
- Hydro Line
- Railway
- - - Constructed Drain
- Permanent Stream
- Waterbody
- / / Provincially Significant Wetland
- Wooded Area
- ANSI, Life Science
- Municipal Boundary



**Enbridge Panhandle Regional Expansion**

<b>Constraints Map</b>	
<p>Meters DATUM: NAD 1983 UTM Zone 17N</p>	
July 2021	1:25,000 *when printed 11"x17"
P#:	V#:
<b>Figure 1-3</b>	
This drawing has been prepared for the use of AECOM's client and may not be used, reproduced or relied upon by third parties, except as agreed by AECOM and its client, as required by law or for use by governmental reviewing agencies. AECOM accepts no responsibility, and denies any liability whatsoever, to any party that modifies this drawing without AECOM's express written consent.	

Map location: \\na.aecom.com\AECOM\NA\Brentner-CAKON\DCS\GIS\Proposals\0410299\_4014\_Ehridge\_Panhandle\Design\01\_Reports\Proposals\Constraints\_EhridgePanhandle.mxd Date saved: 7/26/2021 10:13:49 PM User Name: tsaib



# Appendix **C**

## Schedule of Per Diem Fees

Enbridge Gas Inc.

Environmental, Cumulative Effects, Stage I & II Archaeology Assessment, Cultural Heritage Assessment and Species at Risk  
Panhandle Regional Expansion Project

## Appendix C. Schedule of Per Diem Fees

The following table provides the per diem rates for AECOM personnel to attend additional meetings and testify at the OEB. Expenses will be charged per the Master Service Agreement (Environmental Consulting) between Enbridge and AECOM dated December 18, 2020.

### Per Diem Professional Fees for Additional Meeting Attendance and Testifying

Professional Level <sup>1</sup>	Possible Titles <sup>1</sup>	Meeting Per Diem <sup>2</sup>	Testifying Per Diem <sup>2</sup>
Level 1	Junior Scientist / Engineer	\$█	-
Level 2	Junior Scientist / Engineer	\$█	-
Level 3	Intermediate Scientist / Engineer	\$█	\$█
Level 4	Mid-level Scientist / Engineer / Task Leader	\$█	\$█
Level 5	Senior Scientist / Engineer / Task Leader	\$█	\$█
Level 6	Senior Scientist / Engineer / Project Manager / Task Manager	\$█	\$█
Level 7	Senior Project Manager	\$█	\$█
Level 8	Principal / Program Director	\$█	\$█

Notes: 1 Professional levels and corresponding titles in accordance with the Master Service Agreement.

2 Based on 8-hour day. If the time to attend meetings or testify is less than the per diem, meeting attendance or testifying will be billed on a time and materials basis.

Mark van der Woerd, MES, EP  
Senior Project Manager  
*Mark.VanderWoerd@aecom.com*

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

T: 905.578.3040  
F: 905.578.4129  
[www.aecom.com](http://www.aecom.com)

## Washburn, Kristan

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**Subject:** FW: Request for Quotation - Panhandle Regional Expansion

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**From:** Evan Tomek <Evan.Tomek@enbridge.com>  
**Sent:** Friday, August 6, 2021 3:54 PM  
**To:** Washburn, Kristan <Kristan.Washburn@aecom.com>; van der Woerd, Mark <Mark.VanderWoerd@aecom.com>  
**Cc:** Doug Schmidt <Doug.Schmidt@enbridge.com>  
**Subject:** [EXTERNAL] RE: Request for Quotation - Panhandle Regional Expansion

Hi Mark/Kristan,

Having spoke earlier this week Mark, my apologies for not sending the official email approval!

We are accepting this proposal and awarding Aecom this project.

Thank you for your efforts so far and we look forward to working with you on this!

Mark – please provide your availability over the next couple of weeks for a drive along the proposed routes as we discussed. We will be setting something up with you, Construction and us to take a preliminary look at things.

Thanks again and we will be in touch soon to set up a kick-off meeting.

Evan

**Evan Tomek, BES**  
Sr. Analyst, Environment  
Enbridge Inc.  
50 Keil Drive North | Chatham, ON N7M 5M1  
Tel: 519.436.4600 ext 5003441  
Cell: 226.229.9598  
email: [evan.tomek@enbridge.com](mailto:evan.tomek@enbridge.com)  
**Safety. Integrity. Respect.**

---

**From:** van der Woerd, Mark <[Mark.VanderWoerd@aecom.com](mailto:Mark.VanderWoerd@aecom.com)>  
**Sent:** Thursday, July 22, 2021 5:58 PM  
**To:** Evan Tomek <[Evan.Tomek@enbridge.com](mailto:Evan.Tomek@enbridge.com)>  
**Cc:** Doug Schmidt <[Doug.Schmidt@enbridge.com](mailto:Doug.Schmidt@enbridge.com)>; Washburn, Kristan <[Kristan.Washburn@aecom.com](mailto:Kristan.Washburn@aecom.com)>  
**Subject:** RE: Request for Quotation - Panhandle Regional Expansion  
**Importance:** High

Hi Evan,

Thanks again for inviting AECOM to submit a quote to support you with the Panhandle Regional Expansion Project. We enjoy working with you and the team. Please find our proposal attached to this email. If any questions arise, please do not hesitate to reach out to us. We are happy to discuss and make any changes that may be required.

Just a reminder that I am away on holidays next week but will have access to email.

Thanks!  
Mark

**Mark van der Woerd**  
AECOM  
[mark.vanderwoerd@aecom.com](mailto:mark.vanderwoerd@aecom.com)  
(289) 439-9803

---

**From:** Evan Tomek <[Evan.Tomek@enbridge.com](mailto:Evan.Tomek@enbridge.com)>  
**Sent:** July-14-21 3:35 PM  
**To:** van der Woerd, Mark <[Mark.VanderWoerd@aecom.com](mailto:Mark.VanderWoerd@aecom.com)>  
**Cc:** Doug Schmidt <[Doug.Schmidt@enbridge.com](mailto:Doug.Schmidt@enbridge.com)>  
**Subject:** [EXTERNAL] RE: Request for Quotation - Panhandle Regional Expansion

Hi Mark,

So another update here – I had a meeting today to discuss this project and the team wants to put the 10 km NPS 16 transmission lateral in the road allowance on Wheatley Road back into the mix. While they won't know for another few weeks if they would like to continue with it on this project for sure, they would like it quoted in your proposal.

Please let me know if this is an issue or you need any more information from me.

Thanks!

Evan

**Evan Tomek, BES**  
Sr. Analyst, Environment  
Enbridge Inc.  
50 Keil Drive North | Chatham, ON N7M 5M1  
Tel: 519.436.4600 ext 5003441  
Cell: 226.229.9598  
email: [evan.tomek@enbridge.com](mailto:evan.tomek@enbridge.com)  
**Safety. Integrity. Respect.**

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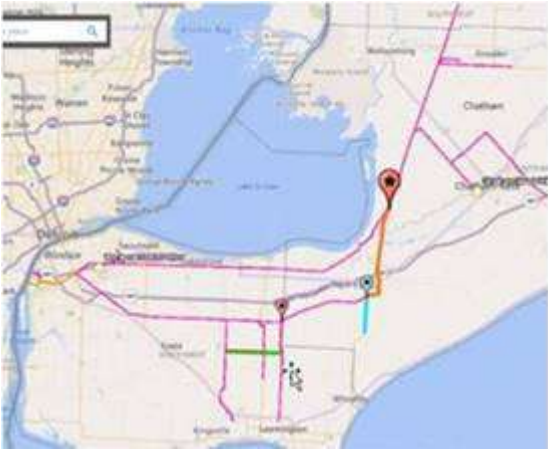
**From:** Evan Tomek  
**Sent:** Wednesday, July 7, 2021 11:20 AM  
**To:** van der Woerd, Mark <[Mark.VanderWoerd@aecom.com](mailto:Mark.VanderWoerd@aecom.com)>  
**Cc:** Doug Schmidt <[Doug.Schmidt@enbridge.com](mailto:Doug.Schmidt@enbridge.com)>  
**Subject:** RE: Request for Quotation - Panhandle Regional Expansion

Hi Mark,

Soon after we sent out the RFQ we had an update to the proposed project.

Now, we are only going to be looking at the 23 km of looping the existing NPS 20 Panhandle from Dover to Comber (orange line on the picture below) and the "Leamington Interconnect" transmission lateral (green line). We had originally said it would be approx. 5km of NPS 16 in the Mersea Road 11 road allowance, and now it will be approx. 10 km. The Wheatley Road transmission lateral (blue line) will be taken off of this project.





Please let me know if you'd like me to re-issue the RFQ to reflect the updated info, and if you'd like to touch base with Doug and I for a short discussion on this project and I can set something up.

Thanks,

Evan

**Evan Tomek, BES**

Sr. Analyst, Environment

Enbridge Inc.

50 Keil Drive North | Chatham, ON N7M 5M1

Tel: 519.436.4600 ext 5003441

Cell: 226.229.9598

email: [evan.tomek@enbridge.com](mailto:evan.tomek@enbridge.com)

**Safety. Integrity. Respect.**

---

**From:** van der Woerd, Mark <[Mark.VanderWoerd@aecom.com](mailto:Mark.VanderWoerd@aecom.com)>

**Sent:** Monday, July 5, 2021 5:21 PM

**To:** Evan Tomek <[Evan.Tomek@enbridge.com](mailto:Evan.Tomek@enbridge.com)>

**Cc:** Doug Schmidt <[Doug.Schmidt@enbridge.com](mailto:Doug.Schmidt@enbridge.com)>

**Subject:** [External] RE: Request for Quotation - Panhandle Regional Expansion

**EXTERNAL: PLEASE PROCEED WITH CAUTION.**

This e-mail has originated from outside of the organization. Do not respond, click on links or open attachments unless you recognize the sender or know the content is safe.

Hi Evan,

Thanks for this! We appreciate the opportunity to provide a quote to Enbridge. I am confirming receipt. We will let you know if any questions come up.

Cheers,  
Mark

**Mark van der Woerd**

AECOM

[mark.vanderwoerd@aecom.com](mailto:mark.vanderwoerd@aecom.com)

(289) 439-9803

---

**From:** Evan Tomek <[Evan.Tomek@enbridge.com](mailto:Evan.Tomek@enbridge.com)>

**Sent:** July-05-21 4:51 PM

**To:** van der Woerd, Mark <[Mark.VanderWoerd@aecom.com](mailto:Mark.VanderWoerd@aecom.com)>

**Cc:** Doug Schmidt <[Doug.Schmidt@enbridge.com](mailto:Doug.Schmidt@enbridge.com)>

**Subject:** [EXTERNAL] Request for Quotation - Panhandle Regional Expansion

Hi Mark,

Please see attached a Request for Quotation to provide Environmental Consulting services in support of Enbridge's proposed Panhandle Regional Expansion Project.

Enbridge is seeking the services of an environmental consultant to perform an EA, including an environmental, cumulative effects, and Stage 1 Archaeological Assessment of the proposed work as well as preparing the ER which will form part of the evidence filed with the OEB for the Leave to Construct. Enbridge is also seeking the services of an environmental consultant to perform a Stage II Archaeological Assessment, Cultural Heritage Assessment, and field surveys supporting the review for Species at Risk.

There are three main components of this project which are described in more detail in the attached RFQ, but generally it involves:

- Approx. 23 km of up to NPS 42 pipeline looping the existing Panhandle Pipeline from Dover to Comber
- A 10 km NPS 16 transmission lateral in the road allowance on Wheatley Road
- A 5 km NPS 16 transmission lateral in the road allowance Mersea Road 11.

We are currently targeting to have a completed ER by May 2022, and an in-service date as early as November 2023.

We are requesting a proposal be submitted to Enbridge by July 26<sup>th</sup>, 2021.

If you have any questions we can set up a call to discuss more.

Thanks,

Evan

**Evan Tomek, BES**

**Sr. Analyst, Environment**

**Enbridge Inc.**

50 Keil Drive North | Chatham, ON N7M 5M1

Tel: 519.436.4600 ext 5003441

Cell: 226.229.9598

email: [evan.tomek@enbridge.com](mailto:evan.tomek@enbridge.com)

**Safety. Integrity. Respect.**

## MASTER SERVICES AGREEMENT (ENVIRONMENTAL CONSULTING)

**This Agreement** is made as of the 16th day of November, 2018,

BETWEEN:

**ENBRIDGE EMPLOYEE SERVICES CANADA INC.**, a body corporate incorporated under the laws of Canada, having an office at Edmonton, in the Province of Alberta

(hereinafter called “Company”)

- and -

**AECOM Canada Ltd**, a body corporate incorporated under the laws of British Columbia, having an office at 105 Commerce Valley Drive, 7th Floor, Markham, L3T 7W3, in the Province of Ontario

(hereinafter called “Contractor”)

**NOW THEREFORE THIS AGREEMENT WITNESSETH** that in consideration of the premises, mutual covenants and agreements herein contained and for other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the parties hereto covenant and agree with each other as follows:

### 1. DEFINITIONS

1.1 In this Agreement, including without limitation the recitals hereto, the following terms shall have the following meaning respectively:

- (a) “**Affiliate**” means with respect to any Person, any other Person directly or indirectly controlling, controlled by, or under common control with, such Person as of the date on which the determination of affiliation is being made. For purposes of this definition, (a) the term “control” (including the correlative meanings of the terms “controlled by” and “under common control with”), as used with respect to any Person, means the possession, directly or indirectly, of the power to direct or cause the direction of the management and policies of such Person by virtue of: (i) the ownership or direction of voting securities of the other Person; (ii) a written agreement or trust instrument; (iii) being the general partner or controlling the general partner of the other Person, or (iv) being the trustee of the other Person; and (b) each of Enbridge Income Fund Holdings Inc., Enbridge Income Fund, and Persons any of them control shall be deemed to be Affiliates of Company;
- (b) “**Canadian Affiliate**” means an Affiliate of Enbridge Inc. but only to the extent such Affiliate is not a non-resident of Canada for the purposes of the *Income Tax Act (Canada)*.
- (c) “**Company**” has the meaning set out above;
- (d) “**Company Disclosed IP**” shall have the meaning as set forth in Section 7.1 of this Agreement;
- (e) “**Company IP**” means Deliverables and Company Disclosed IP;
- (f) “**Confidential Information**” means any and all trade secrets, confidential, private, or secret information of Company or any Affiliate of Company regardless of form and

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whether or not recorded and the term "Confidential Information" includes without limitation the following information of or in the possession of Company or any Affiliate of Company which shall come or shall have come to Contractor's knowledge during the course of providing Services for Company (whether before or after the date of this Agreement): (i) business, economic, financial, operational, marketing or technical information, (ii) compilations of data or information (iii) business methods and practices of Company or Affiliates of Company, (iv) information relating to actual or prospective services, products, activities, know-how, research and development, or commercial relationships of Company or any Affiliate of Company, (v) information and data and computer software of third persons to whom Company or any Affiliate of Company owes a duty of confidence, and (vi) such information as Company or any Affiliate of Company may from time to time designate as being included in the expression "Confidential Information". "Confidential Information" does not include information that is: (a) prior to the commencement of the Services, already lawfully in the possession of the Contractor other than, directly or indirectly, from Company or any Affiliate of Company including through the provision of previous services (as evidenced by the Contractor's written records), (b) in the public domain, or information that falls into the public domain, unless such information falls into the public domain by disclosure or other acts of Contractor, or through the fault of Contractor, (c) lawfully acquired by the Contractor from a third party that has no obligation of confidentiality with respect to the Confidential Information, or (d) independently and lawfully developed by the Contractor who has not made use of or had access to the Confidential Information, alone or in conjunction with a third party

- (g) **"Deliverable"** shall have the meaning as set forth in Section 7.1 of this Agreement.
- (h) **"Enbridge Group Members"** means Enbridge Inc. and its Canadian Affiliates, and **"Enbridge Group Member"** means any one of them, as the context indicates;
- (i) **"Intellectual Property"** means all intellectual property including (i) discoveries, concepts, inventions (whether patentable or not), invention disclosures, improvements (whether patentable or not), formulae, formulations, algorithms, subroutines, compositions, manufacturing and production processes and techniques, know-how; (ii) technical and product specification, equipment descriptions, plans, layouts, drawings, computer programs (including, without limitation, all source code, object code, byte code, or machine code), assembly, quality control procedures, installation procedures, and operating procedures, operating, maintenance and/or repair manuals, instructions, training materials, and other user documentation, technical and marketing information (including slogans and logos), designs, data, and/or other similar items; (iii) other trade secrets, copyrightable material, or proprietary information; (iv) all documentation of any of the foregoing;
- (j) **"Intellectual Property Rights"** means all rights in Intellectual Property of every kind, nature or description and any other proprietary rights throughout the world, including: (i) copyrights and all rights associated with works of authorship, neighbouring rights and moral rights, whether registered or unregistered; (ii) industrial design rights; (iii) integrated circuit topography rights and mask works; (iv) rights in trade secrets, confidential information and know-how; (v) trademarks, trade names, certification marks and distinguishing guise rights, whether registered or unregistered; (vi) patent rights and (vii) all registrations, applications, renewals, extensions, continuations, continuations-in-part, divisions, reissues, and priority rights thereof now or hereafter in force (including any rights in any of the foregoing);
- (k) **"Initial Term"** means the period commencing on November 16, 2018 and concluding December 31, 2021 at 11:59 pm;

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- (l) **“Parties”** where such term is used in this Agreement, means Company and Contractor and **“Party”** means any one of them, provided however, in the context of a work authorization, **“Parties”** where such term is used in this Agreement, means the Service Recipient and Contractor and any other Person that is made a party to such work authorization, and **“Party”** means any one of them
- (m) **“Person”** means any natural person, sole proprietorship, corporation, partnership (general or limited, including master limited), limited liability company, trust, joint venture, joint stock company, unincorporated association, unincorporated syndicate, unincorporated organization, or other entity or association, and, where the context requires, any of the foregoing in its capacity as trustee, executor, administrator or other legal representative;
- (n) **“Renewal Term”** means an additional one (1) year period that automatically follows the Initial Term and any Renewal Term thereafter, unless either party gives written notice of termination to the other not less than 30 days prior to the last day of the Term;
- (o) **“Representative”** means any employee, director, officer, agent or subcontractor of Contractor;
- (p) **“Service Recipient”** means, in relation to a work authorization, the Enbridge Group Member (which may include the Company) that is receiving the Services pursuant to such work authorization and is listed as the “Service Recipient” in such work authorization;
- (q) **“Services”** means the environmental services to be provided by the Contractor to the Company, or to another Enbridge Group Member, which shall include, without limitation, those services as set forth in one or more work authorizations, all as may be reasonably requested and directed by the Company, together with such other reasonably related duties and travel assignments as may be requested of the Contractor by the Company from time to time; for greater certainty, this Agreement covers only environmental services provided by the Contractor to the Company or to another Enbridge Group Member; the Parties expressly contemplate that there may be other kinds of services provided by the Contractor that are not covered by this Agreement.
- (r) **“Term”** means the Initial Term and any Renewal Term(s) of this Agreement; and
- (s) **“Work Authorization”** means a work authorization substantially in the form attached hereto as Schedule “A” and signed by Contractor and by the Enbridge Group Member wishing to receive Services, it being acknowledged that more than one work authorization may be issued pursuant to this Agreement, and “work authorizations” means more than one work authorization;

## 2. SERVICES

- 2.1 The Company hereby retains the Contractor to provide the Services to the Company or any Enbridge Group Members for the Term of this Agreement.
- 2.2 The Company may, from time to time, in its sole discretion, request that the Contractor provide the Company with the Services identified in a new proposed Work Authorization in which case the Contractor will meet with the Company in order to review in good faith such desired Services and proposed terms and conditions and determine whether it is capable of providing same to the Company and if so, under what specific terms and conditions. Where both Parties agree, they will then enter into a Work Authorization. Each Work Authorization will be deemed to incorporate by reference the terms and conditions of this Agreement (excluding any prior Work Authorizations)

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and shall be deemed a separate agreement entered into solely by the Parties, unless the applicable Work Authorization expressly provides otherwise.

- 2.3 Upon the Company's request, the Contractor will provide the Services, or any part of the Services, to any other Enbridge Group Member in accordance with this Agreement pursuant to a Work Authorization. The Company will elect, in its sole discretion, whether, such Services will be provided under a then existing Work Authorization entered into by the Company or a new Work Authorization to be entered into between the Enbridge Group Member and the Contractor on the terms and conditions of this Agreement. If the Services are provided to an Enbridge Group Member under an existing Work Authorization entered into by the Company, the Company will be entitled to enforce rights or remedies under such Work Authorization on behalf of such Enbridge Group Member in connection with such Services provided to such Enbridge Group Member as if such Services were provided directly to the Company. If the Services are provided to any such Enbridge Group Member under a new Work Authorization entered into by such Enbridge Group Member and the Contractor, then the following shall apply in respect of such Work Authorization:
- (a) the Work Authorization shall be deemed a separate agreement entered into solely by the Parties to such Work Authorization and shall be deemed to incorporate by reference and shall be subject to all the terms and conditions of this Agreement with the same force and effect as if the terms and conditions of this Agreement were fully set out in such Work Authorization, except as may be expressly modified or amended in the Work Authorization;
  - (b) the Service Recipient to an Work Authorization shall be entitled to enforce all of the rights and remedies of Company set forth in this Agreement in respect of such Work Authorization as if the Service Recipient were substituted in this Agreement for the Company, *mutatis mutandis*, which rights and remedies are in addition to, and not in substitution of any other rights or remedies set forth in the Work Authorization; and
  - (c) neither the Company nor any other Enbridge Group Member shall have any liability to Contractor in relation to such Work Authorization and any liability that may arise in connection with such Work Authorization shall be limited to the Service Recipient to such Work Authorization.
- 2.7 For clarity, if an Enbridge Group Member (other than the Company) is receiving any Services or is granted any rights as contemplated in this Section 2, a reference to the Company in this Agreement will refer to such Enbridge Group Member to the extent that applicable term applies to such Enbridge Group Member's receipt of such Services or grant of rights.
- 2.8 The Contractor acknowledges that the Company (or Enbridge Group Member) may enter into multiple Work Authorizations with the Contractor with respect to the same or similar Services to accommodate the respective unique requirements of the Company (or Enbridge Group Member) departments, business lines and business units.
- 2.9 Each Work Authorization will set out its term and any provisions relating to its renewal or extension. If the term of a Work Authorization extends past the termination or expiry of the Term, then such Work Authorization including the terms and conditions of this Agreement deemed incorporated into such Work Authorization, will survive the termination or expiry of the Term. For greater certainty, no new Work Authorization under this Agreement may be entered into between the parties hereto after the termination or expiry of the Term.

2.10 The Work Authorizations shall be numbered sequentially in the order that they are entered into and attached as Schedules to this Agreement, with the first Work Authorization numbered "Schedule A-1" and successive Work Authorizations being numbered "Schedule A-2", "Schedule A-3" and so on.

2.11 The Contractor shall provide the Services in accordance with the highest standards of skill, diligence and effort applicable to those in the industry providing similar services as the Services. In addition, the Contractor shall devote the necessary resources to complete the Services in accordance with the timeframes identified in this Agreement and any Work Authorization, and as approved by the Company or as otherwise may be agreed upon by the Contractor and the Company from time to time.

### **3. ASSIGNED PERSONNEL**

3.1 The Contractor shall promptly remove from the Services any of its personnel deemed unacceptable by Enbridge, in its sole discretion. In the event any members of the Contractor's personnel are removed from service pursuant to this Section, the Contractor shall be entitled to replace those personnel for the purposes of continuing and completing the Services.

### **4. LAWS AND POLICIES**

4.1 The Contractor represents and warrants that, in the performance of the Services, it shall comply with and shall cause its personnel to comply with:

(a) all applicable laws, regulations, ordinances, standards, codes, specifications, rules, permits, licenses or other authorizations, whether federal, provincial, territorial, municipal or enacted or adopted by governmental agencies and regulatory bodies having jurisdiction over the Company or other Enbridge Group Member receiving the Services, or the Services; and

(b) all internal processes, policies and procedures of the Company or other Enbridge Group Member receiving the Services, to the extent that they are relevant to the Services and the Contractor is advised of the same. Without limiting the foregoing, the terms and conditions of the Company's or any other Enbridge Group Member receiving the Services Environmental, Health & Safety programs and policies, business conduct policies, and any applicable Environmental Protection Plan are incorporated herein by reference as if set forth in full herein. The Company or Enbridge Group Member receiving the Services shall provide the Contractor with the same access to, and training on such documents, programs and policies prior to the commencement of the Services, that is provides to its own employees.

### **5. FEES AND PAYMENT OF INVOICES**

5.1 As compensation for providing the Services rendered by the Contractor, Service Recipient shall pay to the Contractor fees pursuant to the then current rate sheet ("**Rate Sheet**") attached to this Agreement as **Schedule "B"**.

5.2 The Contractor may provide one new Rate Sheet, along with a written rationale for any changes from the then current Rate Sheet, once before **December 31** of any year during the Term of this Agreement, which, absent written objection by Service Recipient, shall become effective and automatically replace **Schedule "B"** herein as of **February 15** of the following year. In the event that Service Recipient objects in writing to any part of a proposed new Rate Sheet, Service Recipient

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shall continue to pay the Contractor based on the then current Rate Sheet until both parties have agreed on the terms of any changes.

- 5.3 Unless otherwise specified in a Work Authorization, the Contractor shall submit one invoice per Work Authorization per month to Service Recipient, with contents and in a form as may be directed by Service Recipient from time to time, for the Services provided in the previous month. Service Recipient will have no obligation to pay any invoice not received within a reasonable time. Service Recipient will have no obligation to pay any disbursement that it has not pre-approved. The Contractor shall ensure that all invoices reference the applicable Work Authorization and include a reasonably detailed breakdown and distribution of charges by name of specific personnel or resource or disbursement, and that all disbursements are accompanied by supporting documentation.

Service Recipient shall pay all invoices, except in the case of a *bona fide* dispute, within (forty-five (45) days of receipt of the invoice. In the event of a *bona fide* dispute regarding Contractor's invoice, Service Recipient shall nevertheless pay the undisputed portion of the invoice in accordance with the terms of this section.

- 5.4 All fees paid or payable to the Contractor are inclusive of all taxes, including applicable sales and use taxes, customs duties and excise taxes (collectively, "Taxes"), except any amounts payable in respect of the federal Goods and Services tax imposed pursuant to the *Excise Tax Act (Canada)*, as amended from time to time, the Quebec sales tax and any fully harmonized federal/provincial sales tax (collectively, "GST"). Service Recipient shall pay to the Contractor the amount of such Taxes and GST upon receipt of any undisputed invoice issued in compliance with the appropriate tax laws or regulations.
- 5.5 The Contractor hereby represents that it is duly registered for the purposes of the GST legislation and will remain so registered during the currency of its dealing with Service Recipient. The Contractor will provide Service Recipient with any documentary evidence as may be required by it in order to claim input tax credits/reimbursements in respect of any GST paid to the Contractor and all invoices rendered by the Contractor shall contain such information as is required by, or prescribed under, the GST legislation.
- 5.6 The Contractor warrants that it is a currently registered and green-rated member of ISNetworld. The Contractor will maintain its registered and green-rated status with ISNetworld and will immediately notify Service Recipient in writing should its registration or green-rated change at any time throughout the currency of this Agreement. Service Recipient may, in its sole discretion, accept an ISNetworld rating status other than green for the Contractor.
- 5.7 In the event the Contractor is a non-resident of Canada and has not obtained and provided to Service Recipient a non-resident withholding tax waiver at such time as Service Recipient makes any payment to the Contractor for Services rendered in Canada, Service Recipient shall withhold such percentage of any payment made by it for the Services as is from time to time mandated under the Income Tax Act (Canada) (the "ITA") and shall remit the withheld amount to Canada Revenue Agency in the manner and at the time required by the ITA. In the event that Service Recipient is assessed for any non-resident withholding taxes payable, the Contractor agrees to forthwith reimburse Service Recipient for such amount together with applicable interest and penalties, if any.
- 5.8 In the event of the expiration or termination of this Agreement, Service Recipient shall remain responsible to the Contractor for payment of all fees earned by Contractor pursuant to and in accordance with the terms and conditions of this Agreement, up to and including the date of expiration or termination.



5.9 No progress or final payment by Service Recipient nor approval of any invoice for payment by Service Recipient shall constitute a waiver by Service Recipient nor relieve the Contractor from its obligation for Services not performed in accordance with this Agreement and any Work Authorization issued hereunder.

## 6. TERM & TERMINATION

6.1 This Agreement will be in effect from the Start Date to the end of the Term, subject to earlier termination pursuant to this Agreement.

6.2 This Agreement shall terminate immediately upon the occurrence of any of the following events:

- (a) the expiration of the Term of this Agreement;
- (b) the termination of this Agreement by Service Recipient pursuant to Section 6.3 hereof;
- (c) the insolvency, bankruptcy or dissolution of any of the parties hereto; or
- (d) the passing of thirty (30) days from the giving of written notice of termination at any time by Service Recipient.

Where this Agreement is terminated under Subsection (d) above, Service Recipient shall pay the Contractor for all Services completed to the date of termination, plus the Contractor's reasonable costs and expenses of demobilization.

6.3 In the event that the Contractor or any of its personnel:

- (a) fail, refuse or neglect to provide Services to Service Recipient as and when reasonably required or requested by Service Recipient;
- (b) breach any term, condition or provision of this Agreement;
- (c) become de-registered by or receive other than a green-rating from ISNetworld; or
- (d) contravene any applicable law or regulation in any of the locations where Services are being performed which contravention has a material effect on the provision of the Services under this Agreement or on Service Recipient, as determined in the sole discretion of Service Recipient;

then Service Recipient shall be entitled, in addition to any other remedy that it may have, to terminate this the applicable Work Authorization immediately and the Contractor shall not be entitled to any further fees or other payments in respect of the period of time after such termination.

6.4 Without limitation to Service Recipient's rights and remedies available hereunder at law or in equity, upon expiry, termination or suspension of all or part of this Agreement, Service Recipient shall be entitled to take possession of all records of any kind (including but not limited to electronic and paper records) in the Contractor's possession or control and may thereafter complete the Services itself by whatever method it deems expedient.

## 7. CONFIDENTIALITY AND PROPRIETARY INFORMATION

7.1. **Ownership.** If Contractor shall, at any time before the date of this Agreement, during the Term of the Agreement, and for three (3) years thereafter, either alone or in conjunction with any other person, create, develop, author, conceive, produce, reduce to practice or originate any Intellectual Property, or deliver to a Service Recipient any deliverable or work product, whether created in whole or in part under a Work Authorization, in performing or as a result of Services performed

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by Contractor for or on behalf of the Service Recipient (a “Deliverable”), Contractor shall immediately disclose the same to Company, and all Intellectual Property Rights in any such Intellectual Property, shall automatically be the exclusive property of and vest in Company immediately on its creation. To the extent that any such rights have not or do not automatically vest in Company, Contractor hereby assigns and conveys, and, if and to the extent necessary, agrees to assign and convey, all such rights to Company. Company and/or the applicable Service Recipients shall retain all Intellectual Property Rights in all Intellectual Property including Confidential Information disclosed or provided to Contractor hereunder to perform the Services (“Company Disclosed IP”) and nothing herein transfers or grants to Contractor any right, title, or interest or Intellectual Property Right or license in or to any Company Disclosed IP other than a non-exclusive, revocable, terminable license to use same solely for the purpose of providing the Services under the Work Authorization pursuant to which it was provided.

- 7.2 **Originality of Intellectual Property.** Subject to any exceptions expressly set out in any Work Authorization, Contractor represents, warrants and covenants to Company that: (i) all Intellectual Property created under a Work Authorization will be created only by the personnel identified in the Work Authorization, (ii) no person other than Company will have any Intellectual Property Right in or related to Intellectual Property created or developed under the Work Authorization, and (iii) all Intellectual Property created under the Work Authorization by Contractor and the use thereof will not infringe upon, or violate any Intellectual Property Right or moral rights of any third person.
- 7.3 **Assignment and Waiver of Moral Rights.** Contractor agrees to waive and hereby waives, unconditionally and irrevocably any and all of Contractor's moral rights and rights of a similar nature which Contractor now or in the future may have (including rights in existing works and works which may come into existence after the date hereof) in which copyright may subsist in each jurisdiction throughout the world, to the extent that such rights may be waived in each respective jurisdiction and will cause the authors of same to also waive their moral rights to the same extent. All works created, in whole or in part, by Contractor may be maintained, changed, modified, and/or adapted by Company or Service Recipient (if different from Company) without the consent of Contractor.
- 7.4 **Further Assurances.** Contractor shall from time to time execute and deliver all such further documents and instruments (including instruments of conveyance and waivers of moral rights in the form requested by Company from time to time including at the completion of Services under a Work Authorization) and do all acts and things as Company may, at any time, reasonably require to effectively carry out or better evidence or perfect the full intent and meaning of this Agreement. Without limiting the generality of the foregoing, Contractor agrees to assist Company (at Company's expense) to obtain and from time to time enforce its rights in the Intellectual Property created pursuant to this Agreement, and to that end, Contractor will execute all documents for use in applying for and obtaining Intellectual Property Rights and enforcing Company's rights therein, as Company may desire.
- 7.5 **Duty of Confidence.** Contractor agrees not, during or after the term of any Work Authorization or the Agreement or any extensions or renewals thereof (even in the event of a termination due to the default of Company), either directly or indirectly, in any manner whatsoever, to utilize on Contractor's own behalf or on behalf of any other Person, or to divulge to any other Person, any of the Confidential Information other than to its Representatives, but only insofar as the Representative needs to know such Confidential Information in the discharge of the Contractor's obligations to perform the Services, and subject to the other provisions set forth in this Agreement or any Work Authorization. Contractor agrees to prevent the unauthorized disclosure, publication or misuse of such information by any of its Representatives, and any other Person over whom Contractor has authority or control for whom Contractor is responsible under applicable law.

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Without limiting the generality of the foregoing, Contractor shall obtain a written acknowledgment respecting the Confidential Information and ownership of Intellectual Property from all of its Representatives who are providing Services or who may have access to any of the Confidential Information. Contractor shall (a) provide Company with executed copies of all such agreements prior to permitting its employees to commence any work on any Work Authorization, and (b) establish and maintain security procedures acceptable to Company to ensure the confidentiality of the Confidential Information. The Contractor shall be liable for any and all damages and cost arising out of unauthorized use or disclosure of Confidential Information by any of its Representatives. Further, the parties acknowledge that unauthorized use or disclosure of the Confidential Information could cause irreparable harm and significant injury to the Company and its Affiliates and as such, money damages may not be a sufficient remedy for any breach of this Agreement. Accordingly, the Contractor covenants that it will not oppose any application for equitable relief, including, but not limited to, specific performance and injunctive relief in the event it breaches this Section 8.

- 7.6 **Disclosure of Confidential Information to a Court.** The Contractor shall be entitled to disclose Confidential Information to a court of competent jurisdiction or any regulatory body having jurisdiction, provided that the Contractor shall take reasonable steps to maintain the confidentiality of the Confidential Information by such court or government department or agency or regulatory body, promptly inform the Company or Service Recipient to whom such Confidential Information applies, to the extent legally permitted, of any request for disclosure and shall cooperate with the Company and such Service Recipient if the Company chooses to challenge such a disclosure to the general public.
- 7.7 **Delivery and Return of Property.** The Contractor shall return all Company IP and any other property including Intellectual Property received by it from or on behalf of the Company or any of its Affiliates that is in its or its Representatives' possession and shall destroy or erase any and all copies it may have made thereof, within ten (10) days of: (i) a written request by the Company or Service Recipient, or (ii) termination or expiration of an Work Authorization or this Agreement, or (iii) termination of the business relationship between the Parties by mutual written consent. Upon request of the Company, the Contractor shall provide written confirmation that such Confidential Information, Intellectual Property, and other property, and copies thereof, have been destroyed or erased by it and by its Representatives.
- 7.8 **Disclosure of Information by Contractor.** Contractor agrees not to disclose or provide to any Service Recipient any Intellectual Property in which it or a third party not Affiliated with Company has any Intellectual Property Rights including any trade secrets, or confidential information. Notwithstanding and without derogating from the foregoing, if Contractor should provide or disclose any such Intellectual Property, Contractor shall ensure that Company has, and Contractor hereby grants to Company, a worldwide, non-exclusive, irrevocable and non-terminable license to exercise all Intellectual Property Rights in such Intellectual Property. If any such Intellectual Property is and is clearly marked or stamped as being a trade secret of Contractor, the Service Recipient will require any unaffiliated third parties to whom the Intellectual Property is disclosed to use reasonable efforts to maintain it in confidence. This duty will be deemed to be met if the Service Recipient uses the same steps in relation to the Intellectual Property that it uses in disclosing its own confidential information to the third party or third parties.
- 7.9 **Obligations Survive Termination.** The parties' obligations under this Section shall survive any termination or suspension of the Services and the expiration of this Agreement or any Work Authorization.
8. **ENFORCEMENT**

8.1 The Contractor acknowledges that the provisions contained in Sections 7 and 11 hereof are reasonable in the circumstances and necessary for the adequate economic protection of the Company or any other Enbridge Group Member. The Contractor further acknowledges that the breach by it of any of the provisions in Sections 7 or 11 herein would cause irreparable harm to the Company and any other Enbridge Group Member which would not be adequately compensated for by damages and accordingly, in the event of such breach, the Contractor acknowledges and agrees that the Company or any other Enbridge Group Member shall be entitled, in its sole discretion, to commence proceedings for injunctive relief and the Contractor hereby consents to any and all injunctions, restraining orders, directives and other equitable orders being issued against it or its personnel restraining them from any further breach of the said provisions.

## 9. INDEMNITY AND LIMITATION OF LIABILITY

9.1 The Contractor shall indemnify and save harmless the Company or any other Enbridge Group Member, its Affiliates and their respective directors, officers, employees and agents from and against all losses, damages, costs (including costs as between a solicitor and his client), expenses, claims, demands, actions, proceedings and suits of every kind or nature whatsoever which may be brought against or suffered by the Company or any other Enbridge Group Member, its Affiliates or their respective directors, officers, employees and agents or which any of them may sustain, pay or incur as a result of the breach of this Agreement by the Contractor or as a result of the negligence or wilful misconduct of the Contractor, its directors, officers or personnel in connection with, related to or arising out of the performance, purported performance or non-performance of this Agreement.

## 10. INSURANCE

10.1 **Required Contractor Insurance.** At all times during the Term of the Agreement and for so long thereafter as a Claim related to this Contract is possible under applicable statutes of limitations, Contractor shall maintain at its own expense, the insurance coverage outlined below, in each case with insurers having financial security ratings of at least "A-" by AM Best or "A" by Standard & Poor's and which are authorized to do business in all jurisdictions where Services are performed.

a) **Intentionally deleted.**

b) **Intentionally deleted.**

c) **Commercial General Liability** coverage with a limit of five million dollars (\$5,000,000) each occurrence for bodily injury and property damage arising out of or relating to Contractor's activities under this Agreement. The policy shall include coverage for personal and advertising injury, contractual liability addressing indemnification under this Agreement, cross liability, severability of interests, products and completed operations, limited time element pollution, contingent employer's liability and **as applicable**, shall provide coverage for explosion, collapse, and underground hazards ("XCU").

d) **As applicable, Commercial Auto Liability** covering all vehicles used by the Contractor in connection with this Agreement with a combined single limit of five million dollars (\$5,000,000) for injury or death of one or more persons or damage to or destruction of property as a result of each accident.

e) **Umbrella or Excess Liability** coverage with a limit of two million dollars (\$2,000,000) per occurrence excess of required insurance in this Section 10.1 b), c), and d) on a

“follow form” basis with coverage at least as broad as the underlying policy terms and conditions.

- f) **As applicable, Aircraft Liability** coverage for any aircraft used in connection with this Agreement, with policy limit of the greater of ten million dollars (\$10,000,000) or two million dollars (\$2,000,000) per seat for aircraft with greater than five (5) seats, each occurrence including passenger liability and replacement cost of the aircraft.
- g) **As applicable, Professional Liability or Errors and Omissions Liability** for Claims arising out of the Services, with a policy limit of two million dollars (\$2,000,000) per claim and in the aggregate.
- h) **As applicable, All Risk Property Damage** insurance on a replacement cost basis covering loss of or damage to property owned or leased, or in the care custody and control by the Contractor or for which the Contractor has otherwise assumed responsibility for loss or damage under the terms of this Agreement, including property in transit.
- i) **As applicable**, any other insurance required by law or as Company may, in its discretion, determine to be necessary as set out in a Rider, if any, to this Agreement.

10.2 **Intentionally deleted.**

10.3 **Insurance Limits.** Subject to the total required amount of insurance for each individual insurance coverage requirement herein, the amounts of insurance specified in the foregoing sections may be satisfied through a combination of primary and excess insurance limits.

10.4 **Additional Insured, Subrogation Waiver, Policies as Primary.** Contractor shall ensure that each insurance carrier providing coverage hereunder provides (in each case arranged to provide the maximum benefit to the Company), the following:

- a) With exception of 10.1 a), b), g), and h), inclusion of Company as additional insured in insurance policies under this Section 10.
- b) Waiver of insurers’ rights of recovery, contribution, subrogation, set-off or counterclaim, in favour of Company, in all policies of insurance under this Section 10 and including all applicable third party liability policies, property insurance policies and marine insurance policies, arising out of or related in any way to this Agreement.
- c) That coverage, in all of Contractor’s insurance policies (whether such policies are primary, umbrella or excess) under this Section 10 or arising out of or related to this Agreement in any way, shall be written to respond on a primary and non-contributory basis irrespective of any other applicable insurance otherwise available to Company under this Agreement.

10.5 **Notice of Cancellation.** Insurance maintained by Contractor shall not be canceled without thirty (30) days prior written notice being furnished to Company.

10.6 **Evidence of Insurance.** Upon execution of this Agreement, and on an annual basis thereafter until this Agreement is terminated, Contractor shall provide to Company (or Company’s designated Representative) Certificate(s) of Insurance on standard forms regularly accepted in the industry certifying Contractor’s compliance with this Section 10 and specifically identifying

coverage extensions and endorsements required herein. In the event of a reduction in Contractor insurance limits during the Term which may otherwise reduce the limits of insurance required to comply with this Section 10, the Contractor shall promptly provide Company with notice of same, and immediately thereafter secure such additional insurance as is required to comply with the terms of this Section 10. Company's (or Company's Representative's) acceptance of certificates or correspondence associated thereto does not constitute a waiver, release or modification of the requirements under this Section 10.

"Certificate Holder" shall be:

ENBRIDGE EMPLOYEE SERVICES CANADA INC., and its Subsidiaries and all other Affiliates, 200, Fifth Avenue Place, 425-1<sup>st</sup> Street SW, Calgary Alberta T2P 3L8

- 10.7 **Failure to Maintain.** In the event Contractor fails to comply with insurance requirements under this Section 10, such failure shall constitute cause for immediate termination of this Agreement by Company in addition to any other rights available to Company at law or in equity. At its sole discretion, Company may, but shall not be obligated to, obtain such insurance for Company's sole benefit as Company deems necessary to address any failure on the part of the Contractor to obtain the insurance required pursuant to this Section 10. Any cost thereof shall be payable by the Contractor to Company on demand and Company may, at its election, deduct the cost thereof or set-off from any monies which are due or may become due to Contractor. No liability shall attach to Company for any decision on the part of Company to forego the purchase of additional insurance under this Section 10.7, nor does Company's decision not to purchase additional insurance pursuant to this Section 10.7 constitute a waiver, release or modification of the requirements under this Section 10, or constitute a statement by Company that Contractor's insurance coverage at any time during the Term hereof is in compliance with the requirements under this Section 10.
- 10.8 **Subcontractors.** Contractor shall make commercially reasonable efforts to require all its Subcontractors to provide insurance coverage in accordance with this Section 10. Contractor shall ensure that all insurance maintained by its Subcontractors providing Services include a waiver of insurers' rights of recovery, contribution, subrogation, set-off or counterclaim in favor of Company. The failure of any Subcontractor to obtain and maintain the required insurance shall not in any way impact the obligations of Contractor under this Agreement.
- 10.9 **Insurance Costs.** Company will not be responsible for any premiums, surcharges, supplemental calls, penalty payments, deductibles, self-insured retentions, self-insurance or any other costs for the insurance provided by or on behalf of Contractor in accordance with this Section 10.
- 10.10 **Compliance with Applicable Law.** If it is judicially determined that the monetary limits of the insurance required herein do not conform with applicable law, it is agreed that Contractor shall take whatever steps are necessary, at its own expense, to ensure said insurance shall conform to the greater of the minimum monetary limits and other provisions in such law, or the limits specified herein.
- 10.11 **Effect on Indemnity Obligations.** Except as required by applicable law, Contractor's compliance with the obligations under this Section 10 shall in no way limit or replace the indemnity and other obligations of Contractor contained elsewhere in this Agreement.
- 10.12 **Indemnities to Be Supported By Insurance.** To the fullest extent required by certain applicable law and not prohibited by other applicable law, Contractor agrees to obtain and maintain, for the benefit of the Company, as indemnitee, types and amounts of insurance coverage at least equal to the insurance requirements set forth in Section 10 of this Agreement, in each case to cover the entire scope of the release, indemnity, defense, and hold harmless obligations assumed in Section

9. All insurance required under this Section 10 is in support of Contractor's respective release, indemnity, defense, and hold harmless obligations in addition to, and independent of, any other insurance requirements contained in this Agreement.

10.13 **Intentionally deleted.**

10.14 **Intentionally deleted.**

10.15 **Intentionally deleted.**

## **11. PRIVACY**

11.1 If, in the course of performing the Services, the Contractor or its personnel obtain personal information about an employee, contractor or landowner of the Company or any other Enbridge Group Member, or any individual with whom the Company or any other Enbridge Group Member interacts, the Contractor agrees to comply with all applicable federal or provincial privacy legislation and shall only use such personal information for the purposes of performing the Services. Furthermore, the Contractor acknowledges and agrees that it will:

- (a) not otherwise use or disclose any personal information, except as required by law;
- (b) establish and implement appropriate policies and procedures to protect personal information from unauthorized use or disclosure;
- (c) indemnify and hold the Company or any other Enbridge Group Member harmless from any claim relating to Contractor's breach of any applicable federal or provincial privacy legislation ; and
- (d) upon completion of the Services, destroy all personal information and all copies and records thereof, unless otherwise advised by the Company or any other Enbridge Group Member.

11.2 Upon providing the Contractor with fourteen (14) days written notice, Service Recipient shall be entitled to examine the Contractor's personal information handling policies and procedures to ensure that the Contractor is in compliance with this Agreement.

## **12. INTERPRETATION**

12.1 If any section, subsection, paragraph, word, combination of words or other portion of this Agreement shall be held illegal, invalid or unenforceable, then the illegal, invalid or unenforceable portion shall, only in the circumstances then under adjudication, be stricken from this Agreement and the remaining provisions of this Agreement shall be considered as if the portion so struck does not form a part of this Agreement.

## **13. INDEPENDENT CONTRACTOR**

13.1 The parties acknowledge and agree that the Contractor is an independent contractor and is not an agent, partner, joint venturer or employee of the Company or any other Enbridge Group Member. Likewise, personnel provided by the Contractor to perform the Services are not Company or any other Enbridge Group Member employees, nor agents, partners or joint venturers of the Company or any other Enbridge Group Member.

13.2 The Contractor shall be solely responsible for payment of any and all fees, salaries and/or wages and benefits for its personnel, and the withholding and remittance of all deductions therefrom, including, without limitation, all taxes, employment insurance premiums, pension plan contributions, workers compensation premiums and any other statutory or otherwise required withholdings.

13.3 The Contractor agrees to indemnify and save harmless the Company or any other Enbridge Group Member from and against all claims and demands under the *Income Tax Act* (Canada), any relevant provincial income tax legislation, the *Canada Pension Plan (Act)* and the *Employment Insurance Act* (Canada), for or in respect of any failure to withhold or remit income tax premiums or other withholdings of any kind from all or any part of the payments set out in this Agreement including any interest or penalties relating thereto as assessed and any costs (including legal costs and disbursements) incurred by the Company or any other Enbridge Group Member in defending such claims or demands.

## 14. NOTICES

14.1 Any notice to be given pursuant to or concerning this Agreement shall be in writing and may be given by personal service, registered mail, e-mail or facsimile to the respective parties at the following addresses:

### **For the Company:**

Address: 26 East Superior Street, Suite 309, Duluth, Minnesota 55802

Telephone: 218-464-5834

Email: [jenna.dzuck@enbridge.com](mailto:jenna.dzuck@enbridge.com)

Attention: Jenna Dzuck

### **For the Contractor:**

Address: 105 Commerce Valley Drive, 7th Floor, Markham, Ontario, L3T 7W3

Telephone: Phone: 905-390-2003 / Mobile: 289-439-9803

Email: [mark.vanderwoerd@aecom.com](mailto:mark.vanderwoerd@aecom.com)

Fax: 905.886.5206

Attention: Mark van der Woerd

14.2 Any Party may change its address for notice by providing prior written notice of the same to the other Party. Notices that are delivered by personal service shall be deemed to have been received when delivered to the address set forth in Section 14.1. Notices sent by registered mail shall be deemed to have been received 5 business days after mailing such notice by registered mail to the address set out in Section 14.1. Receipt of any facsimile or email messages shall be deemed to have been received on the date sent to the number or email address set out in Section 14.1 provided no incomplete or bounce-back error transmissions are received by the sending Party.

## 15. GOVERNING LAW

15.1 This Agreement shall be governed by and construed in accordance with the laws of the Province of Alberta, without reference to its conflicts of laws principles, and the laws of Canada applicable therein. Each party hereto agrees to submit to the jurisdiction of the courts of Alberta for any proceedings relating to the interpretation and enforcement of this Agreement.



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**16. SURVIVING OBLIGATIONS**

16.1 The Contractor's obligations under this Agreement, including without limitation, the requirements of Sections 2.5, 4, 6, 7, 8, 9, 10, 11, 13 and 17 hereof shall remain in effect and survive the expiry or termination of this Agreement.

**17. AUDIT AND RECORDS RETENTION**

17.1 Company or any other Enbridge Group Member may audit and inspect the Contractor's records regarding all charges made to the Company or any other Enbridge Group Member in relation to this Agreement, including but not limited to records relating to disbursements to third parties, for a period of twelve (12) months following the completion of any Services. Contractor shall maintain all such records and shall allow such inspection upon reasonable notice and at such times and locations as the parties may reasonably agree.

17.2 Company or any other Enbridge Group Member may, from time to time and at its expense, have a representative inspect and copy any technical records in the Contractor's possession relative to the Services. The Contractor shall provide the Company or any other Enbridge Group Member with reasonable assistance and facilities to conduct such inspection and copying, including conversion to a format compatible with Company's or any other Enbridge Group Member's standard software environment.

17.3 The Contractor shall ensure that its contracts with its personnel performing the Services contain provisions which are substantially similar to Section 17.2 above and shall ensure that the Company or any other Enbridge Group Member may inspect, verify, review and copy the technical records of its personnel.

**18. GENERAL PROVISIONS**

18.1 This Agreement, together with each Work Authorization, constitutes the entire agreement between the parties hereto as to the subject matter hereof and merges all prior discussions between the parties hereto and neither of the parties shall be bound by any terms, conditions, representations or undertakings other than as expressly set forth herein.

18.2 This Agreement shall enure to the benefit of and be binding upon the parties hereto and their heirs, beneficiaries, executors, administrators and successors.

18.3 The Contractor shall not be entitled to assign this Agreement or any of its benefits or obligations hereunder without the prior written consent of the Company or any other Enbridge Group Member.

18.4 This Agreement shall not be varied, altered or amended except by a document in writing signed by all the Parties hereto.

18.5 In the event of any inconsistency or conflict between the terms of this Agreement and the terms of any Work Authorization or other instrument issued by a Service Recipient to the Contractor, the terms of this Agreement will prevail over the conflicting or inconsistent provisions of such Work Authorization or other instruments.

**IN WITNESS WHEREOF** the parties hereto have executed this Agreement on the date and year first written above.

**ENBRIDGE EMPLOYEE SERVICES  
CANADA INC.**

Per: Rob Watson  
Name: Rob Watson  
Title: Vice President SEM  
Date: Dec 5/18

*I have authority to bind Enbridge*

**AECOM Canada Ltd.**

Per: Paul Murray  
Name: Paul Murray  
Title: Senior Vice President  
Date: December 4, 2018

*I have authority to bind the Contractor*

**SCHEDULE "A-\*\*\*"**

**WORK AUTHORIZATION**

**THIS WORK AUTHORIZATION IS ENTERED INTO BETWEEN \*\*\* ("SERVICE RECIPIENT") AND ("CONTRACTOR") AS OF , 20, AND IS SUBJECT TO THE MASTER SERVICES AGREEMENT FOR ENVIRONMENTAL CONSULTING SERVICES BETWEEN ENBRIDGE EMPLOYEE SERVICES CANADA INC. AND THE CONTRACTOR DATED , 20 (THE "MSA"). ANY CAPITALIZED TERM USED IN THIS WORK AUTHORIZATION BUT NOT DEFINED SHALL HAVE THE MEANING ASCRIBED TO SUCH CAPITALIZED TERM IN THE MSA.**

**PLEASE NOTE: The Agreement covers only environmental consulting services provided by the Contractor to Service Recipient; this Work Authorization may not be used for other kinds of services provided by the Contractor that are not covered by this Agreement.**

**1. Term**

**2. Enbridge Work Order Number:**

**3. Project:**

**4. Scope:**

**5. Project end date / deadlines:**

**6. Proposal reference:**

**7. Special directions:**

- The Service Recipient "Major Projects" or "MP" requirements apply to this work.*
- The Service Recipient "Liquids Pipelines" or "LP" requirements apply to this work.*
- Other:*

**THIS WORK AUTHORIZATION IS SUBMITTED AND APPROVED BY:**

**.\*\*\***

**NAME OF CONTRACTOR**

Per: \_\_\_\_\_  
Name:  
Title:  
Date:

Per: \_\_\_\_\_  
Name:  
Title:  
Date:

*I have authority to bind Service Recipient*

*I have authority to bind the Contractor*

## SCHEDULE "B"

### CONTRACTOR RATE SHEET EFFECTIVE AS OF NOVEMBER 16, 2018

#### Canada East and Canada West

RATE TABLE - ENVIRONMENTAL			
1.1 Professional (See table below for further positions)	Experience	Possible Titles	Straight Time Hourly Billing Rate (\$)
Level 1	0-2 Years	Junior scientist/engineer/project controls.	
Level 2	2-4 Years	Junior scientist/engineer/project controls.	
Level 3	4-6 Years	Intermediate scientist/engineer/project controls.	
Level 4	6-8 Years	Mid-level scientist/engineer/task leader/crew leader/project controls.	
Level 5	8-10 Years	Senior scientist/engineer/task leader/crew leader/project controls	
Level 6	10-12 Years	Senior scientist/engineer/project manager/task manager	
Level 7	13-18 Years	Senior Project Manager	
Level 8	18+ Years	Principal/Project/Program Director	
1.2 Technical (See table below for further positions)	Certifications / Qualifications	Possible Titles	
Level 1 - Entry	Technologist diploma. Entry level position.Basic computer skills. 0-2 Years.	N/A	
Level 2 - Fully Qualified	Technologist diploma. Fully qualified level typically with 2 - 5 Years	<b>Junior</b> - Technologist/Technician/ Engineering Technologist	
Level 3 - Senior	Technologist diploma. Senior technologist role with 5-10 Years	<b>Intermediate</b> - Technician/ Engineering Technologist	
Level 4 - Specialist 1/ Team Lead	Technologist diploma. Senior/Specialist Technologist with 10 - 15 Years Note: Emphasis is on the technical complexity and scope of the role versus years of experience.	<b>Senior</b> - Technician/ Engineering Technologist	
Level 5 - Specialist 2/ Supervisor	Technologist diploma. Senior/Specialist Technologist with 15-20 Years. Note: Emphasis is on the technical complexity and scope of the role versus years of experience.	<b>Senior/ Lead</b> - Technician/Engineering Technologist	
Level 6 - Specialist 3/ Manager	Technologist diploma. Senior/Specialist Technologist with 20+ Years. Note: Emphasis is on the technical complexity and scope of the role versus years of experience.	<b>Project Manager/Planner/ Senior</b> - Environmental P/M Technician/ Engineering Technologist	
1.2.1 Technical Inspection	Certifications / Qualifications	Possible Titles	
Level 1 - Entry	0 - 2 Years.	Inspector 1	
Level 2 - Fully Qualified	2 - 5 Years	Inspector 2	
Level 3 - Senior	5-10 Years	Inspector 3	
Level 4 - Team Lead	10 - 15 Years	Lead Inspector	
Level 5 - Supervisor	15-20 Years.	Asst. Chief Inspector	
Level 6 - Manager	20+ Years.	Chief Inspector	
1.4 Additional Job Categories	Proponent's Resource Level (Please input your resource's job title e.g. Sr. Inspector, Planner, Jr. Inspector, etc.); Please see tab - Job Categories	Possible Titles	
Level 0	0-5 Years	Project Administrator	
Level 9	15+ Years; technical directors/leaders used in exceptional circumstances as advisors	Senior Manager	
Level 10	20+ Years; technical directors/leaders used in exceptional circumstances as advisors	Senior Leader	

**SCHEDULE "B"**

**CONTRACTOR RATE SHEET EFFECTIVE AS OF NOVEMBER 16, 2018**

Professional and Technical Positions Detail

<b>1.1 Professional Positions Included</b>	<b>1..2 Technical Positions Included</b>
Archaeologist	Engineering Technician
Biologist	Engineering Technologist
Community/Regional Planner	CADD
Consultant	Designer
Advisor	Graphic Designer
Scientist	Inspector
Planner	
Geographer	
Geological Engineer	
Geologist	
Hydrogeologist	
Hydrologist	
Land Surveyor	
Landscape Architect	
Occupational Health Professional	
Paleontologist	
Professional	
Sustainability Consultant	
Toxicologist	
Analyst	
Social Scientist	
<b>Related Engineering</b>	
Civil Engineer	
Chemical Engineer	
Engineer	
Physics Engineer	
Structural Engineer	
<b>GIS/IT</b>	
GIS	
IT	
<b>Project Management/ Services</b>	
Document Control	
Project Administration	
Project Controls - Estimating/ Planning/ Scheduling	
Project Controls - Procurement/ Contract Administration	
Project Coordination	
Project Management	
Project Services	
Principal	
Project Manager	

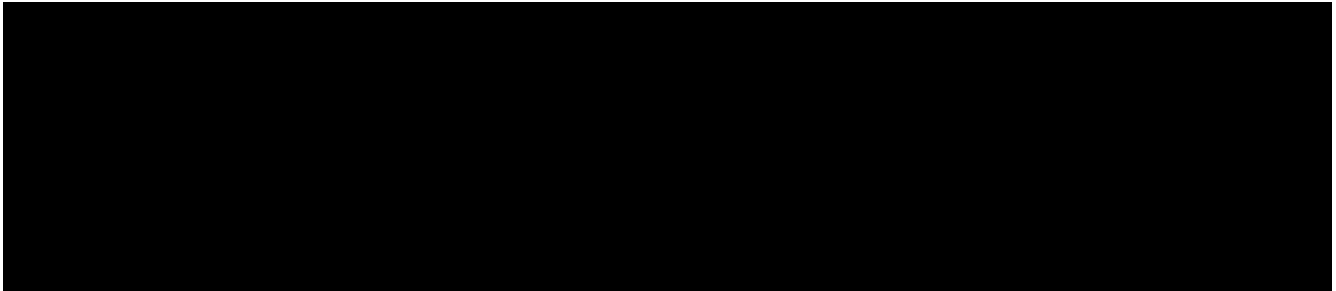
## SCHEDULE B

### CONTRACTOR RATE SHEET EFFECTIVE AS OF NOVEMBER 16, 2018

#### Expenses

2. EXPENSES		Daily Rates (12 Hr/Day)	
		\$	Unit of Measurement
<b>2.1 Living Out Expense (LOA)</b>	Accommodation		
	Living Out Expense (LOA)		
	Northern LOA Zone A (Canada Specific)		
	Northern LOA Zone B (Canada Specific)		
	Camp Daily Charge (In any)		
	Meals		
	Breakfast		
	Dinner		
	Lunch		
<b>2.2 Transportation Cost</b>	Vehicle Allowance		
	UTV		
	ATV, Snowmobile		
	Vehicle KMs (Off Right of Way)		
	Vehicle KMs (On Right of Way)		
	Single Axle Trailer		
	Double Axle Trailer		
<b>2.3 Disbursement</b>	All Inclusive Standard Field Equipment (Digital Camera, cell phone, mobile computer, GPS, field safety kit, data collection kit etc.)		
	Pre-Approved expenses including air travel, courier, lab testing, reproduction specialized or non-standard field equipment or environmental job supplies		
	Lab testing and field equipment		
<b>2.4 Subcontractor/ Third Party</b>	Labour		
	Equipment		
	Material		
<b>2.5 Mangement Fee on Expenses for LOA and Transportation Only (if applicable)</b>			

#### Volume Discount Structure and Example



- [Redacted]
- [Redacted]
- [Redacted]
- [Redacted]
- [Redacted]
- [Redacted]



**SERVICE RELEASE ORDER**

**4950025833**

\* THIS DOCUMENT NUMBER MUST APPEAR ON ALL PACKAGES, INVOICES, CORRESPONDENCE, ETC.  
\* NOTIFY US IMMEDIATELY IF YOU ARE UNABLE TO SHIP AS SPECIFIED BELOW.

**VENDOR:** AECOM  
5080 COMMERCE BLVD  
MISSISSAUGA ON L4W 4P2  
Pre-Qual Status: ON - Pass

**SHIP TO:** ENBRIDGE GAS INC.  
50 KEIL DRIVE NORTH  
CHATHAM ON N7M 5M1

**INVOICE TO:** Enbridge Gas Inc.  
PO Box 2005  
Chatham, Ontario  
N7M 0J9  
APCAEastInvoices@SpectraEnergy.com

**QUESTIONS TO:** Procurement Dept, Enbridge Gas Inc., 50 Keil Dr N., Chatham ON N7M 5M1  
**Phone:** 519-436-4600 x 5002212 **Fax:** 519-436-4665 **Email:** psupport@uniongas.com

ORDER DATE(y/m/d)	F.O.B.	TERMS
2021.10.08	SHIPPING POINT	NET 30

ITEM	QUANTITY	UoM	MATERIAL NO.	DESCRIPTION	DELIVERY DATE	UNIT PRICE
------	----------	-----	--------------	-------------	---------------	------------

10	1	SRV		<p><b>Product Description:</b> Environmental planning support for the project, including the production of an Environmental Report and Environmental Protection Plan, Stage 1 and 2 Archaeological Assessment, Cultural Heritage Assessment, Species at Risk surveys, agency and public consultation, OPCC review and hearing support, and soils management. Desktop background research, field surveys, correspondence with relevant agencies, report writing and production.</p>		
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Duration of Service: 2021.08.12 - 2023.12.31

-----  
Total net item value CAD

HST Extra

**From:** [Washburn, Kristan](#)  
**To:** [Lauren Whitwham](#)  
**Cc:** [Evan Tomek](#); [Consultation](#)  
**Subject:** [External] RE: CKSPFN monitor contact  
**Date:** Wednesday, July 20, 2022 3:07:04 PM

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**CAUTION! EXTERNAL SENDER**

Were you expecting this email? TAKE A CLOSER LOOK. Is the sender legitimate?  
DO NOT click links or open attachments unless you are 100% sure that the email is safe.

Will do.

Thanks,

Kristan

**Kristan Washburn, MES**  
Senior Terrestrial Ecologist, Manager, Impact Assessment & Permitting  
D +1-705-669-4711  
M +1-705-665-2467  
[kristan.washburn@aecom.com](mailto:kristan.washburn@aecom.com)

[Click here to connect with me on LinkedIn](#)

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T +1-705-674-8343  
[aecom.com](http://aecom.com)

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**From:** Lauren Whitwham <Lauren.Whitwham@enbridge.com>  
**Sent:** Wednesday, July 20, 2022 3:06 PM  
**To:** Washburn, Kristan <Kristan.Washburn@aecom.com>  
**Cc:** Evan Tomek <Evan.Tomek@enbridge.com>; Consultation <consultation@kettlepoint.org>  
**Subject:** [EXTERNAL] CKSPFN monitor contact

Hello Kristan,

Can you please ensure that all Aecom consultants (environmental, archaeological, Professional Agrologist, and any others) are using the Consultation inbox [consultation@kettlepoint.org](mailto:consultation@kettlepoint.org) for Kettle and Stony Point First Nation.

If you have any questions, please feel free to reach out.

Thanks,



Lauren

**Lauren Whitwham**

Senior Advisor, Community & Indigenous Engagement, Eastern Region

**Public Affairs, Communications & Sustainability**

—

**ENBRIDGE INC.**

TEL: 519-667-4100 x 5153545 | CELL: 519-852-3474 | [lauren.whitwham@enbridge.com](mailto:lauren.whitwham@enbridge.com)

109 Commissioners Road West, London, ON N6A4P1

**Safety. Integrity. Respect. Inclusion.**

Enbridge Gas Inc. ("Enbridge Gas") Response to Chippewas of the Thames First Nation ("COTTFN") Comments received July 28, 2022 re: Environmental Report on the Panhandle Regional Expansion Project ("Project")		
Item	Comment	Enbridge Gas Response
1.0 General		
Comment 1	Why does the Land Acknowledgement not mention the McKee Treaty?	The McKee Treaty was not specifically mentioned, since the Environmental Report ("ER") was distributed to all Indigenous communities engaged on the project, which spans different Treaty areas.
Comment 2	We expect that Enbridge and its contractors will be following all mitigation measures identified in the Environmental Report. If any mitigation measures will not be followed, we request notification and explanation.	That's correct. Enbridge Gas and its contractor will follow all mitigation measures identified in the ER. In addition, a full-time Environmental Inspector (EI) will be onsite throughout construction to ensure compliance. Enbridge Gas will notify COTTFN of any significant changes to the proposed mitigation measures.
Comment 3	We requested a system map of Enbridge infrastructure within COTTFN's Traditional and Treaty Territory on Feb. 14, 2022 and subsequent occasions. We request an update on why this map has not been provided to date.	Thank you for your patience in addressing this request. Enbridge Gas does not currently have a map of Enbridge Gas's infrastructure with an overlay of COTTFN's Traditional and Treaty Area. We are working on preparing a map and will provide it to COTTFN once it has been completed.
2.0 Ecological		
Comment 4	The preferred route crosses dozens of watercourses within the Nation's Traditional and Treaty Territory. Many of these watercourses are important habitats for species at risk and other significant species. We are particularly concerned about crossings of the Thames River (Deshkan Ziibiing) and Jeannette's Creek. We request more information on what method will be used for each water crossing.	At this point Enbridge Gas has determined that the majority of watercourse crossings will be completed using Isolated Open-Cut (i.e., dam & pump) methods. The remaining watercourses (e.g., Jeannettes and Baptiste Creek, the Thames River, and some smaller watercourses close to roadways) will be installed using trenchless methods (e.g., Horizontal Directional Drilling [HDD] or direct pipe).
Comment 5	For trenchless crossings, please provide the plans for inadvertent fluid release. We are also concerned how the vibrations may impact species. What measures will be taken to protect overwintering turtle and/or reptile eggs?	<p>For trenchless crossings, contingency plans for inadvertent fluid release will be developed by Enbridge Gas's contractor and we will share this information with COTTFN once the plans have been prepared.</p> <p>HDD crossings are all planned to be completed within the active season for snakes and turtles as stated in Section 5.3.2.4 (Table 5-9) of the ER (i.e., no watercourse crossing construction will occur during the turtle and snake overwintering period of October 30 to April 1). Therefore, vibrations generated by HDD are not anticipated to have any impacts to overwintering snakes and turtles. Additionally, there is some research that has been conducted on hypoxic turtles and how they respond to sensory information such as light and vibration (Madsen et al., 2015). Research indicates turtles show some responsiveness</p>

		<p>to light stimuli during prolonged hypoxia but they have no response to vibrations (600Hz, 0.05G). The vibrations from this research are expected to be higher than any vibrations that might be felt within the watercourse during HDD operations.</p> <p>With regard to impacts to eggs, although we are not aware of any scientific research related to vibrations from HDD and affects to turtle nests, vibrations are not generally felt at the ground surface by humans along the extent of an HDD because of the depths at which they operate (&gt;20m). The only time vibrations (very minor) may be felt at the entry and exit pits, which will be well set back from the watercourse (&gt;100m). Additionally, the drilling fluid, which helps with the drilling operation generally dampers any vibrations.</p>
Comment 6	In cases where breeding bird habitat or vegetation will be permanently removed, will it be compensated for through habitat creation or enhancement in other locations? We are looking for a commitment from Enbridge to compensate for habitat loss through biodiversity initiatives.	<p>Significant removal of breeding bird habitat and vegetation is not anticipated. Enbridge Gas is committed to implementing a tree replacement program, which includes replanting the woodland removed with seedlings of native species that are guaranteed until they reach free to grow status. This program was planned at a ratio of 2:1 for the woodland areas removed and will now be increased to 3:1 (trees to be replaced on a 3:1 area basis at 1000 tree seedlings per acre).</p> <p>Directly impacted landowners are given first right of refusal for the tree planting under this program. However, if landowners are not interested in planting trees on their property, Enbridge Gas will work with Indigenous communities and local conservation authorities to find suitable locations to plant trees.</p>
Comment 7	Regarding mitigation measures for soil, how long would vegetation be removed for (estimation)? We support the suggestion in Neegan Burnside review of leaving some debris from vegetation removal as brush piles for snakes, as appropriate.	<p>All restoration is anticipated to be completed by 2025.</p> <p>Enbridge Gas supports the idea of leaving some debris piles for snakes and will look for opportunities, as appropriate.</p>
Comment 8	How will construction be timed to avoid impacts on wildlife?	Section 5.3.2.4 (Table 5-9) of the ER lists mitigation measures to be followed during construction, in order to limit and protect the various wildlife species. The mitigation measures include all appropriate timing windows to be followed for each species (i.e., vegetation removals, bat roosting, breeding bird nesting, fish spawning, turtle/snake overwintering period). During construction, an EI will verify that wildlife protection timing windows are adhered to.
Comment 9	We have been participating in ecological studies by sending COTTFN Field Liaisons and expect to continue to do so. We	Thank you for your participation in these studies. Enbridge Gas will provide COTTFN with reports summarizing the field survey findings once they have been completed.

	would also like to receive those reports as they become available.	
Comment 10	Will SAR training be provided to those involved in construction?	Species at Risk (SAR) training will be provided to the contractor and those involved in the construction of the Project. Training will include identifying known SAR in the Project study area and appropriate regulatory & reporting procedures if SAR are found within the construction limits. Trained personnel will also be on-site to monitor construction and be responsible for checking that the ER's mitigation measures and monitoring requirements are being executed. Enbridge Gas will implement an orientation program for inspectors and contractor personnel to provide information regarding Enbridge Gas's environmental program, commitments, and safety measures.
Comment 11	We request updates on future comments from MECP, DFO, NDMNRF, and St Clair Region Conservation Authority.	An up-to-date Ontario Pipeline Coordinating Committee (OPCC)/agency review summary table is being maintained and can be provided to COTTFN upon request.
Comment 12	We request to be kept informed on SAR monitoring plans during construction and may request to include our Species at Risk Specialist for field visits.	Enbridge Gas will keep COTTFN informed of SAR monitoring plans during construction and can discuss opportunities for COTTFN's Species at Risk Specialist to attend field visits..
<b>3.0 Climate Change</b>		
Comment 13	How is Enbridge calculating and addressing fugitive methane emissions from existing and proposed infrastructure? How much do you expect the Panhandle Regional Expansion Project to contribute to increased methane emissions?	<p>Enbridge Gas' fugitive emissions are calculated based on emission factors and engineering estimates, as well as direct measurement of fugitive emissions, in accordance with the Ontario Ministry of Environment, Conservation and Parks' (MECP) Guideline for Quantification, Reporting and Verification of Greenhouse Gas Emissions (Guideline). For example, results from field surveys performed at transmission and storage compressor stations are applied to the compressor station fugitive calculations. Where possible, site or equipment specific emission factors are used, in place of industry standard factors.</p> <p>Enbridge Gas currently minimizes fugitive emissions from its operations through the implementation of industry accepted best management practices. For example, in 2020, Enbridge Gas implemented a harmonized leak operating standard, which includes increased traceability and tracking of leak repairs, increased monitoring frequencies, harmonized repair timelines for above ground leaks, and initiation of the station leak survey program.</p> <p>Enbridge Gas is developing and implementing a GHG emission reduction strategy. The strategy will identify and assess cost effective emission reduction opportunities. Opportunities have been identified over several years through the Asset Management Plan, updated operating practices, equipment modernization/innovation, compliance with regulatory requirements (i.e. federal Methane Regulations) and corporate initiatives.</p>

		<p>Considering the fugitive emissions due to operation only, the Project is estimated to result in an increase in fugitive emissions of approximately 140 tCO<sub>2</sub>e/year.</p>
<p>Comment 14</p>	<p>We are facing a human-made climate crisis, largely due to reliance on fossil fuels for energy. The Panhandle Regional Expansion Project is responding to greater demand for energy in the region, but also locks in expanding fossil fuel usage and associated greenhouse gas emissions. This trajectory is incompatible with emission reduction targets set by Ontario and Canada. What is Enbridge doing to decarbonize its operations and promote sustainable forms of heating for residential and industrial users?</p>	<p>Enbridge Gas is uniquely positioned to support Ontario’s clean energy transition, with immediate, cost-effective solutions that leverage existing infrastructure and innovative technologies. Through collaboration with governments and partners, we’re advancing innovative energy solutions to keep energy reliable, affordable and reduce environmental impact. Leveraging our pipeline infrastructure is a responsible and cost-effective way to supply cleaner fuels and reduce emissions in a significant way.</p> <p>On November 6, 2020, Enbridge Inc. announced its environmental, social and governance (ESG) goals, which represent the next stage of our evolution as an ESG leader to help ensure we’re positioned to grow sustainably for decades to come. Recognizing that climate change requires serious solutions, one of the goals Enbridge Inc. has set is to reach net zero GHG emissions by 2050 with an interim target to reduce GHG emissions intensity 35 percent by 2030.</p> <p>To meet Enbridge Inc.’s 2030 emission targets and its 2050 net-zero ambition, Enbridge Gas will be pursuing multiple avenues that are strongly aligned and embedded in our strategy and business plans. These include:</p> <ul style="list-style-type: none"> <li>• Modernization, technology and innovation improvements applied to existing infrastructure to reduce emissions intensity</li> <li>• Building and operating renewable “self power” generation facilities to reduce emissions related to the energy consumed by operations</li> <li>• Gradual investment in low carbon projects and businesses</li> <li>• Purchasing and retaining renewable energy credits and selective investment in nature-based solutions and offsets</li> </ul> <p>In September 2022, a new study carried out by Guidehouse, an independent consultant engaged by Enbridge Gas was released.</p> <p>The Pathways to Net Zero Emissions for Ontario study looks at two ways Ontario’s energy system could achieve its net zero emissions goals by 2050: a wide-scale electrification</p>

		<p>approach or a diversified approach that balances electrification with the use of renewable natural gas, hydrogen, and natural gas with carbon capture.</p> <p>The study concludes that the diversified approach is the most cost-effective, reliable and resilient way to help Ontario meet its greenhouse gas emission targets by 2050.</p>
<p>4.0 Archaeological</p>		
<p>Comment 15</p>	<p>We understand that the Stage 2 archaeological assessment is ongoing. We have been participating by sending Archaeological Field Liaisons and expect to continue to do so.</p>	<p>That is correct. Thank you for your participation. We will continue to provide opportunities for COTTFN's Archaeological Field Liaisons to participate.</p>

Type	Date	From	To	Ecology/Archaeology	Subject Matter
Email	16-Mar-22	AECOM	Caldwell First Nation	Archaeology	The AECOM representative sent the First Nation representative an invitation to participate in the Stage 2 Archaeological Assessment (AA) of the Enbridge Gas Panhandle Regional Expansion Project (Project) in Essex County and western Chatham-Kent this spring/summer. The AECOM representative advised the First Nation representative(s) that they would like to get any necessary agreements in place so they can compensate the Nation for their participation in the field work. The AECOM representative also advised that if the First Nation was unable to send a representative to join the field work that they would provide them with a copy of the Stage 2 AA report for their review once it has been completed.
Email	16-Mar-22	Caldwell First Nation	AECOM	Archaeology	The Caldwell First Nation representative advised the AECOM representative of the Nation's Protocols for Engagement and Consultation and recommended that the AECOM representative review these Protocols to allow the parties to work toward meaningful engagement.
Email	16-Mar-22	AECOM	Caldwell First Nation	Ecology	The AECOM representative advised the First Nation representative(s) that they would be completing some preliminary Species at Risk (SAR) habitat assessments (snake and turtle overwintering habitat and nesting habitat identification) for the Project over the next couple of weeks and invited the Nation to participate. The AECOM representative advised the First Nation representative(s) that they would like to get any necessary agreements in place so they can compensate the Nation for their participation in the field work. The AECOM representative also advised that if the First Nation was unable to send a representative to join the field work that they would share their findings for the Nation's review once it has been completed.
Email	16-Mar-22	Caldwell First Nation	AECOM	Ecology	The Caldwell First Nation representative advised the AECOM representative of the Nation's Protocols for Engagement and Consultation and recommended that the AECOM representative review these Protocols to allow the parties to work toward meaningful engagement.
Email	16-Mar-22	AECOM	Chippewas of the Thames First Nation	Archaeology	The AECOM representative sent the First Nation representative an invitation to participate in the Stage 2 AA of the Project in Essex County and western Chatham-Kent this spring/summer. The AECOM representative advised the First Nation representative(s) that they would like to get any necessary agreements in place so they can compensate the Nation for their participation in the field work. The AECOM representative also advised that if the First Nation was unable to send a representative to join the field work that they would provide them with a copy of the Stage 2 AA report for their review once it has been completed.
Email	16-Mar-22	AECOM	Chippewas of the Thames First Nation	Archaeology	The AECOM representative advised the First Nation representatives that they had received an out of office from one of the Nation's representative so they re-sent the invitation to participate in the Stage 2 AA to different representatives of the Nation.

Type	Date	From	To	Ecology/Archaeology	Subject Matter
Email	16-Mar-22	AECOM	Chippewas of the Thames First Nation	Ecology	The AECOM representative advised the First Nation representative(s) that they would be completing some preliminary Species at Risk (SAR) habitat assessments (snake and turtle overwintering habitat and nesting habitat identification) for the Project over the next couple of weeks and invited the Nation to participate. The AECOM representative advised the First Nation representative(s) that they would like to get any necessary agreements in place so they can compensate the Nation for their participation in the field work. The AECOM representative also advised that if the First Nation was unable to send a representative to join the field work that they would share their findings for the Nation's review once it has been completed.
Email	16-Mar-22	AECOM	Chippewas of Kettle and Stony Point First Nation	Ecology	The AECOM representative advised the First Nation representative(s) that they would be completing some preliminary Species at Risk (SAR) habitat assessments (snake and turtle overwintering habitat and nesting habitat identification) for the Project over the next couple of weeks and invited the Nation to participate. The AECOM representative advised the First Nation representative(s) that they would like to get any necessary agreements in place so they can compensate the Nation for their participation in the field work. The AECOM representative also advised that if the First Nation was unable to send a representative to join the field work that they would share their findings for the Nation's review once it has been completed.
Email	16-Mar-22	AECOM	Chippewas of Kettle and Stony Point First Nation	Archaeology	The AECOM representative sent the First Nation representative an invitation to participate in the Stage 2 AA of the Project in Essex County and western Chatham-Kent this spring/summer. The AECOM representative advised the First Nation representative(s) that they would like to get any necessary agreements in place so they can compensate the Nation for their participation in the field work. The AECOM representative also advised that if the First Nation was unable to send a representative to join the field work that they would provide them with a copy of the Stage 2 AA report for their review once it has been completed.
Email	16-Mar-22	AECOM	Walpole Island First Nation	Archaeology	The AECOM representative sent the First Nation representative an invitation to participate in the Stage 2 AA of the Project in Essex County and western Chatham-Kent this spring/summer. The AECOM representative advised the First Nation representative(s) that they would like to get any necessary agreements in place so they can compensate the Nation for their participation in the field work. The AECOM representative also advised that if the First Nation was unable to send a representative to join the field work that they would provide them with a copy of the Stage 2 AA report for their review once it has been completed.



Type	Date	From	To	Ecology/Archaeology	Subject Matter
Email	16-Mar-22	AECOM	Walpole Island First Nation	Ecology	The AECOM representative advised the First Nation representative(s) that they would be completing some preliminary Species at Risk (SAR) habitat assessments (snake and turtle overwintering habitat and nesting habitat identification) for the Project over the next couple of weeks and invited the Nation to participate. The AECOM representative advised the First Nation representative(s) that they would like to get any necessary agreements in place so they can compensate the Nation for their participation in the field work. The AECOM representative also advised that if the First Nation was unable to send a representative to join the field work that they would share their findings for the Nation's review once it has been completed. SAR habitat assessment.
Email	16-Mar-22	AECOM	Delaware Nation	Archaeology	The AECOM representative sent the First Nation representative an invitation to participate in the Stage 2 AA of the Project in Essex County and western Chatham-Kent this spring/summer. The AECOM representative advised the First Nation representative(s) that they would like to get any necessary agreements in place so they can compensate the Nation for their participation in the field work. The AECOM representative also advised that if the First Nation was unable to send a representative to join the field work that they would provide them with a copy of the Stage 2 AA report for their review once it has been completed.
Email	16-Mar-22	AECOM	Delaware Nation	Ecology	The AECOM representative advised the First Nation representative(s) that they would be completing some preliminary Species at Risk (SAR) habitat assessments (snake and turtle overwintering habitat and nesting habitat identification) for the Project over the next couple of weeks and invited the Nation to participate. The AECOM representative advised the First Nation representative(s) that they would like to get any necessary agreements in place so they can compensate the Nation for their participation in the field work. The AECOM representative also advised that if the First Nation was unable to send a representative to join the field work that they would share their findings for the Nation's review once it has been completed. SAR habitat assessment.
Email	16-Mar-22	AECOM	Oneida Nation of the Thames	Archaeology	The AECOM representative sent the First Nation representative an invitation to participate in the Stage 2 AA of the Project in Essex County and western Chatham-Kent this spring/summer. The AECOM representative advised the First Nation representative(s) that they would like to get any necessary agreements in place so they can compensate the Nation for their participation in the field work. The AECOM representative also advised that if the First Nation was unable to send a representative to join the field work that they would provide them with a copy of the Stage 2 AA report for their review once it has been completed.

Type	Date	From	To	Ecology/Archaeology	Subject Matter
Email	16-Mar-22	AECOM	Oneida Nation of the Thames	Ecology	The AECOM representative advised the First Nation representative(s) that they would be completing some preliminary Species at Risk (SAR) habitat assessments (snake and turtle overwintering habitat and nesting habitat identification) for the Project over the next couple of weeks and invited the Nation to participate. The AECOM representative advised the First Nation representative(s) that they would like to get any necessary agreements in place so they can compensate the Nation for their participation in the field work. The AECOM representative also advised that if the First Nation was unable to send a representative to join the field work that they would share their findings for the Nation's review once it has been completed. SAR habitat assessment
Email	16-Mar-22	AECOM	Aamjiwnaang First Nation	Ecology	The AECOM representative advised the First Nation representative(s) that they would be completing some preliminary Species at Risk (SAR) habitat assessments (snake and turtle overwintering habitat and nesting habitat identification) for the Project over the next couple of weeks and invited the Nation to participate. The AECOM representative advised the First Nation representative(s) that they would like to get any necessary agreements in place so they can compensate the Nation for their participation in the field work. The AECOM representative also advised that if the First Nation was unable to send a representative to join the field work that they would share their findings for the Nation's review once it has been completed.
Email	16-Mar-22	AECOM	Aamjiwnaang First Nation	Archaeology	The AECOM representative sent the First Nation representative an invitation to participate in the Stage 2 Archaeological Assessment (AA) of the Enbridge Gas Panhandle Regional Expansion Project (Project) in Essex County and western Chatham-Kent this spring/summer. The AECOM representative advised the First Nation representative(s) that they would like to get any necessary agreements in place so they can compensate the Nation for their participation in the field work. The AECOM representative also advised that if the First Nation was unable to send a representative to join the field work that they would provide them with a copy of the Stage 2 AA report for their review once it has been completed.
Email	18-Mar-22	Chippewas of Kettle and Stony Point First Nation	AECOM	Ecology	The First Nation representative advised the AECOM representative that they were compiling a list of trained monitors.

Type	Date	From	To	Ecology/Archaeology	Subject Matter
Email	21-Mar-22	AECOM	Caldwell First Nation	Ecology	The AECOM representative advised the First Nation representative(s) that they would be completing some preliminary Species at Risk (SAR) habitat assessments (snake and turtle overwintering habitat and nesting habitat identification) for the Project over the next couple of weeks and invited the Nation to participate. The AECOM representative advised the First Nation representative(s) that they would like to get any necessary agreements in place so they can compensate the Nation for their participation in the field work. The AECOM representative also advised that if the First Nation was unable to send a representative to join the field work that they would share their findings for the Nation's review once it has been completed.
Email	21-Mar-22	AECOM	Caldwell First Nation	Archaeology	The AECOM representative advised the First Nation representative that they would be completing the Stage 2 AA for the Project and invited the Nation to participate. The AECOM representative advised that they would provide compensation for the Nation's participation in the Project.
Email	21-Mar-22	Chippewas of the Thames First Nation	AECOM	Archaeology	The First Nation representative advised the AECOM representative that they should reach out to their Energy Consultation Coordinator regarding archaeological assessments.
Email	21-Mar-22	AECOM	Chippewas of the Thames First Nation	Archaeology	The AECOM representative advised the First Nation representative that they would continue to reach out to them to arrange archaeological fieldwork.
Email	21-Mar-22	Aamjiwnanng First Nation	AECOM	Archaeology	The Aamjiwnaang First Nation representative advised the AECOM representative they would be happy to participate in the Stage 2 AA field work for the Project.
Email	21-Mar-22	AECOM	Chippewas of Kettle and Stony Point First Nation	Ecology	The AECOM representative advised the First Nation representative(s) that they would be completing some preliminary Species at Risk (SAR) habitat assessments (snake and turtle overwintering habitat and nesting habitat identification) for the Project over the next couple of weeks and invited the Nation to participate. The AECOM representative advised the First Nation representative(s) that they would like to get any necessary agreements in place so they can compensate the Nation for their participation in the field work. The AECOM representative also advised that if the First Nation was unable to send a representative to join the field work that they would share their findings for the Nation's review once it has been completed.
Email	23-Mar-22	Chippewas of the Thames First Nation	AECOM	Archaeology/Ecology	The First Nation representative advised the AECOM representative that they had received notice of the Stage 2 AA and SAR habitat assessments and would like to participate. The First Nation representative advised they would send an agreement for AECOM's review.
Email	25-Mar-22	Chippewas of the Thames First Nation	AECOM	Archaeology/Ecology	The First Nation representative provided the AECOM representative with a draft agreement the Nation uses for archaeology and natural heritage work.

Type	Date	From	To	Ecology/Archaeology	Subject Matter
Email	4-Apr-22	AECOM	Caldwell First Nation	Archaeology	The AECOM representative emailed the First Nation representative to see if they had any questions or concerns regarding the archaeology work on the Project. The AECOM representative asked the First Nation representative let them know if they had a representative from the community who would like to participate in the fieldwork.
Email	4-Apr-22	AECOM	Walpole Island First Nation	Archaeology	The AECOM representative emailed the First Nation representative to see if they had any questions or concerns regarding the archaeology work on the Project. The AECOM representative asked the First Nation representative let them know if they had a representative from the community who would like to participate in the fieldwork.
Email	4-Apr-22	AECOM	Delaware Nation	Archaeology	The AECOM representative emailed the First Nation representative to see if they had any questions or concerns regarding the archaeology work on the Project. The AECOM representative asked the First Nation representative let them know if they had a representative from the community who would like to participate in the fieldwork.
Email	4-Apr-22	AECOM	Oneida Nation of the Thames	Archaeology	The AECOM representative emailed the First Nation representative to see if they had any questions or concerns regarding the archaeology work on the Project. The AECOM representative asked the First Nation representative let them know if they had a representative from the community who would like to participate in the fieldwork.
Email	5-Apr-22	Walpole Island First Nation	AECOM	Archaeology	The First Nation representative advised the AECOM representative that they would like to participate in the Project and would require an agreement to be signed.
Email	5-Apr-22	AECOM	Walpole Island First Nation	Archaeology	The AECOM representative advised the First Nation representative that they would send them a contract regarding their participation in the Stage 2 AA and advised that they agreed to their rates.
Email	5-Apr-22	AECOM	Chippewas of the Thames First Nation	Archaeology/Ecology	The AECOM representative provided the First Nation representative with a signed copy of the participation agreement for the Project.
Email	19-Apr-22	AECOM	Aamjiwnaang First Nation	Ecology	The AECOM representative advised the First Nation representative that they would be completing the Aquatic habitat assessments for the Project starting on April 25 until April 29 and the week of May 2 until May 6 as needed and invited the First Nation representative to participate in these surveys. The AECOM representative advised the First Nation representative that they would share their findings for the Nation's review if they are not able to participate.
Email	19-Apr-22	AECOM	Chippewas of Kettle and Stony Point First Nation	Ecology	The AECOM representative advised the First Nation representative that they would be completing the Aquatic habitat assessments for the Project starting on April 25 until April 29 and the week of May 2 until May 6 as needed and invited the First Nation representative to participate in these surveys. The AECOM representative advised the First Nation representative that they would share their findings for the Nation's review if they are not able to participate.
Email	19-Apr-22	Chippewas of Kettle and Stony Point First Nation	AECOM	Ecology	The First Nation representative advised the AECOM representative that they had someone who may be able to participate in the Aquatic habitat assessments.

Type	Date	From	To	Ecology/Archaeology	Subject Matter
Email	19-Apr-22	AECOM	Walpole Island First Nation	Ecology	The AECOM representative advised the First Nation representative that they would be completing the Aquatic habitat assessments for the Project starting on April 25 until April 29 and the week of May 2 until May 6 as needed and invited the First Nation representative to participate in these surveys. The AECOM representative advised the First Nation representative that they would share their findings for the Nation's review if they are not able to participate.
Email	19-Apr-22	AECOM	Delaware Nation	Ecology	The AECOM representative advised the First Nation representative that they would be completing the Aquatic habitat assessments for the Project starting on April 25 until April 29 and the week of May 2 until May 6 as needed and invited the First Nation representative to participate in these surveys. The AECOM representative advised the First Nation representative that they would share their findings for the Nation's review if they are not able to participate.
Email	19-Apr-22	AECOM	Oneida Nation of the Thames	Ecology	The AECOM representative advised the First Nation representative that they would be completing the Aquatic habitat assessments for the Project starting on April 25 until April 29 and the week of May 2 until May 6 as needed and invited the First Nation representative to participate in these surveys. The AECOM representative advised the First Nation representative that they would share their findings for the Nation's review if they are not able to participate.
Email	19-Apr-22	AECOM	Aamjiwnaang First Nation	Ecology	The AECOM representative advised the Aamjiwnaang First Nation representative that they had a team of ecologists going out to do some Aquatic Habitat Assessments at the Project starting the week of April 25 and asked whether the Nation's representative would be interested in joining. The AECOM representative advised that they would share their findings once complete, if the Nation is unable to send a representative to participate in the surveys.
Email	21-Apr-22	Aamjiwnaang First Nation	AECOM	Ecology	The Aamjiwnaang First Nation representative advised the AECOM representative that they would only be able to attend evening sessions for the Aquatic habitat assessments for the Project. The First Nation representative asked if any of the studies would be taking place during the evening.
Email	29-Apr-22	Oneida Nation of the Thames	AECOM	Ecology	The First Nation representative advised the AECOM representative that they had 6 participants taking part in an archaeological monitoring field course and they would complete the training by the end of next week. Otherwise, the First Nation representative would have liked to have sent a monitor to participate. The First Nation representative asked that AECOM share the findings of the study. Aquatic habitat assessments
Email	2-May-22	AECOM	Oneida Nation of the Thames	Ecology	The AECOM representative invited the First Nation representative and their staff to participate in training related to Fish community assessments.
Email	4-May-22	Oneida Nation of the Thames	AECOM	Ecology	The First Nation representative advised the AECOM representative that they would be having some reptile surveys completed over the next couple of months and were hoping the agreement with AECOM would cover these surveys as well.

Type	Date	From	To	Ecology/Archaeology	Subject Matter
Email	4-May-22	AECOM	Oneida Nation of the Thames	Ecology	The AECOM representative advised the First Nation representative about the agreement related to the Project and advised that the fisheries component would be taking place over 3-5 days next week depending on weather and the number of fish caught.
Email	6-May-22	Aamjiwnaang First Nation	AECOM	Ecology	The Aamjiwnaang First Nation representative advised that an illness has affected their office over the last 2 weeks and they missed the AECOM representative's email inviting them to participate in the Aquatic habitat assessments. The Aamjiwnaang First Nation representative asked the AECOM representative to share the findings once complete.
Phone	6-May-22	AECOM	Aamjiwnaang First Nation	Ecology	Aquatic habitat assessments and capacity to send monitor. Confirmed findings will be shared once complete.
Email	9-Jun-22	AECOM	Chippewas of the Thames First Nation	Archaeology	The AECOM representative advised the First Nation representative that the field work had been cancelled for the day.
Email	9-Jun-22	Chippewas of the Thames First Nation	AECOM	Archaeology	The First Nation representative advised the AECOM representative that they would try to send a field liaison tomorrow.
Email	9-Jun-22	Chippewas of the Thames First Nation	AECOM	Archaeology	The First Nation representative advised they would not be able to send a field liaison to site due to capacity issues.
Email	29-Jul-22	AECOM	Caldwell First Nation	Archaeology	The AECOM representative advised the First Nation representative that they would be completing two stages of archaeology at the same time and they would be heading back to the field August 2. The AECOM representative provided details of the field work and meeting locations.
Email	29-Jul-22	Caldwell First Nation	AECOM	Archaeology	The First Nation representative emailed the AECOM representative to advise that they wanted to participate in the fieldwork and sent AECOM a copy of their field participation agreement for review.
Email	29-Jul-22	AECOM	Chippewas of the Thames First Nation	Archaeology	The AECOM representative advised the First Nation representative that they would be completing two stages of archaeology at the same time and they would be heading back to the field August 2. The AECOM representative provided details of the field work and meeting locations.
Email	29-Jul-22	Chippewas of the Thames First Nation	AECOM	Archaeology	The First Nation representative advised the AECOM representative that they would have a field liaison on the Stage 3 site for August 2, 2022 and advised they are currently working on a field liaison to attend the Stage 2 site.
Email	29-Jul-22	Chippewas of the Thames First Nation	AECOM	Archaeology	The First Nation representative requested the Field Director's name and contact for the Stage 3 AA and Stage 2 AA.
Email	29-Jul-22	AECOM	Chippewas of the Thames First Nation	Archaeology	The AECOM representative provided the First Nation representative with the supervisor contact information for the Stage 2 and 3 AA.
Email	29-Jul-22	AECOM	Chippewas of the Thames First Nation	Archaeology	The AECOM representative advised that they are heading back out to the Project August 2 to complete the Stage 2 and 3 AA.
Email	29-Jul-22	Chippewas of the Thames First Nation	AECOM	Archaeology	The First Nation representative asked the AECOM representative about the Stage 3 AA and Stage 2 AA and how many days each project would be.
Email	29-Jul-22	AECOM	Aamjiwnanng First Nation	Archaeology	The AECOM representative advised the Aamjiwnaang First Nation representative that they would be completing Stage 2 and Stage 3 field work for the Project. The AECOM representative provided the location of the meeting place for the field work.

Type	Date	From	To	Ecology/Archaeology	Subject Matter
Email	29-Jul-22	AECOM	Chippewas of Kettle and Stony Point First Nation	Archaeology	The AECOM representative advised the Aamjiwnaang First Nation representative that they would be completing Stage 2 and Stage 3 field work for the Project. The AECOM representative provided the location of the meeting place for the field work.
Email	29-Jul-22	AECOM	Walpole Island First Nation	Archaeology	The AECOM representative advised the Aamjiwnaang First Nation representative that they would be completing Stage 2 and Stage 3 field work for the Project. The AECOM representative provided the location of the meeting place for the field work.
Email	1-Aug-22	Aamjiwnanng First Nation	AECOM	Archaeology	The First Nation representative advised the AECOM representative that they would send a representative to participate in the Stage 3 and Stage 2 field work.
Email	2-Aug-22	AECOM	Caldwell First Nation	Archaeology	The AECOM representative provided the First Nation representative with a signed copy of the field participation agreement.
Email	2-Aug-22	Caldwell First Nation	AECOM	Archaeology	The First Nation representative provided the AECOM representative with an agreement to participate in the field work for AECOM's review.
Email	5-Aug-22	Chippewas of the Thames First Nation	AECOM	Archaeology	The First Nation representative asked the AECOM representative about the status of the Stage 3 AA and Stage 2 AA sites.
Email	5-Aug-22	AECOM	Chippewas of the Thames First Nation	Archaeology	The AECOM representative advised the First Nation representative that the historic Stage 3 site is complete and that the Indigenous Stage 3 is still ongoing. The AECOM representative advised the First Nation representative that they would be returning next week and would let them know when they plan to return.
Email	19-Aug-22	AECOM	Chippewas of the Thames First Nation	Archaeology	The AECOM representative advised the Aamjiwnaang First Nation representative that they would be continuing with the stage 3 field work and some stage 2 fieldwalking and possible test pitting a couple parcels later in the week and provided details on the meeting location and time.
Email	19-Aug-22	AECOM	Aamjiwnanng First Nation	Archaeology	The AECOM representative advised the Aamjiwnaang First Nation representative that they would be continuing with the stage 3 field work and some stage 2 fieldwalking and possible test pitting a couple parcels later in the week and provided details on the meeting location and time.
Email	19-Aug-22	AECOM	Caldwell First Nation	Archaeology	The AECOM representative advised the First Nation representative that they would be continuing with the Stage 3 and some Stage 2 fieldwalking and possibly test pitting a couple parcels later in the week and provided details on the meeting location and time.
Email	19-Aug-22	AECOM	Walpole Island First Nation	Archaeology	The AECOM representative advised the First Nation representative that they would be continuing with the Stage 3 and some Stage 2 fieldwalking and possibly test pitting a couple parcels later in the week and provided details on the meeting location and time.
Email	20-Aug-22	Aamjiwnanng First Nation	AECOM	Archaeology	The Aamjiwnaang First Nation representative advised the AECOM representative that they would be sending a representative to participate in the Stage 3 field work.
Email	21-Aug-22	Chippewas of the Thames First Nation	AECOM	Archaeology	The First Nation representative advised the AECOM representative that they would be sending a field liaison representative to participate on behalf of the Nation in the Stage 3 field work.

Type	Date	From	To	Ecology/Archaeology	Subject Matter
Email	30-Aug-22	Caldwell First Nation	AECOM	Archaeology	The First Nation representative advised the AECOM representative that the Nation had signed a Field Participation Agreement with Enbridge Gas and could deploy field liaisons to the Project. The First Nation representative requested that the AECOM representative provide them with updates on fieldwork, relevant materials and their fieldwork schedule so they could arrange for field liaison representatives to participate.
Email	30-Aug-22	AECOM	Caldwell First Nation	Archaeology	The AECOM representative advised the First Nation representative that they had completed the Stage 3 AA for the Project. The AECOM representative attached a map and photo of one of the units along the north line of the site and advised that all counts on the map reflect Onondaga flakes. No tools, diagnostics, pottery or features were found. The AECOM representative advised that they would notify the First Nation representative when they headed back out for further work.
Email	30-Sep-22	AECOM	Chippewas of Kettle and Stony Point First Nation	Archaeology	The AECOM representative advised the First Nation representative that the archaeological team will be heading out on October 3 to conduct some Stage 2 test pitting for the Project.
Email	30-Sep-22	Chippewas of Kettle and Stony Point First Nation	AECOM	Archaeology	The First Nation representative advised the AECOM representative that they appreciated the notification about the archaeological work on the Project and that they are still finalizing contract details. The First Nation representative asked the AECOM representative about what the Project work would look like over the next few months in terms of days in the field.
Email	30-Sep-22	AECOM	Chippewas of Kettle and Stony Point First Nation	Archaeology	The AECOM representative advised the First Nation representative that they are not sure what the field work will look like, since they are discussing with the Ministry whether some Stage 4 AA work would need to be completed. The AECOM representative advised that Enbridge Gas is planning on directionally drilling the area where a historic scatter and Indigenous artifacts were located, which would normally go to a Stage 4 AA. However, since the plan is to do directional drilling, the site may not be impacted. The AECOM representative advised they would keep the First Nation representative updated and informed of any upcoming field work.
Email	30-Sep-22	Chippewas of Kettle and Stony Point First Nation	AECOM	Archaeology	The First Nation representative advised the AECOM representative that they would finalize contract details in the next week or two and that they would be sending a monitor to participate in the Stage 2 AA.





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To: Chippewas of Kettle and Stony Point First Nation

Date: August 8, 2022

Project #: 60665521

From: Kristan Washburn (AECOM)

Johanna Perz (AECOM)

Nicholas Allen (AECOM)

cc: Evan Tomek (Enbridge)

# Memorandum

Subject: **Enbridge – Panhandle Regional Expansion Project – Natural Heritage Background Review and Field Investigations Technical Memorandum**

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## 1. Project Description

AECOM Canada Ltd. (hereafter referred to as AECOM) has been retained by Enbridge Gas Inc. (Enbridge Gas) to complete an Environmental Report (ER) and to assess the potential environmental and socio-economic effects of increasing the capacity of the Panhandle Transmission System, which serves residential, commercial, industrial, greenhouse and power generation customers in Windsor, Essex County and Chatham-Kent. The Project includes the construction of the following:

- Panhandle Loop: Approximately 19 kilometres (km) of new pipeline which loops – or parallels – the existing 20-inch Panhandle Pipeline. The new pipeline will be 36 inches in diameter and located adjacent to an existing pipeline corridor from approximately Richardson Side Road in the Municipality of Lakeshore, and Enbridge Gas’ existing Dover Transmission Station in the Municipality of Chatham-Kent.
- Leamington Interconnect: Approximately 12 km of new pipeline, 16 inches in diameter, adjacent to or within an existing road allowance on public or private property to connect the existing Leamington North Lines to both the Kingsville East Line and Leamington North Reinforcement Line, located in the Municipality of Lakeshore, Town of Kingsville, and the Municipality of Leamington.

The ER was prepared in accordance with the Ontario Energy Board’s (OEB) *Environmental Guidelines* (2016). The *Environmental Guidelines* are designed to provide direction to proponents in the preparation of an ER and to assist in determining how to identify, manage and document potential effects associated with their projects on the environment (OEB, 2016). The ER was submitted to the OEB, along with Enbridge Gas’ Leave-to-Construct application for the Panhandle Regional Expansion Project, in April 2022. OEB review and approval to proceed is required prior to construction. Proposed construction dates for the Panhandle Loop and Leamington Interconnect are 2023 and 2024, respectively.

The following memorandum documents the methods and results of the natural heritage background information review and field investigations completed in 2022 to address Chippewas of Kettle and Stony Point First Nation



as presented in the Environmental Report Review (Vertex Professional Services Ltd., 2022). The Study Area of the Panhandle Loop (Panhandle Study Area) and Leamington Interconnect (Leamington Study Area) includes the Preferred Routes and an additional 120 m to allow for the identification of adjacent lands as defined by the Natural Heritage Reference Manual (MNR, 2010).

## 1.1 Preferred Route

The Preferred Route for the Panhandle Loop has the pipeline travelling in a semi-diagonal orientation southwest from the Dover Transmission Station in the Municipality of Chatham-Kent, paralleling the existing 20-inch Panhandle Pipeline to a new proposed transmission station at approximately Richardson Side Road in the Municipality of Lakeshore.

The Preferred Route for the Leamington Interconnect travels adjacent to or within an existing road allowance on public or private property. The pipeline travels west from the existing Leamington North Lines along Mersea Road 10 before tying into the existing Leamington North Reinforcement Line. The pipeline continues to travel north on County Road 31, turns west, and travels along County Road 8 before tying into the existing Kingsville East Line. The pipeline would travel adjacent to or within an existing road allowance on public or private property.

The Preferred Routes for the Panhandle Loop and Leamington Interconnect are currently illustrated within approximate locations. Enbridge Gas is currently undertaking detailed design to refine the exact locations of the running lines, permanent easements, Temporary Land Use (TLU) requirements and road/watercourse crossing methods. The detailed design process will be influenced by supplemental studies (including environmental studies) and site-specific requests from landowners and agencies. In general, the evaluation has sought to avoid socio-economic features and sensitive natural features to the extent possible.

## 2. Background Information Review

A summary of background information as documented in the Panhandle Regional Expansion Project Environmental Report (AECOM, 2022) is provided below.

### 2.1 Methods

A background information review was completed using the secondary sources listed in **Table 2-1**.

**Table 2-1: Background Information Sources**

Information Source	Website or Contact Information	Date of Background Review
Land Information Ontario	<a href="https://www.ontario.ca/page/land-information-ontario">https://www.ontario.ca/page/land-information-ontario</a>	February 2, 2022
Natural Heritage Information Centre (NHIC)	<a href="https://www.ontario.ca/page/make-natural-heritage-area-map">https://www.ontario.ca/page/make-natural-heritage-area-map</a>	February 2, 2022
Ontario Breeding Bird Atlas (OBBA)	<a href="http://www.birdsontario.org/atlas/index.jsp?lang=en%20">http://www.birdsontario.org/atlas/index.jsp?lang=en%20</a>	February 2, 2022
Ontario Butterfly Atlas (OBA)	<a href="https://www.ontarioinsects.org/atlas/">https://www.ontarioinsects.org/atlas/</a>	February 2, 2022
eBird	<a href="https://ebird.org/home">https://ebird.org/home</a>	February 2, 2022
iNaturalist	<a href="https://www.inaturalist.org/">https://www.inaturalist.org/</a>	February 2, 2022
Ontario Reptile and Amphibian	<a href="https://www.ontarioinsects.org/herp/">https://www.ontarioinsects.org/herp/</a>	February 2, 2022

Information Source	Website or Contact Information	Date of Background Review
Atlas (ORAA)		
Bat Conservation International (BCI)	<a href="http://www.batcon.org/">http://www.batcon.org/</a>	February 2, 2022
Fisheries and Oceans Canada (DFO) Aquatic Species at Risk Maps	<a href="https://www.dfo-mpo.gc.ca/species-especies/sara-lep/map-carte/index-eng.html">https://www.dfo-mpo.gc.ca/species-especies/sara-lep/map-carte/index-eng.html</a>	February 2, 2022
Ministry of Natural Resources and Forestry (MNR) Fish Online	<a href="https://www.livestockapplications.lrc.gov.on.ca/fishonline">https://www.livestockapplications.lrc.gov.on.ca/fishonline</a>	February 2, 2022
Ministry of Environment MECP Species at Risk (SAR) Range Maps	<a href="https://www.ontario.ca/page/species-risk-ontario#section-0">https://www.ontario.ca/page/species-risk-ontario#section-0</a>	February 2, 2022

## 2.2 Results

### 2.2.1 Aquatic Features

#### 2.2.1.1 Surface Water

Based on air photo interpretation, the Study Areas are within an area of dynamic agriculturally dominant land use and thus there is an extensive network of field and field edge drainage ditches designed to lower water levels in the surrounding agricultural fields. These drainage ditches and flow conveyance features can potentially contain or support fish habitat but may periodically change configuration through regular farming and maintenance practices.

#### Panhandle Loop

There are 42 watercourse crossings in the Panhandle Loop based on a desktop review of relevant aerial imagery and watercourse mapping and several site visits. They include 20 named drains including Jeannettes Creek, Baptiste Creek, and Thames River as well as 22 unnamed drains. Ultimately, these watercourses drain to the Thames River or Lake St. Clair. These drains and watercourses are shown in relation to the route in **Figure 2**.

For more information regarding fish and fish habitat, refer to **Section 2.2.1.2** below.

#### Leamington Interconnect

Based on a desktop review of relevant aerial imagery and watercourse mapping, there are 11 watercourse crossings along the Leamington Interconnect. These drains and watercourses are shown in relation to the Leamington Interconnect on **Figure 1**. Aside from Hollingsworth Drain which flows North for 3 km before joining Duck Creek and flowing 10 km into Lake St. Clair all the other drains flow and converge with the Ruscom River or are branches of the Ruscom River themselves. Some drains flow for up to 7.5 km before meeting with the Ruscom River.

DFO drainage classification was reviewed to assess habitat sensitivity within the drains that transect the Leamington Interconnect. For this project, reference to drainage classification is intended to infer if a drain is classified as direct fish habitat and if sensitive habitat is present in the drain. All the municipal drains within the Leamington Interconnect are categorized as Class F suggesting that the watercourse is intermittent. There are three crossings of the Ruscom River, classified as Class C, which indicates spring spawning fish with no sensitive species. There was no other publicly available information regarding the fish communities.

For more information regarding fish and fish habitat, refer to **Section 2.2.1.2** below

**2.2.1.2 Fish and Fish Habitat**

The DFO drainage classification of each watercourse was reviewed to assess habitat sensitivity within the drains that transect the Panhandle Loop and Leamington Interconnect. Drainage classification is determined by a combination of flow periodicity (i.e., permanent vs. intermittent), thermal regime, fish community assemblage, and time since last clean out, as shown in **Table 2-2** (DFO, 2017). The classification system indicates fish habitat sensitivity in the drain and the level of approval required for drainage maintenance and operations under the Drainage Act. Based on that information a Restricted Activity Timing Window is selected for the watercourse. This means that no in-water work may occur during those times; a spring restricted activity window means all work has to take place before or after the spring, typically March to July.

For this project, reference to drainage classification is intended to infer if a drain is classified as direct fish habitat and if sensitive habitat is present in the drain. In addition, the LIO database published by the Ministry of Northern Development, Mines, Natural Resources, and Forestry (MNRF) was used to develop fish community assemblages and thermal regimes.

**Table 2-2: Summary of DFO Drain Classification Types**

Class	Flow	Restricted Activity Timing Window <sup>1</sup>	Species	Present in Study Areas
A	Permanent	Fall or Combination Spring/Fall	No sensitive fish species present	0
B	Permanent	Spring	Sensitive fish species present	0
C	Permanent	Spring	No sensitive fish species present	2
D	Permanent	Fall or Combination Spring/Fall	Sensitive fish species present	2
E	Permanent	Spring	Sensitive fish species present	3
F	Intermittent	Periods of Flow <sup>4</sup>	Not Applicable	5
Unrated (NR)	Unknown	Unknown	Unknown	39

Source: DFO (2017)

1. Restricted activity timing windows vary by geographic location and fish species present.
2. Time since last cleanout is no longer collected as part of the Drain Classification Project as per a decision made by the Drainage Action Working Group (DAWG) in 2010. No new Class B drains will be assigned and any existing Class B drains will not change classification unless new data becomes available to support the reclassification.
3. If work was to occur during a period of flow (e.g., spring), a site specific review will be required.
4. Flow is defined as the movement of water between two points.
5. For details, see Appendix 10 – Sensitive Fish Species List.
6. If there is data on flow and fish species for the drain, a Class Authorization may be issued; otherwise, a site-specific review will be required.

**2.2.1.3 Aquatic Species at Risk**

**2.2.1.3.1 Panhandle Loop - Aquatic SAR**

According to the DFO Online Aquatic SAR Mapping Tool (2022), 11 watercourses within the Study Area have been identified as providing habitat for aquatic SAR, including critical habitat as per the Species at Risk Act (SARA). Species listed as Special Concern under Schedule 1 of SARA receive management initiatives under SARA but do not receive individual or habitat protection. Additionally, species listed as Special Concern under the ESA are not provided species or habitat protection under the provincial legislation. All the Threatened and Endangered species within the Study Area receive protection under both the provincial ESA and federal SARA.

This section focuses on watercourses that contain provincially or federally listed SAR. While all of the water crossings within the Panhandle Loop and Leamington Interconnect have the potential to contain fish habitat, the additional concerns around SAR warrant the extra detail and focus of this section. Fish community sampling and fish/mussel habitat assessment were completed at the proposed watercourse crossings in 2022.

If a watercourse containing provincially or federally listed SAR will be affected by the project (e.g., open-cutting SAR Habitat for the pipeline installation), additional correspondence with agencies will be required. The DFO may require a *Fisheries Act* Authorization for the Harmful Alteration, Disruption or Destruction (HADD) to fish habitat or activities that result in the death of fish. An authorization would include constructing compensation habitat to offset for potential impacts to fish and fish habitat. Additionally, consultation with MECP to determine permitting requirements under the ESA will likely be required for any proposed impacts to a watercourse that provides habitat for aquatic SAR. Potential permitting requirements could either come as mitigation advice that would support avoidance or contravention of the ESA, a notification of activity under O.Reg. 242/08, or a permit under Section 17(2)(c).

The following watercourses have been identified to contain or potentially contain aquatic SAR:

#### **Unnamed Non-Flowing Waterbody 002 (SC-07)**

This 0.46 acre pond is an offline waterbody with no surface connection to the surrounding watercourses and is assumed to be used or developed for irrigation. There is no publicly available information about this pond regarding thermal classification, but a warmwater regime is assumed. This pond is included as a SAR waterbody because several Lilliput (*Toxolasma parvum* – END under SARA, THR under ESA) mussel shells were found along the shoreline, likely predated by a local muskrat.

#### **Baptiste Creek (SC-19)**

Baptiste Creek flows West towards to its confluence with the Thames River 1.5 km downstream of the crossing. Several sections of the creek appear to have been re-aligned. While Baptiste Creek does not have a drain classification, it is a permanently flowing watercourse that provides fish habitat for sensitive fish species which would likely generate a Class E characterization. Background information indicates that Baptiste Creek provides habitat for nine species of fish, including the Spotted Sucker, Mapleleaf, and Lilliput.

#### **Jeannettes Creek (SC-27)**

Jeannettes Creek flows North-west through agricultural land towards its confluence with the Thames River 2 km downstream of the crossings. The proposed watercourse crossing of Jeannettes Creek is located approximately 2 km upstream from its confluence with the Thames River. Several sections of the watercourse appear to have been aligned historically, and the creek becomes markedly wider after crossing under County Road 7 and receiving inputs from two agricultural drains. Jeannettes Creek is categorized as Class E, meaning it has a permanent flow regime, is direct fish habitat, and has sensitive fish species present. Jeannettes Creek contains 17 species, of which two are SAR species: Spotted Sucker (*Minytrema melanops* – SC under SARA and ESA) and Silver Lamprey (*Ichthyomyzon unicuspis* – SC under SARA and ESA).

#### **Thames River (SC-29)**

The Thames River watershed runs through agricultural lands in southwestern Ontario and drains to Lake St. Clair. The river is 273 km long and drains 5,285 square kilometres (km<sup>2</sup>) of land, making it the second-largest watershed in southwestern Ontario (UTRCA, 2017). Before its confluence with Lake St. Clair, numerous agricultural drains flow into the Thames River. LIO data indicates that the Thames River is a warmwater watercourse that supports a fish community assemblage of warmwater and coolwater species (MNR, 2022). The Thames River is classified as a Class E drain, meaning it has a permanent flow regime and provides fish

habitat for sensitive fish species. There are 66 species within the Thames River, of which 17 are SAR. The complete list of species and SAR is available in **Table 2-3**.

#### **Unnamed Trib to the Thames River 001 (SC-30)**

This unnamed tributary to the Thames River flows North-west towards the Thames at a very gentle gradient. The watercourse is classified as a Class E drain, meaning it has a permanent flow regime and provides fish habitat for sensitive fish species. There is no publicly available information about this drain regarding flow regime or thermal classification but a warmwater regime is assumed. This drain is mapped by DFO (2022) as containing Lake Chubsucker.

#### **Myers Pump Works Drain (SC-33)**

Myers Pump Works Drain flows North East towards McFarlane Relief Drain. The watercourse is unrated by the DFO with respect to drainage classification. There is no publicly available information about this drain regarding flow regime or thermal classification. This drain is mapped by DFO (2022) as containing Lake Chubsucker.

#### **Unnamed Trib to Myers Pump Works Drain 001 (SC-34)**

This unnamed tributary flows South-East towards Myers Pump Works Drain. The watercourse is unrated by the DFO with respect to drainage classification and there is no publicly available information about this drain regarding flow regime or thermal classification. According to DFO Aquatic SAR Online Mapping (2022), Lake Chubsucker have been identified within this watercourse.

#### **Unnamed Trib to Myers Pump Works Drain 002 (SC-35)**

This unnamed tributary flows South-East towards Myers Pump Works Drain. The watercourse is unrated by the DFO with respect to drainage classification and there is no publicly available information about this drain regarding flow regime or thermal classification. According to DFO Aquatic SAR Online Mapping (2022), Lake Chubsucker have been identified within this watercourse.

#### **Unnamed Trib to Myers Pump Works Drain 003 (SC-36)**

This unnamed tributary flows South-East towards Myers Pump Works Drain. The watercourse is unrated by the DFO with respect to drainage classification and there is no publicly available information about this drain regarding flow regime or thermal classification. According to DFO Aquatic SAR Online Mapping (2022), Lake Chubsucker have been identified within this watercourse.

#### **Unnamed Trib to Myers Pump Works Drain 004 (SC-37)**

This unnamed tributary flows South-East towards Myers Pump Works Drain. The watercourse is unrated by the DFO with respect to drainage classification and there is no publicly available information about this drain regarding flow regime or thermal classification. According to DFO Aquatic SAR Online Mapping (2022), Lake Chubsucker have been identified within this watercourse.

#### **McFarlane Relief Drain (SC-40)**

McFarlane Relief Drain flows North-West for 2.5 km from the crossing before it meets merges with Jacks Creek and then flows into Lake St. Clair. This watercourse is categorized as a municipal Class D drain meaning it is permanent, has a fall or fall and spring restriction window, and contains sensitive fish. McFarlane Relief Drain provides habitat for an assemblage of 28 warmwater and coolwater fish species (Table 2-3), several species of mussels, and is characterized overall as having a warmwater thermal regime. Additionally, DFO SAR mapping (2022) identified Lake Chubsucker (*Erimyzon sucetta* – Endangered (END) under SARA, Threatened (THR) under Endangered Species Act (ESA)) and the recently down-listed Mapleleaf mussel (*Quadrula quadrula* – Special Concern (SC) under SARA and ESA) within the watercourse.



**Table 2-3: Species at Risk Fish Communities within the Panhandle Loop**

Common Name	Scientific Name	SARA	ESA	Preferred Thermal Regime	Unnamed Non-Flowing Waterbody 002 (SC-07)	Baptiste Creek (SC-19)	Jeannettes Creek (SC-27)	Thames River (SC-29)	Unnamed Trib to the Thames River 001 (SC-30)	Myers Pump Works Drain (PSC21)	Unnamed Trib to Myers Pump Drain 001 (SC-34)	Unnamed Trib to Myers Pump Drain 002 (SC-35)	Unnamed Trib to Myers Pump Drain 003 (SC-36)	Unnamed Trib to Myers Pump Drain 004 (SC-37)	McFarlane Relief Drain (SC40)
<b>Black Bullhead</b>	<i>Ameiurus melas</i>	-	-	warmwater	-	-	X	-	-	-	-	-	-	-	X
<b>Black Crappie</b>	<i>Pomoxis nigromaculatus</i>	-	-	coolwater	-	X	-	-	-	-	-	-	-	-	X
<b>Black Redhorse</b>	<i>Moxostoma duquesnei</i>	THR	THR	warmwater	-	-	-	X	-	-	-	-	-	-	-
<b>Blackchin Shiner</b>	<i>Notropis heterodon</i>	NAR	NAR	coolwater	-	-	-	X	-	-	-	-	-	-	-
<b>Blackside Darter</b>	<i>Percina maculata</i>	-	-	coolwater	-	-	X	X	-	-	-	-	-	-	-
<b>Bluegill</b>	<i>Lepomis macrochirus</i>	-	-	warmwater	-	X	-	X	-	-	-	-	-	-	X
<b>Bluntnose Minnow</b>	<i>Pimephales notatus</i>	NAR	NAR	warmwater	-	-	X	X	-	-	-	-	-	-	-
<b>Bowfin</b>	<i>Amia calva</i>	-	-	warmwater	-	-	-	-	-	-	-	-	-	-	X
<b>Brook Silverside</b>	<i>Labidesthes sicculus</i>	NAR	NAR	warmwater	-	-	-	-	-	-	-	-	-	-	X
<b>Brook Stickleback</b>	<i>Culaea inconstans</i>	-	-	coolwater	-	-	-	X	-	-	-	-	-	-	-
<b>Brown Bullhead</b>	<i>Ameiurus nebulosus</i>	-	-	warmwater	-	-	-	-	-	-	-	-	-	-	X
<b>Central Mudminnow</b>	<i>Umbra limi</i>	-	-	coolwater	-	-	-	X	-	-	-	-	-	-	-
<b>Central Stoneroller</b>	<i>Campostoma anomalum</i>	NAR	NAR	coolwater	-	-	-	X	-	-	-	-	-	-	-
<b>Channel Catfish</b>	<i>Ictalurus punctatus</i>	-	-	warmwater	-	-	-	X	-	-	-	-	-	-	X
<b>Common Carp</b>	<i>Cyprinus carpio</i>	-	-	warmwater	-	-	X	X	-	-	-	-	-	-	X
<b>Common Shiner</b>	<i>Luxilus cornutus</i>	-	-	coolwater	-	-	-	X	-	-	-	-	-	-	-
<b>Creek Chub</b>	<i>Semotilus atromaculatus</i>	-	-	coolwater	-	-	X	X	-	-	-	-	-	-	-
<b>Eastern Sand Darter</b>	<i>Ammocrypta pellucida</i>	THR	THR	-	-	-	-	X	-	-	-	-	-	-	-
<b>Emerald Shiner</b>	<i>Notropis atherinoides</i>	-	-	coolwater	-	-	-	X	-	-	-	-	-	-	X
<b>Fallfish</b>	<i>Semotilus corporalis</i>	-	-	coolwater	-	-	-	X	-	-	-	-	-	-	-



Common Name	Scientific Name	SARA	ESA	Preferred Thermal Regime	Unnamed Non-Flowing Waterbody 002 (SC-07)	Baptiste Creek (SC-19)	Jeannettes Creek (SC-27)	Thames River (SC-29)	Unnamed Trib to the Thames River 001 (SC-30)	Myers Pump Works Drain (PSC21)	Unnamed Trib to Myers Pump Drain 001 (SC-34)	Unnamed Trib to Myers Pump Drain 002 (SC-35)	Unnamed Trib to Myers Pump Drain 003 (SC-36)	Unnamed Trib to Myers Pump Drain 004 (SC-37)	McFarlane Relief Drain (SC40)
Fantail Darter	<i>Etheostoma flabellare</i>	-	-	coolwater	-	-	-	x	-	-	-	-	-	-	-
Freshwater Drum	<i>Aplodinotus grunniens</i>	-	-	warmwater	-	-	-	x	-	-	-	-	-	-	x
Gizzard Shad	<i>Dorosoma cepedianum</i>	-	-	coolwater	-	x	x	x	-	-	-	-	-	-	x
Goldfish	<i>Carassius auratus</i>	-	-	warmwater	x	-	-	-	-	-	-	-	-	-	-
Golden Redhorse	<i>Moxostoma erythrurum</i>	NAR	NAR	warmwater	-	-	-	x	-	-	-	-	-	-	-
Gravel Chub	<i>Erimystax x-punctatus</i>	EXP	EXP	-	-	-	-	x	-	-	-	-	-	-	-
Green Sunfish	<i>Lepomis cyanellus</i>	NAR	NAR	warmwater	-	-	x	x	-	-	-	-	-	-	x
Greenside Darter	<i>Etheostoma blennioides</i>	NAR	NAR	warmwater	-	-	-	x	-	-	-	-	-	-	-
Hornyhead Chub	<i>Nocomis biguttatus</i>	NAR	NAR	coolwater	-	-	-	x	-	-	-	-	-	-	-
Iowa Darter	<i>Etheostoma exile</i>	-	-	coolwater	-	-	-	x	-	-	-	-	-	-	-
Johnny Darter	<i>Etheostoma nigrum</i>	-	-	coolwater	-	-	x	x	-	-	-	-	-	-	-
Lake Sturgeon	<i>Acipenser fulvescens</i>	END	END	coldwater	-	-	x	x	-	-	-	-	-	-	-
Lake Chubsucker	<i>Erimyzon sucetta</i>	END	THR	warmwater	-	-	-	x	X	x	-	x	x	x	x
Lake Whitefish	<i>Coregonus clupeaformis</i>	DD	-	coldwater	-	-	-	-	-	-	-	-	-	-	x
Largemouth Bass	<i>Micropterus salmoides</i>	-	-	warmwater	-	x	x	x	-	-	-	-	-	-	x
Logperch	<i>Percina caprodes</i>	-	-	warmwater	-	-	-	x	-	-	-	-	-	-	x
Longnose Dace	<i>Rhinichthys cataractae</i>	-	-	coolwater	-	-	-	x	-	-	-	-	-	-	-
Longnose Gar	<i>Lepisosteus osseus</i>	-	-	warmwater	-	-	-	-	-	-	-	-	-	-	x
Mimic Shiner	<i>Notropis volucellus</i>	-	-	warmwater	-	x	-	x	-	-	-	-	-	-	-
Mooneye	<i>Hiodon tergisus</i>	-	-	coolwater	-	-	-	x	-	-	-	-	-	-	-
Mottled Sculpin	<i>Cottus bairdii</i>	-	-	coolwater	-	-	-	x	-	-	-	-	-	-	-
Muskellunge (muskie)	<i>Esox masquinongy</i>	-	-	warmwater	-	-	-	x	-	-	-	-	-	-	-





Common Name	Scientific Name	SARA	ESA	Preferred Thermal Regime	Unnamed Non-Flowing Waterbody 002 (SC-07)	Baptiste Creek (SC-19)	Jeannettes Creek (SC-27)	Thames River (SC-29)	Unnamed Trib to the Thames River 001 (SC-30)	Myers Pump Works Drain (PSC21)	Unnamed Trib to Myers Pump Drain 001 (SC-34)	Unnamed Trib to Myers Pump Drain 002 (SC-35)	Unnamed Trib to Myers Pump Drain 003 (SC-36)	Unnamed Trib to Myers Pump Drain 004 (SC-37)	McFarlane Relief Drain (SC40)
Northern Hog Sucker	<i>Hypentelium nigricans</i>	-	-	warmwater	-	-	-	x	-	-	-	-	-	-	-
Northern Madtom	<i>Noturus stigmosus</i>	END	END	-	-	-	-	x	-	-	-	-	-	-	-
Northern Pike	<i>Esox lucius</i>	-	-	coolwater	-	-	x	-	-	-	-	-	-	-	x
Northern Sunfish	<i>Lepomis peltastes</i>	SC	SC	-	-	-	-	x	-	-	-	-	-	-	-
Pugnose Minnow	<i>Opsopoeodus emiliae</i>	THR	THR	-	-	-	-	x	-	-	-	-	-	-	-
Pumpkinseed	<i>Lepomis gibbosus</i>	-	-	warmwater	-	x	x	x	-	-	-	-	-	-	x
Quillback	<i>Carpiodes cyprinus</i>	-	-	coolwater	-	-	-	x	-	-	-	-	-	-	x
Rainbow Darter	<i>Etheostoma caeruleum</i>	-	-	coolwater	-	-	-	x	-	-	-	-	-	-	-
Redfin Shiner	<i>Lythrurus umbratilis</i>	NAR	NAR	-	-	-	x	-	-	-	-	-	-	-	-
River Chub	<i>Nocomis micropogon</i>	NAR	NAR	coolwater	-	-	-	x	-	-	-	-	-	-	-
River Redhorse	<i>Moxostoma carinatum</i>	SC	SC	-	-	-	-	x	-	-	-	-	-	-	-
Rock Bass	<i>Ambloplites rupestris</i>	-	-	coolwater	-	-	-	x	-	-	-	-	-	-	x
Rosyface Shiner	<i>Notropis rubellus</i>	NAR	NAR	warmwater	-	-	-	x	-	-	-	-	-	-	-
Sand Shiner	<i>Notropis stramineus</i>	-	-	warmwater	-	-	-	-	-	-	-	-	-	-	x
Shorthead Redhorse	<i>Moxostoma macrolepidotum</i>	-	-	warmwater	-	-	-	x	-	-	-	-	-	-	-
Silver Lamprey	<i>Ichthyomyzon unicuspis</i>	SC	SC	-	-	-	x	x	-	-	-	-	-	-	-
Silver Redhorse	<i>Moxostoma anisurum</i>	-	-	coolwater	-	-	-	x	-	-	-	-	-	-	-
Smallmouth Bass	<i>Micropterus dolomieu</i>	-	-	coolwater	-	-	-	x	-	-	-	-	-	-	-
Silver Chub	<i>Macrhybopsis storeriana</i>	END	THR	-	-	-	-	x	-	-	-	-	-	-	-
Silver Shiner	<i>Notropis photogenis</i>	THR	THR	-	-	-	-	x	-	-	-	-	-	-	-
Spotfin Shiner	<i>Cyprinella spiloptera</i>	-	-	warmwater	-	-	x	x	-	-	-	-	-	-	-
Spottail Shiner	<i>Notropis hudsonius</i>	-	-	coolwater	-	-	-	x	-	-	-	-	-	-	x



Common Name	Scientific Name	SARA	ESA	Preferred Thermal Regime	Unnamed Non-Flowing Waterbody 002 (SC-07)	Baptiste Creek (SC-19)	Jeannettes Creek (SC-27)	Thames River (SC-29)	Unnamed Trib to the Thames River 001 (SC-30)	Myers Pump Works Drain (PSC21)	Unnamed Trib to Myers Pump Drain 001 (SC-34)	Unnamed Trib to Myers Pump Drain 002 (SC-35)	Unnamed Trib to Myers Pump Drain 003 (SC-36)	Unnamed Trib to Myers Pump Drain 004 (SC-37)	McFarlane Relief Drain (SC40)
Spotted Sucker	<i>Minytrema melanops</i>	SC	SC	-	-	x	x	x	-	-	-	-	-	-	-
Stonecat	<i>Noturus flavus</i>	-	-	warmwater	-	-	-	x	-	-	-	-	-	-	-
Walleye	<i>Stizostedion vitreum</i>	-	-	coolwater	-	-	-	x	-	-	-	-	-	-	x
White Bass	<i>Morone chrysops</i>	-	-	warmwater	-	x	-	x	-	-	-	-	-	-	x
White Crappie	<i>Pomoxis annularis</i>	-	-	warmwater	-	x	-	x	-	-	-	-	-	-	x
White Perch	<i>Morone americana</i>	-	-	warmwater	-	-	-	x	-	-	-	-	-	-	x
White Sucker	<i>Catostomus commersonii</i>	-	-	coolwater	-	-	x	x	-	-	-	-	-	-	x
Yellow Bullhead	<i>Ameiurus natalis</i>	-	-	warmwater	-	-	x	x	-	-	-	-	-	-	-
Yellow Perch	<i>Perca flavescens</i>	-	-	coolwater	-	-	-	x	-	-	-	-	-	-	-
Fawnsfoot	<i>Truncilla donaciformis</i>	END	END	N/A	-	-	-	x	-	-	-	-	-	-	-
Hickorynut	<i>Obovaria olivaria</i>	END	END	N/A	-	-	-	x	-	-	-	-	-	-	-
Lilliput	<i>Toxolasma parvum</i>	END	THR	N/A	x	x	-	-	-	-	-	-	-	-	-
Mapleleaf	<i>Quadrula quadrula</i>	SC	SC	N/A	-	-	-	x	-	x	x	-	-	-	x
Round Hickornut	<i>Obovaria subrotunda</i>	END	END	N/A	-	-	-	x	-	-	-	-	-	-	-
Threehorn Wartyback	<i>Obliquaria reflexa</i>	THR	THR	N/A	-	-	-	x	-	-	-	-	-	-	-

Source: DFO (2022), MNRFLIO (2022)

Notes:

END – Endangered

THR – Threatened

SC – Special Concern

NAR – Not at Risk

DD – Data Deficient



#### 2.2.1.3.2 Leamington Interconnect - Aquatic SAR

According to DFO's aquatic SAR mapping (DFO, 2022), there are no records of aquatic SAR within the watercourses crossed by the Leamington Interconnect. Fish community sampling and fish/mussel habitat assessment did not identify any SAR during the 2022 field investigations.

### 2.2.2 Designated Natural Areas and Vegetation

The project is located within the most southern ecoregion of Ontario, Ecoregion 7E (Lake Erie-Lake Ontario). It extends from Windsor and Sarnia east to the Niagara Peninsula and Toronto. Approximately 78% of the ecoregion has been converted to agricultural and developed land. The remaining natural areas consist of Carolinian forest remnants, dense deciduous, sparse deciduous and mixed deciduous forest cover (Crins et al., 2009). This ecoregion also supports the largest remnants of tall-grass prairie in the province.

The project also falls fully within ecodistrict 7E-1 (Essex). The majority of this ecodistrict has been converted to cropland and pasture. Where there is remaining forest (roughly 4% of the ecodistrict), deciduous forests are the dominant natural vegetation (Wester et al., 2018). Tree species include sugar maple (*Acer saccharum*), American beech (*Fagus grandifolia*), red oak (*Quercus rubra*), white ash (*Fraxinus americana*), pin cherry (*Prunus pensylvanica*), white oak (*Quercus alba*), American basswood (*Tilia americana*), black cherry (*Prunus serotina*), bitternut hickory (*Carya cordiformis*), trembling aspen (*Populus tremuloides*), large-toothed aspen (*Populus grandidentata*), yellow birch (*Betula alleghaniensis*), and balsam poplar (*Populus balsamifera*). Marshes are common adjacent to lakes and rivers in this ecodistrict (Wester et al., 2018).

#### 2.2.2.1 Significant Wetlands

Based on the results of the background review using the sources listed in **Table 2-1**, the St. Clair Marsh Provincially Significant Wetland (PSW) Complex was identified within the Panhandle Study Area. Two wetland units of the St. Clair Marsh PSW Complex fall within the Study Area. One unit is located east of the Dover Transmission Station more than 100 m from the Panhandle Loop. The other unit is located south of Bradley Line about 15 m from the Panhandle Loop.

#### 2.2.2.2 Significant Woodlands

Woodlands were identified within the Panhandle and Leamington Study Areas. The Panhandle Loop crosses four significant woodlands, and one is candidate significant woodland, as defined in the Official Plan for the Municipality of Chatham-Kent. No significant woodlands are crossed by the Leamington Interconnect.

#### 2.2.2.3 Significant Valleylands

There were no significant valleylands identified within the Study Areas.

#### 2.2.2.4 Areas of Natural and Scientific Interest

The St. Clair Marsh PSW Complex unit located east of the Dover Transmission Station within the Panhandle Study Area is also designated provincially significant Life Science Area of Natural and Scientific Interest (ANSI).

### 2.2.3 Significant Wildlife Habitat

As the Study Areas fall within the Lake Erie – Lake Ontario Ecoregion 7E, the criteria for determining significant wildlife habitat (SWH) are outlined in the Significant Wildlife Technical Guide (MNR, 2000) and the Significant Wildlife Habitat Criteria Schedules for Ecoregion 7E (MNRF, 2015a). SWH includes habitat for Species of Conservation Concern (SOCC). SOCC includes species designated as Special Concern (MNRF, 2015a) under the ESA, which are not afforded species or habitat protection under the Act.



In addition to Special Concern species, SOCC includes flora and fauna provincially ranked by the NHIC as extremely rare in Ontario (S1), very rare in Ontario (S2) or rare to uncommon in Ontario (S3). SOCC are also considered species listed under Schedule 1 of the federal SARA. Several Ontario natural heritage databases exist that can be accessed to conduct a screening for existing SOCC records in a given area. The resources outlined in **Table 2-1** above were reviewed to identify SOCC in the vicinity of the Study Areas. A total of 26 SOCC were identified for the Study Areas and are presented in **Table 2-4**.

A colonial waterbird nesting area was confirmed through the background review within the Lake St. Clair Marsh PSW Complex. There is also the potential for the presence of additional SWH including but not limited to amphibian breeding habitat, turtle nesting habitat and/or reptile hibernacula.

**Table 2-4: Species of Conservation Concern records in the vicinity of the Study Areas identified through background review**

Common Name	Scientific Name	Taxonomic Group	S-Rank <sup>1</sup>	SARA Schedule 1 Status <sup>2</sup>	ESA Status <sup>3</sup>	Study Area <sup>4</sup>	Data Source <sup>5</sup>
Western Chorus Frog	<i>Pseudacris maculata</i>	Amphibian	S4	THR <sup>6</sup>	-	L, P	ORAA
Bald Eagle	<i>Haliaeetus leucocephalus</i>	Bird	S4	NAR	SC	P	NHIC
Black Tern	<i>Chlidonia niger</i>	Bird	S3B, S4M	NAR	SC	P	OBBA, NHIC
Common Nighthawk	<i>Chordeiles minor</i>	Bird	S4B	THR	SC	L	OBBA
Dickcissel	<i>Spiza americana</i>	Bird	S2M	N/A	N/A	L	OBBA
Eastern Wood-pewee	<i>Contopus virens</i>	Bird	S4B	SC	SC	L, P	OBBA
Purple Martin	<i>Progne subis</i>	Bird	S3B	N/A	N/A	L, P	OBBA
Short-eared Owl	<i>Asio flammeus</i>	Bird	S4?B, S2S3N	SC	SC	P	NHIC
Wood Thrush	<i>Hylocichla mustelina</i>	Bird	S4B	THR	SC	L, P	OBBA
American Lotus	<i>Nelumbo lutea</i>	Insect	S2S3	N/A	N/A	P	NHIC
Duke's Skipper	<i>Euphyes dukesi</i>	Insect	S2	N/A	N/A	L, P	OBA
Monarch	<i>Danaus plexippus</i>	Insect	S2N, S4B	SC	SC	L, P	OBA
Short-winged Green Grasshopper	<i>Dichromopha viridis</i>	Insect	S2	-	-	P	NHIC
Midland Painted Turtle	<i>Chrysemys picta marginata</i>	Reptile	S4	SC	N/A	L, P	NHIC, ORAA
Northern Map Turtle	<i>Graptemys geographica</i>	Reptile	S3	SC	SC	P	NHIC, ORAA
Snapping Turtle	<i>Chelydra serpentina</i>	Reptile	S3	SC	SC	P	NHIC, ORAA
Climbing Prairie Rose	<i>Rosa setigera</i>	Vascular Plant	S2S3	SC	SC	L	NHIC
Crowned Beggarticks	<i>Bidens trichosperma</i>	Vascular Plant	S2	-	-	P	NHIC
Cup Plant	<i>Silphium perfoliatum</i>	Vascular Plant	S2	-	-	P	NHIC
Field Thistle	<i>Cirsium arvense</i>	Vascular Plant	S3	-	-	P	NHIC
Giant Ironweed	<i>Vernonia gigantea</i>	Vascular Plant	S1?	-	-	P	NHIC
Grey-headed Prairie Coneflower	<i>Ratibida pinnata</i>	Vascular Plant	S3	-	-	P	NHIC
Mead's Sedge	<i>Carex meadii</i>	Vascular Plant	S2	-	-	P	NHIC
Shellback Hickory	<i>Carya laciniosa</i>	Vascular Plant	S3	-	-	L	NHIC
Swamp Rose-mallow	<i>Hibiscus moscheutos</i>	Vascular Plant	S3	SC	SC	P	NHIC
Walter's Barnyard Grass	<i>Echinochloa walteri</i>	Vascular Plant	S3	-	-	P	NHIC
Wingstem	<i>Verbesina alternifolia</i>	Vascular Plant	S3	-	-	P	NHIC

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

SX - Presumed Extirpated—Species or community is believed to be extirpated from the province. Not located despite intensive searches of historical sites and other appropriate habitat, and virtually no likelihood that it will be rediscovered.  
 SH - Possibly Extirpated (Historical)—Species or community occurred historically in the province, and there is some possibility that it may be rediscovered. Its presence may not have been verified in the past 20-40 years. A species or community could become SH without such a 20-40-year delay if the only known occurrences in a province were destroyed or if it had been extensively and unsuccessfully looked for.



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

- <sup>2</sup>COSEWIC Status: The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) provides the Canadian government with advice regarding wildlife species that are nationally at risk of extinction or extirpation. Species assessed and designated at risk by COSEWIC may qualify for legal protection and recovery under the SARA. The following are categories of at risk:  
 EXT (Extirpated) – A species that no longer exists in the wild in Canada but exists elsewhere.  
 END (Endangered) – A species facing imminent extirpation or extinction in Canada.  
 THR (Threatened) – A species that is likely to become an endangered through all or a large portion of its Canadian range if limiting factors are not reversed.  
 SC (Special Concern) – A species that may become threatened or endangered due to a combination of biological characteristics and identified threats.  
 NAR (Not at Risk) – A species that has been evaluated and found to be not at risk.
- <sup>3</sup>ESA Status: The Endangered Species Act, 2007 (ESA) protects species listed as Threatened and Endangered on the Species at Risk in Ontario (SARO) List on provincial and private land. The Minister lists species on the SARO list based on recommendations from the Committee on the Status of Species at Risk in Ontario (COSSARO), which evaluates the conservation status of species occurring in Ontario. The following are the categories of at risk:  
 END (Endangered) – A species facing imminent extinction or extirpation in Ontario.  
 THR (Threatened) – Any native species that, on the basis of the best available scientific evidence, is at risk of becoming endangered throughout all or a large portion of its Ontario range if the limiting factors are not reversed.  
 SC (Special Concern) – A species that may become threatened or endangered due to a combination of biological characteristics and identified threats.  
 NAR (Not at Risk) – A species that has been evaluated and found to be not at risk.
- <sup>4</sup>Study Area: L: Leamington Interconnect  
 P: Panhandle Loop
- <sup>5</sup> Data Source: NHIC: Record obtained from MNR's Make-a-Map: Natural Heritage Areas Application (2022).  
 OBBA: Record obtained from the OBBA (BSC et al., 2006)  
 ORAA: Record obtained from the ORAA (Ontario Nature, 2022).  
 OBA: Record obtained from the OBA (Macnaughton et al., 2022).
- <sup>6</sup> Only the Western Chorus Frog – Great Lake – St. Lawrence – Canadian Shield Population is designated as THR under Schedule 1 of the SARA. The Carolinian population, which may occur in the Study Areas is not considered at risk.

## 2.2.4 Species at Risk

Based on the background resources outlined in **Table 2-1**, 44 provincial SAR designated as Threatened (THR), Endangered (END) or Extirpated (EXP) under the *Endangered Species Act* (ESA;2007) were identified as having records in the vicinity of the project Study Areas (e.g., 1 x 1 km squares, 10 x 10 km squares based on information sources). **Table 2-5** provides an outline of the provincial SAR identified during the background review and includes the most recent observation date as per the information sources, where applicable.

**Table 2-5: Species at Risk records in the vicinity of the Study Areas identified through background review**

Common Name	Scientific Name	Family	S-Rank <sup>1</sup>	SARA Schedule 1 Status <sup>2</sup>	ESA Status <sup>3</sup>	Study Area <sup>4</sup>	Data Source <sup>5</sup>
Bank Swallow	<i>Riparia riparia</i>	Bird	S4B	THR	THR	P, L	OBBA
Barn Owl	<i>Tyto alba</i>	Bird	S1	END	END	P	OBBA
Barn Swallow	<i>Hirundo rustica</i>	Bird	S4B	THR	THR	P, L	NHIC, OBBA
Bobolink	<i>Dolichonyx oryzivorus</i>	Bird	S4B	THR	THR	P, L	NHIC, OBBA
Chimney Swift	<i>Chaetura pelagica</i>	Bird	S3B	THR	THR	P, L	OBBA



Common Name	Scientific Name	Family	S-Rank <sup>1</sup>	SARA Schedule 1 Status <sup>2</sup>	ESA Status <sup>3</sup>	Study Area <sup>4</sup>	Data Source <sup>5</sup>
Eastern Meadowlark	<i>Sturnella magna</i>	Bird	S4B, S3N	THR	THR	P, L	NHIC, OBBA
Henslow's Sparrow	<i>Centronyx henslowii</i>	Bird	S1B	END	END	P	NHIC
King Rail	<i>Rallus elegans</i>	Bird	S1B	END	END	P	NHIC, OBBA
Least Bittern	<i>Ixobrychus exilis</i>	Bird	S4B	THR	THR	P	NHIC, OBBA
Prothonotary Warbler	<i>Protonotaria citrea</i>	Bird	S1B	END	END	P	NHIC, OBBA
Eastern Small-footed Myotis	<i>Myotis leibii</i>	Mammal	S2S3	N/A	END	P, L	BCI
Little Brown Myotis	<i>Myotis lucifugus</i>	Mammal	S3	END	END	P, L	BCI
Northern Myotis	<i>Myotis septentrionalis</i>	Mammal	S3	END	END	P, L	BCI, MECP
Tri-colored Bat	<i>Perimyotis subflavus</i>	Mammal	S3?	END	END	P, L	BCI
Dense Blazing Star	<i>Liatrix spicata</i>	Plant	S2	THR	THR	P, L	NHIC
Blanding's Turtle (Great Lakes / St. Lawrence population)	<i>Emydidea blandingii</i>	Reptile	S3	END	THR	P	NHIC, ORAA
Common Five-lined Skink (Five-lined Skink; Carolinian population)	<i>Plestiodon fasciatus</i>	Reptile	S2	END	END	P	NHIC, ORAA
Eastern Foxsnake (Carolinian population)	<i>Pantherophis gloydi</i>	Reptile	S2	END	END	P, L	ORAA
Massasauga (Carolinian Population)	<i>Sistrurus catenatus</i>	Reptile	S1	END	END	P	ORAA
Queensnake	<i>Regina septemvittata</i>	Reptile	S2	END	END	P	ORAA
Spiny Softshell	<i>Apalone spinifera</i>	Reptile	S2	END	END	P	NHIC
Timber Rattlesnake	<i>Crotalus horridus</i>	Reptile	SX	EXP	EXP	P	NHIC

<sup>1</sup>S-rank: As noted in the footnote to Table 2-4

<sup>2</sup>SARA Status: As noted in the footnote in Table 2-4

<sup>3</sup>ESA Status: As noted in the footnote in Table 2-4

<sup>4</sup>Study Area: L: Leamington Interconnect  
P: Panhandle Loop

<sup>5</sup>Data Source: NHIC: Record obtained from MNRF's Make-a-Map: Natural Heritage Areas Application (2022).

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

ORAA: Record obtained from the ORAA (Ontario Nature, 2022).

OBA: Record obtained from the OBA (Macnaughton et al., 2022).

BCI: Record obtained from Bat Conservation International (BCI)

MECP: Record obtained from MECP range mapping.

### 3. Field Investigations

#### 3.1 Methods

##### 3.1.1 Preliminary Site Visit

AECOM ecologists conducted a preliminary review of habitat of each Study Area on November 9, 2021 to gain an understanding of possible locations of SAR and SAR habitat within the Study Areas. During the preliminary field investigations, AECOM ecologists noted all species and habitat features observed with a focus on the potential SAR identified during the background review. The results of the preliminary site visit were used to inform the 2022 field investigations.

##### 3.1.2 Aquatic Habitat Assessments

Visual aquatic habitat assessments were completed at each of the watercourse crossings in support potential *Fisheries Act* approvals and permits under the Federal SARA and the ESA. Field investigations were completed within the pipeline right-of-way where property access was permitted. Investigations included an assessment of morphology, approximate channel dimensions, substrates, aquatic vegetation, and SAR habitat suitability as well as identifying potential enhancement opportunities for the watercourse. One survey was completed for each watercrossing April 25-26, 2022. As several crossings were identified after the initial assessment a second site visit was completed May 10-13 to finalize the surveys.

Watercourses that did not contain SAR also underwent fish community assessments using backpack electrofishing equipment to determine community makeup and potentially identify any unmapped SAR fish presence. This work was completed May 10-11, 2022.

### **3.1.3 Ecological Land Classification**

Vegetation communities within the Panhandle and Leamington Study Areas were delineated following the Ecological Land Classification (ELC) for Southern Ontario: First Approximation and its Application (Lee et al., 1998). A botanical inventory was conducted in conjunction with the ELC surveys to document local diversity and determine the presence of SAR or rare plants within each Study Area. ELC surveys were conducted on November 9, 2021 and June 7-8, 2022. The results of these field investigations were also used to assess the presence of candidate SWH and SAR habitat. Micro-habitat features for wildlife including SAR e.g., hibernation or nesting habitat were searched for as part of the ELC surveys.

### **3.1.4 Bat SAR Surveys**

Potential maternity roost habitat was identified according to Phase 1: Bat Habitat Suitability Assessment of the *Survey Protocol for Species at Risk Bats within Treed Habitats: Little Brown Myotis, Northern Myotis & Tri-Colored Bat* (MNRF, 2017). Forested communities identified within each Study Area through ELC were recorded and mapped.

Impacts to anthropogenic structures (i.e., buildings and barns) potentially suitable for roosting, identified during the background review within each Study Area, are not anticipated to be impacted by the proposed scope of work. One forested ELC community, a Fresh – Moist Poplar Deciduous Forest (FOD8-1), was identified within the Panhandle Study Area along both banks of the Thames River (SC29). Additional surveys including snag density surveys and acoustic monitoring were not completed as the community is not expected to be impacted by the trenchless crossing methods (i.e., Horizontal Directional Drilling [HDD]) proposed at this location. Rock piles, which may provide suitable maternity roost habitat for Eastern Small-footed Myotis were also considered.

Two forested ELC communities were identified within the Leamington Study Area. Of the two forested ELC communities identified, only one, the Fresh – Moist Shagbark Hickory Deciduous Forest (FOD9-4) community, is expected to be impacted by the proposed works. The FOD9-4 within the limits of works were surveyed during the leaf-off period on May 12, 2022 to identify the presence of suitable maternity roost trees (snags, i.e., any standing live or dead tree at least 10 cm diameter-at-breast-height [dbh] with cracks, crevices, hollows, cavities and/or loose or naturally exfoliating bark) following the methods outlined in the *Survey Protocol for Species at Risk Bats within Treed Habitats: Little Brown Myotis, Northern Myotis & Tri-colored Bat* (MNRF, 2017). Rock piles, which may provide suitable maternity roost habitat for Eastern Small-footed Myotis was also considered.

Acoustic monitoring surveys were then completed within the FOD9-4 in accordance with Maternity Roost Surveys in Treed Habitats (MECP, 2021). Four acoustic monitors (SM4BAT, Wildlife Acoustics Brand) were deployed within the woodlot before dusk on June 7 and recorded until June 17, 2022. The monitors were programmed to record from dusk for a period of five hours. The acoustic monitors were mounted on tree trunks at an average height of 1.6 m and ultrasonic microphones attached to the detector using 3 m recording cables; microphones were positioned as high as possible, away from potential obstacles and angled away from prevailing winds. This placement improves recording quality by reducing surface echoes and ground noise caused by proximal vegetation, which can distort ultrasonic signals. The locations of the acoustic monitors are illustrated on **Figure 1-4**. The precise locations of acoustic monitoring stations were selected in-situ. Field staff considered landscape, likelihood of recording clean calls and proximity to maternity roosting features of interest (i.e., maternity roosting trees, leaf clusters (if noted), and rock piles (including rock outcrops, rocky former fence lines etc.).



Recorded ultrasonic data was analyzed using the Wildlife Acoustics' Kaleidoscope Pro 5.4.2 Analysis Software in order to identify the bat species present. This software is designed to convert files, sort, and categorize bat data by species. It identifies bats to species by comparing the recorded ultrasonic patterns (also known as a pass) to those of known species-specific patterns using the up-to-date Bats of North America classifier (version 5.4.0). Where the recordings are not consistent with the known typical characteristics of a bat or the recording are beyond the software's capability to apply species identification, the analyser assigns the recording as "No ID". No ID recordings can result from background noise such as vehicles, rustling plants, other wildlife, incomplete recordings of bat calls, or bats which are outside of the range of the microphone. AECOM conducted an extensive review of the No ID files to further identify potential bat SAR within the dataset. No ID calls were then run through a secondary software program, SonoBat (Version 4.4.5) to gain a second opinion on the calls. SAR bat calls identified by both programs were manually verified by qualified AECOM ecologists to ensure the patterns were consistent with the typical characteristics of a call for each species.

### 3.1.5 Turtle SAR Surveys

The potential presence of SAR turtles within the Panhandle and Leamington Study Areas was addressed through Visual Encounter Surveys (VES) generally conducted employing the Survey Technique for Open Water Wetlands as described in the *Survey Protocol for Blanding's Turtle* (MNRFP, 2015b). At each watercourse or constructed drain crossing, the surveyor used binoculars to examine basking sites (up to 1 m from the water's edge on shoreline and channel banks, logs, rocks etc.). The water was also scanned to locate swimming turtles. When vegetation obscured the view of the shoreline or other available basking sites (e.g., floating logs), turtles were searched for in conjunction with the snake SAR surveys described below. Surveys were carried out during sunny periods when air temperature was above 5°C. Surveys were also carried out on partially cloudy or overcast days only when air temperature was above 15°C.

Surveys were completed on May 9-13, 16-20, 2022 between 8 am and 5 pm. Turtle survey locations for each Study Area are shown on **Figure 1-1 to Figure 1-13** and **Figure 2-1 to Figure 2-20**, with the number of surveys completed presented in **Table 3-1** below. Surveys were discontinued following email correspondence with the Ministry of the Environment, Conservation and Parks (MECP) on May 14, 2022 that confirmed reptile SAR surveys were not required.

**Table 3-1: Number of turtle surveys completed by Study Area**

Study Area	Number of Stations	Total Number of Rounds	Total Number of Surveys
Panhandle	32	~3	98
Leamington	6	3	15

### 3.1.6 Queensnake Surveys

Species presence/absence within the Panhandle Study Area was assessed generally following the *Survey Protocol for Queensnake (Regina septemvittata) in Ontario* (MNRFP, 2015c). Surveys for Queensnake involved searching for individuals basking in shoreline vegetation (e.g., shrub branches overhanging water), foraging for crayfish in calm shallow water near the shore or hiding beneath cover objects (i.e., rocks as small as 8 cm in diameter submerged or along the bank, logs, geotextile, scrap metal and any other debris). Surveys were conducted in terrestrial habitats within 5 m of the water and aquatic habitats within 3 m of the shoreline. Surveys occurred on sunny/partly sunny days when air temperature was between 12°C and 30°C. Surveys were conducted within 100 m on either side of the Thames River (SC29), Jeannettes Creek (SC27), watercourse crossing south of Jeannettes Creek (SC25) and Baptiste Creek (SC19) to identify category 1 habitat (the watercourse within 100 m of a Queensnake occurrence plus the adjacent terrestrial area up to 30 m inland,



which has the lowest tolerance to alteration; MECP, 2022). In addition to individuals, potential Queensnake hibernacula were also searched for during surveys. A total of eight Queensnake surveys, or one round at each of the eight survey locations mapped on **Figure 2-10**, **Figure 2-13**, **Figure 2-15** and **Figure 2-16**, were completed May 17-18, 2022. Surveys ceased following email correspondence with the MECP that confirmed reptile SAR surveys were not required.

### **3.1.7 Eastern Foxsnake Surveys**

VES were generally conducted in accordance with the *Survey Protocol for Ontario's Species at Risk Snakes* (MNR, 2016) to assess the presence/absence of Eastern Foxsnake within the Panhandle Study Area. Habitat for Eastern Foxsnakes in the Carolinian population includes marsh, prairie, old fields, woodlands, and patches of habitat (riparian, grass or hedgerow) along drainage ditches, creeks, roads and railway tracks (Eastern Foxsnake Recovery Team, 2010). As such, VES consisted of searching for snakes or suitable Eastern Foxsnake micro-habitat features (i.e., hibernacula or natural or non-natural egg laying sites) within 100 m of the Preferred Route where it crosses natural and semi-natural habitat and along watercourses or constructed drains. Surveys occurred under sunny conditions when air temperature was between 10°C and 25°C or under overcast conditions when air temperature was between 15°C and 30°C. A total of 172 VES for SAR snakes were completed May 9-12, 16-20, 2022 between 9 am and 5pm, approximately three rounds at each of the 56 snake survey locations mapped on **Figure 2-1** to **Figure 2-20**.

The presence/absence of Eastern Foxsnake within the Leamington Study Area was assessed through road surveys generally conducted in accordance with the *Survey Protocol for Ontario's Species at Risk Snakes* (MNR, 2016). Surveys were carried out by driving at a speed that did not exceed 45 km/h with a spotter as a passenger. Road surveys were carried out when air temperature was between 20°C and 30 °C. Road surveys were not carried out during or immediately following periods of heavy rain. In addition to road surveys within the Leamington Study Area, snakes and Eastern Foxsnake micro-habitat features (i.e., hibernacula or natural or non-natural egg laying sites) were searched for within natural and semi-natural habitat and watercourses/drains that cross the Preferred Route.

## **3.2 Results**

### **3.2.1 Aquatic Features**

A total of 42 watercrossing were identified within the Panhandle Study Area. They are numbered from South to North and shown on **Figure 2-1** to **Figure 2-20**. The watercrossing habitat assessments are compiled within **Attachment A**. In total there were 5 ephemeral watercourses, 9 intermittent watercourses, 27 permanent watercourses, and 1 unknown watercourse due to land access constraints.

A total of 11 watercrossings were identified within the Leamington Study Area. They are number from East to West and shown on **Figure 1-1** to **Figure 1-13**. The watercrossing habitat assessments are compiled within **Attachment B**. In total there were 2 ephemeral watercourses, 4 intermittent watercourses, and 5 permanent watercourses.

### **3.2.2 Ecological Land Classification**

A total of four ELC communities were identified within the Panhandle Study Areas and five within the Leamington Study Area. The locations and classification of these vegetation communities are shown on **Figure 1-1** to **Figure 1-13** and **Figure 2-1** to **Figure 2-20**. In addition, these figures include anthropogenic (A) areas which include most non-natural, human-created features in the landscape such as buildings, driveways, lawns



and ornamental plantings. Agricultural fields (F) encompass areas that are used to grow crops including winter wheat. These vegetation communities are further described in **Table 3-2** below. This table includes common names of plant species; the scientific species names for these species can be found in the plant list included in **Attachment C**. In total, 159 vascular plants were observed with the Panhandle and Leamington Study Area. Of these, 94 (59%) were native and 52 (33%) are exotic to Ontario. European reed (*Phragmites australis* spp. *australis*) was noted within the ROW of both Study Areas as well as within the MAS2-9b community. European reed is considered an invasive species in Ontario as it is an aggressive plant which spreads quickly and out-competes native vegetation. It releases toxins from its roots into the soil to hinder the growth of and kill surrounding plants.

Cultural Hedgerow (CUH) and the majority of Dry – Moist Old Field Meadow (CUM1-1) communities within the Study Areas represented narrow strips of vegetation along waterways or within the road ROW. Woody vegetation within these communities included northern red oak, Freeman’s maple, Manitoba maple, green ash, black walnut, swamp white oak, thicket creeper, riverbank grape, red raspberry, hawthorn, staghorn sumac, and grey dogwood. Disturbance-tolerant and/or weedy plant species dominated ground cover of these communities and included species such as reed canary grass, orchard grass, wild parsnip, and European reed. However, five locally rare plants were observed: Canada anemone, smooth sumac, Canada plum, rough avens, and planted honey locust.

The rarity of each species was determined using Appendices J and M of the *Significant Wildlife Habitat Technical Guide* (MNR, 2000) and the Natural Heritage Information Centre. No SAR plants were observed during the field investigations, however four SOCC plants and an additional eight locally rare plants were identified as described in **Table 3-2**.

**Table 3-2: Summary of Ecological Land Classification Communities**

ELC Code	ELC Name	Tree Canopy	Shrub Layer	Ground Layer	Locally Rare and SOCC Plants	Location
<b>Forest (FO) Communities</b>						
<b>Deciduous Forest (FOD)</b>						
<b>FOD2-2</b>	Dry - Fresh Oak - Hickory Deciduous Forest	Greater than 60% cover: canopy dominated by Shagbark Hickory and Bur Oak. Subcanopy dominated by silky dogwood, prickly ash, and red raspberry.	Could not be assessed from roadside.	Could not be assessed from roadside.	None identified.	Leamington Study Area on south side of Concession Road 10 between Highway 77 and Albuna Townline.
<b>FOD8-1</b>	Fresh – Moist Poplar Deciduous Forest	Greater than 60% cover: canopy dominated by eastern cottonwood with less crack willow and large-toothed aspen. Subcanopy	Between 25 and 60% shrub cover: dominated by poison ivy, riverbank grape, grey dogwood and red raspberry	Greater than 60% Ground cover (0.2-0.5 m) included poison ivy, smooth brome, spotted jewelweed and reed canarygrass.	Wingstem.	Panhandle Study Area along both sides of the Thames River (SC29).



ELC Code	ELC Name	Tree Canopy	Shrub Layer	Ground Layer	Locally Rare and SOCC Plants	Location
		dominated by Manitoba maple, red ash with less eastern cottonwood and crack willow.				
<b>FOD9-4</b>	Fresh – Moist Shagbark Hickory Deciduous Forest	Greater than 60% cover: canopy heavily dominated by shagbark hickory with less white elm, swamp white oak, and Freeman’s maple. Subcanopy heavily dominated by shagbark hickory with less white elm and green ash.	Greater than 60% shrub cover: dominated by prickly ash with less shagbark hickory, chokecherry, and eastern prickly gooseberry.	Greater than 60% ground cover dominated by running strawberry bush with less poison ivy, thicket creeper, and broad-leaved enchanter’s nightshade.	Inland sedge, necklace sedge, Swan’s sedge, and swamp pin oak.	Leamington Study Area on north side of Highway 8 between Lakeshore Road 229 and 233.
<b>Marsh (MA) Communities</b>						
<b>Shallow Marsh (MAS)</b>						
<b>MAS2-9a</b>	Jewelweed Mineral Meadow Marsh	N/A	N/A	Between 25 and 60% ground cover: dominated by swamp loosestrife with less swamp milkweed, broad-leaved arrowhead, and swamp rose mallow. The water surface was between 25 and 60% cover and dominated by fragrant water lily with less European frogbit.	Swamp loosestrife, fragrant water lily, and swamp rose mallow.	Panhandle Study Area at the southeast corner of the St. Clair Marsh PSW Complex.



ELC Code	ELC Name	Tree Canopy	Shrub Layer	Ground Layer	Locally Rare and SOCC Plants	Location
MAS2-9b	Jewelweed Mineral Meadow Marsh	N/A	N/A	Between 25 and 60% ground cover: heavily dominated by flowering-rush with less Aster sp., common reed, and spikerush sp. The water surface and underwater community was between 10 and 25% cover and dominated by lesser duckweed and potamogeton sp. respectively.	None identified.	Panhandle Study Area south of Highway 8 between Wheatley Road and King & Whittle Road.
<b>Cultural (CU) Communities</b>						
<b>Plantation (CUP)</b>						
CUP1	Deciduous Plantation	Between 25 and 60% canopy cover: canopy equally dominated by northern red oak, bur oak, and swamp pin oak with less sycamore.	Between 10 and 25% shrub cover: dominated by eastern red cedar with less eastern redbud, white elm, and black walnut.	Greater than 60% ground cover: dominated by tall goldenrod with less Kentucky bluegrass, and much less common milkweed and Canada goldenrod.	Swamp pin oak.	Leamington Study Area on the north side of Concession Road 10 between Highway 77 and Albuna Town Line.
<b>Cultural Meadow (CUM)</b>						
CUM1-1	Hedgerow/Dry - Moist Old Field Meadow	N/A	N/A	Greater than 60% ground cover: dominated by goldenrod sp., with less foxtail, orchard grass, thistle sp., and Dame's rocket.		Abandoned agricultural fields within the Leamington Study Area

### 3.2.3 Significant Wildlife Habitat

As described in **Section 2.2.3**, several candidate SWHs were identified to potentially occur in the Study Areas based on information collected through a review of available background resources and interpretation of aerial

photography. Further analysis using the results of the field investigations confirmed the presence of three SWH types within the Study Area. The following provides details regarding confirmed SWH:

### **Special Concern and Rare Wildlife Species:**

Special Concern and/or provincially rare (S1-S3) plants and animals are quite rare and/or have experienced population declines in Ontario. Habitats of four Species Concern and/or provincially rare (S1-S3) species were observed within the Study Areas during field investigations:

- Provincially rare Swamp rose-mallow (S3) is listed as Special Concern under the ESA and Schedule 1 of the SARA; this species was identified within the Panhandle Study Area in the MAS2-9 community recognized as PSW (St. Clair Marsh Complex). The St. Clair Marsh PSW Complex occurs beyond the construction footprint and any potential indirect effects will be avoided/minimized through the application of mitigation measures.
- Provincially rare Wingstem (S3) was identified within the Panhandle Study Area in the FOD8-1 community located on the banks of the Thames River. The FOD8-1 community is not expected to be impacted by the proposed works as trenchless crossing methods (HDD) will be used to drill under both communities).
- Midland Painted Turtle (S4) is listed as Special Concern under Schedule 1 of the SARA; individuals were observed in multiple aquatic features throughout the Panhandle Study Area.
- Provincially rare Snapping Turtle (S3) is listed as Special Concern under the ESA and Schedule 1 of the SARA; individuals were observed in multiple aquatic features throughout the Panhandle and Leamington Study Areas.

Generally, SWH is limited to the St. Clair Marsh PSW Complex, watercourses and constructed drains and forest communities. Additional SWHs may be present within the Study Area but could not be confirmed as targeted surveys were not performed as it is anticipated any potential negative effects can be avoided or minimized through the application of mitigation measures. **Attachment D** provides the complete SWH assessment.

### **3.2.4 Species at Risk**

A SAR habitat assessment was conducted utilizing background information and the results of field investigations to determine whether SAR and their habitats exist within the Study Areas. The detailed SAR Screening is appended to this document as **Attachment E**. The following sections describe the results of the SAR habitat assessment and field investigations.

#### **3.2.4.1 Aquatic SAR**

A total of twelve aquatic SAR listed as Threatened or Endangered under the ESA or SARA were identified within the Panhandle Study Area during the desktop review. No aquatic SAR records were identified in the other Study Areas. **Table 3-3** provides a list of the Critical SAR Aquatic Habitat and SAR that are present at each of the proposed watercourse crossing where records were available, as per the Fisheries and Oceans Canada (DFO) Aquatic SAR mapping. Watercourse crossing locations are displayed on **Figure 2-1** to **Figure 2-20**. In addition to the DFO records, NHIC records indicate that Lake sturgeon (*Acipenser fulvescens*, THR) has been identified within both the Thames River and Jeannettes Creek. Aquatic habitat assessments were completed in 2022 at each watercourse crossing for the Panhandle and Leamington preferred routes to determine whether they provide fish habitat. Where aquatic SAR had been identified, an assessment was completed to confirm suitable habitat is present to support the SAR.



**Table 3-3: DFO Aquatic Species at Risk records per Watercourse Crossing**

Crossing ID	Water Feature	Crossing Method	Critical Habitat <sup>1</sup>	Species at Risk Found <sup>1</sup>
SC-07	Unnamed Non-Flowing Waterbody 002	Open Cut	N/A	Lilliput
SC-19	Baptiste Creek	HDD	N/A	Lilliput
SC-27	Jeannettes Creek	HDD	N/A	Lake Sturgeon
SC-29	Thames River	HDD	Fawnsfoot ( <i>Truncilla donaciformis</i> , END)	Hickorynut, Fawnsfoot, Lake Chubsucker, Black Redhorse, Eastern Sand Darter, Northern Madtom, Pugnose Minnow, Silver Chub, Round Hickorynut, Threehorn Wartyback, Lake Sturgeon
SC-30	Unnamed Trib to Thames River 001	HDD	N/A	Lake Chubsucker
SC-33	Myers Pump Works Drain	Open Cut	N/A	Lake Chubsucker
SC-34	Unnamed Trib to Myers Pump Works Drain 001	Open Cut	N/A	Lake Chubsucker
SC-35	Unnamed Trib to Myers Pump Works Drain 002	Open Cut	N/A	Lake Chubsucker
SC-36	Unnamed Trib to Myers Pump Works Drain 003	Open Cut	N/A	Lake Chubsucker
SC-37	Unnamed Trib to Myers Pump Works Drain 004	Open Cut	N/A	Lake Chubsucker
SC-40	McFarlane Relief Drain	Trenchless	N/A	Lake Chubsucker

<sup>1</sup> THR – Threatened, END – Endangered

At all of the listed watercourse crossings it was determined that the watercourse could provide suitable habitat for the identified SAR. There is no expected impact from any crossing using HDD or Trenchless techniques, however Open Cut will require DFO and MECP authorization.

**3.2.4.2 Plant SAR**

The potential for dense blazing star (*Liatrix spicata*, THR) and other SAR or rare plants within the Study Areas was addressed through botanical inventories completed in conjunction with ELC surveys. No SAR plants were identified within the Panhandle and Leamington Study Areas (refer to **Section 3.2.2**). However, swamp rose

mallow (*Hibiscus moscheutos*), listed as Special Concern in Ontario, was identified in the MAS2-9a community located in the St. Clair Marsh PSW Complex (**Table 3-2**). Additionally, Wingstem (*Verbesina alternifolia*) and planted honey locust (*Gleditsia triacanthos*), which are considered provincially rare, were identified in the FOD8-1 and hedgerows within the Panhandle Study Area (**Table 3-2**). Vegetation clearing will neither be occurring within the St. Clair Marsh PSW Complex nor the FOD8-1 communities.

#### **3.2.4.3 Bat SAR**

In total there were 44 passes of Little Brown Myotis (*Myotis lucifugus*) and 15 passes of Tri-colored bat (*Perimyotis subflavus*) recorded in the vicinity of the acoustic monitoring locations within the Leamington Study Area during the bat maternity roosting period. These data reflect the number of times ultrasonic noise from a bat was recorded by the acoustic monitor (i.e., the number of times a bat flew by the acoustic monitor's microphone). These data confirm species presence within the FOD9-4; however, does not provide an indication of the number of individuals present.

The Little Brown Myotis roosts during the day in trees and buildings (barns, attics, and abandoned structures) (MNRF, 2016). In natural areas, the Little Brown Myotis roosts in tree cavities in old growth deciduous, mixed or conifer forests (COSEWIC, 2013). A total of 56 suitable maternity roost trees were identified within and adjacent to the proposed easement and TLU areas. The average density of suitable maternity roost trees of the FOD9-4 was calculated at 47 per hectare (ha); this value is generally representative of high-quality maternity roosting bat habitat (MNRF, 2017). Tri-colored Bat lives in a variety of forested habitats, forming day roosts and maternity colonies in older forests and occasionally in anthropogenic structures. Roosting habitat for this species is strongly associated with leaf clusters in oak and maple trees (MNRF, 2017). Specific surveys to assess potentially suitable maternity roosting habitat during the leaf-on season was not undertaken. However, the presence of oaks, maples and leaf clusters (i.e., Tri-colored Bat habitat) were taken into consideration during acoustic monitor installation. While both oak species and maple species were present in the Leamington Study Area, field staff did not identify the presence of any leaf clusters considered suitable for Tri-colored Bat maternity roosting within the vicinity of the proposed easement and TLU areas. However, suitable leaf-clusters may be present throughout the remainder of the FOD9-4 community.

#### **3.2.4.4 Turtle SAR**

The presence of Snapping Turtle was confirmed within both Study Areas during field investigations, which included three rounds of turtle surveys. Midland Painted Turtle was also observed during surveys within the Panhandle Study Area. Although no Blanding's Turtles or Spiny Softshell were observed, presence of these species within the Panhandle Study Area is assumed given occurrence records.

Blanding's Turtle often prefer relatively eutrophic environments, with shallow water (less than 2 m deep, often less than 50 cm), soft highly organic substrates, and abundant submergent, floating and emergent vegetation that can occur in a variety of wetland habitats, slow flowing rivers and creeks, pools, lakes, bays, sloughs, marshy meadows, and artificial channels (MECP, 2019a). Blanding's Turtle often travel long distances (up to 6 km from their wetland of origin) to seek out suitable open areas for nesting, which includes beaches, shorelines, meadows, rocky outcrops, forest clearings and a variety of human-altered sites (e.g., gardens, gravel roads, road shoulders, etc.; MECP, 2019a).

Within the Panhandle Study Area suitable habitat was observed within the St. Clair Marsh PSW Complex and watercourses and constructed drains as well as their associated riparian habitats. Blanding's Turtle may also use or move through human-altered habitats within the Panhandle Study Area including agricultural fields and road shoulders (MECP, 2019). Evidence of nesting by an unknown turtle species was observed within or in the vicinity of TLUs associated with the Panhandle Pipeline crossing of SC35 and SC32.

Spiny Softshell turtles rarely leave the water, and most home ranges are associated with large bodies of water such as rivers or lakes, although they can also occur in connected streams or adjacent ponds or wetlands (MECP, 2019b). Within the Panhandle Study Area, the St. Clair Marsh PSW Complex, Thames River (SC29) and Jeannettes Creek (SC27) may provide suitable habitat to carry out life processes including foraging, thermoregulation, movement, predator avoidance and hibernation. Spiny Softshell turtle use terrestrial habitats only for nesting and remain close to the water with nests typically laid within 50 m of the shoreline (MECP, 2019). Nests are usually found in areas with little vegetation, low slope and a sand or a mix of sand and gravel substrate (MECP, 2019). No suitable nesting sites or evidence of turtle nesting were observed in proximity to the St. Clair Marsh PSW, Thames River (SC29) or Jeannettes Creek (SC27).

### 3.2.4.5 Snake SAR

#### 3.2.4.5.1 Queensnake

This species was not observed; however, only one round of Queensnake surveys were performed and the species is assumed present for the purposes of impact assessment and the development of mitigation measures. Queensnake is a highly aquatic species of snake rarely venturing far overland and usually confined within three to five meters of a shoreline (Gillingwater, 2011). This species prefers rock or gravel bottomed streams or rivers and is assumed present within the St. Clair Marsh PSW Complex, Thames River (SC29), Jeannettes Creek (SC27), SC25 and Baptiste Creek (SC19) and their associated riparian habitats, considering existing records. Very little is known about Queensnake hibernation habitat, but sites may include abutments of old bridges, crevices in bedrock outcrops and crayfish or small mammal burrows (COSEWIC, 2000). Although a number of burrows were identified during field investigations, none were located in close proximity of the St. Clair Marsh PSW, Thames River (SC29), Jeannettes Creek (SC27), SC25 or Baptiste Creek (SC19).

#### 3.2.4.5.2 Eastern Foxsnake

A total of two Eastern Foxsnakes were observed within the Panhandle Study Area moving in the vicinity of agricultural drains. While studies have shown that Eastern Foxsnake within the Carolinian population have a strong avoidance of agricultural fields, extensive habitat loss in the last century has led to the species utilizing anthropogenically modified habitats including semi-maintained grass and fields greater than 15 m in width along drainage ditches, creeks, roads and railway tracks (Eastern Foxsnake Recovery Team, 2010). The Panhandle and Leamington Study Areas are largely dominated by agricultural lands and suitable habitat is generally limited to the riparian areas associated with watercourses and constructed drains.

Hibernation sites for Eastern Foxsnake across the Carolinian region includes any natural (e.g., animal burrows) or anthropogenic features (e.g., old wells) that extend below the frostline (Eastern Foxsnake Recovery Team, 2010). Several animal burrows were identified during field investigations within the Panhandle Study Area, in the vicinity of the easement incidentally. The majority of the burrows likely belonged to Woodchuck (*Marmota monax*) which were observed during field investigations. This species typically has one main entrance but up to four other exits. Other species observed using the area, such as European Hare (*Lepus europaeus*), also have multiple entrances and exits to their burrow. If it happens that one entrance falls within the trenched area of construction, it may still be possible for snakes to access the area for overwintering through the other entrances. The majority of the animal burrows were also located in the riparian areas of agricultural drains that are largely less than 15 m in width or within the agricultural fields themselves, indicating that preferred habitat of the Eastern Foxsnake is typically not present next to these burrows.

Oviposition habitats include rotten, interior cavities of large logs and stumps; decaying leaf, wood or compost piles created by humans; abandoned drains under roads and intentionally created artificial nests (Eastern Foxsnake Recovery Team, 2010). Suitable nesting sites were not identified within 100 m of the open cut easement.



### **3.2.4.6 Bird SAR**

No species targeted surveys were completed; however, bird SAR incidentally observed during field investigations were recorded.

#### **3.2.4.6.1 Bank Swallow**

Bank Swallow was not observed during field investigations; however, targeted surveys were not completed. Candidate nesting habitat was identified within the Leamington Study Area within 50 m including exposed banks at crossing LSC-11 and a large dirt pile on private property at the intersection of County Road 31 and County Road 8.

#### **3.2.4.6.2 Barn Owl**

Barn Owl was not observed; however, targeted surveys were not completed as part of the field investigations. Buildings or hollowed out trees present within the Panhandle Study Area may provide candidate nesting habitat for Barn Owl (Ontario Barn Owl Recovery Team, 2010). Barn Owls also utilize open areas including agricultural fields for foraging (Ontario Barn Owl Recovery Team, 2010). Buildings within the Panhandle Study Area are not expected to be impacted by the proposed works.

#### **3.2.4.6.3 Barn Swallow**

Barn Swallow will forage over agricultural fields as well as a wide range of open terrestrial, aquatic and wetland habitats. Agricultural fields dominate the landscape and foraging Barn Swallows were observed on numerous occasions and at multiple locations throughout the Study Areas incidentally during field investigations. Barn Swallows build their cup-shaped mud nests almost exclusively on human-made structures that provide either a horizontal nesting surface (e.g., a ledge) or a vertical face, often with some sort of overhang that provides shelter (COSEWIC, 2021). Barn Swallows were confirmed nesting within the Panhandle Study Area. More than 10 Barn Swallow nests were observed under the Mint Line Bridge over SC19 located approximately 13 m from the construction footprint. Barn Swallows were also assumed nesting under the Balmoral Line bridge over SC40, immediately adjacent to the construction footprint.

#### **3.2.4.6.4 Bobolink and Eastern Meadowlark**

Bobolink was observed within the Study Areas on several occasions incidentally during field investigations. Eastern Meadowlark was not observed in either Study Area; however, this species is assumed present given that targeted surveys were not performed and there is an abundance of existing information documenting their presence.

These species prefer to nest in native grasslands of at least 5 ha in size (McCracken et al., 2013). This habitat type is becoming increasingly rare in Ontario and as such, both species can now be found utilizing agricultural hayfields and pastures as nesting habitat (McCracken et al., 2013). Agricultural fields that dominate the Study Areas were found to be mostly comprised of annual row crops like corn and soybean rarely used by Bobolink or Eastern Meadowlark. Therefore, Bobolinks observed within the Study Areas were likely nesting in large winter wheat fields given that the availability of more suitable, alternative breeding habitat (i.e., hayfields and pastures) was limited.

#### **3.2.4.6.5 Chimney Swift**

Buildings with chimneys suitable for Chimney Swift nesting or roosting may be present within each Study Area; however, are not expected to be impacted by the proposed scope of work.

#### **3.2.4.6.6 King Rail and Least Bittern**

King Rails prefer larger marshes or wetlands with a lower percentage of shrub cover (Kraus, 2016) and Least Bittern have been found to have an affinity to larger marsh communities dominated by cattails that contain a



network of open pools and channels for hunting and stable water levels during the nesting season (COSEWIC, 2011). Given the habitat requirements for each species, it is likely that the records of each species are associated with the St. Clair Marsh PSW Complex situated at the northern end of the Panhandle Study Area. The St. Clair Marsh PSW Complex, which contains larger areas of marsh habitat with open channels and pools, is not expected to be impacted by the proposed scope of work.

#### **4. Effects Assessment and Mitigation Measures**

Effects identification, assessment and mitigation were provided in the ER; however, site-specific and species-specific mitigation will be developed based on the results of the 2022 field investigations and in consultation with the MECP and DFO.

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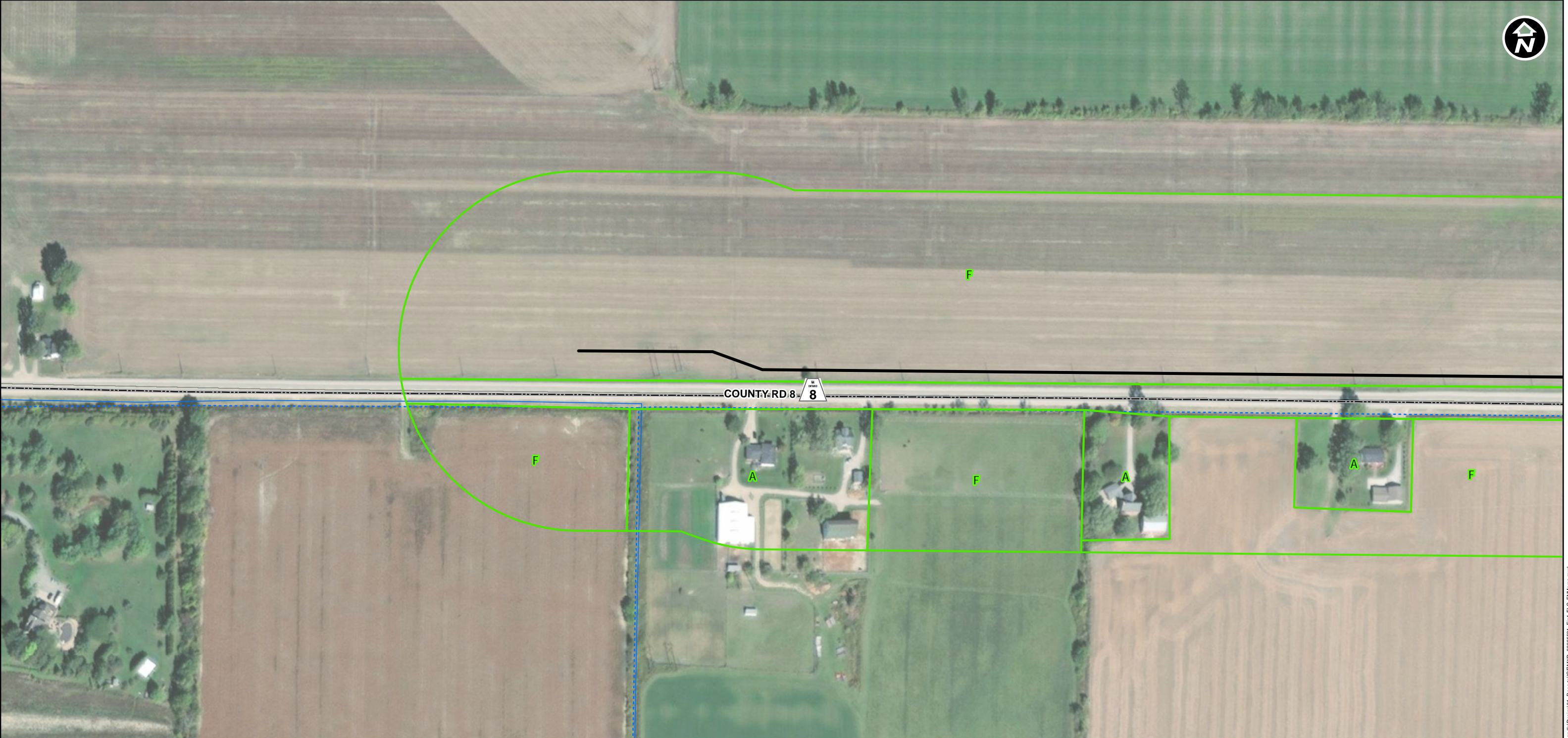
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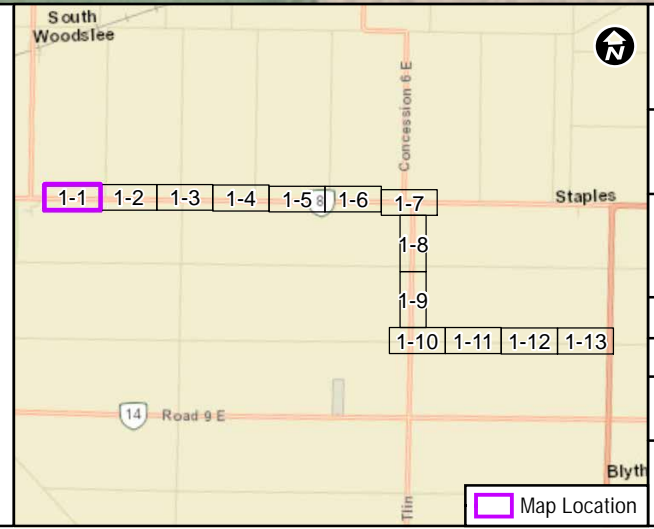
# Figures



**Legend**

- Preferred Route
- Constructed Drain
- Permanent Stream
- Municipal Boundaries
- ELC

Label	ELC Description
A	Anthropogenic
CUH	Cultural Hedgerow
CUM1-1	Dry – Moist Old Field Meadow Type
F	Agricultural Field
FOD 9-4	Fresh – Moist Shagbark Hickory Deciduous Forest
FOD2-2	Dry – Fresh Oak – Hickory Deciduous Forest Type
OAO	Open Aquatic



**Panhandle Regional Expansion Project**

**Leamington Interconnect**

**ELC**

0                      95                      190  
Meters  
DATUM: NAD 1983 UTM Zone 17N

July 2022	1:2,500 * when printed 11"x17"	Source: MNRF 2020 Image: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community
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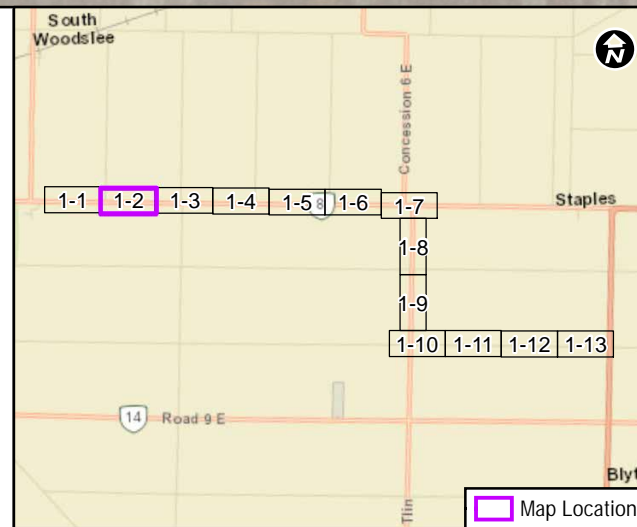
Map Location



### Legend

- Turtle Survey Location
- Preferred Route
- - - - - Constructed Drain
- Permanent Stream
- Municipal Boundaries
- ELC

Label	ELC Description
A	Anthropogenic
CUH	Cultural Hedgerow
CUM1-1	Dry – Moist Old Field Meadow Type
F	Agricultural Field
FOD 9-4	Fresh – Moist Shagbark Hickory Deciduous Forest
FOD2-2	Dry – Fresh Oak – Hickory Deciduous Forest Type
OAO	Open Aquatic



## Panhandle Regional Expansion Project

### Leamington Interconnect

#### ELC

Meters  
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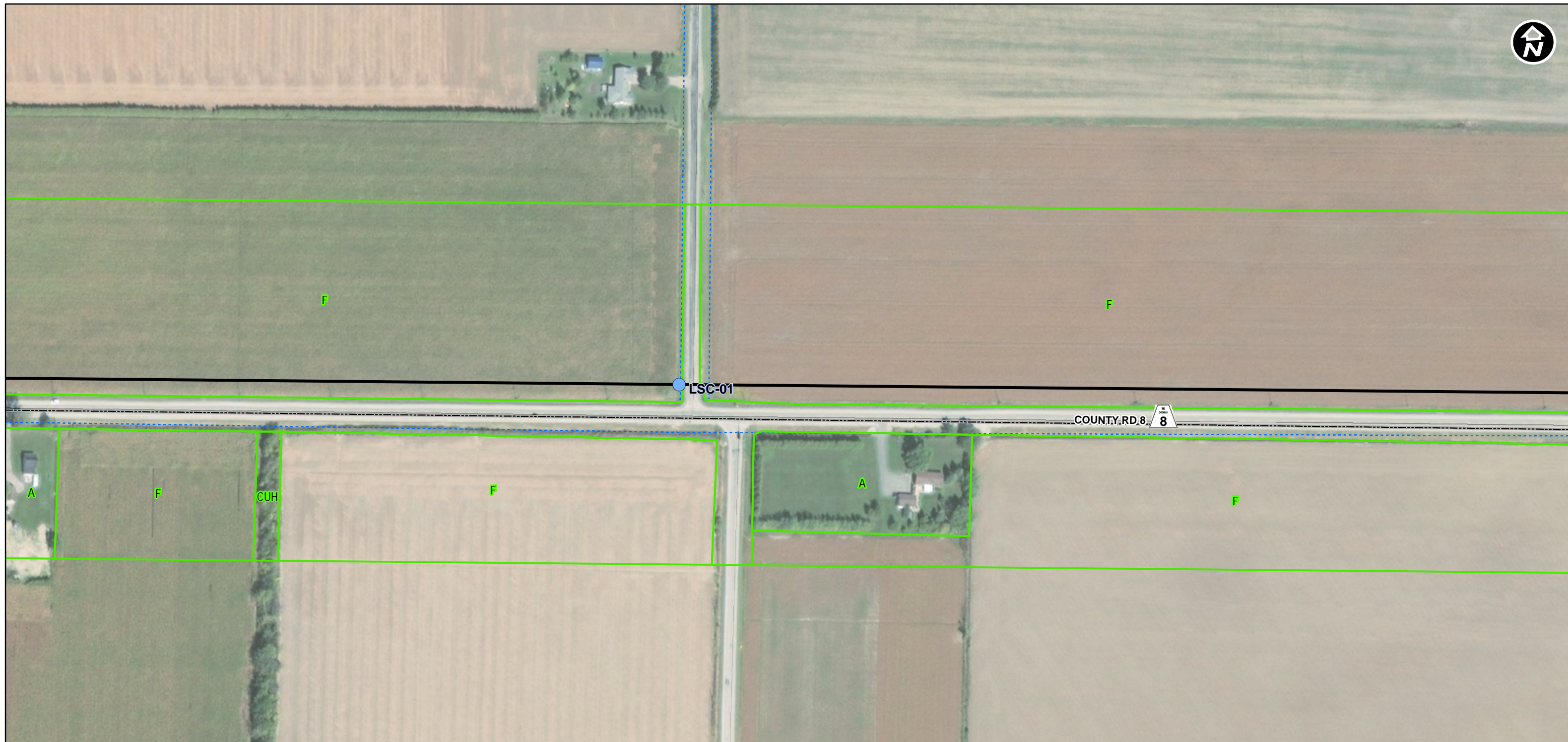
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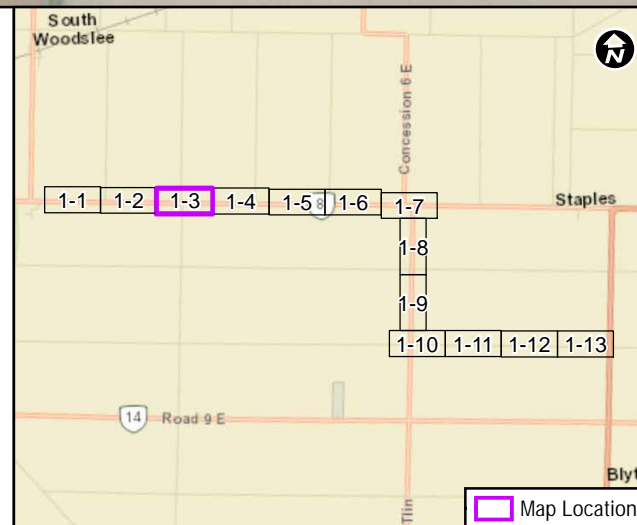




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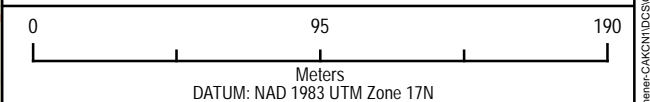
- Watercourse Crossing
- Preferred Route
- Constructed Drain
- Municipal Boundaries
- ELC

Label	ELC Description
A	Anthropogenic
CUH	Cultural Hedgerow
CUM1-1	Dry – Moist Old Field Meadow Type
F	Agricultural Field
FOD 9-4	Fresh – Moist Shagbark Hickory Deciduous Forest
FOD2-2	Dry – Fresh Oak – Hickory Deciduous Forest Type
OAO	Open Aquatic



**Panhandle Regional Expansion Project**

**Leamington Interconnect  
ELC**



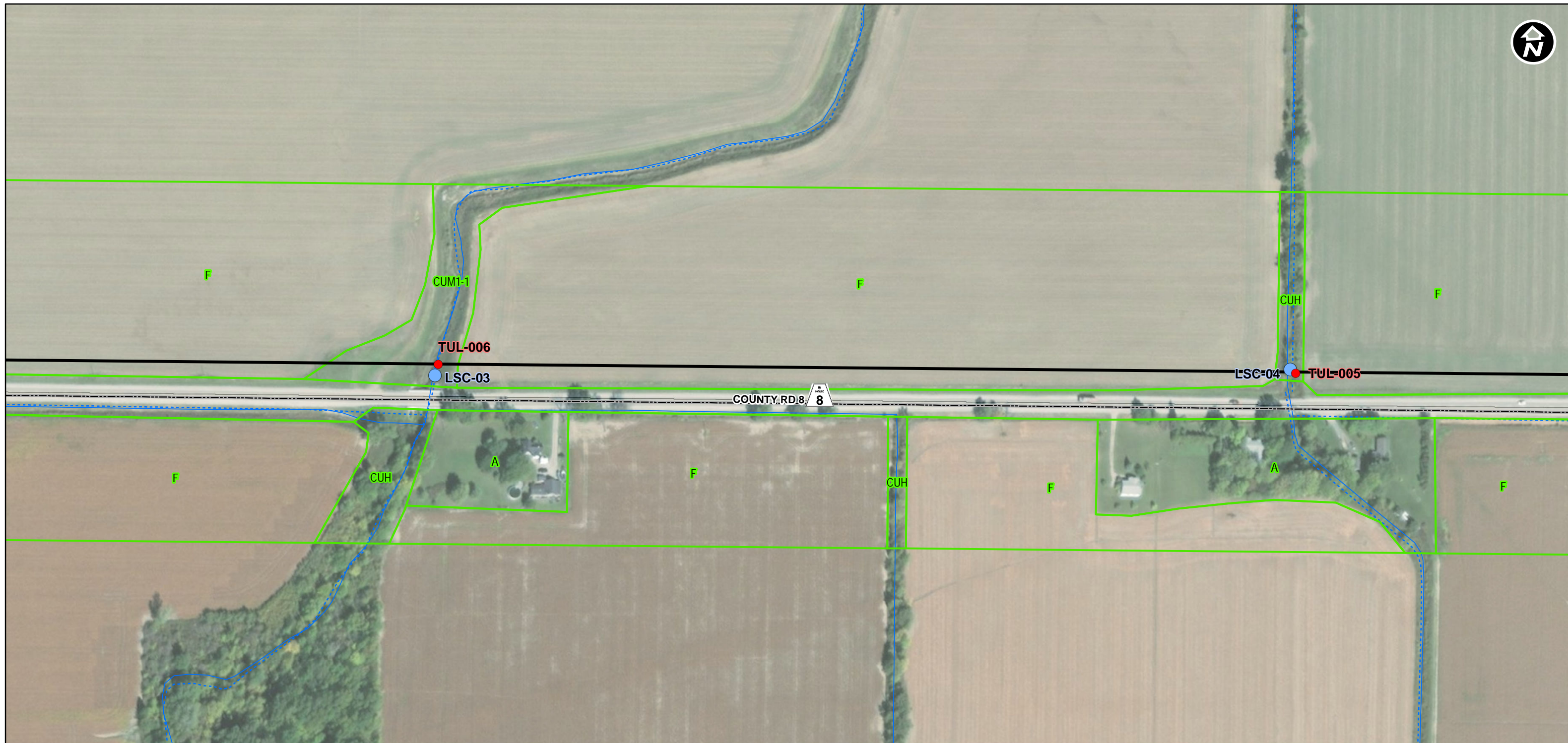
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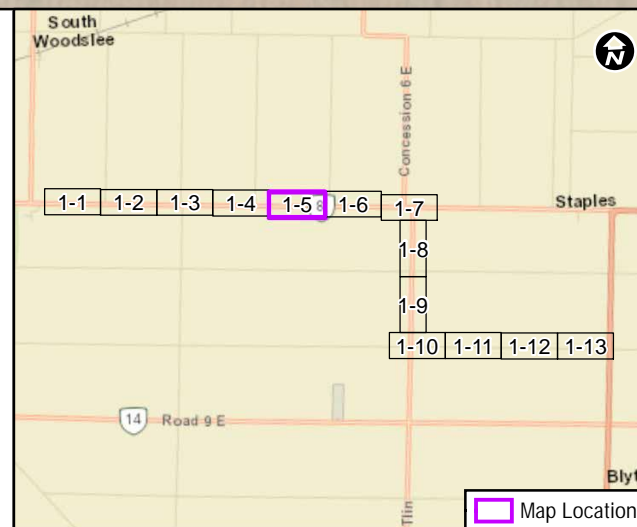




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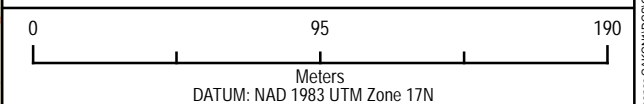
- Turtle Survey Location
- Watercourse Crossing
- Preferred Route
- Constructed Drain
- Permanent Stream
- Municipal Boundaries
- ELC

Label	ELC Description
A	Anthropogenic
CUH	Cultural Hedgerow
CUM1-1	Dry – Moist Old Field Meadow Type
F	Agricultural Field
FOD 9-4	Fresh – Moist Shagbark Hickory Deciduous Forest
FOD2-2	Dry – Fresh Oak – Hickory Deciduous Forest Type
OAO	Open Aquatic



**Panhandle Regional Expansion Project**

**Leamington Interconnect  
ELC**



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**Figure 1-5**

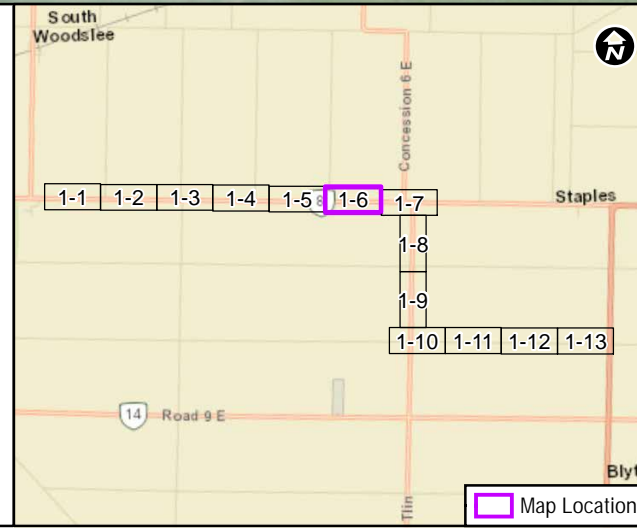
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**Legend**

- Watercourse Crossing
- Preferred Route
- Constructed Drain
- Permanent Stream
- Municipal Boundaries
- ELC

Label	ELC Description
A	Anthropogenic
CUH	Cultural Hedgerow
CUM1-1	Dry – Moist Old Field Meadow Type
F	Agricultural Field
FOD 9-4	Fresh – Moist Shagbark Hickory Deciduous Forest
FOD2-2	Dry – Fresh Oak – Hickory Deciduous Forest Type
OAO	Open Aquatic



**Panhandle Regional Expansion Project**

Leamington Interconnect  
ELC

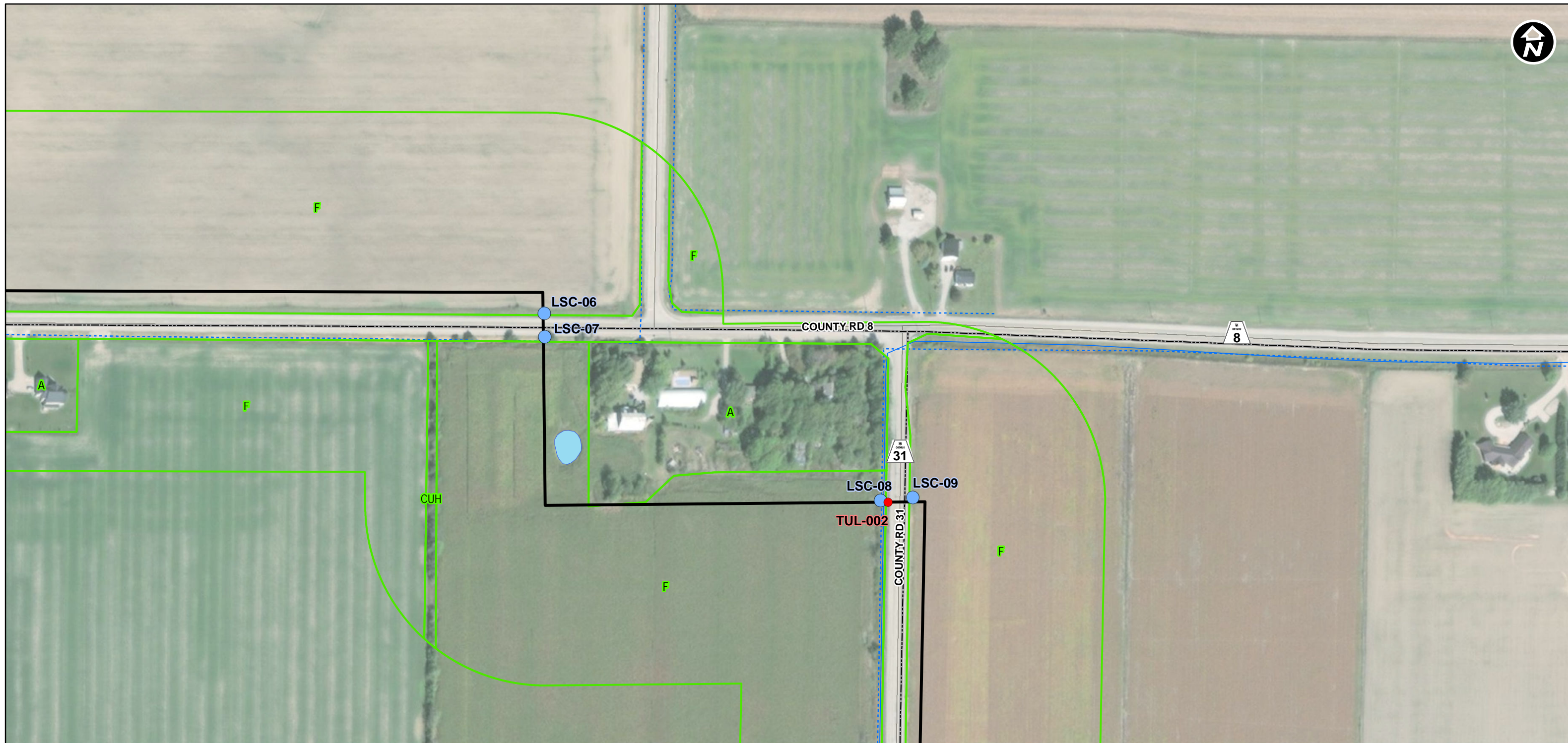
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**Figure 1-6**

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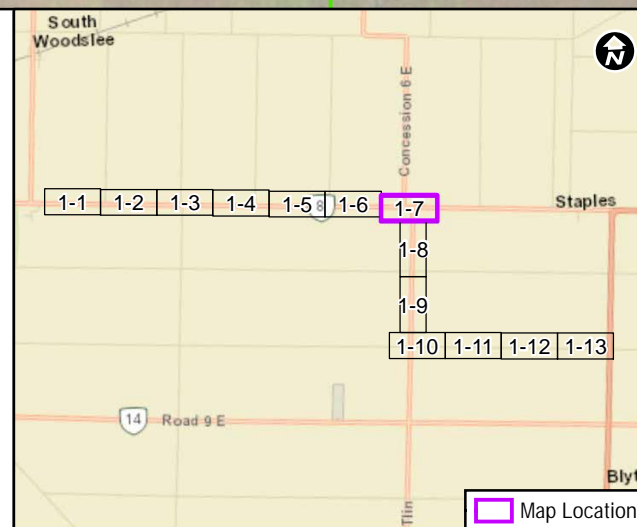
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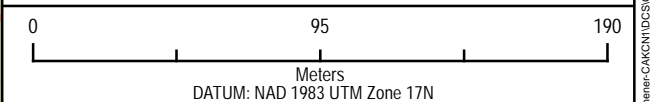
- Turtle Survey Location
- Watercourse Crossing
- Preferred Route
- Constructed Drain
- Permanent Stream
- Waterbody
- Municipal Boundaries
- ELC

Label	ELC Description
A	Anthropogenic
CUH	Cultural Hedgerow
CUM1-1	Dry – Moist Old Field Meadow Type
F	Agricultural Field
FOD 9-4	Fresh – Moist Shagbark Hickory Deciduous Forest
FOD2-2	Dry – Fresh Oak – Hickory Deciduous Forest Type
OAO	Open Aquatic



**Panhandle Regional Expansion Project**

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ELC**

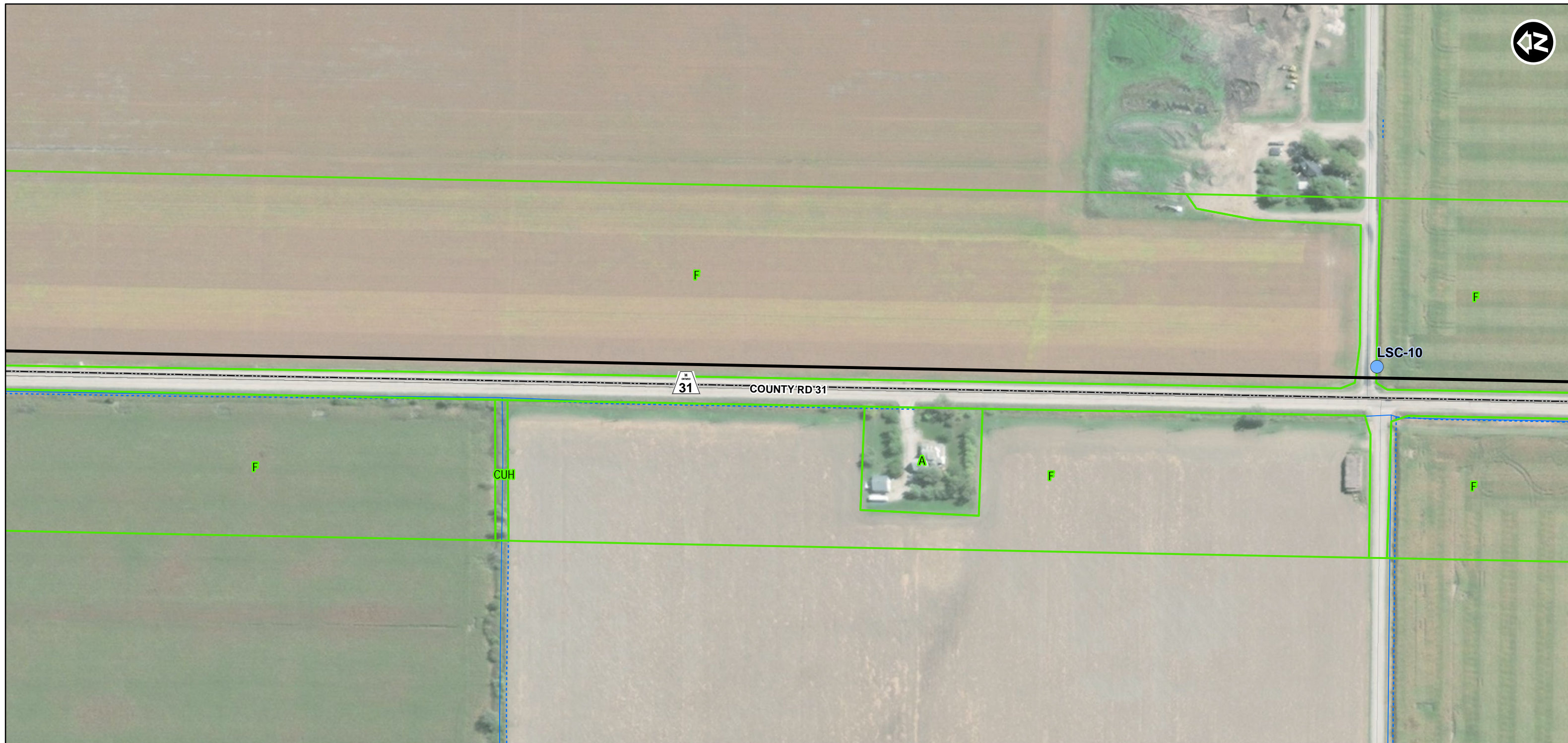


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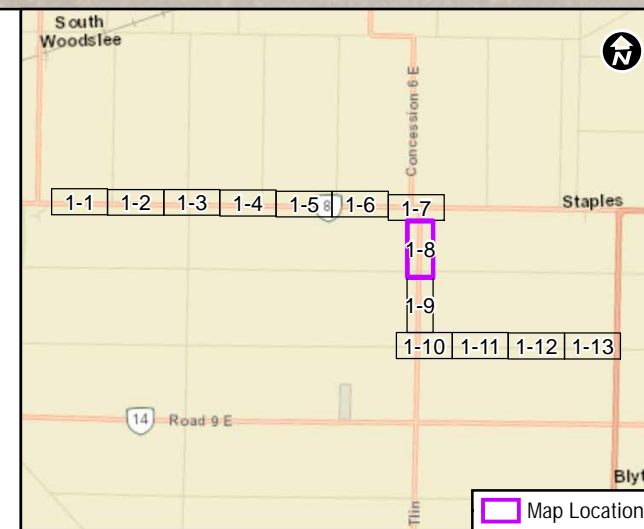
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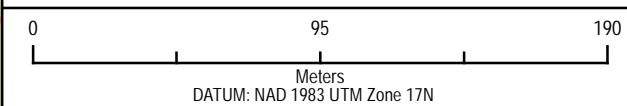
- Watercourse Crossing
- Preferred Route
- Constructed Drain
- Permanent Stream
- Municipal Boundaries
- ELC

Label	ELC Description
A	Anthropogenic
CUH	Cultural Hedgerow
CUM1-1	Dry – Moist Old Field Meadow Type
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FOD2-2	Dry – Fresh Oak – Hickory Deciduous Forest Type
OAO	Open Aquatic



**Panhandle Regional Expansion Project**

**Leamington Interconnect  
ELC**



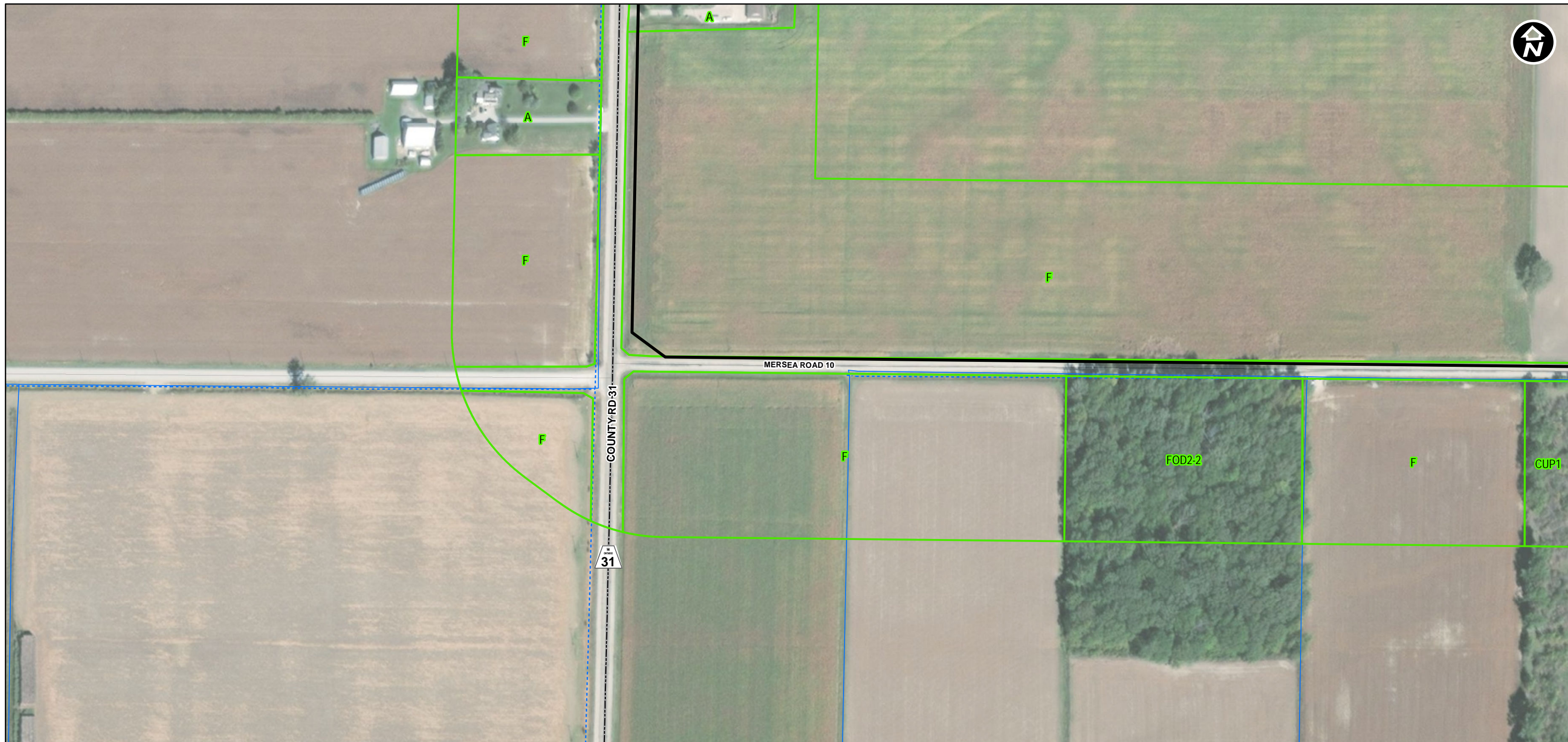
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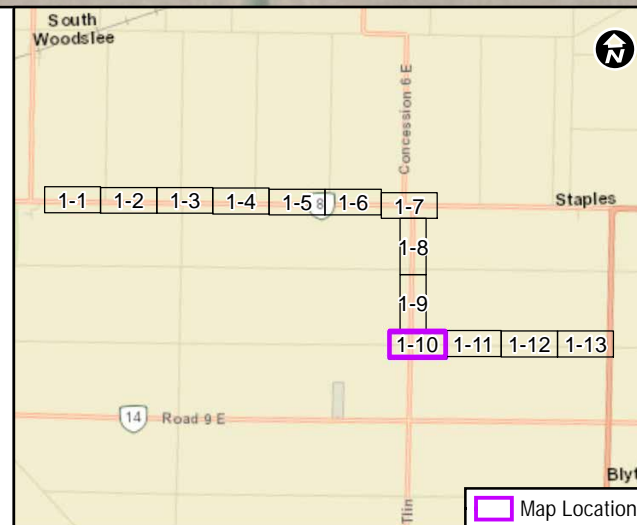




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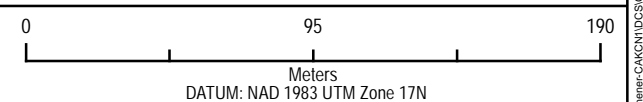
- Preferred Route
- Constructed Drain
- Permanent Stream
- Municipal Boundaries
- ELC

Label	ELC Description
A	Anthropogenic
CUH	Cultural Hedgerow
CUM1-1	Dry – Moist Old Field Meadow Type
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OAO	Open Aquatic



**Panhandle Regional Expansion Project**

Leamington Interconnect  
ELC



July 2022      1:2,500  
\* when printed 11"x17"  
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**AECOM**      **Figure 1-10**

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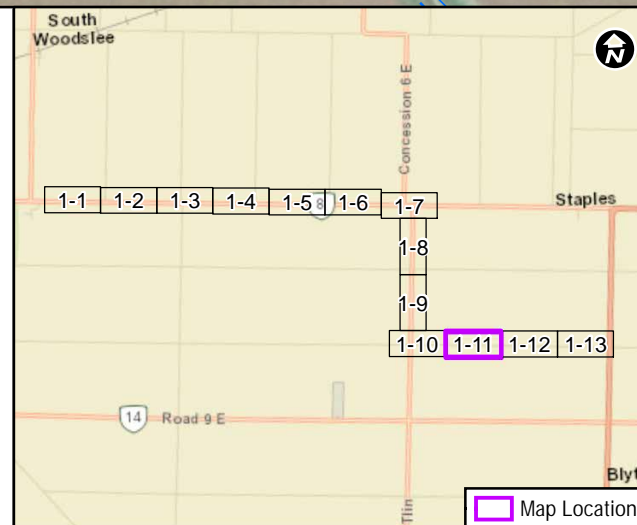




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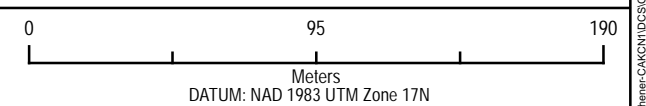
- Turtle Survey Location
- Watercourse Crossing
- Preferred Route
- Constructed Drain
- Permanent Stream
- ▭ Municipal Boundaries
- ▭ ELC

Label	ELC Description
A	Anthropogenic
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OAO	Open Aquatic



**Panhandle Regional Expansion Project**

**Leamington Interconnect  
ELC**



July 2022	1:2,500 * when printed 11"x17"	Source: MNRF 2020 Image: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community
P#:60665521	V#:	



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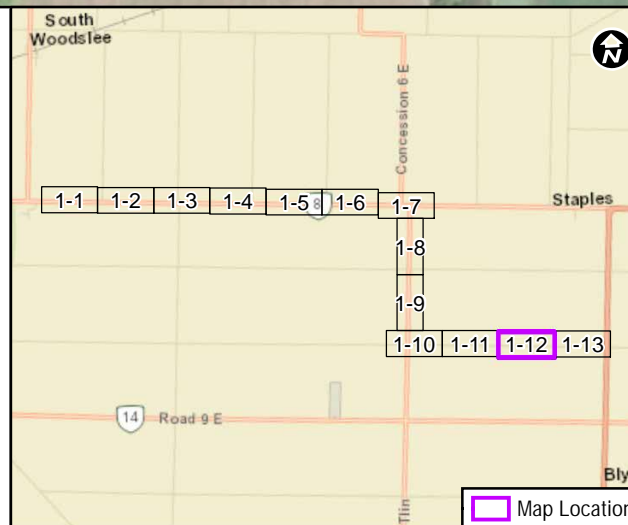
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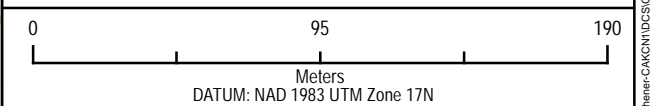
- Preferred Route
- Constructed Drain
- Permanent Stream
- Municipal Boundaries
- ELC

Label	ELC Description
A	Anthropogenic
CUH	Cultural Hedgerow
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FOD2-2	Dry – Fresh Oak – Hickory Deciduous Forest Type
OAO	Open Aquatic



**Panhandle Regional Expansion Project**

**Leamington Interconnect  
ELC**



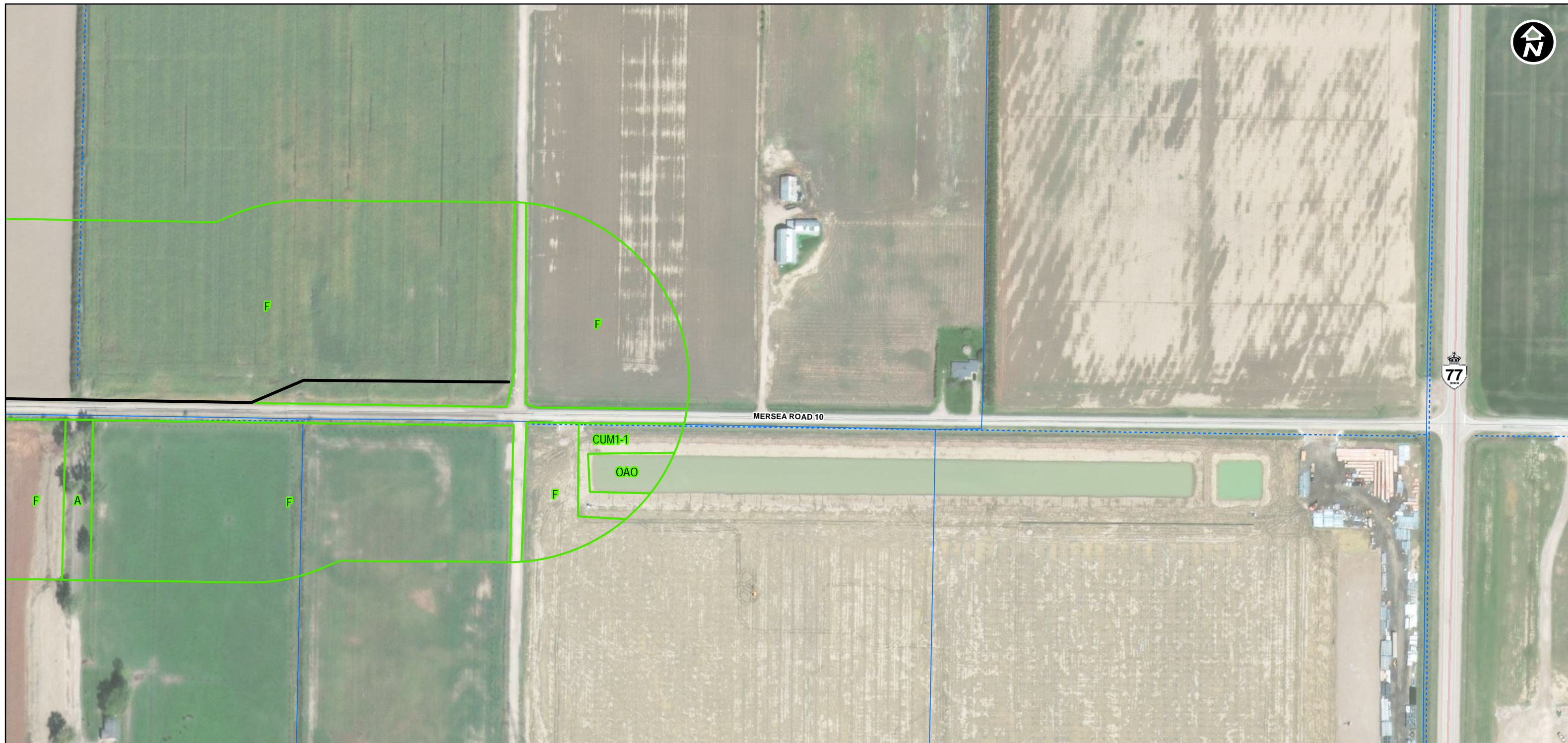
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P#:60665521	V#:	



**Figure 1-12**

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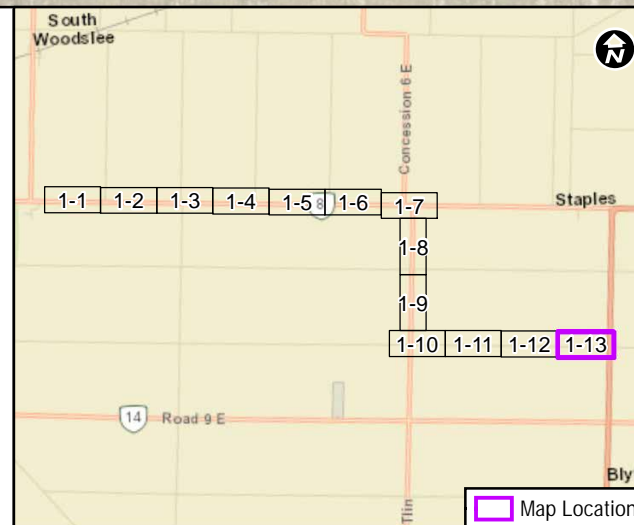
Map Location



**Legend**

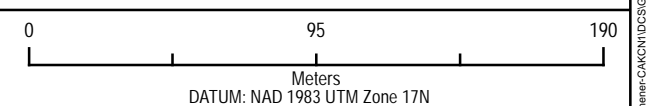
- Preferred Route
- Constructed Drain
- Permanent Stream
- Municipal Boundaries
- ELC

Label	ELC Description
A	Anthropogenic
CUH	Cultural Hedgerow
CUM1-1	Dry – Moist Old Field Meadow Type
F	Agricultural Field
FOD 9-4	Fresh – Moist Shagbark Hickory Deciduous Forest
FOD2-2	Dry – Fresh Oak – Hickory Deciduous Forest Type
OAO	Open Aquatic



**Panhandle Regional Expansion Project**

**Leamington Interconnect  
ELC**

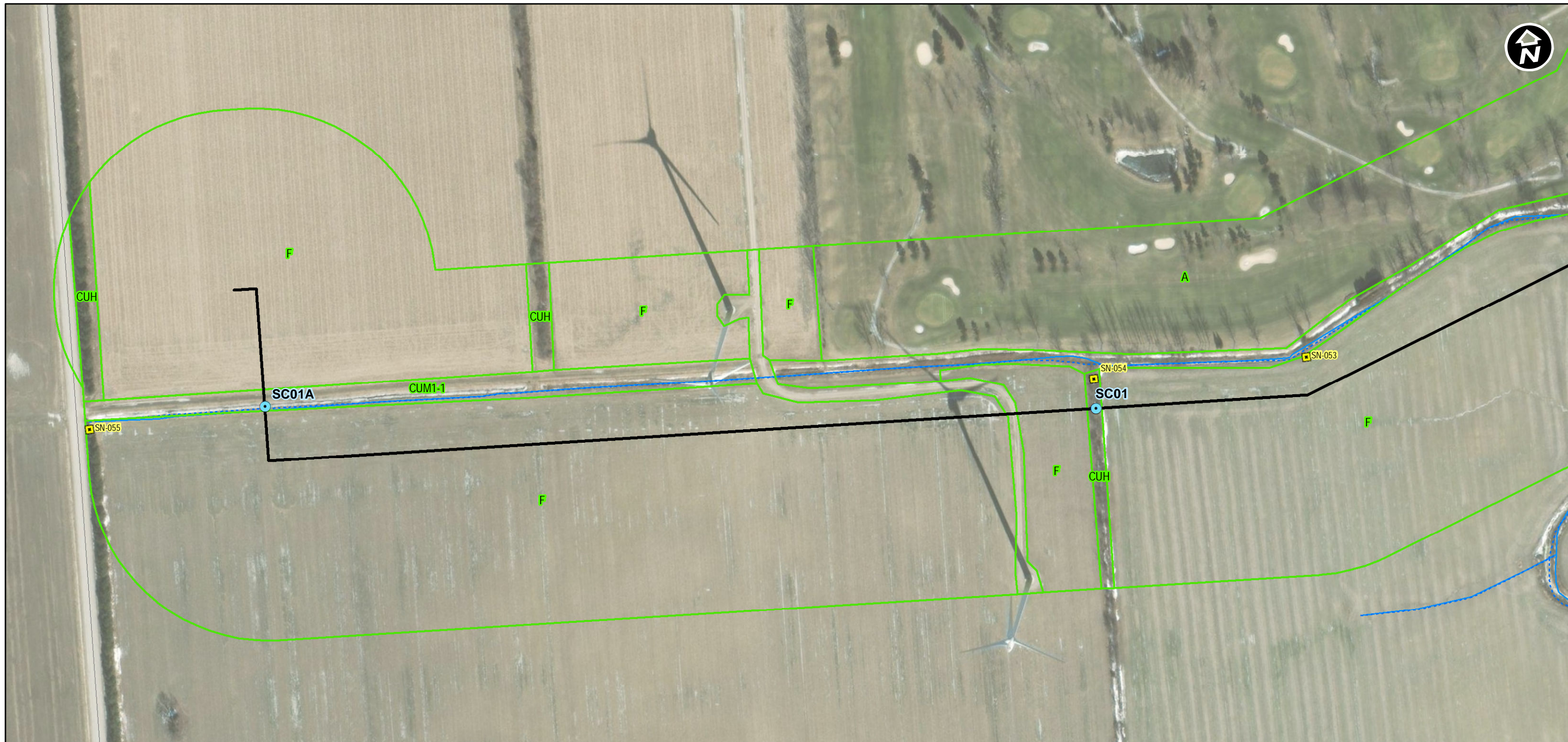


July 2022	1:2,500 * when printed 11"x17"	Source: MNRF 2020 Image: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community
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**Figure 1-13**

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**Legend**

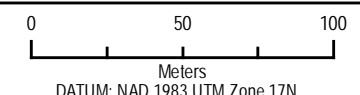
- Snake Survey Locations
- Watercourse Crossing
- Preferred Route 2022-06-03
- Constructed Drain
- Watercourse
- ELC

Label	ELC Description
A	Anthropogenic
CUM1-1	Dry – Moist Old Field Meadow Type
CUH	Cultural Hedgerow
F	Agricultural Field
FOD8-1	Fresh – Moist Poplar Deciduous Forest Type
MAS2-9	Forb Mineral Shallow Marsh Type
OAO	Open Aquatic



**Panhandle Regional Expansion Project**

ELC  
Panhandle



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P#: 60665521	V#:	



**Figure 2-1**

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Map Location: C:\Users\mre\OneDrive\Documents\Projects\60665521\_Panhandle\Design\01\_Report\MAPS\SUP\MXD\_06665521\_Fig2-ELC.mxd  
Date Saved: 8/24/2022 4:10:53 PM User Name: mrsalazar



**Legend**

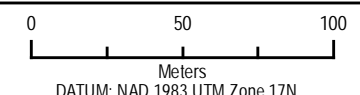
- Turtle Survey Locations
- Snake Survey Locations
- Watercourse Crossing
- Preferred Route 2022-06-03
- Constructed Drain
- Watercourse
- ELC

Label	ELC Description
A	Anthropogenic
CUM1-1	Dry – Moist Old Field Meadow Type
CUH	Cultural Hedgerow
F	Agricultural Field
FOD8-1	Fresh – Moist Poplar Deciduous Forest Type
MAS2-9	Forb Mineral Shallow Marsh Type
OAO	Open Aquatic



**Panhandle Regional Expansion Project**

ELC  
Panhandle



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**Figure 2-2**

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Map location: C:\Users\mrc\OneDrive\Documents\Projects\60665521\_Panhandle\Design\01\_Report\MAPS\SUP\MXD\_06665521\_Fig2.ELC.mxd Date Saved: 20/11/2022 4:10:53 PM User Name: mrc@aec.com



**Legend**

- Snake Survey Locations
- Watercourse Crossing
- Preferred Route 2022-06-03
- Constructed Drain
- Watercourse
- ELC

Label	ELC Description
A	Anthropogenic
CUM1-1	Dry – Moist Old Field Meadow Type
CUH	Cultural Hedgerow
F	Agricultural Field
FOD8-1	Fresh – Moist Poplar Deciduous Forest Type
MAS2-9	Forb Mineral Shallow Marsh Type
OAO	Open Aquatic



**Panhandle Regional Expansion Project**

ELC Panhandle	
<p>Meters DATUM: NAD 1983 UTM Zone 17N</p>	
July 2022	1:2,500 * when printed 11"x17"
P#: 60665521	V#:
<p><b>Figure 2-3</b></p> <p><small>This drawing has been prepared for the use of AECOM's client and may not be used, reproduced or relied upon by third parties, except as agreed by AECOM and its client, as required by law or for use by governmental reviewing agencies. AECOM accepts no responsibility, and denies any liability whatsoever, to any party that modifies this drawing without AECOM's express written consent.</small></p>	

Map Location: \\sawtooth\mrs.com\GIS\PROJECTS\2022\2022-11-28 EB-2022-0157\Exhibit JT1.11 Supplementary, Attachment 8, Page 46 of 122  
 Date: 2022-11-28 4:16:53 PM User Name: mrs.com



**Legend**

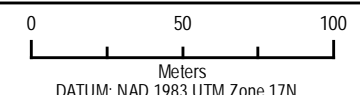
- Turtle Survey Locations
- Snake Survey Locations
- Watercourse Crossing
- Preferred Route 2022-06-03
- Constructed Drain
- Watercourse
- ELC

Label	ELC Description
A	Anthropogenic
CUM1-1	Dry – Moist Old Field Meadow Type
CUH	Cultural Hedgerow
F	Agricultural Field
FOD8-1	Fresh – Moist Poplar Deciduous Forest Type
MAS2-9	Forb Mineral Shallow Marsh Type
OAO	Open Aquatic



**Panhandle Regional Expansion Project**

ELC  
Panhandle



July 2022  
P#: 60665521  
1:2,500  
V#:   
Source: MNR 2020  
INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

**AECOM** **Figure 2-4**

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Map Location: \\panhandle\mrs\mrs\GIS\Projects\60665521\_Erldg\_Panhandle\Design\01\_Report\METP\SUP\MXD\_06665521\_Fig2.ELC.mxd Date Saved: 6/29/22 4:16:53 PM User Name: mrs@ecm.com



**Legend**

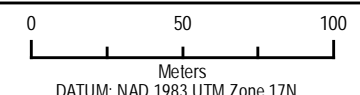
- Turtle Survey Locations
- Snake Survey Locations
- Watercourse Crossing
- Preferred Route 2022-06-03
- Constructed Drain
- Watercourse
- ELC

Label	ELC Description
A	Anthropogenic
CUM1-1	Dry – Moist Old Field Meadow Type
CUH	Cultural Hedgerow
F	Agricultural Field
FOD8-1	Fresh – Moist Poplar Deciduous Forest Type
MAS2-9	Forb Mineral Shallow Marsh Type
OAO	Open Aquatic



**Panhandle Regional Expansion Project**

ELC  
Panhandle



July 2022	1:2,500 * when printed 11"x17"	Source: MNRF 2020 Image: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community
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**Figure 2-5**

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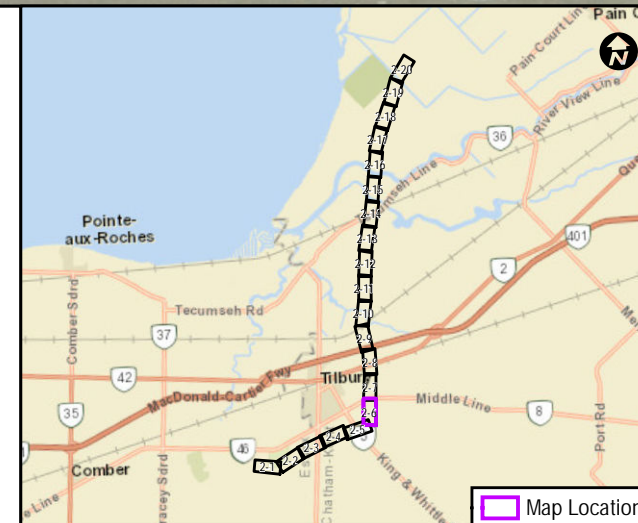




**Legend**

- Turtle Survey Locations
- Snake Survey Locations
- Watercourse Crossing
- Preferred Route 2022-06-03
- Constructed Drain
- Watercourse
- ELC
- Category 3 Habitat
- Category 2 Habitat

Label	ELC Description
A	Anthropogenic
CUM1-1	Dry – Moist Old Field Meadow Type
CUH	Cultural Hedgerow
F	Agricultural Field
FOD8-1	Fresh – Moist Poplar Deciduous Forest Type
MAS2-9	Forb Mineral Shallow Marsh Type
OAO	Open Aquatic



**Panhandle Regional Expansion Project**

ELC  
Panhandle

0 50 100  
Meters  
DATUM: NAD 1983 UTM Zone 17N

July 2022	1:2,500 * when printed 11"x17"	Source: MNRF 2020 Image: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community
P#: 60665521	V#:	

**AECOM** **Figure 2-6**

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**Legend**

- Turtle Survey Locations
- Snake Survey Locations
- Watercourse Crossing
- Preferred Route 2022-06-03
- Constructed Drain
- Watercourse
- ELC
- Eastern Foxsnake Habitat**
- Category 2 Habitat
- Category 3 Habitat

Label	ELC Description
A	Anthropogenic
CUM1-1	Dry – Moist Old Field Meadow Type
CUH	Cultural Hedgerow
F	Agricultural Field
FOD8-1	Fresh – Moist Poplar Deciduous Forest Type
MAS2-9	Forb Mineral Shallow Marsh Type
OAO	Open Aquatic



**Panhandle Regional Expansion Project**

ELC  
Panhandle

Meters  
DATUM: NAD 1983 UTM Zone 17N

July 2022	1:2,500 * when printed 11"x17"	Source: MNRF 2020 Image: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community
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**Figure 2-7**

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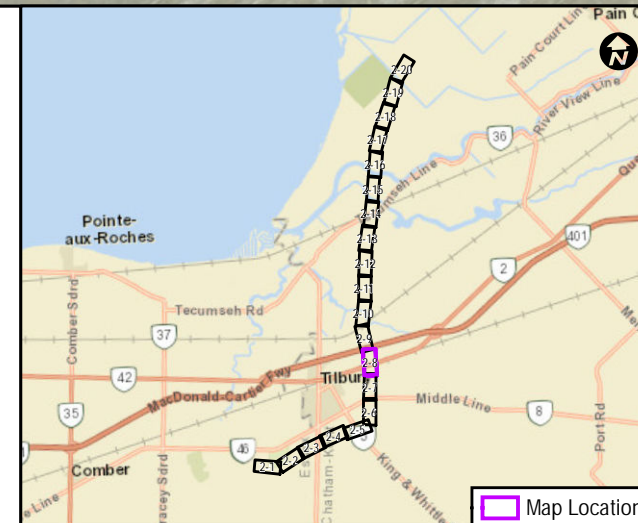
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Date Saved: 6/20/2022 4:10:53 PM User Name: mrdave@ecm.com



**Legend**

- Turtle Survey Locations
- Snake Survey Locations
- Watercourse Crossing
- Preferred Route 2022-06-03
- Constructed Drain
- Watercourse
- ELC
- Eastern Foxsnake Habitat**
- Category 2 Habitat
- Category 3 Habitat

Label	ELC Description
A	Anthropogenic
CUM1-1	Dry – Moist Old Field Meadow Type
CUH	Cultural Hedgerow
F	Agricultural Field
FOD8-1	Fresh – Moist Poplar Deciduous Forest Type
MAS2-9	Forb Mineral Shallow Marsh Type
OAO	Open Aquatic



**Panhandle Regional Expansion Project**

ELC  
Panhandle

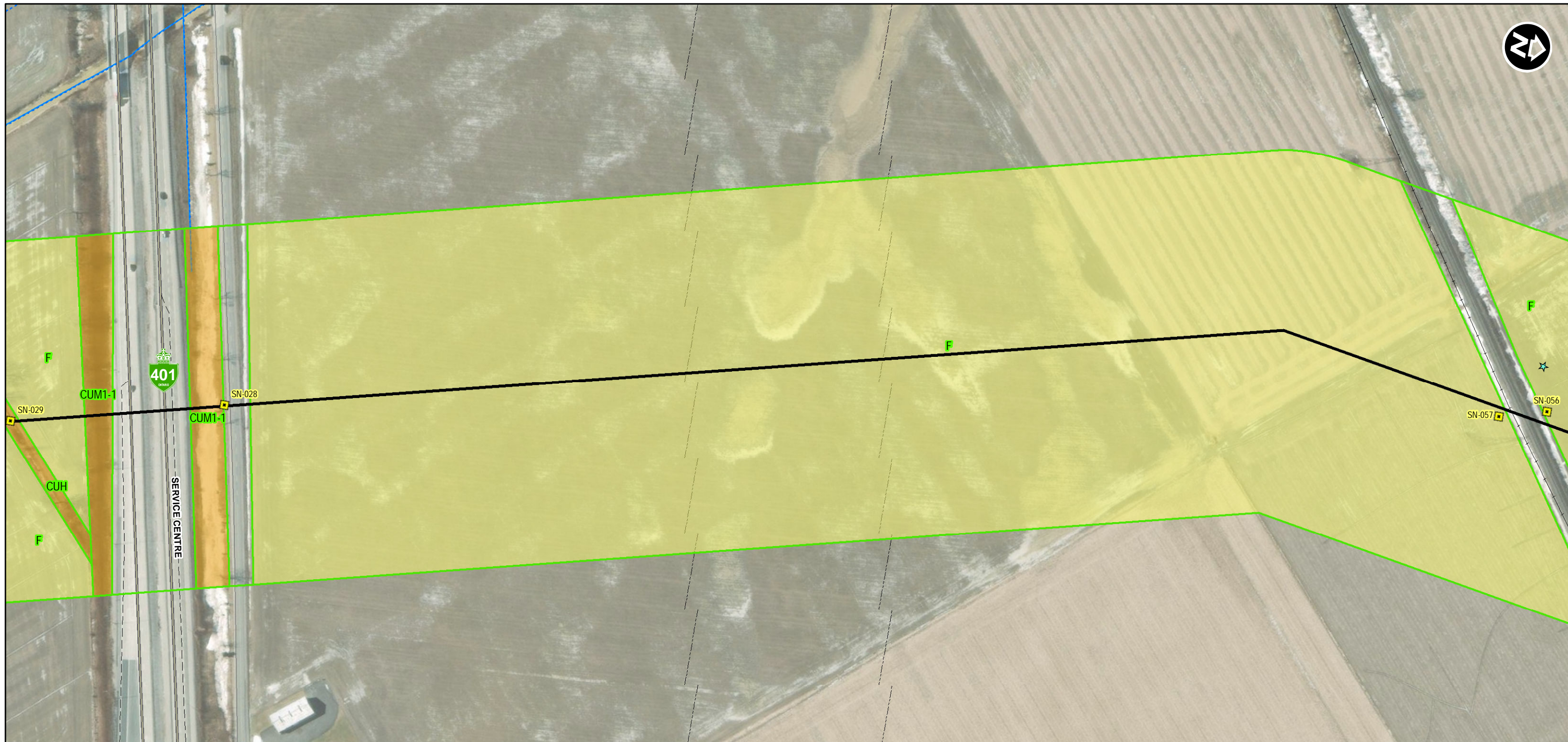
Meters  
DATUM: NAD 1983 UTM Zone 17N

July 2022	1:2,500 <small>* when printed 11"x17"</small>	<small>Source: MNRF 2020 Image: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community</small>
P#: 60665521	V#:	

**Figure 2-8**

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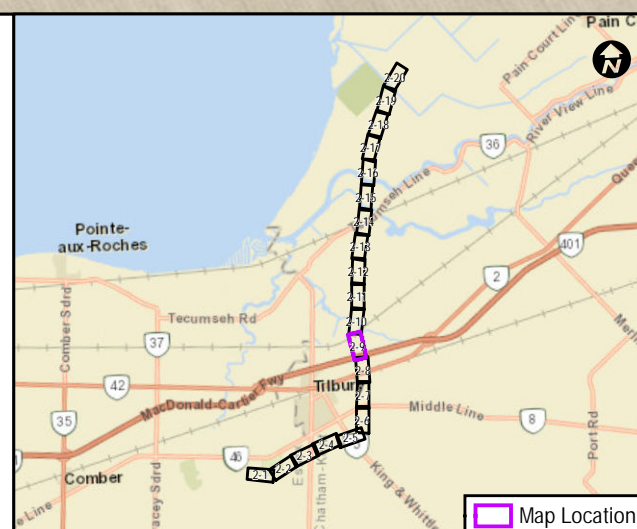
Map location: C:\Users\mre\OneDrive\Documents\Projects\2022\EB-2022-0157\Map\MapLocation.mxd; Date: 2022-11-28 4:10:53 PM; User Name: mre; Title: mre



### Legend

- Snake Survey Locations
- Watercourse Crossing
- Preferred Route 2022-06-03
- Constructed Drain
- Watercourse
- ELC
- Eastern Foxsnake Habitat**
- Category 2 Habitat
- Category 3 Habitat

Label	ELC Description
A	Anthropogenic
CUM1-1	Dry – Moist Old Field Meadow Type
CUH	Cultural Hedgerow
F	Agricultural Field
FOD8-1	Fresh – Moist Poplar Deciduous Forest Type
MAS2-9	Forb Mineral Shallow Marsh Type
OAO	Open Aquatic



## Panhandle Regional Expansion Project

### ELC Panhandle

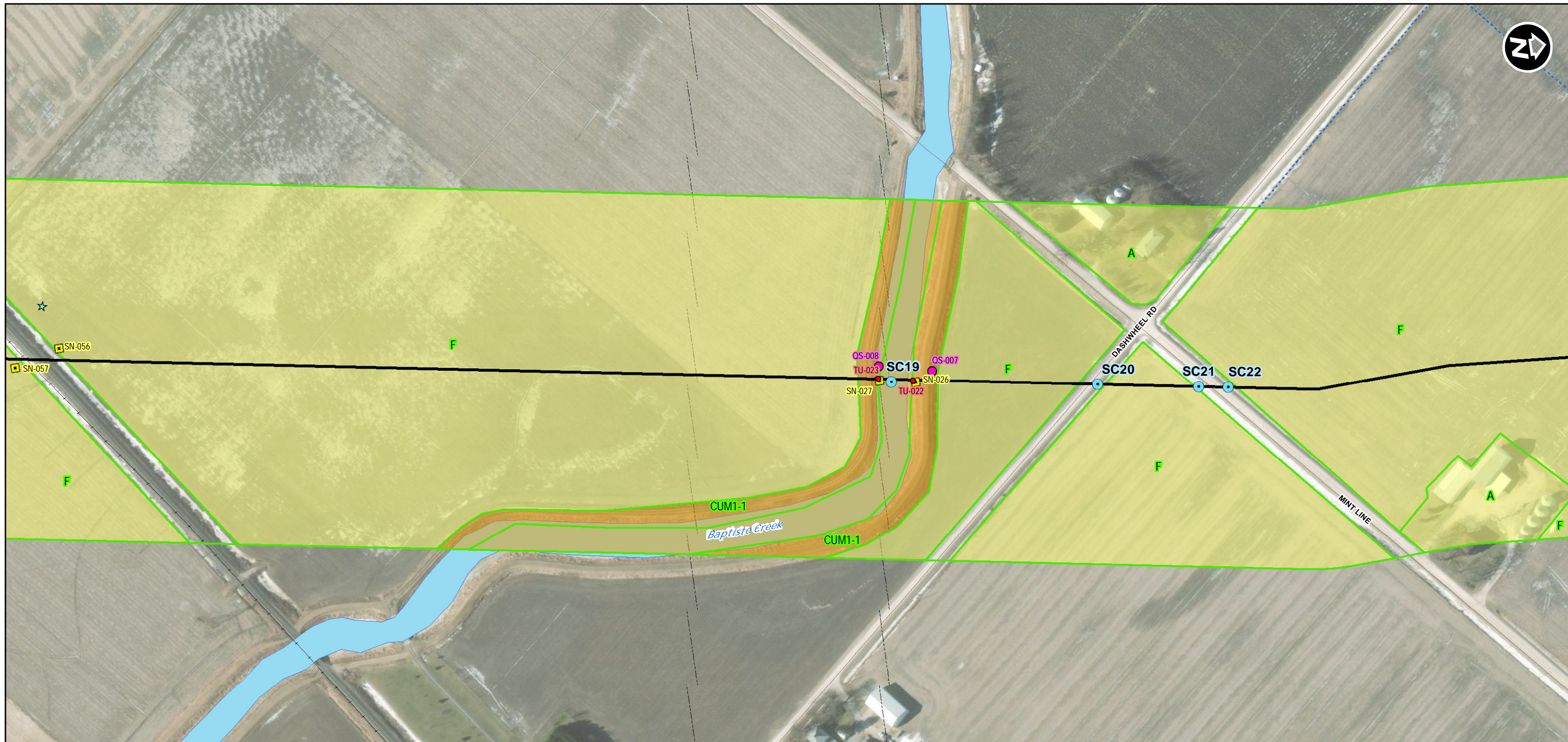
Meters  
DATUM: NAD 1983 UTM Zone 17N

July 2022	1:2,500 * when printed 11"x17"	Source: MNRF 2020 Image: Sources: Esri, HERE, Garmin, USCS, Intermap INCREMENT P, NRCAn, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community
P#: 60665521	V#:	

**Figure 2-9**

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Map location: \\sawana2022\mrs.com\GIS\MapServer\workspace\CHK\GIS\US\GIS\Projects\60665521\_Eubridge\_Panhandle\Design\01\_Report\MCEP\SUP\MXD\_06665521\_Fig2-9.ELC.mxd  
Date Saved: 6/29/2022 4:10:53 PM User Name: mrs@ecm.com



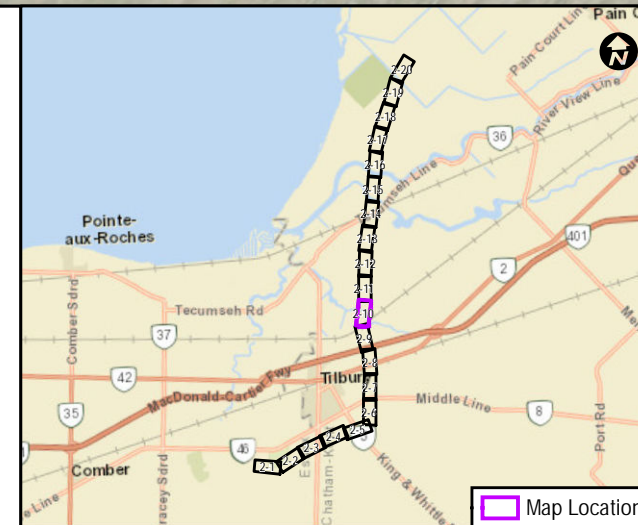
**Legend**

- Turtle Survey Locations
- Snake Survey Locations
- Queen Snake Survey
- Watercourse Crossing
- Preferred Route 2022-06-03
- Constructed Drain
- Watercourse
- ELC

**Eastern Foxsnake Habitat**

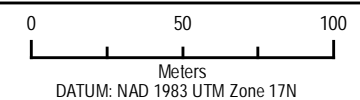
- Category 2 Habitat
- Category 3 Habitat

Label	ELC Description
A	Anthropogenic
CUM1-1	Dry – Moist Old Field Meadow Type
CUH	Cultural Hedgerow
F	Agricultural Field
FOD8-1	Fresh – Moist Poplar Deciduous Forest Type
MAS2-9	Forb Mineral Shallow Marsh Type
OAO	Open Aquatic



**Panhandle Regional Expansion Project**

ELC  
Panhandle



July 2022  
P#: 60665521

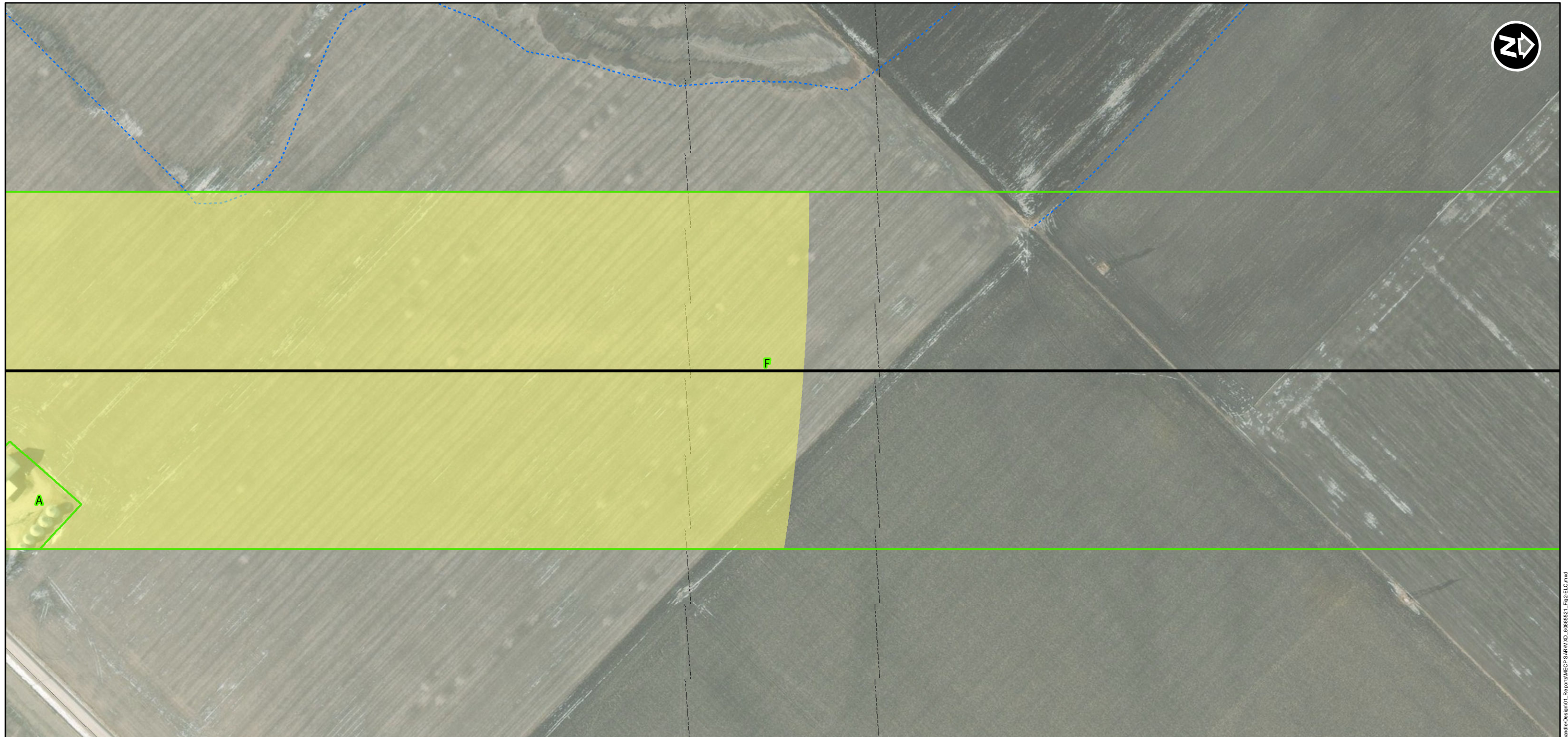
1:2,500  
\* when printed 11"x17"

Source: MNRF 2020  
Image: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community









**Figure 2-10**

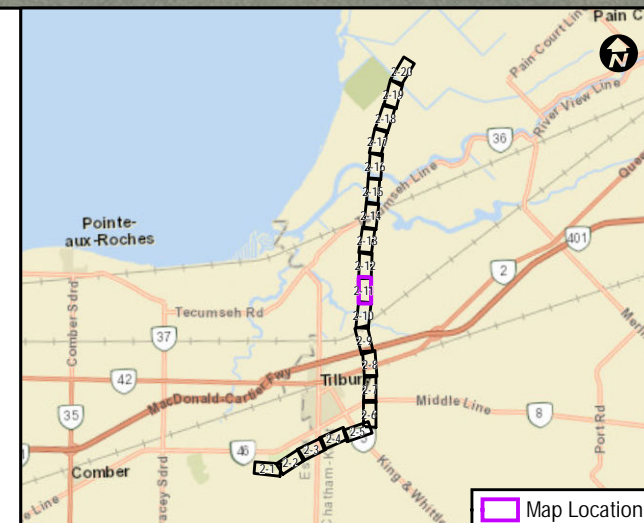
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**Legend**

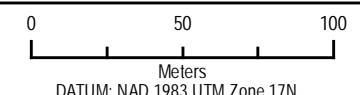
-  Watercourse Crossing
-  Preferred Route 2022-06-03
-  Constructed Drain
-  Watercourse
-  ELC
- Eastern Foxsnake Habitat**
-  Category 3 Habitat

Label	ELC Description
A	Anthropogenic
CUM1-1	Dry – Moist Old Field Meadow Type
CUH	Cultural Hedgerow
F	Agricultural Field
FOD8-1	Fresh – Moist Poplar Deciduous Forest Type
MAS2-9	Forb Mineral Shallow Marsh Type
OAO	Open Aquatic



**Panhandle Regional Expansion Project**

ELC  
Panhandle



July 2022	1:2,500 * when printed 11"x17"	Source: MNRF 2020 Image: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community
P#:60665521	V#:	

**AECOM** **Figure 2-11**

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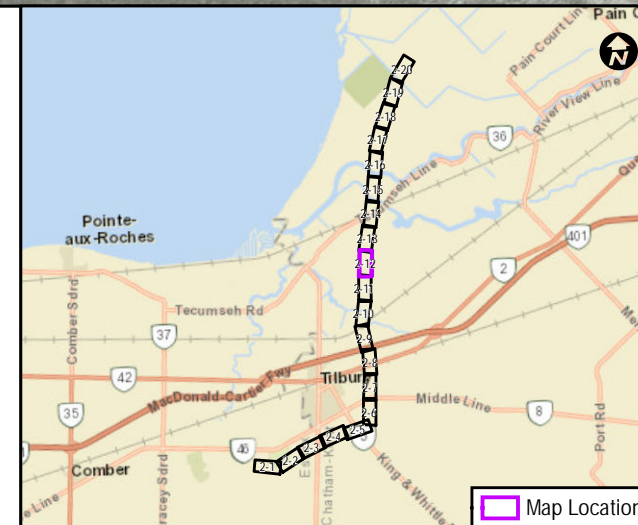
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**Legend**

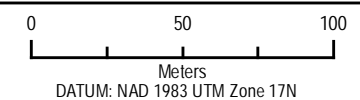
- Turtle Survey Locations
- Snake Survey Locations
- Watercourse Crossing
- Preferred Route 2022-06-03
- Constructed Drain
- Watercourse
- ELC

Label	ELC Description
A	Anthropogenic
CUM1-1	Dry – Moist Old Field Meadow Type
CUH	Cultural Hedgerow
F	Agricultural Field
FOD8-1	Fresh – Moist Poplar Deciduous Forest Type
MAS2-9	Forb Mineral Shallow Marsh Type
OAO	Open Aquatic



**Panhandle Regional Expansion Project**

ELC  
Panhandle



July 2022	1:2,500 * when printed 11"x17"	Source: MNRF 2020 Image: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community
P#:60665521	V#:	

**AECOM**

**Figure 2-12**

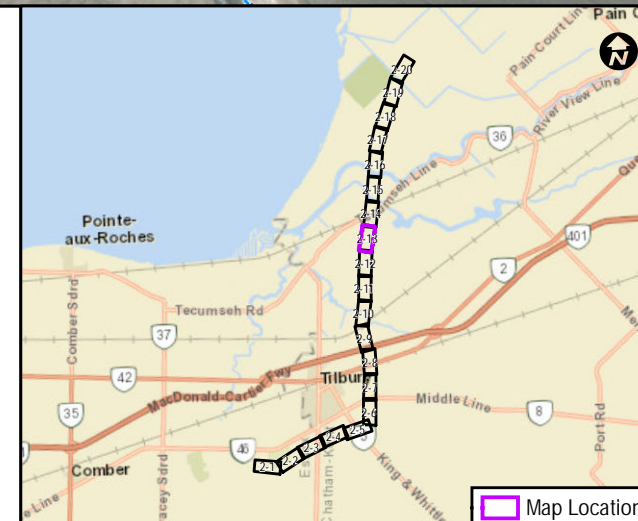
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**Legend**

- Turtle Survey Locations
- Snake Survey Locations
- Queen Snake Survey
- Watercourse Crossing
- Preferred Route 2022-06-03
- - - - - Constructed Drain
- Watercourse
- ELC

Label	ELC Description
A	Anthropogenic
CUM1-1	Dry – Moist Old Field Meadow Type
CUH	Cultural Hedgerow
F	Agricultural Field
FOD8-1	Fresh – Moist Poplar Deciduous Forest Type
MAS2-9	Forb Mineral Shallow Marsh Type
OAO	Open Aquatic



**Panhandle Regional Expansion Project**

<b>ELC</b>	
<b>Panhandle</b>	
DATUM: NAD 1983 UTM Zone 17N	
July 2022	1:2,500 * when printed 11"x17"
P#: 60665521	V#:
Source: MNRF 2020 Image: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community	
<b>AECOM</b>	<b>Figure 2-13</b>
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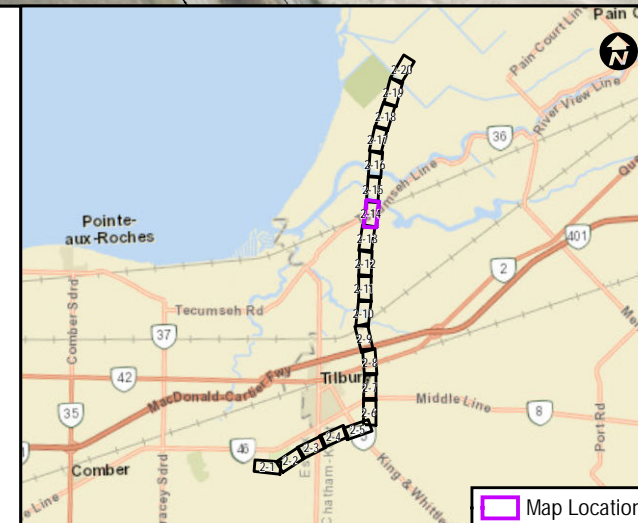




**Legend**

- Turtle Survey Locations
- Snake Survey Locations
- Queen Snake Survey
- Watercourse Crossing
- Preferred Route 2022-06-03
- Constructed Drain
- Watercourse
- ELC

Label	ELC Description
A	Anthropogenic
CUM1-1	Dry – Moist Old Field Meadow Type
CUH	Cultural Hedgerow
F	Agricultural Field
FOD8-1	Fresh – Moist Poplar Deciduous Forest Type
MAS2-9	Forb Mineral Shallow Marsh Type
OAO	Open Aquatic



**Panhandle Regional Expansion Project**

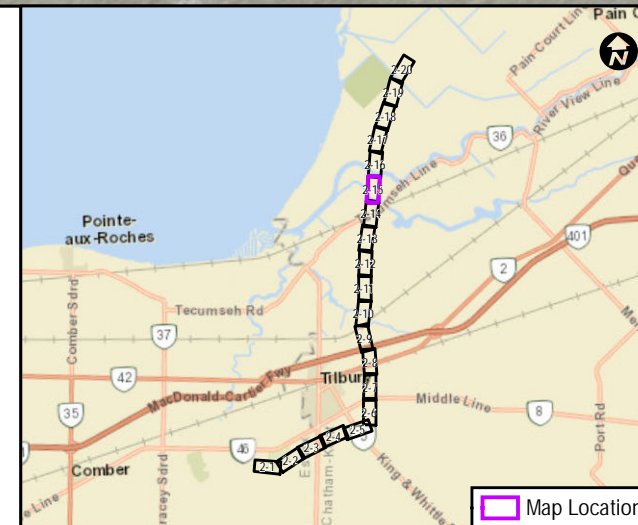
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<b>Panhandle</b>	
DATUM: NAD 1983 UTM Zone 17N	
July 2022	1:2,500 <small>* when printed 11"x17"</small>
P#: 60665521	V#:
<small>Source: MNRF 2020 Image: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community</small>	
<b>AECOM</b>	<b>Figure 2-14</b>
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**Legend**

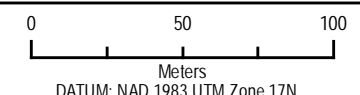
- Turtle Survey Locations
- Snake Survey Locations
- Queen Snake Survey
- Watercourse Crossing
- Preferred Route 2022-06-03
- Constructed Drain
- Watercourse
- ELC

Label	ELC Description
A	Anthropogenic
CUM1-1	Dry – Moist Old Field Meadow Type
CUH	Cultural Hedgerow
F	Agricultural Field
FOD8-1	Fresh – Moist Poplar Deciduous Forest Type
MAS2-9	Forb Mineral Shallow Marsh Type
OAO	Open Aquatic



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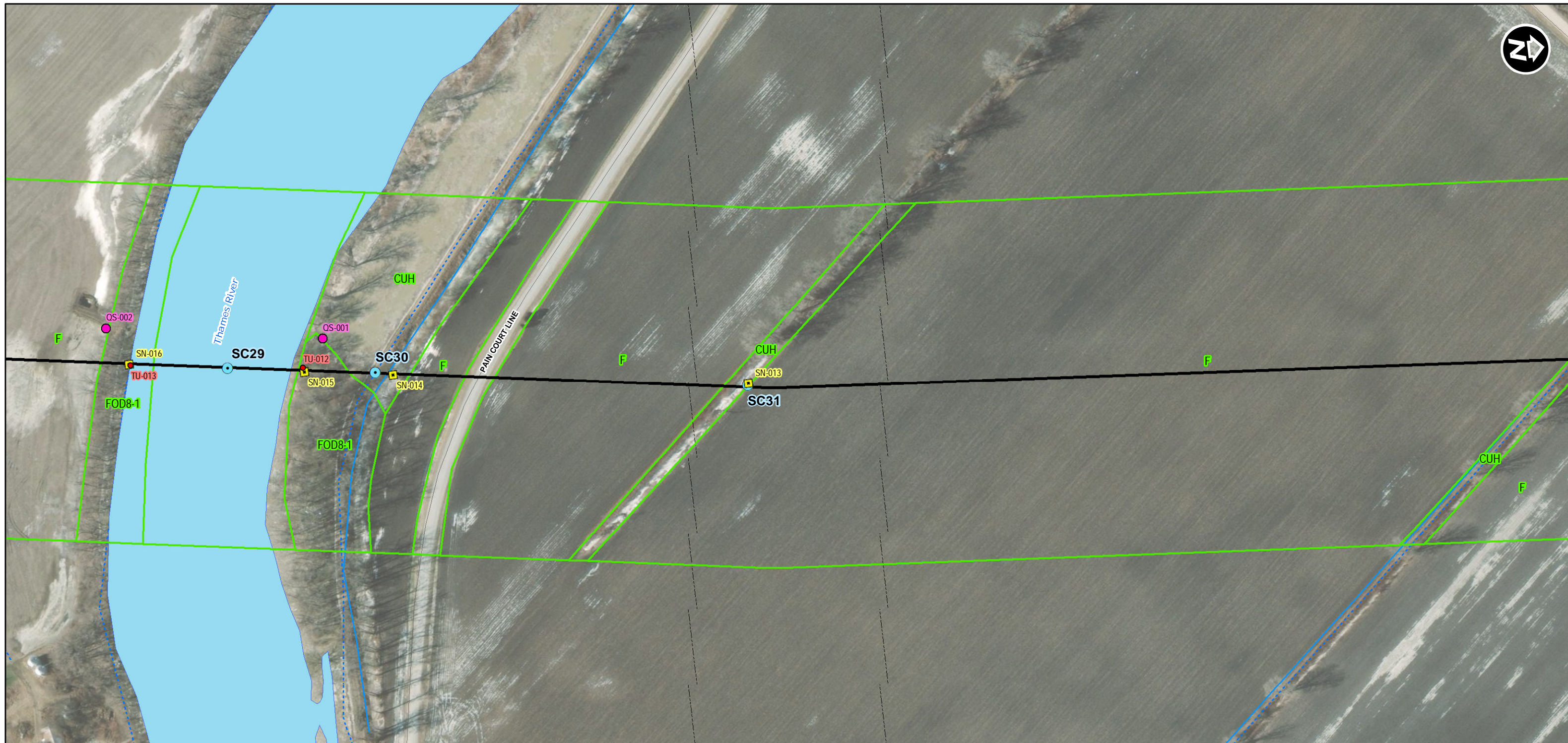


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 P#: 60665521      V#:

**AECOM**      **Figure 2-15**

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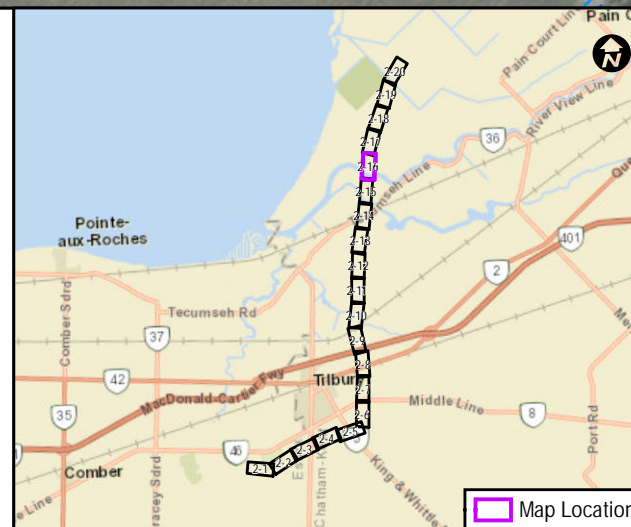
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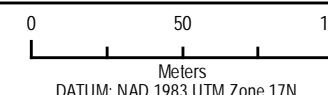
- Turtle Survey Locations
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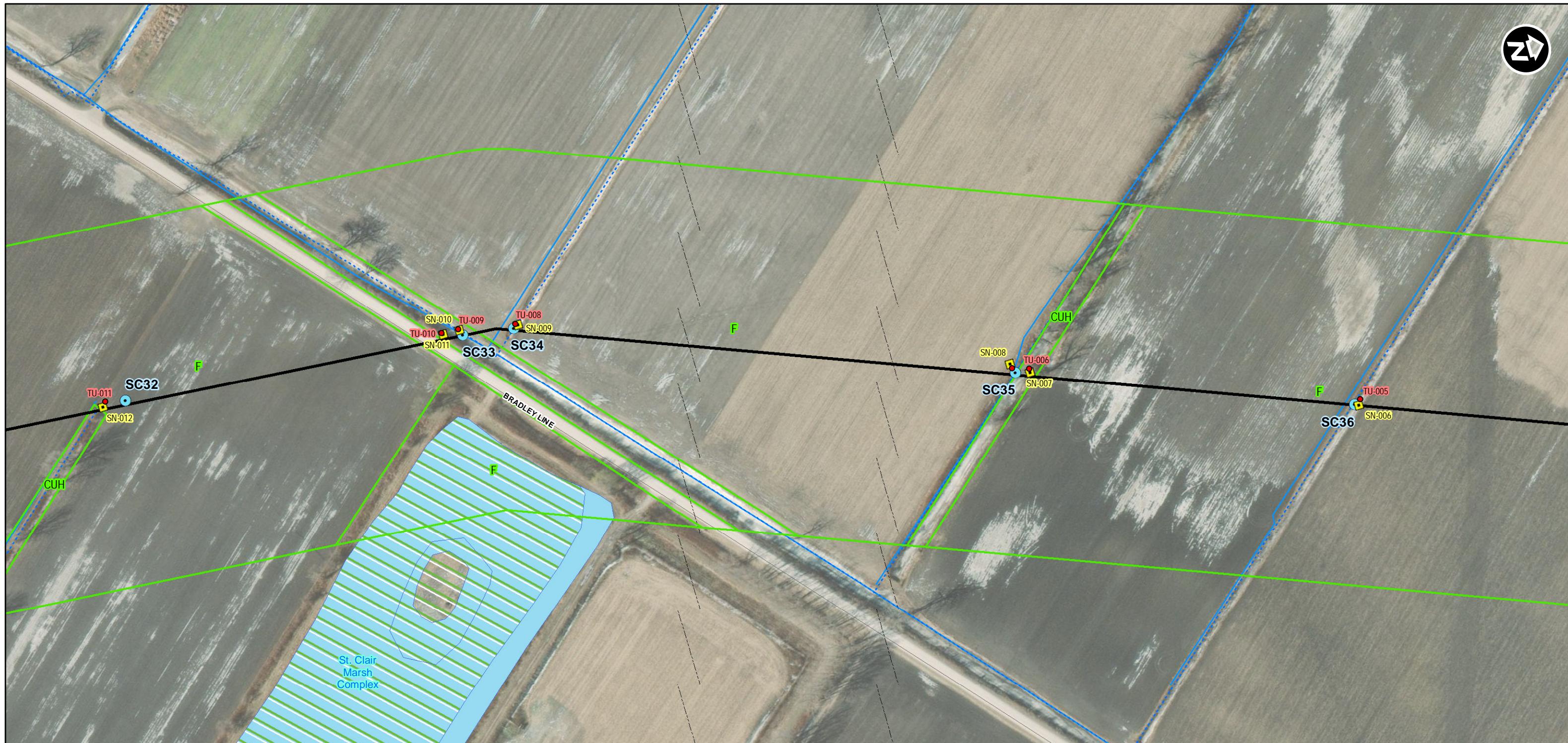


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P#: 60665521	V#:	

**AECOM** **Figure 2-16**

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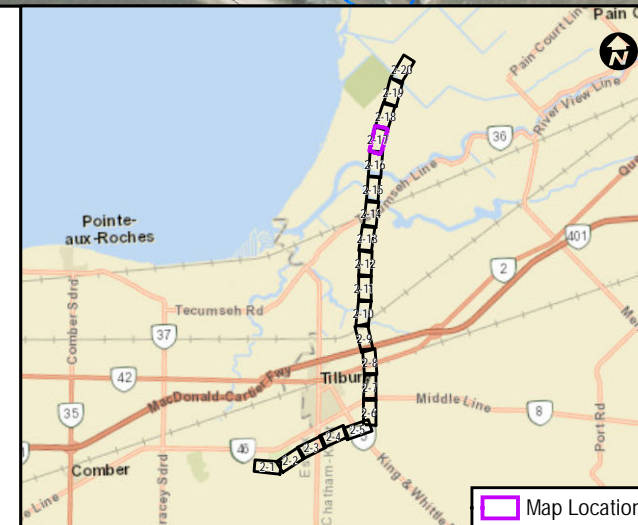
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**Legend**

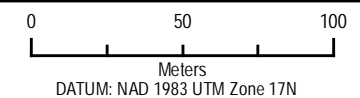
- Turtle Survey Locations
- Snake Survey Locations
- Watercourse Crossing
- Preferred Route 2022-06-03
- Constructed Drain
- Watercourse
- Provincially Significant Wetland
- ELC

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**Figure 2-17**

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**Legend**

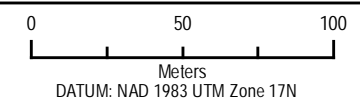
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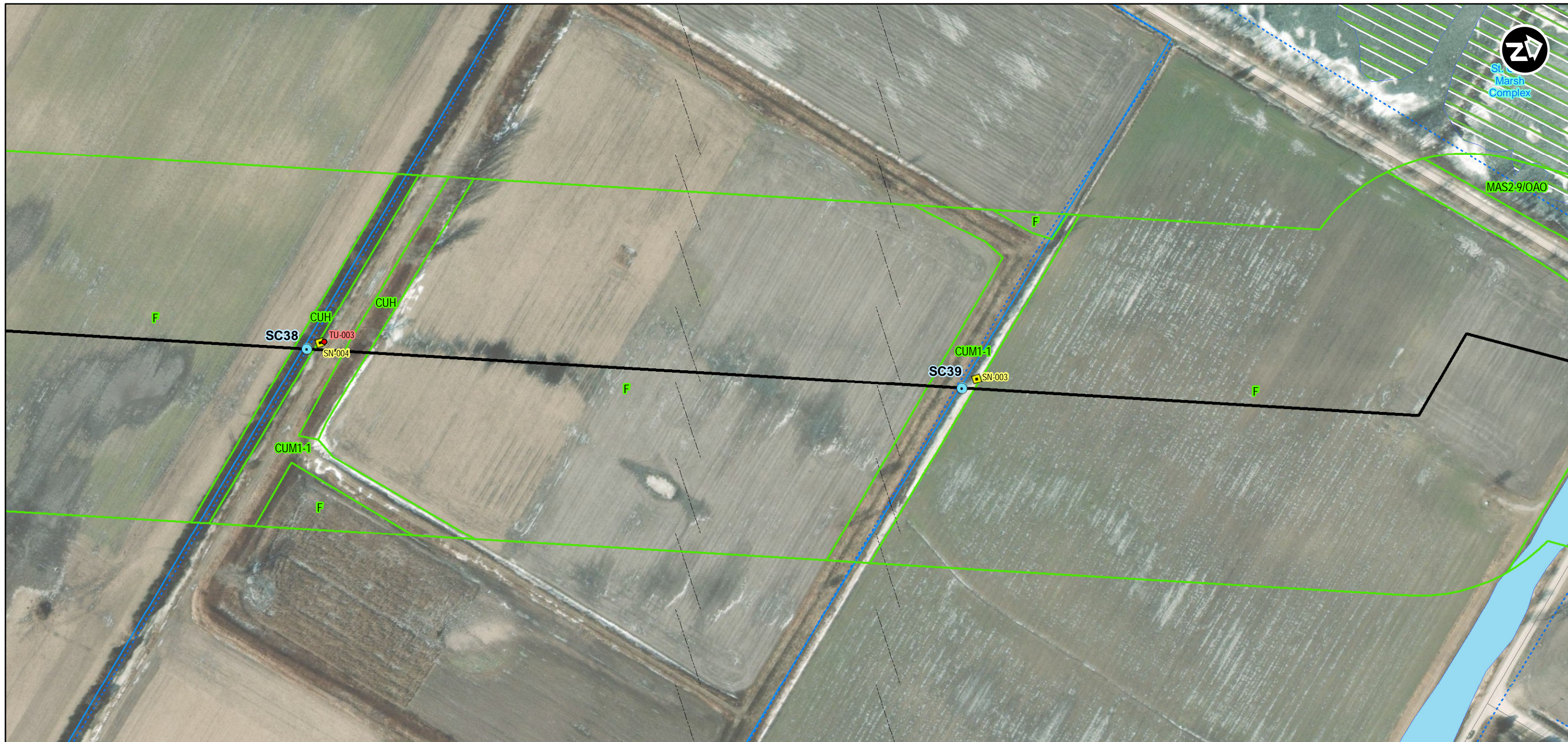
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**Figure 2-18**

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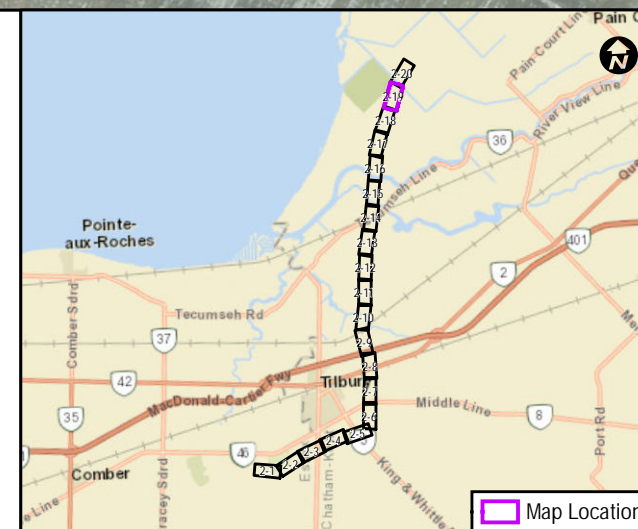
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**Legend**

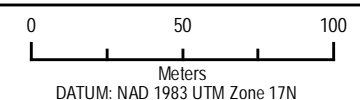
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**Figure 2-19**

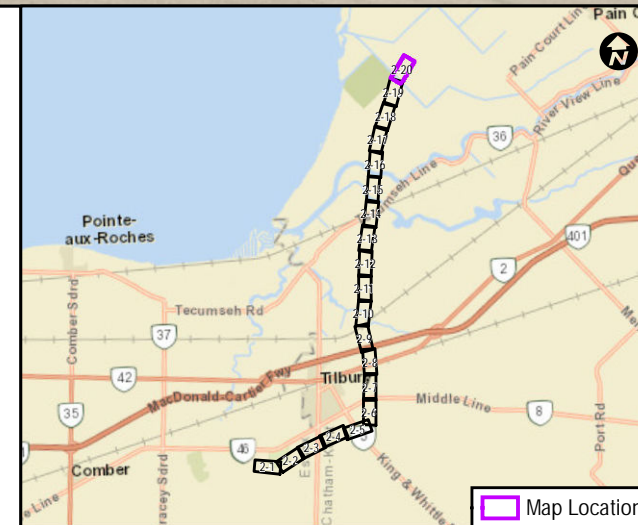
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**Legend**

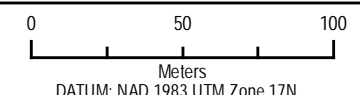
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**AECOM**      **Figure 2-20**

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# **Attachment A**

## **Panhandle Existing Fish Habitat Summary**



**TEMPLATE D2A: EXISTING FISH HABITAT CONDITIONS SUMMARY TABLE**

Waterbody ID	Date	Flow	Thermal Regime	Fish Habitat*	Substrate Type	Channel Morphology	Vegetation	Constraints & Opportunities	Significant Fish Habitat	Fish Community Sampling Results
SC-01A Boucher Drain	To Be Completed	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	N/A
SC-01 Unnamed Trib to Boucher Drain 001	May 10, 2022	Ephemeral	Unknown	Indirect	Silt, Sand	N/A – Dry at the time of assessment	Terrestrial Grasses	Expand riparian area	None	N/A
SC-02 Thilbert Drain	Apr 27, 2022	Permanent	Warm <sup>1</sup>	Direct <sup>1</sup>	Silt, sand, gravel	Flats(50%), Run (30%), Pool (20%)	No vegetation was present at the time of inspection	Expand riparian area, waste removal, add morphology structures	None	None
SC-03 Tremblay Creek Drain / Tilbury Creek)	Apr 27, 2022	Permanent	Warm <sup>1</sup>	Direct <sup>1</sup>	Silt, cobble, gravel	Run (100%)	No vegetation was present at the time of inspection	Stabilize right bank, Expand riparian area, Low flows could present a seasonal barrier to fish habitat	None	Emerald Shiner (36) Creek Chub (16) Yellow Bullhead (4) Pumpkinseed (1) Black Bullhead (1) Johnny Darter (1) Spottail Shiner (1) Yellow Perch (1)
SC-04 Unnamed Non-Flowing Waterbody 001	May 10, 2022	Ephemeral	Unknown	Not fish habitat	Detritus, silt, sand	Pool (100%)	Terrestrial grasses, Phragmites	Seasonal flows, expand riparian area, Remove phragmites	None	N/A

Waterbody ID	Date	Flow	Thermal Regime	Fish Habitat*	Substrate Type	Channel Morphology	Vegetation	Constraints & Opportunities	Significant Fish Habitat	Fish Community Sampling Results
SC-05 Unnamed Trib to Malott Diversion Drain 001	May 10, 2022	Intermittent	Unknown	Indirect	Silt Sand	N/A - Dry at the time of assessment	Terrestrial grasses, Phragmites	Create/Expand riparian area, seasonal low flows restrict passage	None	N/A
SC-06 Unnamed Trib to Malott Diversion Drain 002	May 10, 2022	Ephemeral	Unknown	Indirect	Silt Sand	N/A - Dry at the time of assessment	Terrestrial grasses, Phragmite	Create/Expand riparian area, seasonal low flows restrict passage	None	N/A
SC-07 Unnamed Non-Flowing Waterbody 002	Apr 27, 2022	Permanent	Unknown	Direct	Silt, sand	Flats (100%)	Unidentified floating vegetation present	Expand riparian buffer, improve morphology, remove phragmites	Lilliput mussels	Goldfish (3)
SC-08 Unnamed Non-Flowing Waterbody 003	Apr 27, 2022	Ephemeral	Unknown	Not Fish Habitat	Detritus, silt, sand	Pool (100%)	Algae, floating aquatic vegetation	Improve connectivity, Expand riparian buffer	None	N/A
SC-09 Thompson-Paulus Drain	April 27, 2022	Permanent	Unknown	Direct	Silt, Sand	Flat (100%)	Floating aquatic vegetation, some phragmites	Expand riparian buffer, improve morphology	None	None
SC-10 King and Whittle Drain	Apr 27, 2022	Permanent	Unknown	Direct	Gravel, sand, silt, cobble	Run (95%) Pool (5%)	Algae, grasses	Expand riparian area. Low flows could be a seasonal	Clean gravel bottom,	None

Waterbody ID	Date	Flow	Thermal Regime	Fish Habitat*	Substrate Type	Channel Morphology	Vegetation	Constraints & Opportunities	Significant Fish Habitat	Fish Community Sampling Results
								barrier to fish habitat.		
SC-11 Gagnier Drain	Apr 27, 2022	Permanent	Unknown	Direct	Silt, sand, gravel	Run (100%)	Algae, phragmites	Remove phragmites; low flows could present a seasonal barrier to fish habitat.	None	None
SC-12 Powell Drain	Apr 27, 2022	Permanent	Unknown	Direct	Silt (80%), gravel (10%), cobble (10%)	Run (40%) Riffle (40%) Pool (20%)	No vegetation was present at the time of inspection	Expand/ create riparian buffer	None	Emerald Shiner (1)
SC-13 Unnamed Trib to King and Whittle Drain 001	Apr 27, 2022	Intermittent	Unknown	Indirect	Silt, Sand	Run (100%)	Terrestrial grasses	Expand/ create a riparian buffer; enhance channel morphology; improve connectivity to main channel; the drop in elevation to the main channel could create a seasonal barrier to fish passage	None	None
SC-14 Ivison Drain	Apr 27, 2022	Permanent	Unknown	Indirect	Cobble (30%), gravel (10%), sand	Run (50%) Riffle (50%)	No vegetation was present at the time of inspection	Seasonal "waterfall" to main channel; remove	None	None

Waterbody ID	Date	Flow	Thermal Regime	Fish Habitat*	Substrate Type	Channel Morphology	Vegetation	Constraints & Opportunities	Significant Fish Habitat	Fish Community Sampling Results
					(30%), silt (30%)			phragmites; expand/ create riparian buffer		
SC-15 King and Whittle Drain	May 10, 2022	Permanent	Unknown	Direct	Gravel, sand, silt, cobble	Flat (100%)	Instream aquatic vegetation	Expand riparian area, improve downstream connectivity at low flows (barrier to quillback present), improve upstream water quality	Quillback and Largemouth bass spawning	Did not complete due to staging Quillback
SC-16 Anesser Drain	May 10, 2022	Permanent	Unknown	Indirect	Silt, Sand, Cobble	Run (95%), Riffle (5%)		Create / Expand riparian buffer, improve connectivity to downstream	None	None
SC-17 Unnamed Trib to King and Whittle Drain 002	Apr 27, 2022	Intermittent	Unknown	Indirect	Silt, Detritus	Flats (100%)	Algae, grasses	Clean up garbage Low flows could pose a seasonal barrier to fish	None	N/A
SC-18 King and Whittle Drain	May 10, 2022	Permanent	Unknown	Direct	Silt, Sand	Flats (100%)	Phragmites	Phragmites Removal, Create/Expand riparian buffer, Water Quality	Quillback Spawning	Did not complete due to staging Quillback

Waterbody ID	Date	Flow	Thermal Regime	Fish Habitat*	Substrate Type	Channel Morphology	Vegetation	Constraints & Opportunities	Significant Fish Habitat	Fish Community Sampling Results
								Upstream Improvement		
SC-19 Baptiste Creek	Apr 27, 2022	Permanent <sup>1</sup>	Warm <sup>1</sup>	Direct <sup>1</sup>	Did not assess	Run (100%)	No vegetation was present at the time of inspection	Stabilize vulnerable banks; plant riparian trees/shrubs	Lilliput (END), Spotted Sucker (SC), Silver Lamprey (SC), Mapleleaf (SC)	Did not complete due to SAR presence
SC-20 Unnamed Trib to Johnston Drain 001	May 11, 2022	Intermittent	Unknown	Indirect	Detritus, Silt, Clay	Flats (100%)	Terrestrial grasses	Create/Expand riparian buffer, improve connectivity	None	N/A
SC-21 Unnamed Trib to Johnston Drain 002	Apr 27, 2022	Permanent	Unknown	Direct	Silt, clay	Flats (100%)	Phragmites, unidentified submergent vegetation	Plant riparian trees or shrubs to create a buffer; low flows could cause seasonal barriers to fish passage	None	None
SC-22 Unnamed Trib to Johnston Drain 003	Apr 27, 2022	Intermittent	Unknown	Indirect	Silt (100%)	Flats (100%)	Terrestrial Grasses	Plant riparian trees or shrubs to create a riparian buffer; low flows could cause seasonal barrier to fish passage	None	N/A

Waterbody ID	Date	Flow	Thermal Regime	Fish Habitat*	Substrate Type	Channel Morphology	Vegetation	Constraints & Opportunities	Significant Fish Habitat	Fish Community Sampling Results
SC-23 Olds Drain	Apr 27, 2022	Permanent	Unknown	Direct	Silt, gravel, sand	Run (100%)	No vegetation was present at the time of inspection	Plant riparian trees or shrubs; enhance channel morphology (eg add refuge pools and meanders)	None	None
SC-24 Unnamed Trib to Olds Drain 001	Apr 27, 2022	Ephemeral	Unknown	Not fish habitat	Silt, sand	N/A (dry)	Adjacent terresatrial grasses, some terrestrial grasses in channel	Not fish habitat	None	N/A
SC-25 Forbes Internal Drain	April 27, 2022	Permanent	Unknown	Direct	Silt, Sand	Flats (100%)	No vegetation was present at the time of inspection	Bank Stabilization, expand riparian buffer	None	Did not complete due to safety concerns (steep slope)
SC-26 Unnamed Non-Flowing Waterbody 004	May 10, 2022	Intermittent	Unknown	Not fish habitat	Detritus, Silt, Sand	Pool (100%)	Phragmites	Phragmites Removal, Connectivity improvements	N/A – not fish habitat	N/A
SC-27 Jeannettes Creek	Apr 26, 2022	Permanent <sup>1</sup>	Warm <sup>1</sup>	Direct <sup>1</sup>	Did not assess	Flats (100%)	No vegetation was present at the time of inspection	Remove phragmites, shore stabilization measures, plant additional trees/shrubs to enhance Riparian zone	Silver Lamprey (SC); Spotted Sucker (SC);	Did not complete due to SAR presence

Waterbody ID	Date	Flow	Thermal Regime	Fish Habitat*	Substrate Type	Channel Morphology	Vegetation	Constraints & Opportunities	Significant Fish Habitat	Fish Community Sampling Results
SC-28 Peltier Drain	Apr 26, 2022	Permanent	Unknown	Direct	Silt (80%), Detritus (20%)	Flats (100%)	Duckweed	plant additional trees/shrubs to enhance Riparian zone	None	Goldfish (3)
SC-29 Thames River	Apr 26, 2022	Permanent <sup>1</sup>	Warm <sup>1</sup>	Direct <sup>1</sup>	Silt, sand (along shoreline at crossing)	Flats (100%)	Algae (close to shore) phragmites	Remove phragmites	DFO Critical Habitat: Fawnsfoot  DFO SAR: Hickorynut (END), Fawnsfoot (END), Threehorn Wartyback (THR), Silver Chub (END), Round Hickorynut (END), Black Redhorse (THR), Silver Shiner (THR), Eastern Sand Darter (THR), Northern Madtom (END), Pugnose	Did not complete due to SAR presence

Waterbody ID	Date	Flow	Thermal Regime	Fish Habitat*	Substrate Type	Channel Morphology	Vegetation	Constraints & Opportunities	Significant Fish Habitat	Fish Community Sampling Results
									Minnow (THR), Silvery Lamprey (SC), Northern Sunfish (SC), Spotted Sucker (SC), Mapleleaf (SC), River Redhorse (SC)	
SC-30 Unnamed Trib to Thames River 001	Apr 26, 2022	Permanent	Unknown	Direct	Detritus, Silt, Muck	Flats (100%)	Duckweed, phragmites	Remove phragmites; old rail line is providing a permanent barrier to the Thames River; low flows could cause seasonal barriers to fish passage	Iron staining present which could be an indication of groundwater inputs.  DFO SAR: Lake Chubsucker (END)	Did not complete due to SAR presence
SC-31 Unnamed Non-Flowing Waterbody 005	April 26, 2022	Intermittent	Unknown	Not fish habitat	Detritus, Silt, Sand	Pool (100%)	Phragmites	Remove Phragmites	N/A – Not fish habitat	N/A



Waterbody ID	Date	Flow	Thermal Regime	Fish Habitat*	Substrate Type	Channel Morphology	Vegetation	Constraints & Opportunities	Significant Fish Habitat	Fish Community Sampling Results
SC-32 Myers Pump Works Drain	May 10, 2022	Intermittent	Unknown	Not fish habitat	Detritus, Silt, Sand	Pool (100%)	Phragmites	Remove Phragmites	N/A – Not fish habitat	N/A
SC-33 Myers Pump Works Drain	Apr 26, 2022	Permanent <sup>1</sup>	Unknown	Direct <sup>1</sup>	Silt, Muck	Flats (100%)	Duckweed, Phragmites, Grasses	Remove phragmites; Remove berm that is restricting flows, enhance channel morphology (e.g. add refuge pools and meanders)	DFO SAR: Lake Chubsucker (END)	Did not complete due to SAR presence
SC-34 Unnamed Trib to Myers Pump Works Drain 001	Apr 26, 2022	Permanent	Unknown	Direct	Silt, muck	Flats (100%)	Phragmites, grasses	Remove phragmites; plant additional trees/shrubs to enhance Riparian zone; low flows could cause seasonal barrier to fish passage	DFO SAR: Lake Chubsucker (END)	Did not complete due to SAR presence
SC-35 Unnamed Trib to Myers Pump Works Drain 002	Apr 26, 2022	Permanent <sup>1</sup>	Unknown	Direct	Silt, sand	Flats (100%)	Duckweed	Plant riparian trees or shrubs to create a riparian buffer; vines growing off of exposed pipe downstream of	DFO Sar: Lake Chubsucker (END)	Did not complete due to SAR presence

Waterbody ID	Date	Flow	Thermal Regime	Fish Habitat*	Substrate Type	Channel Morphology	Vegetation	Constraints & Opportunities	Significant Fish Habitat	Fish Community Sampling Results
								the crossing are causing a debris jam which could cause a seasonal barrier to fish passage		
SC-36 Unnamed Trib to Myers Pump Works Drain 003	Apr 26, 2022	Permanent	Unknown	Direct <sup>2</sup>	Silt (100%)	Flats (100%)	Duckweed, grasses	Plant riparian trees or shrubs to create a riparian buffer	DFO Sar: Lake Chubsucker (END)	Did not complete due to SAR presence
PSC-37 Unnamed Trib to Myers Pump Works Drain 004	Apr 26, 2022	Permanent	Unknown	Direct <sup>2</sup>	Silt (100%)	Flats (100%)	Phragmites, duckweed	Remove phragmites; Plant riparian trees or shrubs to create a riparian buffer	DFO SAR: Lake Chubsucker (END)	Did not complete due to SAR presence
SC-38 Unnamed Trib to Myers Pump Works Drain 005	Apr 26, 2022	Permanent <sup>1</sup>	Unknown	Direct	Silt (100%)	Flats (100%)	No vegetation was present at the time of inspection.	Remove phragmites that is present downstream; fix CSPs/drain outlets; create a riparian buffer	None	Goldfish (4)
SC-39 Unnamed Trib to Myers	Apr 25, 2022	Permanent <sup>1</sup>	Unknown	Direct	Sand (30%), silt (40%), cobbles (30%)	Flats (100%)	Duckweed, phragmites, grasses	Increase riparian buffer; Remove phragmites	None	Central Mudminnow (1)

Waterbody ID	Date	Flow	Thermal Regime	Fish Habitat*	Substrate Type	Channel Morphology	Vegetation	Constraints & Opportunities	Significant Fish Habitat	Fish Community Sampling Results
Pump Works Drain 006										
SC-40 Unnamed Trib to Jacks Creek Drain / McFarlane Relief Drain	Apr 25, 2022	Permanent <sup>1</sup>	Warm <sup>1</sup>	Direct <sup>1,2</sup>	Silt, gravel	Flats (100%)	Phragmites	Remove phragmites; fix or remove gate on Balmoral Line Bridge; create a riparian buffer	DFO Sar species: Lake Chubsucker (END), Mapleleaf (SC)	Did not complete due to SAR presence
SC-41 McFarlane Relief Drain / Unnamed Trib to McFarlane Relief Drain	Apr 25, 2022	Intermittent	Unknown	Not Fish Habitat	Silt (70%), Clay (20%), Detritus (10%)	Feature was dry at the time of inspection	Terrestrial grasses	Clean up garbage; enhance channel morphology	N/A – Not fish habitat	N/A

\* Fish habitat is defined in subsection 2(1) of the Fisheries Act to include all waters frequented by fish and any other areas upon which fish depend directly or indirectly to carry out their life processes. The types of areas that can directly or indirectly support life processes include but are not limited to: spawning grounds and nursery, rearing, food supply and migration areas.

<sup>1</sup>NDMNRF, 2022: Ontario GeoHub – Aquatic resource area line segment. Accessed May 2022 from: <https://geohub.lio.gov.on.ca/datasets/aquatic-resource-area-line-segment/explore?location=42.229647%2C-82.439743%2C11.33>.

<sup>2</sup> DFO, 2022: Aquatic Species at Risk Map. Accessed May 2022 from: <https://www.dfo-mpo.gc.ca/species-especes/sara-lep/map-carte/index-eng.html>.

**Table Description:**

Waterbody ID	Name of waterbody and Crossing # / Station
Date	Insert date field investigations occurred (DD/MM/YYYY), as applicable
Flow	Ephemeral, Intermittent, Permanent
Thermal Regime	Warm, Cool, Cold
Fish Habitat	Direct, Indirect, Not Fish Habitat
Substrate Type	Boulder, cobble, rubble, gravel, sand, muck, etc.
Channel Morphology	E.g. Riffles, runs, pools, undercut banks, etc.
Vegetation	Riparian & In-stream species; emergent, submergent and floating aquatic vegetation

Constraints and Opportunities	E.g. Perched culvert, eroding bank, fish passage barrier, undersized CSP
Significant Fish Habitat	E.g. specialized habitat that supports critical life functions, areas contributing to fisheries productivity, etc.

# **Attachment B**

## **Leamington Existing Fish Habitat Summary**

**TEMPLATE D2A: EXISTING FISH HABITAT CONDITIONS SUMMARY TABLE**

<b>Waterbody ID</b>	<b>Date</b>	<b>Flow</b>	<b>Thermal Regime</b>	<b>Direct Fish Habitat*</b>	<b>Substrate Type</b>	<b>Channel Morphology</b>	<b>Vegetation</b>	<b>Constraints &amp; Opportunities</b>	<b>Significant Fish Habitat</b>	<b>Fish Community Sampling Results</b>
<b>LSC-01</b>  previously (LSC-02)	April 27, 2022	Intermittent	Unknown	No	Silt Sand	Flat (100%)	Phrag / Cattail (100%)	Agricultural and Road inputs  Development of a Riparian Buffer, Phragmites Removal, Debris Removal	None	N/A
<b>SC-02</b>  previously (LSC-04)	April 27, 2022	Intermittent	Unknown	No	Silt Sand	Flat (100%)	Terrestrial Grasses (30%), Cattail (40%)	Garbage Removal  Development of a Riparian Buffer, Stream Shading	None	N/A
<b>LSC-03</b>  Previously (LSC-05)	April 27, 2022	Permanent	Warmwater	Yes	Silt, Sand, Cobble Gravel	Run (60%), Pool (20%), Riffle (20%)	None	Improve Riparian Buffer and Slope Stability	Potential spawning Catostomus sp.	Creek Chub (11) Bluntnose Minnow (14) White Sucker (11) Yellow Bullhead (3) Common Shiner (60) Spotfin Shiner (7) Blackside Darter (4) Fathead Minnow (2) Round Goby (2)

Waterbody ID	Date	Flow	Thermal Regime	Direct Fish Habitat*	Substrate Type	Channel Morphology	Vegetation	Constraints & Opportunities	Significant Fish Habitat	Fish Community Sampling Results
<b>LSC-04</b> Previously (LSC-06)	April 27, 2022	Permanent	Warmwater	Yes	Silt Sand Cobble Gravel	Run (50%), Pool (20%), Riffle (30%)	Submergent (10%), Overhanging Veg (10%)	Improve Riparian Buffer and Slope Stability	None	Creek Chub (12) Common Shiner (19) Bluntnose Minnow (55) Green Sunfish (2) Fathead Minnow (6) Johnny Darter (18)
<b>LSC-05</b> Previously (LSC-06B)	April 27, 2022	Ephemeral	Unknown	No	Silt Sand	Pool (100%)	Terrestrial Grass (70%)	Develop Riparian Buffer	None	N/A
<b>LSC-06</b> Previously (LSC-06C)	April 27, 2022	Intermittent	Unknown	No	Silt Sand	Flat (100%)	Phragmites / Terrestrial Grasses (100%)	Remove Phragmites, Develop Riparian Buffer	None	N/A
<b>LSC-07</b> Previously (LSC-07)	April 27, 2022	Permanent	Unknown	Yes	Silt Sand	Flat (100%)	Phragmites (30%)	Develop Riparian Buffer, Remove Phragmites	None	None
<b>LSC-08</b> Previously (LSC-08)	April 27, 2022	Permanent	Unknown	Yes	Silt Sand	Flat (90%) Pool (10%)	None	Develop Riparian Buffer, Remove Phragmites	None	Creek Chub (51) Green Sunfish (20) Bluntnose Minnow (4) Yellow Bullhead (1) Fathead Minnow (2) Common Shiner (1) Spotfin Shiner (1)
<b>LSC-09</b> Previously (LSC-08A or 09A)	April 27, 2022	Intermittent	Unknown	No	Silt Sand	Flat (100%)	Phragmites (100%)	Develop Riparian Buffer, Remove Phragmites	None	N/A

Waterbody ID	Date	Flow	Thermal Regime	Direct Fish Habitat*	Substrate Type	Channel Morphology	Vegetation	Constraints & Opportunities	Significant Fish Habitat	Fish Community Sampling Results
LSC-10 Previously (LSC-09B)	April 27, 2022	Intermittent	Unknown	No	Silt Sand	Flat (100%)	Phragmites (70%)	Develop Riparian Buffer, Remove Phragmites	None	N/A
LSC-11 Previously (LSC-09)	April 27, 2022	Permanent	Warmwater	Yes	Silt Sand	Run (80%), Pool (20%)	Submergent algae (20%)	Improve Riparian Buffer and Slope Stability	None	Creek Chub (34) Fathead Minnow (21) Bluntnose Minnow (18) Spotfin Shiner (7) Bluegill (1) Round Goby (2) Johnny Darter (1)

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Constraints and Opportunities	E.g. Perched culvert, eroding bank, fish passage barrier, undersized CSP
Significant Fish Habitat	E.g. specialized habitat that supports critical life functions, areas contributing to fisheries productivity, etc.

**Attachment C**

**Plant List**

### Attachment C: Vascular Plant List

Botanical Name		Plant Species Information								ELC ID#:	1	2	3	4	5	6	7	8
Common Name	Scientific Name	Family	CC	CW	Native Status	Invasive (Y/N)	SRANK	SARO	CK	ELC Code:	FOD2-2	FOD8-1	FOD9-4	MAS2-9a	MAS2-9b	CUP1	CUH/CUM1-1P	CUH/CUM1-1L
Manitoba Maple	Acer negundo	Aceraceae	0	0	N	Y	S5		X			X					X	X
(Acer rubrum X Acer saccharinum)	Acer x freemanii	Aceraceae	6	0	N	N	SNA		0				X				X	X
Bentgrass sp.	Agrostis sp.	Poaceae																X
Water-plantain sp.	Alisma sp.	Alismataceae													X			
Garlic Mustard	Alliaria petiolata	Brassicaceae	0	0	I	Y	SE5		IX								X	X
Common Ragweed	Ambrosia artemisiifolia	Asteraceae	0	3	N	N	S5		X									X
Great Ragweed	Ambrosia trifida	Asteraceae	0	0	N	N	S5		X								X	X
Canada Anemone	Anemonastrum canadense	Ranunculaceae	3	-3	N	N	S5		R								X	
Hemp Dogbane	Apocynum cannabinum	Apocynaceae	3	0	N	N	S5		0								X	
Common Burdock	Arctium minus	Asteraceae	0	3	I	N	SE5		IX		X						X	X
Swamp Milkweed	Asclepias incarnata	Apocynaceae	6	-5	N	N	S5		X				X					
Common Milkweed	Asclepias syriaca	Apocynaceae	0	5	N	N	S5		X						X		X	X
Garden Asparagus	Asparagus officinalis	Liliaceae	0	3	I	N	SE5		IX							X	X	X
Beggarticks sp.	Bidens sp.	Asteraceae									X							
Smooth Brome	Bromus inermis	Poaceae	0	5	I	Y	SE5		IX		X							X
Downy Brome	Bromus tectorum	Poaceae	0	5	I	N	SE5		IX								X	
Flowering-rush	Butomus umbellatus	Butomaceae	0	-5	I	Y	SE5		IX					X			X	X
Woodland Sedge	Carex blanda	Cyperaceae	3	0	N	N	S5		X			X						
Canada Moonseed	Menispermum canadense	Menispermaceae	7	0	N	N	S4		X								X	
Crested Sedge	Carex cristatella	Cyperaceae	3	-3	N	N	S5		X								X	
Limestone Meadow Sedge	Carex granularis	Cyperaceae	3	-3	N	N	S5		X								X	
Gray's Sedge	Carex grayi	Cyperaceae	8	-3	N	N	S4		X			X						
Grey Sedge	Carex grisea	Cyperaceae	8	0	N	N	S4		X			X						
Shoreline Sedge	Carex hyalinolepis	Cyperaceae	4	-5	N	N	S4		R									X
Inland Sedge	Carex interior	Cyperaceae	6	-5	N	N	S5		R			X						
Troublesome Sedge	Carex molesta	Cyperaceae	5	0	N	N	S4S5		X								X	X
Necklace Sedge	Carex projecta	Cyperaceae	5	-3	N	N	S5		R			X						
Rosy Sedge	Carex rosea	Cyperaceae	2	5	N	N	S5		X			X						
Emory's Sedge	Carex emoryi	Cyperaceae	8	-5	N	N	S4		X								X	
Spiked Sedge	Carex spicata	Cyperaceae	0	3	I	N	SE5		IX								X	
Awl-fruited Sedge	Carex stipata	Cyperaceae	3	-5	N	N	S5		X								X	
Swan's Sedge	Carex swanii	Cyperaceae	7	3	N	N	S4		R									
Fox Sedge	Carex vulpinoidea	Cyperaceae	3	-5	N	N	S5		X		X		X				X	
Sedge sp. 1	Carex sp. 1	Cyperaceae															X	
Sedge sp. 2	Carex sp. 2	Cyperaceae															X	
Eastern Redbud	Cercis canadensis	Fabaceae	8	3	N	N	SX		0						X			
Common Lamb's-quarters	Chenopodium album	Chenopodiaceae	0	3	I	N	SE5		IX								X	
Wild Chicory	Cichorium intybus	Asteraceae	0	3	I	N	SE5		IX									X
Broad-leaved Enchanter's Nightshade	Circaea canadensis	Onagraceae	2	3	N	N	S5		X			X					X	
Canada Thistle	Cirsium arvense	Asteraceae	0	3	I	Y	SE5		IX								X	X
Bull Thistle	Cirsium vulgare	Asteraceae	0	3	I	N	SE5		IX		X						X	
Field Bindweed	Convolvulus arvensis	Convolvulaceae	0	5	I	N	SE5		IX								X	X
Silky Dogwood	Cornus obliqua	Cornaceae	2	-3	N	N	S5		X	X							X	
Grey Dogwood	Cornus racemosa	Cornaceae	2	0	N	N	S5		X		X				X		X	X
Cockspur Hawthorn	Crataegus crus-galli	Rosaceae	4	0	N	N	S4		X								X	
Hawthorn sp.	Crataegus sp.	Rosaceae																X
English Hawthorn	Crataegus monogyna	Rosaceae	0	3	I	Y	SE4		IR								X	
Canada Honewort	Cryptotaenia canadensis	Apiaceae	5	0	N	N	S5		X									X
Orchard Grass	Dactylis glomerata	Poaceae	0	3	I	N	SE5		IX								X	X
Wild Carrot	Daucus carota	Apiaceae	0	5	I	N	SE5		IX		X						X	X
Swamp Loosestrife	Decodon verticillatus	Lythraceae	7	-5	N	N	S5		R				X					
Flixweed	Descurainia sophia	Brassicaceae	0	5	I	N	SE5		IX								X	
Common Teasel	Dipsacus fullonum	Dipsacaceae	0	3	I	Y	SE5		IX								X	X
Spikerush sp.	Eleocharis sp.	Cyperaceae												X			X	
Quackgrass	Elymus repens	Poaceae	0	3	I	N	SE5		IX		X							X
Field Horsetail	Equisetum arvense	Equisetaceae	0	0	N	N	S5		X								X	X
Canada Horseweed	Erigeron canadensis	Asteraceae	0	3	N	N	S5		X								X	
Philadelphia Fleabane	Erigeron philadelphicus	Asteraceae	1	-3	N	N	S5		X	X								X
Fleabane sp.	Erigeron sp.	Asteraceae													X			
Wormseed Wallflower	Erysimum cheiranthoides	Brassicaceae	0	3	N	N	S5		IX									X
Running Strawberry-bush	Euonymus obovatus	Celastraceae	6	3	N	N	S4		X			X						
Wild Strawberry	Fragaria virginiana	Rosaceae	2	3	N	N	S5		X								X	
Red Ash	Fraxinus pennsylvanica	Oleaceae	3	-3	N	N	S4		X	X		X					X	X
Common Bedstraw	Galium aparine	Rubiaceae	4	3	N	N	S5		X			X					X	
Canada Avens	Geum canadense	Rosaceae	3	0	N	N	S5		X			X						
Honey Locust	Gleditsia triacanthos	Fabaceae	8	0	N	N	S2?		R								X	
Fowl Mannagrass	Glyceria striata	Poaceae	3	-5	N	N	S5		X			X						
Dame's Rocket	Hesperis matronalis	Brassicaceae	0	3	I	Y	SE5		IX								X	X
Swamp Rose-mallow	Hibiscus moscheutos	Malvaceae	9	-5	N	N	S3	SC	X				X					
Foxtail Barley	Hordeum jubatum	Poaceae	0	0	N	N	S5?		0								X	
European Frog-bit	Hydrocharis morsus-ranae	Hydrocharitaceae	0	-5	I	Y	SE5		IR				X					
Virginia Waterleaf	Hydrophyllum virginianum	Hydrophyllaceae	6	0	N	N	S5		X			X						

### Attachment C: Vascular Plant List

Common Name	Scientific Name	Family	CC	CW	Native Status	Invasive (Y/N)	SRANK	SARO	CK	ELC Code:	FOD2-2	FOD8-1	FOD9-4	MAS2-9a	MAS2-9b	CUP1	CUH/CUM1-1P	CUH/CUM1-1L
Spotted Jewelweed	<i>Impatiens capensis</i>	Balsaminaceae	4	-3	N	N	S5		X		X	X					X	X
Harlequin Blue Flag	<i>Iris versicolor</i>	Iridaceae	5	-5	N	N	S5		X								X	
Black Walnut	<i>Juglans nigra</i>	Juglandaceae	5	3	N	N	S4?		X							X		X
Dudley's Rush	<i>Juncus dudleyi</i>	Juncaceae	1	-3	N	N	S5		X		X						X	
Eastern Red Cedar	<i>Juniperus virginiana</i>	Cupressaceae	4	3	N	N	S5		X							X	X	
Small Duckweed	<i>Lemna minor</i>	Lemnaceae	5	-5	N	N	S5?		X		X			X			X	
Field Peppergrass	<i>Lepidium campestre</i>	Brassicaceae	0	5	I	N	SE5		IX		X							
Butter-and-eggs	<i>Linaria vulgaris</i>	Scrophulariaceae	0	5	I	N	SE5		IX								X	
Meadow Ryegrass	<i>Lolium pratense</i>	Poaceae	0	3	I	N	SE5		IX		X						X	X
Morrow's Honeysuckle	<i>Lonicera morrowii</i>	Caprifoliaceae	0	3	I	Y	SE3		0								X	
Tatarian Honeysuckle	<i>Lonicera tatarica</i>	Caprifoliaceae	0	3	I	Y	SE5		IX								X	
Garden Bird's-foot Trefoil	<i>Lotus corniculatus</i>	Fabaceae	0	3	I	Y	SE5		IX									X
American Water-horehound	<i>Lycopus americanus</i>	Lamiaceae	4	-5	N	N	S5		X		X							
Common Apple	<i>Malus pumila</i>	Rosaceae	0	5	I	N	SE4		IX								X	
Common Mallow	<i>Malva neglecta</i>	Malvaceae	0	5	I	N	SE5		IX									X
Black Medick	<i>Medicago lupulina</i>	Fabaceae	0	3	I	N	SE5		IX									X
Yellow Sweet-clover	<i>Mellilotus officinalis</i>	Fabaceae	0	3	I	Y	SE5		IX									X
White Mulberry	<i>Morus alba</i>	Moraceae	0	0	I	Y	SE5		IX								X	X
Fragrant Water-lily	<i>Nymphaea odorata</i>	Nymphaeaceae	5	-5	N	N	S5		R					X				
Evening-primrose sp.	<i>Oenothera sp.</i>	Onagraceae															X	
Thicket Creeper	<i>Parthenocissus vitacea</i>	Vitaceae	4	3	N	N	S5		X		X	X					X	X
Wild Parsnip	<i>Pastinaca sativa</i>	Apiaceae	0	5	I	Y	SE5		IX								X	
Virginia Smartweed	<i>Persicaria virginiana</i>	Polygonaceae	6	0	N	N	S4		X			X						
Reed Canarygrass	<i>Phalaris arundinacea</i>	Poaceae	0	-3	N	Y	S5		X		X						X	X
European Reed	<i>Phragmites australis ssp. australis</i>	Poaceae	0	-3	I	Y	SE5		IC					X			X	X
Norway Spruce	<i>Picea abies</i>	Pinaceae	0	5	I	N	SE3		IX								X	
English Plantain	<i>Plantago lanceolata</i>	Plantaginaceae	0	3	I	N	SE5		IX								X	X
Rugel's Plantain	<i>Plantago rugelii</i>	Plantaginaceae	1	0	N	N	S5		X								X	
Sycamore	<i>Platanus occidentalis</i>	Platanaceae	8	-3	N	N	S4		X							X		
Canada Bluegrass	<i>Poa compressa</i>	Poaceae	0	3	I	N	SE5		IX								X	
Kentucky Bluegrass	<i>Poa pratensis</i>	Poaceae	0	3	N	N	S5		0							X		X
May-apple	<i>Podophyllum peltatum</i>	Berberidaceae	5	3	N	N	S5		X			X						
Rough Avens	<i>Geum laciniatum</i>	Rosaceae	4	-3	N	N	S4		R								X	X
Eastern Cottonwood	<i>Populus deltoides</i>	Salicaceae	4	0	N	N	S5		0		X						X	
Large-toothed Aspen	<i>Populus grandidentata</i>	Salicaceae	5	3	N	N	S5		X		X							
Curly-leaved Pondweed	<i>Potamogeton crispus</i>	Potamogetonaceae	0	-5	I	Y	SE5		IX									X
Pondweed sp.	<i>Potamogeton sp.</i>	Potamogetonaceae												X				
Canada Plum	<i>Prunus nigra</i>	Rosaceae	4	3	N	N	S4		R								X	
Shagbark Hickory	<i>Carya ovata</i>	Juglandaceae	6	3	N	N	S5		X	X		X					X	
Black Cherry	<i>Prunus serotina</i>	Rosaceae	3	3	N	N	S5		X								X	
Chokecherry	<i>Prunus virginiana</i>	Rosaceae	2	3	N	N	S5		X			X					X	
Swamp White Oak	<i>Quercus bicolor</i>	Fagaceae	8	-3	N	N	S4		X			X						X
Bur Oak	<i>Quercus macrocarpa</i>	Fagaceae	5	3	N	N	S5		X	X		X			X		X	
Swamp Pin Oak	<i>Quercus palustris</i>	Fagaceae	9	-3	N	N	S4		R			X				X		
Northern Red Oak	<i>Quercus rubra</i>	Fagaceae	6	3	N	N	S5		X			X			X			X
Kidney-leaved Buttercup	<i>Ranunculus abortivus</i>	Ranunculaceae	2	0	N	N	S5		X			X						
Cursed Buttercup	<i>Ranunculus sceleratus</i>	Ranunculaceae	2	-5	N	N	S5		0								X	
Smooth Sumac	<i>Rhus glabra</i>	Anacardiaceae	7	5	N	N	S5		R								X	
Staghorn Sumac	<i>Rhus typhina</i>	Anacardiaceae	1	3	N	N	S5		X		X						X	X
Eastern Prickly Gooseberry	<i>Ribes cynosbati</i>	Grossulariaceae	4	3	N	N	S5		X			X						
Dog Rose	<i>Rosa canina</i>	Rosaceae	0	5	I	N	SE2		IX								X	
Multiflora Rose	<i>Rosa multiflora</i>	Rosaceae	0	3	I	Y	SE5		IX		X						X	
Red Raspberry	<i>Rubus idaeus</i>	Rosaceae	2	3	N	N	S5		0	X	X	X					X	X
Black Raspberry	<i>Rubus occidentalis</i>	Rosaceae	2	5	N	N	S5		X								X	
Curled Dock	<i>Rumex crispus</i>	Polygonaceae	0	0	I	N	SE5		IX		X						X	X
Broad-leaved Arrowhead	<i>Sagittaria latifolia</i>	Alismataceae	4	-5	N	N	S5		X				X				X	
Sandbar Willow	<i>Salix interior</i>	Salicaceae	1	-3	N	N	S5		X						X		X	
(Salix alba X Salix euina)	<i>Salix x fragilis</i>	Salicaceae	0	0	I	N	SNA		hyb		X						X	X
Common Elderberry	<i>Sambucus canadensis</i>	Caprifoliaceae	5	-3	N	N	S5		X								X	
Dark-green Bulrush	<i>Scirpus atrovirens</i>	Cyperaceae	3	-5	N	N	S5		X								X	
Common Ragwort	<i>Senecio vulgaris</i>	Asteraceae	0	5	I	N	SE5		IX								X	
Bittersweet Nightshade	<i>Solanum dulcamara</i>	Solanaceae	0	0	I	Y	SE5		IX								X	
Tall Goldenrod	<i>Solidago altissima</i>	Asteraceae	1	3	N	N	S5		0							X	X	
Canada Goldenrod	<i>Solidago canadensis</i>	Asteraceae	1	3	N	N	S5		0							X	X	
Goldenrod sp.	<i>Solidago sp.</i>	Asteraceae										X				X	X	X
Sow-thistle sp.	<i>Sonchus sp.</i>	Asteraceae															X	
New England Aster	<i>Symphotrichum novae-angliae</i>	Asteraceae	2	-3	N	N	S5		X								X	
Aster sp.	<i>Symphotrichum sp.</i>	Asteraceae												X			X	
Common Lilac	<i>Syringa vulgaris</i>	Oleaceae	0	5	I	Y	SE5		0								X	
Common Dandelion	<i>Taraxacum officinale</i>	Asteraceae	0	3	I	N	SE5		IX								X	X
Field Pennycress	<i>Thlaspi arvense</i>	Brassicaceae	0	5	I	N	SE5		IX								X	X
Eastern White Cedar	<i>Thuja occidentalis</i>	Cupressaceae	4	-3	N	N	S5		0								X	
Basswood	<i>Tilia americana</i>	Tiliaceae	4	3	N	N	S5		X			X			X		X	
Poison Ivy	<i>Toxicodendron radicans</i>	Anacardiaceae	2	0	N	N	S5		0		X	X					X	X
Purple Goatsbeard	<i>Tragopogon porrifolius</i>	Asteraceae	0	5	I	N	SE4?		0									X

### Attachment C: Vascular Plant List

Common Name	Scientific Name	Family	CC	CW	Native Status	Invasive (Y/N)	SRANK	SARO	CK	ELC Code:	FOD2-2	FOD8-1	FOD9-4	MAS2-9a	MAS2-9b	CUP1	CUH/CUM1-1P	CUH/CUM1-1L
Meadow Goatsbeard	Tragopogon pratensis	Asteraceae	0	5	I	N	SE5		IX								X	X
Red Clover	Trifolium pratense	Fabaceae	0	3	I	N	SE5		IX								X	X
Broad-leaved Cattail	Typha latifolia	Typhaceae	1	-5	N	N	S5		X					X				
(Typha angustifolia X Typha latifolia)	Typha x glauca	Typhaceae		-5	N	Y	SNA		0								X	
White Elm	Ulmus americana	Ulmaceae	3	-3	N	N	S5		X		X	X				X	X	X
Moth Mullein	Verbascum blattaria	Scrophulariaceae	0	3	I	N	SE5		IX									X
Common Mullein	Verbascum thapsus	Scrophulariaceae	0	5	I	N	SE5		IX								X	
Wingstem	Verbesina alternifolia	Asteraceae	5	-3	N	N	S3		X		X							
Cranberry Viburnum	Viburnum opulus	Caprifoliaceae	5	-3	N	N	S5		0								X	
Tufted Vetch	Vicia cracca	Fabaceae	0	5	I	Y	SE5		IX								X	
Riverbank Grape	Vitis riparia	Vitaceae	0	0	N	N	S5		X		X					X	X	X
Common Prickly-ash	Zanthoxylum americanum	Rutaceae	3	3	N	N	S5		X	X		X					X	

Floristic Summary and Analysis for Entire Study Area			
<b>Summary</b>			
Total Species:	159	N/A	
Native Species:	94	59%	
Introduced Species:	52	33%	
Invasive Species:	23	14%	
<b>ESA Status</b>			
END	0	0%	
THR	0	0%	
SC	1	1%	
<b>COSEWIC Status</b>			
END	0	0%	
THR	0	0%	
SC	1	1%	
<b>Provincially Rare (S-rank of S1-S3)</b>			
S1	0	0%	
S1?	0	0%	
S1S2	0	0%	
S1S3	0	0%	
S2	0	0%	
S2?	1	1%	
S2S3	0	0%	
S2S4	0	0%	
S3	2	1%	
S3?	0	0%	
S3S4	0	0%	
<b>Total S1-S3:</b>	<b>3</b>	<b>2%</b>	
<b>Local Rank</b>			
0	18	11%	
hyb	1	1%	
IC	1	1%	
IR	2	1%	
IX	46	29%	
R	12	8%	
X	67	42%	
<b>Co-efficient of Conservatism and Floral Quality Index</b>			
Co-efficient of Conservatism (CC) (average):	<b>36.25</b>		
CC 0 to 3	lowest sensitivity	97	103%
CC 4 to 6	moderate sensitivity	35	37%
CC 7 to 8	high sensitivity	11	12%
CC 9 to 10	highest sensitivity	2	2%
<b>Floral Quality Index (FQI)</b>			
FQI:	<b>351.46</b>		
<b>Presence of Wetland Species</b>			
Wetness Value (CW) (average):	<b>29.2</b>		
upland	5	23	14%
facultative upland	2 to 4	52	33%
facultative	1 to -1	27	17%
facultative wetland	-2 to -4	23	14%
obligate wetland	-5	21	13%
<b>Physiognomy</b>			
<b>Plant Form</b>	<b>No. of Total Species</b>	<b>% of Total Species</b>	
Fern	1	1%	
Forb	65	45%	
Grass	11	8%	
RU	1	1%	
Sedge	16	11%	
Shrub	23	16%	
Trees	22	15%	

Floristic Summary and Analysis Per ELC									
<b>Summary</b>									
Total Species:	5	31	34	6	9	17	105	58	
Native Species:	5	19	33	5	3	15	58	26	
Introduced Spe:	0	11	0	1	2	0	40	29	
Invasive Specie:	0	5	0	1	2	0	18	13	
<b>ESA Status</b>									
END	0	0	0	0	0	0	0	0	0
THR	0	0	0	0	0	0	0	0	0
SC	0	0	0	1	0	0	0	0	0
<b>COSEWIC Status</b>									
END	0	0	0	0	0	0	0	0	0
THR	0	0	0	0	0	0	0	0	0
SC	0	0	0	1	0	0	0	0	0
<b>Provincially Rare (S-rank of S1-S3)</b>									
S1	0	0	0	0	0	0	0	0	0
S1?	0	0	0	0	0	0	0	0	0
S1S2	0	0	0	0	0	0	0	0	0
S1S3	0	0	0	0	0	0	0	0	0
S2	0	0	0	0	0	0	0	0	0
S2?	0	0	0	0	0	0	0	1	0
S2S3	0	0	0	0	0	0	0	0	0
S2S4	0	0	0	0	0	0	0	0	0
S3	0	1	0	1	0	0	0	0	0
S3?	0	0	0	0	0	0	0	0	0
S3S4	0	0	0	0	0	0	0	0	0
<b>Total S1-S3:</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>
<b>Local Rank</b>									
0	1	4	3	0	1	3	13	5	
hyb	0	1	0	0	0	0	0	1	
IC	0	0	0	0	0	0	1	1	
IR	0	0	0	1	0	0	1	0	
IX	0	9	0	0	1	0	35	28	
R	0	0	4	2	0	1	5	2	
X	4	16	25	3	3	10	42	19	
<b>Co-efficient of Conservatism and Floral Quality Index</b>									
Co-efficient of (	<b>3.6</b>	<b>1.633333333</b>	<b>4.484848485</b>	<b>5.16666667</b>	<b>1.4</b>	<b>3.733333333</b>	<b>1.793814433</b>	<b>1.181818182</b>	
CC 0 to 3	3	23	13	1	4	7	74	45	
CC 4 to 6	2	7	15	3	1	5	19	9	
CC 7 to 8	0	0	4	1	0	2	4	1	
CC 9 to 10	0	0	1	1	0	1	0	0	
<b>Floral Quality Index (FQI)</b>									
FQI:	<b>8.05</b>	<b>7.12</b>	<b>11.55</b>	<b>2.42</b>	<b>14.46</b>	<b>13.66</b>	<b>6.03</b>		
<b>Presence of Wetland Species</b>									
Wetness Value	<b>1.8</b>	<b>0.1</b>	<b>0.393939394</b>	<b>-5</b>	<b>-4.2</b>	<b>1.533333333</b>	<b>0.959183673</b>	<b>1.327272727</b>	
upland	0	3	1	0	0	1	18	8	
facultative upla	4	9	14	0	0	9	34	24	
facultative	0	7	8	0	0	2	20	12	
facultative wetl.	1	8	8	0	2	3	16	8	
obligate wetlan	0	3	2	6	3	0	10	3	

## Attachment C: Vascular Plant List

Common Name	Scientific Name	Family	CC	CW	Native Status	Invasive (Y/N)	SRANK	SARO	CK	ELC Code:	FOD2-2	FOD8-1	FOD9-4	MAS2-9a	MAS2-9b	CUP1	CUH/CUM1-1P	CUH/CUM1-1L	
Vine		2																	
Woody Vine		5																	
(blank)																			
<b>Grand Total</b>		<b>146</b>																	<b>100%</b>

# Glossary

SARO Status	
RANK	DEFINITION
EXP	<b>Extirpated</b> - A species that no longer exists in the wild in Ontario but still occurs elsewhere.
END	<b>Endangered</b> - A species facing imminent extinction or extirpation in Ontario.
THR	<b>Threatened</b> - A species that is at risk of becoming endangered in Ontario if limiting factors are not reversed.
SC	<b>Special Concern</b> - A species with characteristics that make it sensitive to human activities or natural events.

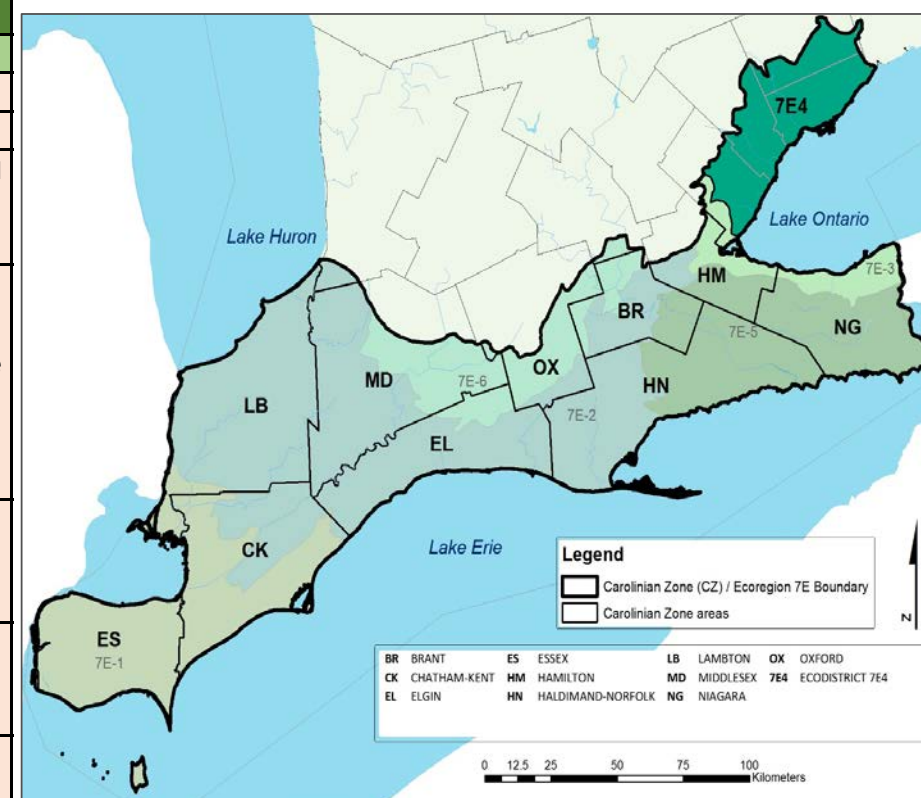
National (N) and Subnational (S) Conservation Status Ranks	
RANK	DEFINITION
NX	<b>Presumed Extirpated</b> - Species or ecosystem is believed to be extirpated from the jurisdiction (i.e., nation, or state/province). Not located despite intensive searches of historical sites and other appropriate habitat, and virtually no likelihood that it will be rediscovered. [equivalent to "Regionally Extinct" in IUCN Red List terminology]
SX	
NH	<b>Possibly Extirpated</b> - Known from only historical records but still some hope of rediscovery. There is evidence that the species or ecosystem may no longer be present in the jurisdiction, but not enough to state this with certainty. Examples of such evidence include (1) that a species has not been documented in approximately 20-40 years despite some searching and/or some evidence of significant habitat loss or degradation; (2) that a species or ecosystem has been searched for unsuccessfully, but not thoroughly enough to presume that it is no longer present in the jurisdiction.
SH	
N1	<b>Critically Imperiled</b> - At very high risk of extirpation in the jurisdiction due to very restricted range, very few populations or occurrences, very steep declines, severe threats, or other factors.
S1	
N2	<b>Imperiled</b> - At high risk of extirpation in the jurisdiction due to restricted range, few populations or occurrences, steep declines, severe threats, or other factors.
S2	
N3	<b>Vulnerable</b> — At moderate risk of extirpation in the jurisdiction due to a fairly restricted range, relatively few populations or occurrences, recent and widespread declines, threats, or other factors.
S3	
N4	<b>Apparently Secure</b> - At a fairly low risk of extirpation in the jurisdiction due to an extensive range and/or many populations or occurrences, but with possible cause for some concern as a result of local recent declines, threats, or other factors.
S4	
N5	<b>Secure</b> - At very low or no risk of extirpation in the jurisdiction due to a very extensive range, abundant populations or occurrences, with little to no concern from declines or threats.
S5	

Variant National and Subnational Conservation Status Ranks	
RANK	DEFINITION
N#	<b>Range Rank</b> - A numeric range rank (e.g., S2S3 or S1S3) is used to indicate any range of uncertainty about the status of the species or ecosystem. Ranges cannot skip more than two ranks (e.g., SU is used rather than S1S4).
S#	

<b>NU</b>	<b>Unrankable</b> - Currently unrankable due to lack of information or due to substantially conflicting information about status or trends.
<b>SU</b>	
<b>NNR</b>	<b>Unranked</b> - National or subnational conservation status not yet assessed.
<b>SNR</b>	
<b>NNA</b>	<b>Not Applicable</b> - A conservation status rank is not applicable because the species or ecosystem is not a suitable target for conservation activities (e.g., long distance aerial and aquatic migrants, hybrids without conservation value, and non-native species or ecosystems (see Master et al. 2012, Appendix A, pg 70 for further details).
<b>SNA</b>	
<b>Not Provided</b>	Species or ecosystem is known to occur in this nation or state/province. Contact the appropriate NatureServe network program for assignment of conservation status.

Rank Qualifier	
RANK	DEFINITION
<b>N#?</b>	<b>Inexact Numeric Rank</b> - Denotes inexact numeric rank; this should not be used with any of the Variant National or Subnational Conservation Status Ranks, or NX, SX, NH, or SH.
<b>S#?</b>	

Carolinian Status	
REGION	DEFINITION
<b>CZ</b>	<b>CZ status</b> (see below)
<b>RANK</b>	<b>DEFINITION</b>
<b>H</b>	<b>Historic.</b> Native in all Carolinian Zone areas and no known records for at least 30 years in all areas where native and ranked (i.e. not X). Occasionally used for a native species known to be extirpated from its only known Carolinian Zone location(s).
<b>R</b>	<b>Rare.</b> Native to the Carolinian Zone and (a) rare (as defined in source lists; sometimes including "very uncommon") or historic (no records in $\geq 30$ years) in more than half of the Carolinian Zone areas ( $\geq 6$ ) in which it is native and ranked (i.e. not X); or (b) if rare or historic in $< 6$ areas it must be uncommon or common in no more than one area.
<b>U</b>	<b>Uncommon.</b> Native in the Carolinian Zone and (a) listed as common in no more than one Carolinian Zone area; and (b) not rare or historic in more than half of the Carolinian Zone areas ( $\geq 6$ ) in which it is native and ranked (i.e. not X).
<b>C</b>	<b>Common.</b> Native in the Carolinian Zone and (a) common in at least two Carolinian Zone areas; and (b) not rare or historic in more than half of the Carolinian Zone areas ( $\geq 6$ ) in which it is native and ranked (i.e. not X).
<b>X</b>	<b>No status.</b> Present and native in the Carolinian Zone but no status assigned because of lack of information, often due to confusion with similar species.
<b>note</b>	In a few cases, based on professional opinion, Carolinian Zone status ranks departed from the above criteria, particularly if the species is not ranked (i.e. X) in at least four Carolinian Zone areas.
<b>CZ RESTR</b>	restricted in Ontario as a native species to CZ (=CZ) or nearly restricted (approximately 90%+ records) in Ontario as a native species to CZ (=cz)
<b>CK</b>	Municipality of Chatham-Kent County





RANK	DEFINITION
I	introduced, thought to have been present in the Caribbean Zone or individual CZ area prior to European settlement; believed to be deliberately or inadvertently introduced to the CZ by humans (followed by a status below)
C	common
U	uncommon
R	rare
H	historic records only (generally >30 years)
X	present; status unknown or not specified in source lists
?	unconfirmed report
hyb	hybrid

Plant Form or Type Codes		
CODE	FORM	DESCRIPTION
<b>FE</b>	Fern	non-flowering, vascular plant, reproducing by spores - Pteridophytes. Including the fern allies such as horsetail, club-moss and quillwort.
<b>FO</b>	Forb	herbaceous broad-leaved plant
<b>GR</b>	Grass	graminoid plants in the Poaceae
<b>RU</b>	Rush	graminoid plants in the Juncaceae
<b>SE</b>	Sedge	graminoid plants in the Cyperaceae
<b>SH</b>	Shrub	plants with erect, reclining or prostrate woody stems (usually with more than one stem)
<b>TR</b>	Tree	woody perennial plant having a single (1-3) stem, usually with an elongate main stem (trunk)
<b>VI</b>	Vine	herbaceous plant that trail, cling, or twine, and requires support to grow vertically
<b>VW</b>	Woody Vine	a vine with a perennial woody stem

Coefficient of Wetness				
CW VALUE	ABBRV.	INDICATOR STATUS	% OCCUR. IN WETLANDS	DEFINITION
-5	<b>OBL</b>	Obligate Wetland	99	Almost always occur in wetlands. With few exceptions, these plants (herbaceous or woody) are found in standing water or seasonally saturated soils (14 or more consecutive days) near the surface.
-4	<b>FACW+</b>			
-3	<b>FACW</b>	Facultative Wetland	67-99	Usually occur in wetlands, but may occur in non-wetlands. These plants predominately occur with hydric soils, often in geomorphic settings where water saturates the soils or floods the soil surface at least seasonally.
-2	<b>FACW-</b>			
-1	<b>FAC+</b>			
<b>0</b>	<b>FAC</b>	Facultative	34-66	Occur in wetlands and nonwetlands. These plants can grow in hydric, mesic, or xeric habitats. The occurrence of these plants in different habitats represents responses to a variety of environmental variables other than just hydrology, such as shade tolerance, soil pH, and

				elevation, and they have a wide tolerance of soil moisture conditions.
<b>1</b>	<b>FAC-</b>			
<b>2</b>	<b>FACU+</b>			
<b>3</b>	<b>FACU</b>	Facultative Upland	1-33	Usually occur in non-wetlands, but may occur in wetlands. These plants predominately occur on drier or more mesic sites in geomorphic settings where water rarely saturates the soils or floods the soil surface seasonally.
<b>4</b>	<b>FACU-</b>			
<b>5</b>	<b>UPL</b>	Obligate Upland	1	Almost never occur in wetlands. These plants occupy mesic to xeric non-wetland habitats. They almost never occur in standing water or saturated soils. Typical growth forms include herbaceous, shrubs, woody vines, and trees.
<p>"+" or "-" signs have been attached to the three Facultative categories to express exaggerated tendencies for those species. The "+" sign denotes that the species generally has a greater estimated probability of occurring in wetlands than species having the general indicator category, but a lesser estimated probability of occurring in wetlands than those having the next higher general indicator. The "-" sign denotes that the species generally has a lesser estimated probability of occurring in wetlands than those having the general indicator status, but a greater estimated probability of occurring in wetlands than those having the next lowest general indicator.</p>				

# **Attachment D**

## **Significant Wildlife Habitat Assessment**

## SWH Ecoregion 7E Criterion Schedule

**Table 1.1 Seasonal Concentration Areas of Animals.**

Wildlife Habitat	Wildlife Species	CANDIDATE SWH		CONFIRMED SWH	Candidate Habitat Present Within the Study Area		Confirmed Habitat Found Within the Study Area	
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	Panhandle	Leamington	Panhandle	Leamington
<p><b>Waterfowl Stopover and Staging Areas (Terrestrial)</b></p> <p><u>Rationale:</u> Habitat important to migrating waterfowl.</p>	American Black Duck Northern Pintail Gadwall Blue-winged Teal Green-winged Teal American Wigeon Northern Shoveler Tundra Swan	CUM1 CUT1 Plus, evidence of annual spring flooding from melt water or run-off within these Ecosites.  Fields with waste grain in the Long Point, Rondeau, Lk. St. Clair, Grand Bend and Pt. Pelee areas may be important to Tundra Swans.	Fields with sheet water during Spring (mid- March to May). <ul style="list-style-type: none"> <li>Fields flooding during spring melt and run-off provide important invertebrate foraging habitat for migrating waterfowl.</li> <li>Agricultural fields with waste grains are commonly used by waterfowl, these are not considered SWH unless they have spring sheet water available.</li> </ul> <p><u>Information Sources</u></p> <ul style="list-style-type: none"> <li>Anecdotal information from the landowner, adjacent landowners or local naturalist clubs may be good information in determining occurrence.</li> <li>Reports and other information available from Conservation Authorities (CAs)</li> <li>Sites documented through waterfowl planning processes (e.g., EHJV implementation plan)</li> <li>Field Naturalist Clubs</li> <li>Ducks Unlimited Canada</li> <li>Natural Heritage Information Centre (NHIC) Waterfowl Concentration Area</li> </ul>	Studies carried out and verified presence of an annual concentration of any listed species, evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects” <sup>ccxi</sup> <ul style="list-style-type: none"> <li>Any mixed species aggregations of 100.</li> <li>or more individuals required.</li> <li>The area of the flooded field ecosite habitat plus a 100-300 m radius buffer dependant on local site conditions and adjacent land use is the significant wildlife habitat<sup>cxlviii</sup>.</li> <li>Annual use of habitat is documented from information sources or field studies (annual use can be based on studies or determined by past surveys with species numbers and dates).</li> <li>SWHMIST<sup>cxlix</sup> Index #7 provides development effects and mitigation measures.</li> </ul>	No;	No;	No;	No;
<p><b>Waterfowl Stopover and Staging Areas (Aquatic)</b></p> <p><u>Rationale:</u> Important for local and migrant</p>	Northern Shoveler American Wigeon Gadwall Green-winged Teal Blue-winged Teal Hooded Merganser Common Merganser Lesser Scaup Greater Scaup Long-tailed Duck	MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 SWD1 SWD2 SWD3 SWD4	<p><u>Information Sources</u></p> <ul style="list-style-type: none"> <li>Environment Canada</li> <li>Naturalist clubs often are aware of staging/stopover areas.</li> <li>OMNRF Wetland Evaluations indicate presence of locally and regionally significant waterfowl staging.</li> <li>Sites documented through waterfowl planning processes (e.g.,</li> </ul>	Studies carried out and verified presence of: <ul style="list-style-type: none"> <li>Aggregations of 100 or more of listed species for 7 days, results in &gt; 700 waterfowl use days.</li> <li>Areas with annual staging of ruddy ducks, canvasbacks, and redheads are SWH<sup>cxlix</sup></li> <li>The combined area of the</li> </ul>	No;	No;	No;	No;

Wildlife Habitat	Wildlife Species	CANDIDATE SWH		CONFIRMED SWH	Candidate Habitat Present Within the Study Area		Confirmed Habitat Found Within the Study Area	
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	Panhandle	Leamington	Panhandle	Leamington
waterfowl populations during the spring or fall migration or both periods combined. Sites identified are usually only one of a few in the eco-district.	Surf Scoter White-winged Scoter Black Scoter Ring-necked duck Common Goldeneye Bufflehead Redhead Ruddy Duck Red-breasted Merganser Brant Canvasback Ruddy Duck	SWD5 SWD6 SWD7	EHJV implementation plan) • Ducks Unlimited projects • Element occurrence specification by Nature Serve: <a href="http://www.natureserve.org">http://www.natureserve.org</a> • Natural Heritage Information Centre (NHIC) Waterfowl Concentration Area	ELC ecosites and a 100m radius area is the SWH <sup>cxlviii</sup> • Wetland area and shorelines associated with sites identified within the SWHTG <sup>cxlviii</sup> Appendix K <sup>cxlix</sup> are significant wildlife habitat. • Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects” <sup>ccxi</sup> . • Annual Use of Habitat is Documented from Information Sources or Field Studies (Annual can be based on completed studies or determined from past surveys with species numbers and dates recorded). • SWH MIST <sup>cxlix</sup> Index #7 provides development effects and mitigation measures.				
<b>Shorebird Migratory Stopover Area</b>  <b>Rationale:</b> High quality shorebird stopover habitat is extremely rare and typically has a long history of use.	Greater Yellowlegs Lesser Yellowlegs Marbled Godwit Hudsonian Godwit Black-bellied Plover American Golden-Plover Semipalmated Plover Solitary Sandpiper Spotted Sandpiper Semipalmated Sandpiper Pectoral Sandpiper White-rumped Sandpiper Baird’s Sandpiper Least Sandpiper Purple Sandpiper Stilt Sandpiper Short-billed Dowitcher Red-necked Phalarope Whimbrel Ruddy Turnstone Sanderling Dunlin	BBO1 BBO2 BBS1 BBS2 BBT1 BBT2 SDO1 SDS2 SDT1 MAM1 MAM2 MAM3 MAM4 MAM5	Shorelines of lakes, rivers, and wetlands, including beach areas, bars, and seasonally flooded, muddy and un-vegetated shoreline habitats. Great Lakes coastal shorelines, including groynes and other forms of armour rock lakeshores, are extremely important for migratory shorebirds in May to mid-June and early July to October. Sewage treatment ponds and storm water ponds do not qualify as a SWH,  <u>Information Sources</u> • Western hemisphere shorebird reserve network. • Canadian Wildlife Service (CWS) Ontario Shorebird Survey. • Bird Studies Canada • Ontario Nature • Local birders and naturalist clubs	Studies confirming: • Presence of 3 or more of listed species and > 1000 shorebird use days during spring or fall migration period (shorebird use days are the accumulated number of shorebirds counted per day over the course of the fall or spring migration period). • Whimbrel stop briefly (<24 hrs) during spring migration, any site with >100 Whimbrel used for 3 years, or more is significant. • The area of significant shorebird habitat includes the mapped ELC shoreline ecosites plus a 100 m radius area <sup>cxlviii</sup> . • Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects” <sup>ccxi</sup> . • SWH MIST <sup>cxlix</sup> Index #8	<b>No;</b>  No suitable ecosites were identified within the Study Area.	<b>No;</b>  No suitable ecosites were identified within the Study Area.	<b>No;</b>  Candidate habitat was not identified.	<b>No;</b>  Candidate habitat was not identified.

Wildlife Habitat	Wildlife Species	CANDIDATE SWH		CONFIRMED SWH	Candidate Habitat Present Within the Study Area		Confirmed Habitat Found Within the Study Area	
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	Panhandle	Leamington	Panhandle	Leamington
			<ul style="list-style-type: none"> <li>NHIC Shorebird Migratory Concentration Area</li> </ul>	provides development effects and mitigation measures.				
<p><b>Raptor Wintering Area</b></p> <p><u>Rationale:</u> Sites used by multiple species, a high number of individuals and used annually are most significant</p>	<p>Rough-legged Hawk Red-tailed Hawk Northern Harrier American Kestrel Snowy Owl</p> <p><u>Special Concern:</u> Short-eared Owl Bald Eagle</p>	<p><b>Hawks/Owls</b> Combination of ELC Community Series; need to have present one Community Series from each land class; Forest: FOD, FOM, FOC.</p> <p>Upland: CUM, CUT, CUS, CUW.</p> <p><b>Bald Eagle:</b> Forest community Series: FOD, FOM, FOC, SWD, SWM or SWC on shoreline areas adjacent to large rivers or lakes with open water (hunting areas).</p>	<p>The habitat provides a combination of fields and woodlands that provide roosting, foraging and resting habitats for wintering raptors. Raptor wintering(hawk/owl) sites need to be &gt; 20 ha <sup>cxlviii, cxlix</sup> with a combination of forest and upland <sup>xvi, xvii, xviii, xix, xx, xxi</sup>.</p> <p>Least disturbed sites, idle/fallow, or lightly grazed field/meadow (&gt;15 ha) with adjacent woodlands <sup>cxlix</sup>. Field area of the habitat is to be wind swept with limited snow depth or accumulation. Eagle sites have open water and large trees and snags available for roosting.</p> <p><u>Information Sources:</u></p> <ul style="list-style-type: none"> <li>OMNR Ecologist or Biologist</li> <li>Naturalist club</li> <li>Natural Heritage Information Center (NHIC) Raptor Winter Concentration Area</li> <li>Data from Bird Studies Canada, most notably for Short-eared Owls.</li> <li>Results of Christmas Bird Counts.</li> <li>Reports and other information available from Conservation Authorities.</li> </ul>	<p>Studies confirm the use of these habitats by:</p> <ul style="list-style-type: none"> <li>One or more Short-eared Owls or; One of more Bald Eagles or; At least 10 individuals and two of listed hawk/owl species.</li> <li>To be significant a site must be used regularly (3 in 5 years) <sup>cxlix</sup> for a minimum of 20 days by the above number of birds.</li> <li>The habitat area for an Eagle winter site is the shoreline forest ecosites directly adjacent to the prime hunting area.</li> <li>Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects” <sup>ccxi</sup>.</li> <li>SWH MIST <sup>cxlix</sup> Index #10 and #11 provides development effects and mitigation measures.</li> </ul>	No;  No suitable ecosites were identified within the Study Area of sufficient size.	No;  No suitable ecosites were identified within the Study Area of sufficient size.	No;  Candidate habitat was not identified.	No;  Candidate habitat was not identified.
<p><b>Bat Hibernacula</b></p> <p><u>Rationale:</u> Bat hibernacula are rare habitats in all Ontario landscapes.</p>	<p>Big Brown Bat Tri-colored Bat</p>	<p>Bat Hibernacula may be found in these ecosites: CCR1 CCR2 CCA1 CCA2 (Note: buildings are not considered to be SWH)</p>	<p>Hibernacula may be found in caves, mine shafts, underground foundations, and Karsts. Active mine sites should not be considered as SWH. The locations of bat hibernacula are relatively poorly known.</p> <p><u>Information Sources</u></p> <ul style="list-style-type: none"> <li>OMNR for possible locations and contact for local experts</li> <li>Natural Heritage Information Center (NHIC) Bat Hibernaculum</li> </ul>	<ul style="list-style-type: none"> <li>All sites with confirmed hibernating bats are SWH.</li> <li>The area includes 200m radius around the entrance of the hibernaculum <sup>cxlviii, ccvii</sup> for most development types and 1000 m for wind farms.</li> <li>Studies are to be conducted during the peak swarming period (Aug. – Sept.). Surveys should be conducted following methods outlined in the “Guideline for Wind Power</li> </ul>	No;  No suitable ecosites were identified within the Study Area.	No;  No suitable ecosites were identified within the Study Area.	No;  Candidate habitat was not identified.	No;  Candidate habitat was not identified.

Wildlife Habitat	Wildlife Species	CANDIDATE SWH		CONFIRMED SWH	Candidate Habitat Present Within the Study Area		Confirmed Habitat Found Within the Study Area	
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	Panhandle	Leamington	Panhandle	Leamington
			<ul style="list-style-type: none"> <li>Ministry of Northern Development and Mines for location of mine shafts.</li> <li>Clubs that explore caves (e.g., Sierra Club)</li> <li>University Biology Departments with bat experts.</li> </ul>	<p>Projects Potential Impacts to Bats and Bat Habitats”<sup>ccv</sup>.</p> <ul style="list-style-type: none"> <li>SWH MIST<sup>cxlix</sup> Index #1 provides development effects and mitigation measures.</li> </ul>				
<p><b>Bat Maternity Colonies</b></p> <p><u>Rationale:</u> Known locations of forested bat maternity colonies is extremely rare in all Ontario landscapes.</p>	<p>Big Brown Bat Silver-haired Bat</p>	<p>Maternity colonies considered SWH are found in forested Ecosites.</p> <p>All ELC Ecosites in ELC Community Series: FOD FOM SWD SWM</p>	<p>Maternity colonies can be found in tree cavities, vegetation and often in buildings<sup>xxii, xxv, xxvi, xxvii, xxxi</sup> (buildings are not considered to be SWH). Maternity roosts are not found in caves and mines in Ontario<sup>xxii</sup>.</p> <ul style="list-style-type: none"> <li>Maternity colonies located in Mature deciduous or mixed forest stands<sup>ccix, ccx</sup> with &gt;10/ha large diameter (&gt;25 cm dbh) wildlife trees<sup>ccvii</sup></li> <li>Female Bats prefer wildlife tree (snags) in early stages of decay, class 1-3<sup>ccxiv</sup> or class 1 or 2<sup>ccxii</sup>.</li> <li>Silver-haired Bats prefer older mixed or deciduous forest and form maternity colonies in tree cavities and small hollows. Older forest areas with at least 21 snags/ha are preferred<sup>ccx</sup></li> </ul> <p><u>Information Sources</u></p> <ul style="list-style-type: none"> <li>OMNR for possible locations and contact for local experts</li> <li>University Biology Departments with bat experts.</li> </ul>	<ul style="list-style-type: none"> <li>Maternity Colonies with confirmed use by;                             <ul style="list-style-type: none"> <li>&gt;10 Big Brown Bats<sup>l</sup></li> <li>&gt;5 Adult Female Silver-haired Bats<sup>l</sup></li> </ul> </li> <li>The area of the habitat includes the entire woodland, or the forest stand ELC Ecosite containing the maternity colonies.</li> <li>Evaluation methods for maternity colonies should be conducted following methods outlined in the “Bats and Bat Habitats: Guidelines for Wind Power Projects”<sup>ccv</sup>.</li> <li>SWH MIST<sup>cxlix</sup> Index #12 provides development effects and mitigation measures.</li> </ul>	<p><b>Yes;</b></p> <p>Suitable deciduous forest community are present within the Study Area (i.e., FOD8-1 along both banks of the Thames River).</p>	<p><b>Yes;</b></p> <p>Suitable deciduous forest community are present within the Study Area (i.e., FOD2-2, FOD9-4)</p>	<p><b>Candidate;</b></p> <p>A full bat habitat assessment was not completed as the FOD8-1 community is not expected to be impacted by the trenchless crossing methods proposed at the Thames River.</p>	<p><b>Candidate;</b></p> <p>The FOD9-4 had a density of 47 snags/ha. A full bat habitat assessment was not completed within the FOD2-2 as the community id not expected to be impacted by proposed works.</p>
<p><b>Turtle Wintering Areas</b></p> <p><u>Rationale:</u> Generally, sites are the only known sites in the area. Sites with the highest number of individuals are most</p>	<p>Midland Painted Turtle</p> <p><u>Special Concern:</u> Northern Map Turtle Snapping Turtle</p>	<p>Snapping and Midland Painted turtles; ELC Community Classes; SW, MA, OA, and SA. ELC Community Series; FEO and BOO</p> <p>Northern Map Turtle - Open Water areas</p>	<p>For most turtles, wintering areas are in the same general area as their core habitat. Water must be deep enough not to freeze and have soft mud substrates.</p> <ul style="list-style-type: none"> <li>Over-wintering sites are permanent water bodies, large wetlands, and bogs or fens with adequate Dissolved Oxygen<sup>ci, cx, cxi, cxviii</sup>.</li> <li>Man-made ponds such as sewage lagoons or storm water ponds should not be considered SWH.</li> </ul>	<ul style="list-style-type: none"> <li>Presence of 5 over-wintering Midland Painted Turtles is significant.</li> <li>One or more Northern Map Turtle or Snapping Turtle over-wintering within a wetland is significant<sup>l</sup>.</li> <li>The mapped ELC ecosite area with the over wintering turtles is the SWH. If the hibernation site is within a stream or river, the deep-water pool where the turtles are over wintering is the SWH.</li> </ul>	<p><b>Yes;</b></p> <p>Suitable habitat is present within the Study Area at crossings with natural aquatic features such as Thames River, Baptiste</p>	<p><b>No;</b></p> <p>Agricultural drains provide suitable habitat, however, they are man-made and therefore do not qualify as SWH.</p>	<p><b>Candidate;</b></p> <p>A turtle overwintering habitat assessment was not completed, however, candidate habitat was observed during field investigations.</p>	<p><b>No;</b></p> <p>Candidate habitat was not identified.</p>



Wildlife Habitat	Wildlife Species	CANDIDATE SWH		CONFIRMED SWH	Candidate Habitat Present Within the Study Area		Confirmed Habitat Found Within the Study Area	
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	Panhandle	Leamington	Panhandle	Leamington
significant.		such as deeper rivers or streams and lakes with current can also be used as over-wintering habitat.	<u>Information Sources</u> <ul style="list-style-type: none"> <li>EIS studies carried out by Conservation Authorities.</li> <li>Field Naturalist Clubs</li> <li>OMNRF Ecologist or Biologist</li> <li>Natural Heritage Information Center (NHIC)</li> </ul>	<ul style="list-style-type: none"> <li>Over wintering areas may be identified by searching for congregations (Basking Areas) of turtles on warm, sunny days during the fall (Sept. – Oct.) or spring (Mar. – May) <sup>cvii</sup>. Congregation of turtles is more common where wintering areas are limited and therefore significant <sup>cix, cx, cxi, cxii</sup>.</li> <li>SWH MIST <sup>cxlix</sup> Index #28 provides development effects and mitigation measures for turtle wintering habitat.</li> </ul>	Creek, and Jeanettes Creek.			
<b>Reptile Hibernaculum</b>  <u>Rationale:</u> Generally sites are the only known sites in the area. Sites with the highest number of individuals are most significant.	<u>Snakes:</u> Eastern Gartersnake Northern Watersnake Northern Red-bellied Snake Northern Brownsnake Smooth Green Snake Northern Ring-necked Snake  <u>Special Concern:</u> Milksnake Eastern Ribbonsnake	For all snakes, habitat may be found in any ecosite other than very wet ones. Talus, Rock Barren, Crevice and Cave, and Alvar sites may be directly related to these habitats.  Observations of congregations of snakes on sunny warm days in the spring or fall is a good indicator.	For snakes, hibernation takes place in sites located below frost lines in burrows, rock crevices and other natural or naturalized locations. The existence of features that go below frost line, such as rock piles or slopes, old stone fences, and abandoned crumbling foundations assist in identifying candidate SWH. Areas of broken and fissured rock are particularly valuable since they provide access to subterranean sites below the frost line <sup>xliv, l, li, lii, cxii</sup> . Wetlands can also be important over-wintering habitat in conifer or shrub swamps and swales, poor fens, or depressions in bedrock terrain with sparse trees or shrubs with sphagnum moss or sedge hummock ground cover.  <u>Information Sources</u> <ul style="list-style-type: none"> <li>In spring, local residents or landowners may have observed the emergence of snakes on their property (e.g., old dug wells).</li> <li>Reports and other information available from Conservation Authorities.</li> <li>Field Naturalist Clubs</li> <li>University herpetologists.</li> <li>Natural Heritage Information Center (NHIC)</li> </ul>	Studies confirming: <ul style="list-style-type: none"> <li>Presence of snake hibernacula used by a minimum of five individuals of a snake sp. or individuals of two or more snake spp.</li> <li>Congregations of a minimum of five individuals of a snake sp. <u>or</u>; individuals of two or more snake spp. near potential hibernacula (e.g., foundation or rocky slope) on sunny warm days in Spring (Apr/May) and Fall (Sept/Oct).</li> <li><u>Note:</u> If there are Special Concern Species present, then site is SWH</li> <li><u>Note:</u> Sites for hibernation possess specific habitat parameters (e.g., temperature, humidity, etc.) and consequently are used annually, often by many of the same individuals of a local population [i.e., strong hibernation site fidelity.]. Other critical life processes (e.g., mating) often take place in close proximity to hibernacula. The feature in which the hibernacula is located plus a 30 m buffer is the SWH</li> <li>SWH MIST <sup>cxlix</sup> Index #13 provides development effects</li> </ul>	<b>Yes;</b>  Candidate Habitat may be present within the Study Area.	<b>No;</b>  Candidate Habitat not identified within the Study Area.	<b>Candidate;</b>  Burrows within identified during field surveys in Study Area provide Candidate Habitat.	<b>No;</b>  Candidate habitat was not identified.

Wildlife Habitat	Wildlife Species	CANDIDATE SWH		CONFIRMED SWH	Candidate Habitat Present Within the Study Area		Confirmed Habitat Found Within the Study Area	
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	Panhandle	Leamington	Panhandle	Leamington
				and mitigation measures for snake hibernacula.				
<p><b>Colonially - Nesting Bird Breeding Habitat (Bank and Cliff)</b></p> <p><b>Rationale:</b> Historical use and number of nests in a colony make this habitat significant. An identified colony can be very important to local populations. All swallow population are declining in Ontario.</p>	<p>Cliff Swallow Northern Rough-winged Swallow (this species is not colonial but can be found in Cliff Swallow colonies).</p>	<p>Eroding banks, sandy hills, borrow pits, steep slopes, and sand piles, cliff faces, bridge abutments, silos, barns (Cliff Swallows).</p> <p>Habitat found in the following ecosites: CUM1 CUT1 CUS1 BLO1 BLS1 BLT1 CLO1 CLS1 CLT1</p>	<ul style="list-style-type: none"> <li>Any site or areas with exposed soil banks, undisturbed or naturally eroding that is not a licensed/permitted aggregate area.</li> <li>Does not include man-made structures (bridges or buildings) or recently (2 years) disturbed soil areas, such as berms, embankments, soil, or aggregate stockpiles.</li> <li>Does not include a licensed/permitted Mineral Aggregate Operation.</li> </ul> <p><u>Information Sources</u></p> <ul style="list-style-type: none"> <li>Reports and other information available from Conservation Authorities</li> <li>Ontario Breeding Bird Atlas <sup>ccv</sup>.</li> <li>Bird Studies Canada; <i>NatureCounts</i> <a href="http://www.birdscanada.org/birdmon/">http://www.birdscanada.org/birdmon/</a></li> <li>Field Naturalist Clubs.</li> </ul>	<p>Studies confirming:</p> <ul style="list-style-type: none"> <li>Presence of 1 or more nesting sites with 8 <sup>cxlix</sup> or more cliff swallow pairs and/or rough-winged swallow pairs during the breeding season.</li> <li>A colony identified as SWH will include a 50 m radius habitat area from the peripheral nests <sup>ccvii</sup>.</li> <li>Field surveys to observe and count swallow nests are to be completed during the breeding season (May-June). Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects” <sup>ccxi</sup>.</li> <li>SWH MIST <sup>cxlix</sup> Index #4 provides development effects and mitigation measures.</li> </ul>	<p><b>Yes;</b></p> <p>Candidate Habitat may be present within the Study Area.</p>	<p><b>Yes;</b></p> <p>Candidate Habitat may be present within the Study Area.</p>	<p><b>Candidate;</b></p> <p>Candidate habitat may be present along the banks of the aquatic features; however, targeted surveys were not completed.</p>	<p><b>Candidate;</b></p> <p>Candidate habitat was identified during field investigations as evidenced by soil slumping from a bank along an unnamed tributary; however, targeted surveys were not completed.</p>
<p><b>Colonially - Nesting Bird Breeding Habitat (Tree/Shrubs)</b></p> <p><b>Rationale:</b> Large colonies are important to local bird population, typically sites are only known colony in area and are used annually.</p>	<p>Great Blue Heron Black-crowned Night-Heron Great Egret Green Heron</p>	<p>SWM2 SWM3 SWM5 SWM6 SWD1 SWD2 SWD3 SWD4 SWD5 SWD6 SWD7 FET1</p>	<ul style="list-style-type: none"> <li>Nests in live or dead standing trees in wetlands, lakes, islands, and peninsulas. Shrubs and occasionally emergent vegetation may also be used.</li> <li>Most nests in trees are 11 to 15 m from ground, near the top of the tree.</li> </ul> <p><u>Information Sources</u></p> <ul style="list-style-type: none"> <li>Ontario Breeding Bird Atlas <sup>ccv</sup>, colonial nest records.</li> <li>Ontario Heronry Inventory 1991 available from Bird Studies Canada or NHIC (OMNRF).</li> <li>Natural Heritage Information Center (NHIC) Mixed Wader Nesting Colony</li> <li>Aerial photographs can help identify large heronries.</li> </ul>	<p>Studies confirming:</p> <ul style="list-style-type: none"> <li>Presence of 2 or more active nests of Great Blue Heron or other listed species.</li> <li>The habitat extends from the edge of the colony and a minimum 300 m radius or extend of the Forest Ecosite containing the colony or any island &lt;15.0ha with a colony is the SWH <sup>cc, ccvii</sup>.</li> <li>Confirmation of active heronries are to be achieved through site visits conducted during the nesting season (April to August) or by evidence such as the presence of fresh guano, dead young and/or eggshells</li> <li>SWH MIST <sup>cxlix</sup> Index #5</li> </ul>	<p><b>No;</b></p> <p>No suitable ecosites were identified within the Study Area.</p>	<p><b>No;</b></p> <p>No suitable ecosites were identified within the Study Area.</p>	<p><b>No;</b></p> <p>No colony sites were observed during field investigations.</p>	<p><b>No;</b></p> <p>No colony sites were observed during field investigations.</p>

Wildlife Habitat	Wildlife Species	CANDIDATE SWH		CONFIRMED SWH	Candidate Habitat Present Within the Study Area		Confirmed Habitat Found Within the Study Area	
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	Panhandle	Leamington	Panhandle	Leamington
			<ul style="list-style-type: none"> <li>Reports and other information available from Conservation Authorities</li> <li>MNRF District Offices.</li> <li>Local naturalist clubs.</li> </ul>	provides development effects and mitigation measures.				
<p><b>Colonially - Nesting Bird Breeding Habitat (Ground)</b></p> <p><b>Rationale:</b> Colonies are important to local bird population, typically sites are only known colony in area and are used annually.</p>	<p>Herring Gull Great Black-backed Gull Little Gull Ring-billed Gull Common Tern Caspian Tern Brewer's Blackbird</p>	<p>Any rocky island or peninsula (natural or artificial) within a lake or large river (two-lined on a 1:50,000 NTS map).</p> <p>Close proximity to watercourses in open fields or pastures with scattered trees or shrubs (Brewer's Blackbird)</p> <p>MAM1-6 MAS1-3 CUM CUT CUS</p>	<ul style="list-style-type: none"> <li>Nesting colonies of gulls and terns are on islands or peninsulas associated with open water or in marshy areas.</li> <li>Brewers Blackbird colonies are found loosely on the ground in or in low bushes in close proximity to streams and irrigation ditches within farmlands.</li> </ul> <p><u>Information Sources</u></p> <ul style="list-style-type: none"> <li>Ontario Breeding Bird Atlas <sup>ccv</sup>, rare/colonial species records.</li> <li>Canadian Wildlife Service</li> <li>Reports and other information available from Conservation Authorities</li> <li>Natural Heritage Information Center (NHIC) Colonial Waterbird Nesting Area</li> <li>MNRF District Offices.</li> <li>Field Naturalist Clubs.</li> </ul>	<p>Studies confirming:</p> <ul style="list-style-type: none"> <li>Presence of &gt; 25 active nests for Herring Gulls or Ring-billed Gulls, &gt;5 active nests for Common Tern or &gt;2 active nests for Caspian Tern.</li> <li>Presence of 5 or more pairs for Brewer's Blackbird.</li> <li>Any active nesting colony of one or more Little Gull, and Great Black-backed Gull is significant.</li> <li>The edge of the colony and a minimum 150 m radius area of habitat, or the extent of the ELC ecosites containing the colony or any island &lt;3.0 ha with a colony is the SWH <sup>cc, ccvii</sup>.</li> <li>Studies would be done during May/June when actively nesting. Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects" <sup>ccxi</sup>.</li> <li>SWH MIST <sup>cxlix</sup> Index #6 provides development effects and mitigation measures.</li> </ul>	<b>Yes;</b> Candidate Habitat may be present within the Study Area for Brewer's Blackbird.	<b>Yes;</b> Candidate Habitat may be present within the Study Area for Brewer's Blackbird.	<b>No;</b> No colony sites were observed during field investigations.	<b>No;</b> No colony sites were observed during field investigations.
<p><b>Migratory Butterfly Stopover Areas</b></p> <p><b>Rationale:</b> Butterfly stopover areas are extremely rare habitats and are biologically important for butterfly</p>	<p>Painted Lady Red Admiral</p> <p><b>Special Concern:</b> Monarch</p>	<p>Combination of ELC Community Series; need to have present one Community Series from each landclass:</p> <p><u>Field:</u> CUM CUT CUS</p>	<p>A butterfly stopover area will be a minimum of 10 ha in size with a combination of field and forest habitat present and will be located within 5 km of Lake Erie and Ontario <sup>cxlix</sup>.</p> <ul style="list-style-type: none"> <li>The habitat is typically a combination of field and forest and provides the butterflies with a location to rest prior to their long migration south <sup>xxxii, xxxiii, xxxiv, xxxv, xxxvi</sup>.</li> <li>The habitat should not be disturbed, fields/meadows with</li> </ul>	<p>Studies confirm:</p> <ul style="list-style-type: none"> <li>The presence of Monarch Use Days (MUD) during fall migration (Aug/Oct) <sup>xliii</sup>. MUD is based on the number of days a site is used by Monarchs, multiplied by the number of individuals using the site. Numbers of butterflies can range from 100-500/day<sup>xxxvii</sup>, significant variation can occur between years and multiple years of sampling should occur <sup>xl, xlii</sup>.</li> </ul>	<b>No;</b> The Study Area is more than 5 km from the Great Lakes.	<b>No;</b> The site is more than 5 km from Lake Ontario and Lake Erie.	<b>No;</b> Candidate habitat was not identified.	<b>No;</b> Candidate habitat was not identified.

Wildlife Habitat	Wildlife Species	CANDIDATE SWH		CONFIRMED SWH	Candidate Habitat Present Within the Study Area		Confirmed Habitat Found Within the Study Area	
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	Panhandle	Leamington	Panhandle	Leamington
species that migrate south for the winter.		<p><u>Forest:</u> FOC FOD FOM CUP</p> <p>Anecdotally, a candidate sight for butterfly stopover will have a history of butterflies being observed.</p>	<p>an abundance of preferred nectar plants and woodland edge providing shelter are requirements for this habitat <sup>cxlviii, cxlix</sup>.</p> <ul style="list-style-type: none"> <li>Stopover areas usually provide protection from the elements and are often spits of land or areas with the shortest distance to cross the Great Lakes <sup>xxxvii, xxxviii, xxxix, xl, xli</sup>.</li> </ul> <p><u>Information Sources</u></p> <ul style="list-style-type: none"> <li>MNRF district Offices</li> <li>Natural Heritage Information Center (NHIC)</li> <li>Agriculture Canada in Ottawa may have list of butterfly experts.</li> <li>Field Naturalist Clubs</li> <li>Toronto Entomologists Association</li> <li>Conservation Authorities</li> </ul>	<ul style="list-style-type: none"> <li>Observational studies are to be completed and need to be done frequently during the migration period to estimate MUD</li> <li>MUD of &gt;5000 or &gt;3000 with the presence of Painted Ladies or Red Admiral's is to be considered significant.</li> <li>SWH MIST <sup>cxlix</sup> Index #16 provides development effects and mitigation measures.</li> </ul>				
<p><b>Landbird Migratory Stopover Areas</b></p> <p><u>Rationale:</u> Sites with a high diversity of species as well as high numbers are most significant.</p>	<p>All migratory songbirds.</p> <p>Canadian Wildlife Service Ontario website: <a href="http://www.ec.gc.ca/nature/default.asp?lang=En&amp;n=421B7A9D-1">http://www.ec.gc.ca/nature/default.asp?lang=En&amp;n=421B7A9D-1</a></p> <p>All migrant raptors species:</p> <p>Ontario Ministry of Natural Resources: Fish and Wildlife Conservation Act, 1997. Schedule 7: Specially Protected Birds (Raptors)</p>	<p>All Ecosites associated with these ELC Community Series; FOC FOM FOD SWC SWM SWD</p>	<p>Woodlots need to be &gt;5 ha in size <sup>iv, v, vi, vii, viii, ix, x, xi, xii, xiii, xiv, xv</sup> of Lake Ontario and Erie. If woodlands are rare in an area of shoreline, woodland fragments 2-5ha can be considered for this habitat.</p> <ul style="list-style-type: none"> <li>If multiple woodlands are located along the shoreline those Woodlands &lt;2 km from Lake Erie and Lake Ontario are more significant <sup>cxlix</sup>.</li> <li>Sites have a variety of habitats; forest, grassland, and wetland complexes <sup>cxlix</sup>.</li> <li>The largest sites are more significant <sup>cxlix</sup>.</li> <li>Woodlots and forest fragments are important habitats to migrating birds <sup>ccxviii</sup>, these features located along the shore and located within 5km of Lake Erie and Lake Ontario are Candidate SWH <sup>cxlviii</sup>.</li> </ul> <p><u>Information Sources</u></p>	<p>Studies confirm:</p> <ul style="list-style-type: none"> <li>Use of the woodlot by &gt;200 birds/day and with &gt;35 spp recorded on at least 5 different survey dates. This abundance and diversity of migrant bird species is considered above average and significant.</li> <li>Studies should be completed during spring (March to May) and fall (Aug to Oct) migration using standardized assessment techniques. Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects" <sup>ccxi</sup></li> <li>SWH MIST <sup>cxlix</sup> Index #9 provides development effects and mitigation measures.</li> </ul>	<p><b>No;</b></p> <p>The site is more than 5 km from Lake Ontario and Lake Erie.</p>	<p><b>No;</b></p> <p>The site is more than 5 km from Lake Ontario and Lake Erie.</p>	<p><b>No;</b></p> <p>Candidate habitat was not identified.</p>	<p><b>No;</b></p> <p>Candidate habitat was not identified.</p>

Wildlife Habitat	Wildlife Species	CANDIDATE SWH		CONFIRMED SWH	Candidate Habitat Present Within the Study Area		Confirmed Habitat Found Within the Study Area	
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	Panhandle	Leamington	Panhandle	Leamington
			<ul style="list-style-type: none"> <li>Bird Studies Canada</li> <li>Ontario Nature</li> <li>Local birders and naturalist club</li> <li>Ontario Important Bird Areas (IBA) Program</li> </ul>					
<b>Deer Winter Congregation Areas</b>  <u>Rationale:</u> Deer movement during winter in the southern areas of Ecoregion 7E are not constrained by snow depth, however deer will annually congregate in large numbers in suitable woodlands to reduce or avoid the impacts of winter conditions <sup>cxlviii</sup> .	White-tailed Deer	All Forested Ecosites with these ELC Community Series; FOC FOM FOD SWC SWM SWD  Conifer plantations much smaller than 50 ha may also be used.	<ul style="list-style-type: none"> <li>Woodlots &gt;100 ha in size or if large woodlots are rare in a planning area, woodlots &gt;5 0 ha.</li> <li>Deer movement during winter in the southern areas Ecoregion 7E are not constrained by snow depth, however deer will annually congregate in large numbers in suitable woodlands <sup>cxlviii</sup>.</li> <li>Large woodlots &gt; 100 ha and up to 1500 ha are known to be used annually by densities of deer that range from 0.1-1.5 deer/ha <sup>ccxxiv</sup>.</li> <li>Woodlots with high densities of deer due to artificial feeding are not significant.</li> </ul> <u>Information Sources</u> <ul style="list-style-type: none"> <li>MNRF District Offices.</li> <li>LIO/NRVIS</li> </ul>	Studies confirm: <ul style="list-style-type: none"> <li>Deer management is an MNRF responsibility, deer winter congregation areas considered significant will be mapped by MNRF <sup>cxlviii</sup>.</li> <li>Use of the woodlot by white-tailed deer will be determined by MNRF, all woodlots exceeding the area criteria are significant, unless determined not to be significant by MNRF.</li> <li>Studies should be completed during winter (Jan/Feb) when &gt;20 cm of snow is on the ground using aerial survey techniques <sup>ccxxiv</sup>, ground or road surveys, or a pellet count deer density survey <sup>ccxxv</sup>.</li> <li>SWH MIST <sup>cxlix</sup> Index #2 provides development effects and mitigation measures.</li> </ul>	<b>No;</b>  There are no yarding areas identified within the Study Area.	<b>No;</b>  There are no yarding areas identified within the Study Area.	<b>No;</b>  Candidate habitat was not identified.	<b>No;</b>  Candidate habitat was not identified.

**Table 1.2 Rare Vegetation Communities.**

Rare Vegetation Community	CANDIDATE SWH			CONFIRMED SWH	Candidate Habitat within the Study Area		Confirmed Habitat within the Study Area	
	ELC Ecosite Code	Habitat Description	Detailed Information and Sources	Defining Criteria	Panhandle	Leamington	Panhandle	Leamington
<p><b>Cliffs and Talus Slopes</b></p> <p><b>Rationale:</b> Cliffs and Talus Slopes are extremely rare habitats in Ontario.</p>	<p>Any ELC Ecosite within Community Series:</p> <p>TAO TAS TAT CLO CLS CLT</p>	<p>A Cliff is vertical to near vertical bedrock &gt;3 m in height.</p> <p>A Talus Slope is rock rubble at the base of a cliff made up of coarse rocky debris</p>	<p>Most cliff and talus slopes occur along the Niagara Escarpment.</p> <p><u>Information Sources</u></p> <ul style="list-style-type: none"> <li>The Niagara Escarpment Commission has detailed information on location of these habitats.</li> <li>OMNRF Districts</li> <li>Natural Heritage Information Center (NHIC) has location information available their website</li> <li>Field Naturalist Clubs</li> <li>Conservation Authorities</li> </ul>	<ul style="list-style-type: none"> <li>Confirm any ELC Vegetation Type for Cliffs or Talus Slopes <sup>lxxviii</sup>.</li> <li>SWH MIST <sup>cxlix</sup> Index #21 provides development effects and mitigation measures.</li> </ul>	<p><b>No;</b></p> <p>No Cliff and Talus slope ecosites were identified within the Study Area.</p>	<p><b>No;</b></p> <p>No Cliff and Talus slope ecosites were identified within the Study Area.</p>	<p><b>No;</b></p> <p>Candidate habitat was not identified.</p>	<p><b>No;</b></p> <p>Candidate habitat was not identified.</p>
<p><b>Sand Barren</b></p> <p><b>Rationale:</b> Sand barrens are rare in Ontario and support rare species. Most Sand Barrens have been lost due to cottage development and forestry</p>	<p>ELC Ecosites:</p> <p>SBO1 SBS1 SBT1</p> <p>Vegetation cover varies from patchy and barren to continuous meadow (SBO1), thicket-like (SBS1), or more closed and treed (SBT1). Tree cover always ≤60%.</p>	<p>Sand Barrens typically are exposed sand, generally sparsely vegetated and caused by lack of moisture, periodic fires, and erosion. Usually located within other types of natural habitat such as forest or savannah. Vegetation can vary from patchy and barren to tree covered but less than 60%.</p>	<p>A sand barren area &gt;0.5ha in size.</p> <p><u>Information Sources</u></p> <ul style="list-style-type: none"> <li>OMNRF Districts.</li> <li>Natural Heritage Information Center (NHIC) has location information available on their website</li> <li>Field Naturalist Clubs</li> <li>Conservation Authorities</li> </ul>	<ul style="list-style-type: none"> <li>Confirm any ELC Vegetation Type for Sand Barrens <sup>lxxviii</sup></li> <li>Site must not be dominated by exotic or introduced species (&lt;50% vegetative cover exotics).</li> <li>SWHMIST <sup>cxlix</sup> Index #20 provides development effects and mitigation measures.</li> </ul>	<p><b>No;</b></p> <p>No Sand Barren ecosites were identified within the Study Area.</p>	<p><b>No;</b></p> <p>No Sand Baren ecosites were identified within the Study Area.</p>	<p><b>No;</b></p> <p>Candidate habitat was not identified.</p>	<p><b>No;</b></p> <p>Candidate habitat was not identified.</p>
<p><b>Alvar</b></p> <p><b>Rationale:</b> Alvars are extremely rare habitats in Ecoregion 7E.</p>	<p>ALO1 ALS1 ALT1 FOC1 FOC2 CUM2 CUS2 CUT2-1 CUW2</p> <p><b>Five Alvar Indicator Species:</b></p> <p>1) <i>Carex crawei</i> 2) <i>Panicum</i></p>	<p>An alvar is typically a level, mostly unfractured calcareous bedrock feature with a mosaic of rock pavements and bedrock overlain by a thin veneer of soil. The hydrology of alvars is complex, with alternating periods of inundation and drought. Vegetation cover varies from sparse lichen-moss</p>	<p>An Alvar site &gt; 0.5 ha in size <sup>lxxv</sup>. Alvar is particularly rare in Ecoregion 7E where the only known sites are found in the western islands of Lake Erie. <sup>cxix</sup></p> <p><u>Information Sources</u></p> <ul style="list-style-type: none"> <li>Alvars of Ontario (2000), Federation of Ontario Naturalists <sup>lxxvi</sup>.</li> <li>Ontario Nature – Conserving Great Lakes Alvars <sup>ccviii</sup>.</li> <li>Natural Heritage Information Center (NHIC) has location information available on their website</li> <li>OMNRF Staff.</li> <li>Field Naturalist Clubs.</li> <li>Conservation Authorities.</li> </ul>	<p>Field studies identify four of the five <b>Alvar Indicator Species</b> <sup>lxxv</sup> at a Candidate Alvar site is Significant.</p> <ul style="list-style-type: none"> <li>Site must not be dominated by exotic or introduced species (&lt;50% vegetative cover exotics).</li> <li>The alvar must be in excellent condition and fit in with surrounding landscape with few conflicting land uses <sup>lxxv</sup>.</li> <li>SWH MIST <sup>cxlix</sup> Index #17 provides development effects and mitigation measures.</li> </ul>	<p><b>No;</b></p> <p>No Alvar ecosites were identified within the Study Area.</p>	<p><b>No;</b></p> <p>No Alvar ecosites were identified within the Study Area.</p>	<p><b>No;</b></p> <p>Candidate habitat was not identified.</p>	<p><b>No;</b></p> <p>Candidate habitat was not identified.</p>

Rare Vegetation Community	CANDIDATE SWH			CONFIRMED SWH	Candidate Habitat within the Study Area		Confirmed Habitat within the Study Area	
	ELC Ecosite Code	Habitat Description	Detailed Information and Sources	Defining Criteria	Panhandle	Leamington	Panhandle	Leamington
	<p><i>philadelphicum</i> 3) <i>Elocharis compressa</i> 4) <i>Scutellaria parvula</i> 5) <i>Trichostema brachiatum</i></p> <p>These indicator species are very specific to Alvars within Ecoregion 7E.</p>	<p>associations to grasslands and shrublands and comprising a number of characteristic or indicator plant. Undisturbed alvars can be phyto- and zoogeographically diverse, supporting many uncommon or relict plant and animal species. Vegetation cover varies from patchy to barren with a less than 60% tree cover <sup>lxxviii</sup>.</p>						
<p><b>Old Growth Forest</b></p> <p><b>Rationale:</b> Due to historic logging practices and land clearance for agriculture, old growth forest is rare in Ecoregion 7E.</p>	<p>Forest Community Series: FOD FOC FOM SWD SWC SWM</p>	<p>Old-growth forests are characterized by heavy mortality or turnover of over-storey trees resulting in mosaic of gaps that encourage development of multi-layered canopy and an abundance of snags and downed woody debris.</p>	<ul style="list-style-type: none"> <li>Woodland area is &gt;0.5 ha.</li> </ul> <p><u>Information Sources</u></p> <ul style="list-style-type: none"> <li>OMNRF Forest Resource Inventory mapping</li> <li>OMNRF Districts.</li> <li>Field Naturalist Clubs</li> <li>Conservation Authorities</li> <li>Sustainable Forestry Licence (SFL) companies will possibly know locations through field operations.</li> <li>Municipal forestry departments</li> </ul>	<p>Field Studies will determine:</p> <ul style="list-style-type: none"> <li>If dominant trees species of the ecosite are &gt;140 years old, then area containing these trees is Significant Wildlife Habitat <sup>cxlviii</sup>.</li> <li>The forested area containing the old growth characteristics will have experienced no recognizable forestry activities (cut steps will not be present)</li> <li>The area of forest ecosites combined or an eco-element within an ecosite that contain the old growth characteristics is the SWH.</li> <li>Determine ELC vegetation types for the forest area containing the old growth characteristics <sup>lxxviii</sup>.</li> <li>SWH MIST <sup>cxlix</sup> Index #23 provides development effects and mitigation measures.</li> </ul>	<p><b>No;</b></p> <p>No Old Growth Forest communities were identified within the Study Area.</p>	<p><b>No;</b></p> <p>No Old Growth Forest communities were identified within the Study Area.</p>	<p><b>No;</b></p> <p>Candidate habitat was not identified.</p>	<p><b>No;</b></p> <p>Candidate habitat was not identified.</p>
<p><b>Savannah</b></p> <p><b>Rationale:</b> Savannahs are extremely rare habitats in Ontario.</p>	<p>TPS1 TPS2 TPW1 TPW2 CUS2</p>	<p>A Savannah is a tallgrass prairie habitat that has tree cover between 25 – 60%.</p> <p>In ecoregion 7E, known Tallgrass Prairie and savannah remnants are scattered between Lake Huron and Lake</p>	<p>No minimum size to site Site must be restored or a natural site. Remnant sites such as railway right of ways are not considered to be SWH.</p> <p><u>Information Sources</u></p> <ul style="list-style-type: none"> <li>Natural Heritage Information Center (NHIC) has location data available on their website.</li> <li>OMNRF Districts.</li> <li>Field Naturalists Clubs.</li> <li>Conservation Authorities.</li> </ul>	<p>Field studies confirm one or more of the Savannah indicator species listed in <sup>lxxv</sup> Appendix N should be present. Note: Savannah plant spp. list from Ecoregion 7E should be used</p> <ul style="list-style-type: none"> <li>Area of the ELC Ecosite is the SWH.</li> <li>Site must not be dominated by exotic or introduced species (&lt;50% vegetative cover exotics).</li> <li>SWH MIST <sup>cxlix</sup> Index #18 provides</li> </ul>	<p><b>No;</b></p> <p>No Savannah ecosites were identified within the Study Area.</p>	<p><b>No;</b></p> <p>No Savannah ecosites were identified within the Study Area.</p>	<p><b>No;</b></p> <p>Candidate habitat was not identified.</p>	<p><b>No;</b></p> <p>Candidate habitat was not identified.</p>

Rare Vegetation Community	CANDIDATE SWH			CONFIRMED SWH	Candidate Habitat within the Study Area		Confirmed Habitat within the Study Area	
	ELC Ecosite Code	Habitat Description	Detailed Information and Sources	Defining Criteria	Panhandle	Leamington	Panhandle	Leamington
		Erie, near Lake St. Clair, north of and along the Lake Erie shoreline, in Brantford and in the Toronto area (north of Lake Ontario).		development effects and mitigation measures.				
<b>Tallgrass Prairie</b>  <b>Rationale:</b> Tallgrass Prairies are extremely rare habitats in Ontario.	TPO1 TPO2	A Tallgrass Prairie has ground cover dominated by prairie grasses. An open Tallgrass Prairie habitat has < 25% tree cover.  In ecoregion 7E, known Tallgrass Prairie and savannah remnants are scattered between Lake Huron and Lake Erie, near Lake St. Clair, north of and along the Lake Erie shoreline, in Brantford and in the Toronto area (north of Lake Ontario). <sup>cc</sup>	No minimum size to site (E). Site must be restored or a natural site. Remnant sites such as railway right of ways are not considered to be SWH.  <u>Information Sources</u> <ul style="list-style-type: none"> <li>• OMNRF Districts.</li> <li>• Natural Heritage Information Center (NHIC) has location data available on their website.</li> <li>• Field Naturalists Clubs.</li> <li>• Conservation Authorities</li> </ul>	Field studies confirm one or more of the Prairie indicator species listed in <sup>lxxv</sup> Appendix N should be present. Note: Prairie plant spp. list from Ecoregion 7E should be used <ul style="list-style-type: none"> <li>• Area of the ELC Ecosite is the SWH</li> <li>• Site must not be dominated by exotic or introduced species (&lt;50% vegetative cover exotics).</li> <li>• SWH MIST <sup>cxlix</sup> Index #19 provides development effects and mitigation measures.</li> </ul>	<b>No;</b>  No Tallgrass Prairie ecosites were identified within the Study Area.	<b>No;</b>  No Tallgrass Prairie ecosites were identified within the Study Area.	<b>No;</b>  Candidate habitat was not identified.	<b>No;</b>  Candidate habitat was not identified.
<b>Other Rare Vegetation Communities</b>  <b>Rationale:</b> Plant communities that often contain rare species which depend on the habitat for survival.	Provincially Rare S1, S2 and S3 vegetation communities are listed in Appendix M of the SWHTG <sup>cxlviii</sup> . Any ELC Ecosite Code that has a possible ELC Vegetation Type that is Provincially Rare is Candidate SWH.	Rare Vegetation Communities may include beaches, fens, forest, marsh, barrens, dunes, and swamps.	ELC Ecosite codes that have the potential to be a rare ELC Vegetation Type as outlined in appendix M <sup>cxlviii</sup>  The OMNRF/NHIC will have up to date listing for rare vegetation communities.  <u>Information Sources</u> <ul style="list-style-type: none"> <li>• OMNRF Districts.</li> <li>• Natural Heritage Information Center (NHIC) has location data available on their website.</li> <li>• Field Naturalists Clubs.</li> <li>• Conservation Authorities</li> </ul>	Field studies should confirm if an ELC Vegetation Type is a rare vegetation community based on listing within Appendix M of SWHTG <sup>cxlviii</sup> . <ul style="list-style-type: none"> <li>• Area of the ELC Vegetation Type polygon is the SWH.</li> <li>• SWH MIST <sup>cxlix</sup> Index #37 provides development effects and mitigation measures.</li> </ul>	<b>No;</b>  No Rare Vegetation Communities were identified within the Study Area.	<b>No;</b>  No Rare Vegetation Communities were identified within the Study Area	<b>No;</b>  Candidate habitat was not identified.	<b>No;</b>  Candidate habitat was not identified.



**Table 1.3 Specialized Habitats of Wildlife considered SWH.**

Specialized Wildlife Habitat	Wildlife Species	CANDIDATE SWH		CONFIRMED SWH	Candidate Habitat within the Study Area		Confirmed Habitat within the Study Area	
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	Panhandle	Leamington	Panhandle	Leamington
<p><b>Waterfowl Nesting Area</b></p> <p><b>Rationale:</b> Important to local waterfowl populations, sites with greatest number of species and highest number of individuals are significant.</p>	<p>American Black Duck Northern Pintail Northern Shoveler Gadwall Blue-winged Teal Green-winged Teal Wood Duck Hooded Merganser Mallard</p>	<p>All upland habitats located adjacent to these wetland ELC Ecosites are Candidate SWH: MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 SWT1 SWT2 SWD1 SWD2 SWD3 SWD4</p> <p><b>Note: includes adjacency to Provincially Significant Wetlands</b></p>	<p>A waterfowl nesting area extends 120 m <sup>cxlix</sup> from a wetland (&gt; 0.5 ha) or a wetland (&gt;0.5 ha) within 120 m or a cluster of 3 or more small (&lt;0.5 ha) wetlands within 120 m of each individual wetland where waterfowl nesting is known to occur <sup>cxlix</sup>.</p> <ul style="list-style-type: none"> <li>Upland areas should be at least 120 m wide so that predators such as racoons, skunks, and foxes have difficulty finding nests.</li> <li>Wood Ducks and Hooded Mergansers utilize large diameter trees (&gt;40 cm dbh) in woodlands for cavity nest sites.</li> </ul> <p><u>Information Sources</u></p> <ul style="list-style-type: none"> <li>Ducks Unlimited staff may know the locations of particularly productive nesting sites.</li> <li>OMNRF Wetland Evaluations for indication of significant waterfowl nesting habitat.</li> <li>Reports and other information available from Conservation Authorities</li> </ul>	<p>Studies confirmed:</p> <ul style="list-style-type: none"> <li>Presence of 3 or more nesting pairs for listed species excluding Mallards, or presence of 10 or more nesting pairs for listed species including Mallards.</li> <li>Any active nesting site of an American Black Duck is considered significant.</li> <li>Nesting studies should be completed during the spring breeding season (April - June). Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects" <sup>ccxi</sup></li> <li>A field study confirming waterfowl nesting habitat will determine the boundary of the waterfowl nesting habitat for the SWH, this may be greater or less than 120 m <sup>cxlviii</sup> from the wetland and will provide enough habitat for waterfowl to successfully nest.</li> <li>SWH MIST <sup>cxlix</sup> Index #25 provides development effects and mitigation measures.</li> </ul>	<p><b>Yes;</b></p> <p>MA communities were identified within the Study Area.</p>	<p><b>No;</b></p> <p>No suitable ecosites were identified within the Study Area.</p>	<p><b>Candidate;</b></p> <p>Confirmed habitat was not observed during field investigations; however, targeted surveys were not completed.</p>	<p><b>No;</b></p> <p>Candidate habitat was not identified.</p>
<p><b>Bald Eagle and Osprey Nesting, Foraging and Perching Habitat</b></p> <p><b>Rationale:</b> Nest sites are fairly uncommon in Ecoregion 7E and are used annually by these species. Many suitable nesting locations may</p>	<p>Osprey</p> <p><b>Special Concern:</b> Bald Eagle</p>	<p>ELC Forest Community Series: FOD, FOM, FOC, SWD, SWM and SWC directly adjacent to riparian areas – rivers, lakes, ponds, and wetlands</p>	<p>Nests are associated with lakes, ponds, rivers or wetlands along forested shorelines, islands, or on structures over water.</p> <ul style="list-style-type: none"> <li>Osprey nests are usually at the top a tree whereas Bald Eagle nests are typically in super canopy trees in a notch within the tree's canopy.</li> <li>Nests located on man-made objects are not to be included as SWH (e.g., telephone poles and constructed nesting platforms).</li> </ul> <p><u>Information Sources</u></p> <ul style="list-style-type: none"> <li>Natural Heritage Information Center (NHIC) compiles all known nesting sites for Bald Eagles in Ontario.</li> </ul>	<p>Studies confirm the use of these nests by:</p> <ul style="list-style-type: none"> <li>One or more active Osprey or Bald Eagle nests in an area <sup>cxlviii</sup>.</li> <li>Some species have more than one nest in a given area and priority is given to the primary nest with alternate nests included within the area of the SWH.</li> <li>For an Osprey, the active nest and a 300 m radius around the nest or the contiguous woodland stand is the SWH <sup>ccvii</sup>, maintaining undisturbed shorelines with large trees within this area is important <sup>cxlviii</sup>.</li> <li>For a Bald Eagle the active nest</li> </ul>	<p><b>Yes;</b></p> <p>The FOD8-1 community along the Thames River may provide suitable nesting habitat.</p>	<p><b>No;</b></p> <p>No suitable ecosites were identified within the Study Area.</p>	<p><b>Candidate;</b></p> <p>A juvenile Bald Eagle was observed flying overhead during field studies; however, targeted surveys were not completed.</p>	<p><b>No;</b></p> <p>Candidate habitat was not identified.</p>

Specialized Wildlife Habitat	Wildlife Species	CANDIDATE SWH		CONFIRMED SWH	Candidate Habitat within the Study Area		Confirmed Habitat within the Study Area	
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	Panhandle	Leamington	Panhandle	Leamington
be lost due to increasing shoreline development pressures and scarcity of habitat.			<ul style="list-style-type: none"> <li>MNRF values information (LIO/NRVIS) will list known nesting locations, Note: data from NRVIS is provided as a point and does not represent all the habitat.</li> <li>Nature Counts, Ontario Nest Records Scheme data.</li> <li>OMNRF Districts.</li> <li>Check the Ontario Breeding Bird Atlas <sup>ccv</sup> or Rare Breeding Birds in Ontario for species documented</li> <li>Reports and other information available from Conservation Authorities</li> <li>Field naturalist Clubs</li> </ul>	<p>and a 400-800 m radius around the nest is the SWH <sup>cvi, ccvii</sup>. Area of the habitat from 400-800 m is dependent on site lines from the nest to the development and inclusion of perching and foraging habitat <sup>cvi</sup></p> <ul style="list-style-type: none"> <li>To be significant a site must be used annually. When found inactive, the site must be known to be inactive for <math>\geq 3</math> years or suspected of not being used for &gt;5 years before being considered not significant. <sup>ccvii</sup></li> <li>Observational studies to determine nest site use, perching sites and foraging areas need to be done from mid March to mid August.</li> <li>Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects” <sup>ccxi</sup>.</li> <li>SWH MIST <sup>cxlix</sup> Index #26 provides development effects and mitigation measures</li> </ul>				
<p><b>Woodland Raptor Nesting Habitat</b></p> <p><u>Rationale:</u> Nests sites for these species are rarely identified; these area sensitive habitats are often used annually by these species.</p>	<p>Northern Goshawk Cooper’s Hawk Sharp-shinned Hawk Red-shouldered Hawk Barred Owl Broad-winged Hawk</p>	<p>May be found in all forested ELC Ecosites.</p> <p>May also be found in SWC, SWM, SWD and CUP3</p>	<p>All natural or conifer plantation woodland/forest stands combined &gt;30ha or with &gt;4 ha of interior habitat <sup>lxxxviii, lxxxix, xc, xci, xciii, xciv, xcv, xcvi, cxxxiii</sup>. Interior habitat determined with a 200m buffer <sup>cxlviii</sup></p> <ul style="list-style-type: none"> <li>Stick nests found in a variety of intermediate-aged to mature conifer, deciduous or mixed forests within tops or crotches of trees. Species such as Coopers hawk nest along forest edges sometimes on peninsulas or small offshore islands.</li> <li>In disturbed sites, nests may be used again, or a new nest will be in close proximity to old nest.</li> </ul> <p><u>Information Sources</u></p> <ul style="list-style-type: none"> <li>OMNRF Districts.</li> <li>Check the Ontario Breeding Bird Atlas <sup>ccv</sup> or Rare Breeding Birds in Ontario for species documented.</li> <li>Check data from Bird Studies Canada.</li> <li>Reports and other information available from Conservation</li> </ul>	<p>Studies confirm:</p> <ul style="list-style-type: none"> <li>Presence of 1 or more active nests from species list is considered significant <sup>cxlviii</sup>.</li> <li>Red-shouldered Hawk and Northern Goshawk – A 400 m radius around the nest or 28 ha habitat area would be applied where optimal habitat is irregularly shaped around the nest) <sup>ccvii</sup>.</li> <li>Barred Owl – A 200 m radius around the nest is the SWH <sup>ccvii</sup>.</li> <li>Broad-winged Hawk and Coopers Hawk, – A 100 m radius around the nest is the SWH <sup>ccvii</sup>.</li> <li>Sharp-Shinned Hawk – A 50m radius around the nest is the SWH <sup>ccvii</sup>.</li> <li>Conduct field investigations from mid-March to end of May. The use of call broadcasts can help in locating territorial (courting/nesting) raptors and facilitate the discovery of nests by narrowing down the search area.</li> <li>SWH MIST <sup>cxlix</sup> Index #27 provides</li> </ul>	<p><b>No;</b></p> <p>No suitable ecosites were identified within the Study Area of sufficient size.</p>	<p><b>No;</b></p> <p>No suitable ecosites were identified within the Study Area of sufficient size.</p>	<p><b>No;</b></p> <p>Candidate habitat was not identified.</p>	<p><b>No;</b></p> <p>Candidate habitat was not identified.</p>

Specialized Wildlife Habitat	Wildlife Species	CANDIDATE SWH		CONFIRMED SWH	Candidate Habitat within the Study Area		Confirmed Habitat within the Study Area	
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	Panhandle	Leamington	Panhandle	Leamington
			Authorities	development effects and mitigation measures.				
<b>Turtle Nesting Areas</b>  <b>Rationale:</b> These habitats are rare and when identified will often be the only breeding site for local populations of turtles.	Midland Painted Turtle  <b>Special Concern:</b> Northern Map Turtle Snapping Turtle	Exposed mineral soil (sand or gravel) areas adjacent (<100 m) <sup>cxlviii</sup> or within the following ELC Ecosites: MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 BOO1 FEO1	<ul style="list-style-type: none"> <li>Best nesting habitat for turtles are close to water and away from roads and sites less prone to loss of eggs by predation from skunks, raccoons, or other animals.</li> <li>For an area to function as a turtle-nesting area, it must provide sand and gravel that turtles are able to dig in and are located in open, sunny areas. Nesting areas on the sides of municipal or provincial road embankments and shoulders are not SWH.</li> <li>Sand and gravel beaches adjacent to undisturbed shallow weedy areas of marshes, lakes, and rivers are most frequently used.</li> </ul> <p><u>Information Sources</u></p> <ul style="list-style-type: none"> <li>Use Ontario Soil Survey reports and maps to help find suitable substrate for nesting turtles (well-drained sands and fine gravels).</li> <li>Check the Ontario Herpetofaunal Atlas records (or other similar atlases) for uncommon turtles; location information may help to find potential nesting habitat for them.</li> <li>Natural Heritage Information Center (NHIC)</li> <li>Field Naturalist Clubs</li> </ul>	Studies confirm: <ul style="list-style-type: none"> <li>Presence of 5 or more nesting Midland Painted Turtles.</li> <li>One or more Northern Map Turtle or Snapping Turtle nesting is a SWH.</li> <li>The area or collection of sites within an area of exposed mineral soils where the turtles nest, plus a radius of 30-100 m around the nesting area dependent on slope, riparian vegetation and adjacent land use is the SWH <sup>cxlviii</sup>.</li> <li>Travel routes from wetland to nesting area are to be considered within the SWH as a part of the 30-100 m area of habitat. <sup>cxlix</sup></li> <li>Field investigations should be conducted in prime nesting season typically late spring to early summer. Observational studies observing the turtles nesting is a recommended method.</li> <li>SWH MIST <sup>cxlix</sup> Index #28 provides development effects and mitigation measures for turtle nesting habitat.</li> </ul>	<b>Yes;</b>  Suitable ecosites may be present within the Study Area.	<b>No;</b>  No suitable ecosites were identified within the Study Area.	<b>Candidate;</b>  Evidence of turtle nesting was observed during field investigations; however, no targeted surveys were completed.	<b>No;</b>  Candidate habitat was not identified.
<b>Seeps and Springs</b>  <b>Rationale:</b> Seeps/Springs are typical of headwater areas and are often at the source of coldwater streams.	Wild Turkey Ruffed Grouse Spruce Grouse White-tailed Deer Salamander spp.	Seeps/Springs are areas where ground water comes to the surface. Often, they are found within headwater areas within forested habitats. Any forested Ecosite within the headwater areas of a stream could have seeps/springs.	Any forested area (with <25% meadow/field/pasture) within the headwaters of a stream or river system <sup>cxvii, cxlix</sup> . <ul style="list-style-type: none"> <li>Seeps and springs are important feeding and drinking areas especially in the winter will typically support a variety of plant and animal species <sup>cxix, cxx, cxxi, cxxii, cxiii, cxiv</sup>.</li> </ul> <p><u>Information Sources</u></p> <ul style="list-style-type: none"> <li>Topographical Map.</li> <li>Thermography.</li> <li>Hydrological surveys conducted by Conservation Authorities and MOE.</li> </ul>	Field Studies confirm: <ul style="list-style-type: none"> <li>Presence of a site with 2 or more seeps/springs should be considered SWH.</li> <li>The area of a ELC forest ecosite or ecoelement within ecosite containing the seeps/springs is the SWH. The protection of the recharge area considering the slope, vegetation, height of trees and groundwater condition need to be considered in delineation the habitat <sup>cxlviii</sup>.</li> <li>SWH MIST <sup>cxlix</sup> Index #30 provides development effects and mitigation</li> </ul>	<b>No;</b>  No suitable ecosites were identified within the Study Area.	<b>No;</b>  No suitable ecosites were identified within the Study Area.	<b>No;</b>  Candidate habitat was not identified.	<b>No;</b>  Candidate habitat was not identified.

Specialized Wildlife Habitat	Wildlife Species	CANDIDATE SWH		CONFIRMED SWH	Candidate Habitat within the Study Area		Confirmed Habitat within the Study Area	
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	Panhandle	Leamington	Panhandle	Leamington
			<ul style="list-style-type: none"> <li>Field Naturalists Clubs and landowners.</li> <li>Municipalities and Conservation Authorities may have drainage maps and headwater areas mapped.</li> </ul>	measures				
<b>Amphibian Breeding Habitat (Woodland).</b>  <b>Rationale:</b> These habitats are extremely important to amphibian biodiversity within a landscape and often represent the only breeding habitat for local amphibian populations	Eastern Newt Blue-spotted Salamander Spotted Salamander Gray Treefrog Spring Peeper Western Chorus Frog Wood Frog	All Ecosites associated with these ELC Community Series; FOC FOM FOD SWC SWM SWD  Breeding pools within the woodland or the shortest distance from forest habitat are more significant because they are more likely to be used due to reduced risk to migrating amphibians	<ul style="list-style-type: none"> <li>Presence of a wetland, pond, or woodland pool (including vernal pools) &gt;500 m<sup>2</sup> within or adjacent (within 120 m) to a woodland (no minimum size) <sup>clxxxii, lxiii, lxxv, lxvi, lxvii, lxviii, lxxix, lxxx</sup>. Some small wetlands may not be mapped and may be important breeding pools for amphibians.</li> <li>Woodlands with permanent ponds or those containing water in most years until mid-July are more likely to be used as breeding habitat <sup>cxlviii</sup>.</li> </ul> <p><u>Information Sources</u></p> <ul style="list-style-type: none"> <li>Ontario Herpetofaunal Summary Atlas (or other similar atlases) for records</li> <li>Local landowners may also provide assistance as they may hear spring-time choruses of amphibians on their property.</li> <li>OMNRF Districts and wetland evaluations</li> <li>Field Naturalist Clubs</li> <li>Canadian Wildlife Service Amphibian Road Call Survey</li> <li>Ontario Vernal Pool Association: <a href="http://www.ontariovernalpools.org">http://www.ontariovernalpools.org</a></li> </ul>	Studies confirm; <ul style="list-style-type: none"> <li>Presence of breeding population of 1 or more of the listed salamander species or 2 or more of the listed frog species with at least 20 individuals (adults, juveniles, eggs/larval masses) <sup>lxxi</sup> or 2 or more of the listed frog species with Call Level Codes of 3.</li> <li>A combination of observation study and call count survey will be required during the spring (March-June) when amphibians are concentrated around suitable breeding habitat within or near the woodland/wetlands.</li> <li>The habitat is the wetland area plus a 230 m radius of area. If a wetland area is adjacent to a woodland, a travel corridor connecting the wetland to the woodland is to be included in the habitat.</li> <li>SWH MIST <sup>cxlix</sup> Index #14 provides development effects and mitigation measures.</li> </ul>	<b>No;</b>  No suitable ecosites were identified within the Study Area.	<b>No;</b>  No suitable ecosites were identified within the Study Area.	<b>No;</b>  Candidate habitat was not identified.	<b>No;</b>  Candidate habitat was not identified.
<b>Amphibian Breeding Habitat (Wetlands)</b>  <b>Rationale:</b> Wetlands supporting breeding for these amphibian species are extremely important and	Eastern Newt American Toad Spotted Salamander Four-toed Salamander Blue-spotted Salamander Gray Treefrog Western Chorus Frog Northern Leopard Frog Pickerel Frog Green Frog Mink Frog Bullfrog	ELC Community Classes SW, MA, FE, BO, OA and SA.  Typically, these wetland ecosites will be isolated (>120m) from woodland ecosites, however larger wetlands containing predominantly	Wetlands >500 m <sup>2</sup> (about 25 m diameter <sup>ccvii</sup> ), supporting high species diversity are significant; some small or ephemeral habitats may not be identified on MNR mapping and could be important amphibian breeding habitats <sup>clxxxii</sup> . <ul style="list-style-type: none"> <li>Presence of shrubs and logs increase significance of pond for some amphibian species because of available structure for calling, foraging, escape and concealment from predators.</li> <li>Bullfrogs require permanent water</li> </ul>	Studies confirm: <ul style="list-style-type: none"> <li>Presence of breeding population of 1 or more of the listed newt/salamander species or 2 or more of the listed frog/toad species with at least 20 individuals (adults or eggs masses) <sup>lxxi</sup> or 2 or more of the listed frog/toad species with Call Level Codes of 3. or; Wetland with confirmed breeding Bullfrogs are significant.</li> </ul>	<b>Yes;</b>  MA communities were identified within the study area.	<b>No;</b>  No suitable ecosites were identified within the Study Area.	<b>Candidate;</b>  Confirmed habitat was not observed during field investigations; however, targeted surveys were not completed.	<b>No;</b>  Candidate habitat was not identified.

Specialized Wildlife Habitat	Wildlife Species	CANDIDATE SWH		CONFIRMED SWH	Candidate Habitat within the Study Area		Confirmed Habitat within the Study Area	
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	Panhandle	Leamington	Panhandle	Leamington
fairly rare within Central Ontario landscapes.		aquatic species (e.g., Bull Frog) may be adjacent to woodlands.	bodies with abundant emergent vegetation.  <u>Information Sources</u> <ul style="list-style-type: none"> <li>Ontario Herpetofaunal Summary Atlas (or other similar atlases)</li> <li>Canadian Wildlife Service Amphibian Road Surveys and Backyard Amphibian Call Count.</li> <li>OMNRF Districts and wetland evaluations.</li> <li>Reports and other information available from Conservation Authorities.</li> </ul>	<ul style="list-style-type: none"> <li>The ELC ecosite wetland area and the shoreline are the SWH.</li> <li>A combination of observational study and call count surveys cviii will be required during the spring (March-June) when amphibians are concentrated around suitable breeding habitat within or near the wetlands.</li> <li>If a SWH is determined for Amphibian Breeding Habitat (Wetlands) then Movement Corridors are to be considered as outlined in Table 1.4.1 of this Schedule.</li> <li>SWH MIST cxlix Index #15 provides development effects and mitigation measures.</li> </ul>				

**Table 1.4 Habitats of Species of Conservation Concern considered SWH.**

Wildlife	Species	CANDIDATE SWH		CONFIRMED SWH	Candidate Habitat within the Study Area		Confirmed Habitat within the Study Area	
		ELC Ecosite	Habitat Criteria and Information Sources	Defining Criteria	Panhandle	Leamington	Panhandle	Leamington
<p><b>Woodland Area-Sensitive Bird Breeding Habitat</b></p> <p><b>Rationale:</b> Large, natural blocks of mature woodland habitat within the settled areas of Southern Ontario are important habitats for area sensitive interior forest songbirds.</p>	<p>Yellow-bellied Sapsucker Red-breasted Nuthatch Veery Blue-headed Vireo Northern Parula Black-throated Green Warbler Blackburnian Warbler Black-throated Blue Warbler Ovenbird Scarlet Tanager Winter Wren Pileated Woodpecker</p> <p><b>Special Concern:</b> Cerulean Warbler Canada Warbler</p>	<p>All Ecosites associated with these ELC Community Series; FOC FOM FOD SWC SWM SWD</p>	<ul style="list-style-type: none"> <li>Habitats where interior forest breeding birds are breeding, typically large mature (&gt;60 yrs old) forest stands or woodlots &gt;30 ha <sup>cv, cxxx, cxxxii, cxxxiii, cxxxiv, cxxxv, cxxxvi, cxxxvii, cxxxviii, cxxxix, cxl, cxli, cxlii, cxliii, cxliv, cxlv, cxlvi, cl, cli, clii, cliii, cliv, clv, clvi, clvii, clviii, clix</sup>.</li> <li>Interior forest habitat is at least 200 m from forest edge habitat <sup>clxiv</sup>.</li> </ul> <p><u>Information Sources</u></p> <ul style="list-style-type: none"> <li>Local birder clubs.</li> <li>Canadian Wildlife Service (CWS) for the location of forest bird monitoring.</li> <li>Bird Studies Canada conducted a 3-year study of 287 woodlands to determine the effects of forest fragmentation on forest birds and to determine what forests were of greatest value to interior species</li> <li>Reports and other information available from Conservation Authorities</li> </ul>	<p>Studies confirm:</p> <ul style="list-style-type: none"> <li>Presence of nesting or breeding pairs of 3 or more of the listed wildlife species.</li> <li>Note: any site with breeding Cerulean Warblers or Canada Warbler is to be considered SWH.</li> <li>Conduct field investigations in spring and early summer when birds are singing and defending their territories.</li> <li>Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects” <sup>ccxi</sup>.</li> <li>SWH MIST <sup>cxlix</sup> Index #34 provides development effects and mitigation measures.</li> </ul>	<p><b>No;</b></p> <p>No suitable ecosites were identified within the Study Area.</p>	<p><b>No;</b></p> <p>No suitable ecosites were identified within the Study Area.</p>	<p><b>No;</b></p> <p>Candidate habitat was not identified.</p>	<p><b>No;</b></p> <p>Candidate habitat was not identified.</p>
<p><b>Marsh Breeding Bird Habitat</b></p> <p><b>Rationale:</b> Wetlands for these bird species are typically productive and fairly rare in Southern Ontario landscapes.</p>	<p>American Bittern Virginia Rail Sora Common Moorhen American Coot Pied-billed Grebe Marsh Wren Sedge Wren Common Loon Green Heron Trumpeter Swan</p> <p><b>Special Concern:</b> Black Tern Yellow Rail</p>	<p>MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 SAS1 SAM1 SAF1 FEO1 BOO1</p> <p>For Green Heron: All SW, MA and CUM1 sites.</p>	<p>Nesting occurs in wetlands. All wetland habitat is to be considered as long as there is shallow water with emergent aquatic vegetation present <sup>cxxiv</sup>.</p> <ul style="list-style-type: none"> <li>For Green Heron, habitat is at the edge of water such as sluggish streams, ponds and marshes sheltered by shrubs and trees. Less frequently, it may be found in upland shrubs or forest a considerable distance from water.</li> </ul> <p><u>Information Sources</u></p> <ul style="list-style-type: none"> <li>OMNRF District and wetland evaluations.</li> <li>Field Naturalist clubs</li> <li>Natural Heritage Information Centre (NHIC) Records.</li> <li>Reports and other information available from Conservation Authorities.</li> <li>Ontario Breeding Bird Atlas.</li> </ul>	<p>Studies confirm:</p> <ul style="list-style-type: none"> <li>Presence of 5 or more nesting pairs of Sedge Wren or Marsh Wren <b>or</b> breeding by any combination of 4 or more of the listed species.</li> <li>Note: any wetland with breeding of 1 or more Black Terns, Trumpeter Swan, Green Heron or Yellow Rail is SWH.</li> <li>Area of the ELC ecosite is the SWH.</li> <li>Breeding surveys should be done in May/June when these species are actively nesting in wetland habitats.</li> <li>Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”</li> <li>SWH MIST Index #35 provides development effects and mitigation measures</li> </ul>	<p><b>Yes;</b></p> <p>MA communities were identified within the study area.</p>	<p><b>No;</b></p> <p>No suitable ecosites were identified within the Study Area.</p>	<p><b>Candidate;</b></p> <p>Confirmed habitat was not observed during field investigations. however, targeted surveys were not completed.</p>	<p><b>No;</b></p> <p>Candidate habitat was not identified.</p>
<p><b>Open Country Bird Breeding Habitat</b></p> <p><b>Rationale:</b> This wildlife habitat is declining throughout</p>	<p>Upland Sandpiper Grasshopper Sparrow Vesper Sparrow Northern Harrier Savannah Sparrow</p> <p><b>Special Concern:</b> Short-eared Owl</p>	<p>CUM1 CUM2</p>	<p>Large grassland areas (includes natural and cultural fields and meadows) &gt;30 ha <sup>clx, clxi, clxii, clxiii, clxiv, clxv, clxvi, clxvii, clxviii, clxix</sup>.</p> <ul style="list-style-type: none"> <li>Grasslands not Class 1 or 2 agricultural lands, and not being actively used for farming (i.e., no row cropping or intensive hay or livestock pasturing in the last 5 years).</li> </ul>	<p>Studies confirm:</p> <ul style="list-style-type: none"> <li>Presence of nesting or breeding of 2 or more of the listed species.</li> <li>A field with 1 or more breeding Short-eared Owls is to be considered SWH.</li> <li>The area of SWH is the contiguous ELC ecosite field areas.</li> <li>Conduct field investigations of the most</li> </ul>	<p><b>No;</b></p> <p>No suitable ecosites were identified within the Study Area of sufficient size.</p>	<p><b>No;</b></p> <p>No suitable ecosites were identified within the Study Area of sufficient size.</p>	<p><b>No;</b></p> <p>Candidate habitat was not identified.</p>	<p><b>No;</b></p> <p>Candidate habitat was not identified.</p>

Wildlife	Species	CANDIDATE SWH		CONFIRMED SWH	Candidate Habitat within the Study Area		Confirmed Habitat within the Study Area	
		ELC Ecosite	Habitat Criteria and Information Sources	Defining Criteria	Panhandle	Leamington	Panhandle	Leamington
Ontario and North America. Species such as the Upland Sandpiper have declined significantly the past 40 years based on CWS (2004) trend records.			<ul style="list-style-type: none"> <li>Grassland sites considered significant should have a history of longevity, either abandoned fields, mature hayfields and pasturelands that are at least 5 years or older.</li> <li>The indicator bird species are area sensitive requiring larger grassland areas than the common grassland species.</li> </ul> <p><u>Information Sources:</u></p> <ul style="list-style-type: none"> <li>Agricultural land classification maps, Ministry of Agriculture.</li> <li>Local bird clubs.</li> <li>Ontario Breeding Bird Atlas</li> <li>EIS Reports and other information available from Conservation Authorities.</li> </ul>	likely areas in spring and early summer when birds are singing and defending their territories. <ul style="list-style-type: none"> <li>Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects” ccxi.</li> <li>SWH MIST <sup>cxlix</sup> Index #32 provides development effects and mitigation measures.</li> </ul>				
<b>Shrub/Early Successional Bird Breeding Habitat</b>  <b>Rationale:</b> This wildlife habitat is declining throughout Ontario and North America. The Brown Thrasher has declined significantly over the past 40 years based on CWS (2004) trend records <sup>cxci</sup> .	<p><b>Indicator Spp:</b> Brown Thrasher Clay-coloured Sparrow</p> <p><b>Common Spp:</b> Field Sparrow Black-billed Cuckoo Eastern Towhee Willow Flycatcher</p> <p><b>Special Concern:</b> Yellow-breasted Chat Golden-winged Warbler</p>	CUT1 CUT2 CUS1 CUS2 CUW1 CUW2  Patches of shrub ecosites can be complexed into a larger habitat for some bird species	Large field areas succeeding to shrub and thicket habitats >10 ha <sup>clxiv</sup> in size. <ul style="list-style-type: none"> <li>Shrub land or early successional fields, not class 1 or 2 agricultural lands, not being actively used for farming (i.e., no row-cropping, haying or live-stock pasturing in the last 5 years).</li> <li>Shrub thicket habitats (&gt;10 ha) are most likely to support and sustain a diversity of these species <sup>clxxiii</sup>.</li> <li>Shrub and thicket habitat sites considered significant should have a history of longevity, either abandoned fields or pasturelands.</li> </ul> <p><u>Information Sources</u></p> <ul style="list-style-type: none"> <li>Agricultural land classification maps, Ministry of Agriculture.</li> <li>Local bird clubs.</li> <li>Ontario Breeding Bird Atlas</li> <li>Reports and other information available from Conservation Authorities.</li> </ul>	Studies confirm: <ul style="list-style-type: none"> <li>Presence of nesting or breeding of 1 of the indicator species and at least 2 of the common species.</li> <li>A habitat with breeding Yellow-breasted Chat or Golden-winged Warbler is to be considered as Significant Wildlife Habitat.</li> <li>The area of the SWH is the contiguous ELC ecosite field/thicket area.</li> <li>Conduct field investigations of the most likely areas in spring and early summer when birds are singing and defending their territories</li> <li>Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects” <sup>ccxi</sup>.</li> <li>SWH MIST</li> <li>cxlix Index #33 provides development effects and mitigation measures.</li> </ul>	<b>No;</b>  No suitable ecosites were identified within the Study Area of sufficient size.	<b>No;</b>  No suitable ecosites were identified within the Study Area of sufficient size.	<b>No;</b>  Candidate habitat was not identified.	<b>No;</b>  Candidate habitat was not identified.
<b>Terrestrial Crayfish;</b>  <b>Rationale:</b> Terrestrial Crayfish are only found within SW Ontario in Canada and their habitats	Chimney or Digger Crayfish; ( <i>Creaserinus fodiens</i> )  Devil Crawfish or Meadow Crayfish; ( <i>Lacunicambarus nebrascensis</i> )	MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 MAS1 MAS2 MAS3 SWD SWT	Wet meadow and edges of shallow marshes (no minimum size) should be surveyed for terrestrial crayfish. <ul style="list-style-type: none"> <li>Constructs burrows in marshes, mudflats, meadows; they can’t be found far from water.</li> <li>Both species are a semi-terrestrial burrower which spends most of its life within burrows consisting of a network of tunnels. Usually, the soil is not too moist so that the tunnel is well formed.</li> </ul>	Studies Confirm: <ul style="list-style-type: none"> <li>Presence of 1 or more individuals of species listed or their chimneys (burrows) in suitable meadow marsh, swamp, or moist terrestrial sites <sup>cci</sup></li> <li>Area of ELC ecosite or a Habitat ecoelement area of meadow marsh or swamp within the larger ecosite area is the SWH.</li> <li>Surveys should be done April to August in temporary or permanent water. Note</li> </ul>	<b>Yes;</b>  MA communities were identified within the study area.	<b>No;</b>  No suitable ecosites were identified within the Study Area.	<b>Candidate;</b>  Confirmed habitat was not observed during field investigations. however, targeted surveys were not completed.	<b>No;</b>  Candidate habitat was not identified.

Wildlife	Species	CANDIDATE SWH		CONFIRMED SWH	Candidate Habitat within the Study Area		Confirmed Habitat within the Study Area	
		ELC Ecosite	Habitat Criteria and Information Sources	Defining Criteria	Panhandle	Leamington	Panhandle	Leamington
are very rare. <sup>ccii</sup>		SWM	<u>Information Sources</u> <ul style="list-style-type: none"> <li>Information sources from “Conservation Status of Freshwater Crayfishes” by Dr. Premek Hamr for the WWF and CNF March 1998</li> </ul>	the presence of burrows or chimneys are often the only indicator of presence, observance or collection of individuals is very difficult <sup>cci</sup> . <ul style="list-style-type: none"> <li>SWH MIST <sup>cxlix</sup> Index #36 provides development effects and mitigation measures.</li> </ul>				
<b>Special Concern and Rare Wildlife Species</b>  <u>Rationale:</u> These species are quite rare or have experienced significant population declines in Ontario.	All Special Concern and Provincially Rare (S1-S3, SH) plant and animal species. Lists of these species are tracked by the Natural Heritage Information Centre (NHIC).	All plant and animal element occurrences (EO) within a 1 or 10 km grid.  Older element occurrences were recorded prior to GPS being available, therefore location information may lack accuracy	<ul style="list-style-type: none"> <li>When an element occurrence is identified within a 1 or 10 km grid for a Special Concern or provincially Rare species; linking candidate habitat on the site needs to be completed to ELC Ecosites <sup>lxviii</sup>.</li> </ul> <u>Information Sources</u> <ul style="list-style-type: none"> <li>Natural Heritage Information Centre (NHIC) will have Special Concern and Provincially Rare (S1-S3, SH) species lists with element occurrences data.</li> <li>NHIC Website “Get Information”: <a href="http://nhic.mnr.gov.on.ca">http://nhic.mnr.gov.on.ca</a></li> <li>Ontario Breeding Bird Atlas•</li> <li>Expert advice should be sought as many of the rare spp. have little information available about their requirements.</li> </ul>	Studies Confirm: <ul style="list-style-type: none"> <li>Assessment/inventory of the site for the identified special concern or rare species needs to be completed during the time of year when the species is present or easily identifiable.</li> <li>The area of the habitat to the finest ELC scale that protects the habitat form and function is the SWH, this must be delineated through detailed field studies. The habitat needs be easily mapped and cover an important life stage component for a species e.g., specific nesting habitat or foraging habitat.</li> <li>SWH MIST Index #37 provides development effects and mitigation measures</li> </ul>	<b>Yes;</b>  26 SOCC have been identified as potentially present within the Study Areas.	<b>Yes;</b>  26 SOCC have been identified as potentially present within the Study Areas.	<b>Confirmed;</b>  Swamp rose-mallow was identified in the MAS2-9 community.  Wingstem was identified in the FOD8-1 community.  Midland Painted Turtle and Snapping Turtle were observed in multiple aquatic features.	<b>Confirmed;</b>  Snapping Turtle was observed during field investigation.



**Table 1.5 Animal Movement Corridors.**

Habitat	Species	CANDIDATE SWH		CONFIRMED SWH	Candidate Habitat Present Within the Study Area		\Confirmed Habitat Present within the Study Area	
		ELC Eco-sites	Habitat Criteria and Information Sources	Defining Criteria	Panhandle	Leamington	Panhandle	Leamington
<p><b>Amphibian Movement Corridors</b></p> <p><u>Rationale:</u> Movement corridors for amphibians moving from their terrestrial habitat to breeding habitat can be extremely important for local populations.</p>	Eastern Newt American Toad Spotted Salamander Four-toed Salamander Blue-spotted Salamander Gray Treefrog Western Chorus Frog Northern Leopard Frog Pickerel Frog Green Frog Mink Frog Bullfrog	Corridors may be found in all ecosites associated with water. <ul style="list-style-type: none"> <li>Corridors will be determined based on identifying the significant breeding habitat for these species in Table 1.1</li> </ul>	Movement corridors between breeding habitat and summer habitat <sup>clxxiv, clxxv, clxxvi, clxxvii, clxxviii, clxxix, clxxx, clxxxi</sup> .  Movement corridors must be determined when Amphibian breeding habitat is confirmed as SWH from Table 1.2.2 (Amphibian Breeding Habitat – Wetland) of this Schedule.  <u>Information Sources</u> <ul style="list-style-type: none"> <li>MNRF District Office.</li> <li>Natural Heritage Information Centre (NHIC).</li> <li>Reports and other information available from Conservation Authorities.</li> <li>Field Naturalist Clubs.</li> </ul>	<ul style="list-style-type: none"> <li>Field Studies must be conducted at the time of year when species are expected to be migrating or entering breeding sites.</li> <li>Corridors should consist of native vegetation, with several layers of vegetation. Corridors unbroken by roads, waterways or bodies, and undeveloped areas are most significant <sup>cxlix</sup>.</li> <li>Corridors should have at least 15 m of vegetation on both sides of waterway <sup>cxlix</sup> or be up to 200m wide <sup>cxlix</sup> of woodland habitat and with gaps &lt;20 m <sup>cxlix</sup>.</li> <li>Shorter corridors are more significant than longer corridors, however amphibians must be able to get to and from their summer and breeding habitat <sup>cxlix</sup>.</li> <li>SWH MIST <sup>cxlix</sup> Index #40 provides development effects and mitigation measures</li> </ul>	<p><b>No;</b></p> <p>No suitable ecosites were identified within the Study Area of sufficient size.</p>	<p><b>No;</b></p> <p>No suitable ecosites were identified within the Study Area of sufficient size.</p>	<p><b>No;</b></p> <p>Candidate habitat was not identified, however, targeted surveys were not completed.</p>	<p><b>No;</b></p> <p>Candidate habitat was not identified, however, targeted surveys were not completed.</p>

**Table 1.6 Significant Wildlife Habitat Exceptions for Ecodistricts within Eco-Region 7E**

Habitat	Species	CANDIDATE SWH		CONFIRMED SWH	Candidate Habitat Present Within the Study Area		Confirmed Habitat Present within the Study Area	
		ELC Eco-sites	Habitat Criteria and Information Sources	Defining Criteria	Panhandle	Leamington	Panhandle	Leamington
<p><b>7E-2 Bat Migratory Stopover Area</b></p> <p><u>Rationale:</u> Stopover areas for long distance migrant bats are important during fall migration.</p>	<p>Hoary Bat Eastern Red Bat Silver-haired Bat</p>	<p>No specific ELC types.</p>	<ul style="list-style-type: none"> <li>Long distance migratory bats typically migrate during late summer and early fall from summer breeding habitats throughout Ontario to southern wintering areas. Their annual fall migration may concentrate these species of bats at stopover areas.</li> <li>This is the only known bat migratory stopover habitats based on current information.</li> </ul> <p><u>Information Sources</u></p> <ul style="list-style-type: none"> <li>OMNRF for possible locations and contact for local experts</li> <li>University of Waterloo, Biology Department</li> </ul>	<ul style="list-style-type: none"> <li>Long Point (42°35'N, 80°30'E, to 42°33'N, 80°03'E) has been identified as a significant stop-over habitat for fall migrating Silver-haired Bats, due to significant increases in abundance, activity and feeding that was documented during fall migration <sup>ccxv</sup>.</li> <li>The confirmation criteria and habitat areas for this SWH are still being determined.</li> <li>SWH MIST <sup>cxlix</sup> Index #38 provides development effects and mitigation measures.</li> </ul>	<p><b>No;</b></p> <p>The study area does not include Long Point.</p>	<p><b>No;</b></p> <p>The study area does not include Long Point.</p>	<p><b>No;</b></p> <p>Candidate habitat was not identified.</p>	<p><b>No;</b></p> <p>Candidate habitat was not identified.</p>

# Attachment **E**

## **Species at Risk Habitat Assessment**

Taxonomy	Species	ESA Status	SARA Status	COSEWIC Status	Preferred Habitat <sup>1,2</sup>	Associated ELC Communities	Known Species Range <sup>1,2</sup>	Source Identifying Species Record	Suitable Habitat Identified During Background Review - Panhandle Regional Expansion	Species/Suitable Habitat Identified During Field Investigations - Panhandle	Suitable Habitat Identified During Background Review - Lemmington Interconnect	Species/Suitable Habitat Identified During Field Investigations - Leamington
Birds	Bank Swallow <i>Riparia riparia</i>	THR	THR Schedule +E16:116	THR	Bank Swallows nest in burrows in natural and human-made settings where there are vertical faces in silt and sand deposits. Many nests are on banks of rivers and lakes, but they are also found in active sand and gravel pits or former ones where the banks remain suitable. The birds breed in colonies ranging from several to a few thousand pairs.  The Bank Swallow breeds in a wide variety of natural and artificial sites with vertical banks, including riverbanks, lake and ocean bluffs, aggregate pits, road cuts, and stock piles of soil. Sand-silt substrates are preferred for excavating nest burrows. Breeding sites tend to be somewhat ephemeral due to the dynamic nature of bank erosion. Breeding sites are often situated near open terrestrial habitat used for aerial foraging (e.g., grasslands, meadows, pastures, and agricultural cropland). Large wetlands are used as communal nocturnal roost sites during post-breeding, migration, and wintering periods.		The Bank Swallow is found all across southern Ontario, with sparser populations scattered across northern Ontario. The largest populations are found along the Lake Erie and Lake Ontario shorelines, and the Saugeen River (which flows into Lake Huron).  In North America, it breeds widely across the northern two-thirds of the U.S., north to the treeline. It breeds in all Canadian provinces and territories, except perhaps Nunavut.	Lemmington Study Area - OBBA Panhandle Study Area - OBBA	Yes  The banks of the constructed drains and watercourses present within the Study Area may provide suitable nesting habitat for Bank Swallow.	No  Neither species nor suitable was identified during field investigations.	Yes  The banks of the agricultural drains present within the Study Area may provide suitable nesting habitat for Bank Swallow.	No  Suitable habitat identified at crossing LSC-11, though Bank Swallows were not observed.
Birds	Barn Owl <i>Tyto alba</i>	END	END Schedule 1	END	The Barn Owl cannot tolerate severe winter temperatures, and southern Ontario is the northern limit of its range. Breeding sites in Ontario seem to be restricted to areas with the moderating effects of the Great Lakes (within 50 kilometres of the lakes). In southern Ontario, this adaptable owl nests and roosts in barns and abandoned buildings. It may also use natural cavities in trees or holes in cliff faces, as it did before the arrival of Europeans in North America. It lives year round at its nest site and hunts for rodents over orchards, and grasslands such as farmlands, fallow fields, and meadows.  Barn Owls prefer low-elevation, open country, where their small rodent prey are more abundant. In Canada, they are often associated with agricultural lands, especially pasture. Nests are located in buildings, hollow trees, and cavities in cliffs. In Canada, most nests are found on man-made structures, especially those which are abandoned or unused.	<b>TPO, TPS, CUM, CUS and CUW</b> where suitable nesting habitat is present.	In the Western Hemisphere, the Barn Owl is found from extreme southern Canada to southern South America and the West Indies. In Canada, the Barn Owl is at the northern limit of its range, and breeds only locally in southern British Columbia, southern Ontario, and possibly in southern Quebec. Barn Owl numbers in Ontario and Quebec were probably never very large, although the species possibly inhabited oak-savannah vegetation adjacent to tall grass prairie prior to European settlement. Colonization of southern Canada is attributed to clearance of forests for agriculture, which created open habitats supporting high rodent populations. In Ontario, Barn Owls may potentially breed on the Niagara Peninsula, in adjacent Halimand-Norfolk, in the Thousands Island area of Kingston, at Long Point, and in several other localities in the southwestern part of the province. Today, there are fewer than five pairs of Barn Owls in Ontario.	Panhandle Study Area - OBBA	Yes  Buildings (i.e. barns) and trees within the Study Area may provide suitable nesting habitat for Barn Owl. Agricultural fields may also provide suitable nesting habitat for this species.	No  Neither species nor suitable was identified during field investigations, however, targeted surveys were not conducted.	No  Species was not identified through the background review.	No  Neither species nor suitable was identified during field investigations, however, targeted surveys were not conducted.
Birds	Barn Swallow <i>Hirundo rustica</i>	THR	THR Schedule 1	THR	Barn Swallows often live in close association with humans, building their cup-shaped mud nests almost exclusively on human-made structures such as open barns, under bridges, and in culverts. The species is attracted to open structures that include ledges where they can build their nests, which are often re-used from year to year. They prefer unpainted, rough-cut wood, since the mud does not adhere as well to smooth surfaces.  Before European colonization, Barn Swallows nested mostly in caves, holes, crevices, and ledges in cliff faces. Following European settlement, they shifted largely to nesting in and on artificial structures, including barns and other outbuildings, garages, houses, bridges, and road culverts. Barn Swallows prefer various types of open habitats for foraging, including grassy fields, pastures, various kinds of agricultural crops, lake and river shorelines, cleared rights-of-way, cottage areas and farmyards, islands, wetlands, and subarctic tundra.	<b>TPO, CUM1, MAM, MAS, OAO, SAS1, SAM1, SAF1</b> ; containing or adjacent structures that are suitable for nesting.	The Barn Swallow may be found throughout southern Ontario and can range as far north as Hudson Bay, wherever suitable locations for nests exist.  The Barn Swallow has become closely associated with human rural settlements. It breeds across much of North America south of the treeline, south to central Mexico. In Canada, it is known to breed in all provinces and territories.	Lemmington Study Area - OBBA Panhandle Study Area - NHIC, OBBA	Yes  Antropogenic sturctures such as buildings, culverts and bridges may provide suitable nesting habitat for this species.	Yes  Species confirmed nesting under Mint Line Bridge over SC19 and Balmoral Line Bridge over SC40.	Yes  Antropogenic sturctures such as buildings, culverts and bridges may provide suitable nesting habitat for this species.	No  Although species was observed, no nests were identified during field investigations.
Birds	Bobolink <i>Dolichonyx oryzivorus</i>	THR	THR Schedule 1	THR	Historically, Bobolinks lived in North American tallgrass prairie and other open meadows. With the clearing of native prairies, Bobolinks moved to living in hayfields. Bobolinks often build their small nests on the ground in dense grasses. Both parents usually tend to their young, sometimes with a third Bobolink helping.  Most of this prairie was converted to agricultural land over a century ago, and at the same time the forests of eastern North America were cleared to hayfields and meadows that provided habitat for the birds. Since the conversion of the prairie to cropland and the clearing of the eastern forests, the Bobolink has nested in forage crops (e.g., hayfields and pastures dominated by a variety of species, such as clover, Timothy, Kentucky Bluegrass, and broadleaved plants). The Bobolink also occurs in various grassland habitats including wet prairie, graminoid peatlands, and abandoned fields dominated by tall grasses, remnants of uncultivated virgin prairie (tall-grass prairie), no-till cropland, small-grain fields, restored surface mining sites, and irrigated fields in arid regions. It is generally not abundant in short-grass prairie, Alfalfa fields, or in row crop monocultures (e.g., corn, soybean, wheat), although its use of Alfalfa may vary with region.	<b>TPO, TPS, CUM1 and MAM2.</b>	The Bobolink breeds across North America. In Ontario, it is widely distributed throughout most of the province south of the boreal forest, although it may be found in the north where suitable habitat exists.  The breeding range of the Bobolink in North America includes the southern part of all Canadian provinces from British Columbia to Newfoundland and Labrador and south to the northwestern, north-central and northeastern U.S.	Lemmington Study Area - OBBA Panhandle Study Area - NHIC, OBBA	Yes  The Study Area is dominated by agricultural fields which may consist of hayfields.	Yes  Species observed in winter wheat fields within the Study Area.	Yes  The Study Area is dominated by agricultural fields which may consist of hayfields.	Yes  Species observed in winter wheat fields within the Study Area.
Birds	Chimney Swift <i>Chaetura pelagica</i>	THR	THR Schedule 1	THR	Before European settlement, Chimney Swifts mainly nested on cave walls and in hollow trees or tree cavities in old growth forests. However, due to the land clearing associated with colonization, hollow trees became increasingly rare, which led Chimney Swifts to move into house chimneys. Today, they are more likely to be found in and around urban settlements where they nest and roost (rest or sleep) in chimneys and other manmade structures. It is likely that a small portion of the population continues to use hollow trees. They also tend to stay close to water as this is where the flying insects they eat congregate.  The Chimney Swift spends the major part of the day in flight feeding on insects. In the northern part of the breeding range, the Chimney Swift favours sites where the ambient temperature is relatively stable.	<b>TPO, CUM1, MAM, MAS, OAO, SAS1, SAM1, SAF1</b> containing or adjacent structures with suitable nesting habitat (i.e. chimneys).	The Chimney Swift breeds in eastern North America, possibly as far north as southern Newfoundland. In Ontario, it is most widely distributed in the Carolinian zone in the south and southwest of the province, but has been detected throughout most of the province south of the 49th parallel.  The Chimney Swift breeds mainly in eastern North America, from southern Canada down to Texas and Florida. The species breeds in east central Saskatchewan, southern Manitoba, southern Ontario, southern Quebec, New Brunswick, Nova Scotia, and possibly in Prince Edward Island and southwestern Newfoundland.	Lemmington Study Area - OBBA Panhandle Study Area - OBBA	Yes  Buildings present within the Study Area may provide suitable nesting habitat for this species.	No  Neither species nor suitable was identified during field investigations, however, targeted surveys were not conducted.	Yes  Buildings present within the Study Area may provide suitable nesting habitat for this species.	No  Neither species nor suitable was identified during field investigations, however, targeted surveys were not conducted.
Birds	Eastern Meadowlark <i>Sturnella magna</i>	THR	THR Schedule 1	THR	Eastern Meadowlarks breed primarily in moderately tall grasslands, such as pastures and hayfields, but are also found in alfalfa fields, weedy borders of croplands, roadsides, orchards, airports, shrubby overgrown fields, or other open areas. Small trees, shrubs, or fence posts are used as elevated song perches.  Eastern Meadowlarks prefer grassland habitats, including native prairies and savannahs, as well as non-native pastures, hayfields, weedy meadows, herbaceous fencerows, and airfields.	<b>TPO, TPS, CUM1, CUS, and MAM2</b> with elevated song perches.	In Ontario, the Eastern Meadowlark is primarily found south of the Canadian Shield but it also inhabits the Lake Nipissing, Timiskaming, and Lake of the Woods areas.  Including all subspecies, the Eastern Meadowlark's global breeding range extends from central and eastern North America, south through parts of South America. However, there is only one subspecies in Canada and the neighbouring northeastern U.S. In Canada, the bulk of the population breeds in southern Ontario.	Lemmington Study Area - OBBA Panhandle Study Area - NHIC, OBBA	Yes  The Study Area is dominated by agricultural fields which may consist of pastures or hayfields.	No  Suitable habitat identified within the Study Area and presence is assumed though Eastern Meadowlarks were not observed.	Yes  The Study Area is dominated by agricultural fields which may consist of pastures or hayfields.	No  Suitable habitat identified within the Study Area and presence is assumed though Eastern Meadowlarks were not observed.

Taxonomy	Species	ESA Status	SARA Status	COSEWIC Status	Preferred Habitat <sup>1,2</sup>	Associated ELC Communities	Known Species Range <sup>1,2</sup>	Source Identifying Species Record	Suitable Habitat Identified During Background Review - Panhandle Regional Expansion	Species/Suitable Habitat Identified During Field Investigations - Panhandle	Suitable Habitat Identified During Background Review - Lemmington Interconnect	Species/Suitable Habitat Identified During Field Investigations - Leamington
Birds	Henslow's Sparrow <i>Centronyx henslowii</i>	END	END Schedule 1	END	In Ontario, the Henslow's Sparrow lives in open fields with tall grasses, flowering plants, and a few scattered shrubs. It has also been found in abandoned farm fields, pastures, and wet meadows. It tends to avoid fields that have been grazed, burned, or are crowded with trees and shrubs. It prefers extensive, dense, tall grasslands where it can more easily conceal its small ground nest.  Henslow's Sparrows occupy open fields. The vegetation of these areas includes tall grasses that are interspersed with tall herbaceous plants, or shrubby species. It prefers undisturbed areas with dense living grasses and a dense thatch of dead grasses. The species may occupy hayfields, but if the hay is cut early, the nests are destroyed and the resulting losses are severe. Only areas that remain undisturbed for several years appear to be more successfully colonized. The precise amount of remaining suitable habitat in Ontario is unknown.	<b>TPO, CUM, and MAM</b> that are a minimum of 30 ha in size with vegetation that is over 30cm in height with a thick thatch layer and a lack of emergent woody vegetation.	The Henslow's Sparrow breeds in the northeastern and east-central United States, and reaches its northeastern limit in Ontario. It was once fairly common in scattered areas of suitable habitat south of the Canadian Shield. However, steep declines since the 1960s have all but wiped this bird out as a breeding species in Ontario. A few are still seen each spring at migration hotspots such as Point Pelee National Park, and a few may breed at selected locations.  In Canada, it now occurs in southern Ontario. Historical information indicates that the species probably occurred in natural prairie areas and that forest clearing in the 1800s probably lead to an expanded range for a time. In addition to southern Ontario, the Henslow's Sparrow used to occur in southwestern and eastern Ontario.	Panhandle Study Area NHIC	<b>No</b>  Grasslands of sufficient size (i.e. >30 ha) are not anticipated within the Study Area.	<b>No</b>  Neither species nor suitable was identified during field investigations, however, targeted surveys were not conducted.	<b>No</b>  Species was not identified through the background review.	<b>No</b>  Neither species nor suitable was identified during field investigations, however, targeted surveys were not conducted.
Birds	King Rail <i>Rallus elegans</i>	END	END Schedule 1	END	King Rails are found in densely vegetated freshwater marshes with open shallow water that merges with shrubby areas. They are sometimes found in smaller isolated marshes but most seem to prefer larger, coastal wetlands. Its nest is a dinner plate-sized platform made of plant material, placed just above the water in shrubs or clumps of other marsh plants.  King Rails are found in a variety of freshwater marshes and marsh-shrub swamp habitats. The species occurs in areas where wild rice grows, but also in sedge and cattail marshes. Most importantly, the species requires large marshes with open shallow water that merges with shrubby areas. In fact, birds only return in successive years to large marshes that are not overgrown with cattails. Originally, the best habitat for King Rails was in southwestern Ontario, but most of these wetlands have since been eliminated. Only 10% of the original pre-European settlement marshes remain in the one area of Ontario where the largest component of the species occurs. The quality of the remaining habitat is also deteriorating.	<b>MAS, SWT, and MAM.</b>	King Rails reach their northern limit in southern Ontario, where they are quite rare. Recent province-wide surveys suggest there are only about 30 pairs left, the majority of which are in the large wetlands bordering Lake St. Clair. Most of the remainder are found in several key coastal marshes along Lakes Erie and Ontario.  In Canada, the species breeds only in the extreme southern part of Ontario. It is thought that the King Rail was quite common in some southern Ontario marshes, although there is no early information on population numbers and the area occupied.	Panhandle Study Area NHIC, OBBA	<b>Yes</b>  The St. Clair Marsh Complex Provincially Significant Wetland (PSW) may provide suitable nesting habitat for this species.	<b>No</b>  Suitable habitat was identified during field investigations though the species was not observed, however, targeted surveys were not conducted.	<b>No</b>  Species was not identified through the background review.	<b>No</b>  Neither species nor suitable was identified during field investigations, however, targeted surveys were not conducted.
Birds	Least Bittern <i>Ixobrychus exilis</i>	THR	THR Schedule 1	THR	In Ontario, the Least Bittern is found in a variety of wetland habitats, but strongly prefers cattail marshes with a mix of open pools and channels. This bird builds its nest above the marsh water in stands of dense vegetation, hidden among the cattails. The nests are almost always built near open water, which is needed for foraging. This species eats mostly frogs, small fish, and aquatic insects.  The Least Bittern breeds strictly in marshes dominated by emergent vegetation surrounded by areas of open water. Most breeding grounds in Canada are dominated by cattails, but breeding also occurs in areas with other robust emergent plants and in shrubby swamps. The presence of stands of dense vegetation is essential for nesting because the nests of Least Bittern sit on platforms of stiff stems. The nests are almost always within 10 m of open water. Open water is also needed for foraging, because Least Bitterns forage by ambushing their prey in shallow water near marsh edges, often from platforms that they construct out of bent vegetation. Access to clear water is essential for the birds to see their prey. This small heron prefers large marshes that have relatively stable water levels throughout the nesting period. Adults can raise nests somewhat to deal with rising waters, but persistent or sudden increases will flood nests. Conversely, drops in water level can reduce foraging opportunities and increase the species' exposure to predators. Needs for wintering habitat are less specific, and appear to be met by a wide variety of wetlands—not only emergent marshes like those used for breeding, but also brackish and saline swamps. Habitat use during migration is poorly known, but presumably is similar to breeding and wintering habitat.	<b>MAS2-1, MAS3-1, SA and OAO.</b>	In Ontario, the Least Bittern is mostly found south of the Canadian Shield, especially in the central and eastern part of the province. Small numbers also breed occasionally in northwest Ontario. This species has disappeared from much of its former range, especially in southwestern Ontario, where wetland loss has been most severe.  The Least Bittern breeds from southern Canada to South America. In Canada, the Least Bittern has been observed in every province, but most individuals occur in Ontario. The species breeds primarily in southern Ontario.	Panhandle Study Area NHIC, OBBA	<b>Yes</b>  Marsh communities associated with the St. Clair Marsh Complex PSW, Baptiste Creek, Jeannettes Creek and the Thames River may provide suitable nesting habitat for this species.	<b>No</b>  Suitable habitat was identified during field investigations though the species was not observed, however, targeted surveys were not conducted.	<b>No</b>  Species was not identified through the background review.	<b>No</b>  Neither species nor suitable was identified during field investigations, however, targeted surveys were not conducted.
Birds	Prothonotary Warbler <i>Protonotaria citrea</i>	END	END Schedule 1	END	The Prothonotary is the only warbler in eastern North America that nests in tree cavities, where it typically lays four to six eggs on a cushion of moss, leaves, and plant fibres.  In Canada, this species breeds only in deciduous swamp forests or riparian floodplain forests. The forests it occupies are typically dominated by Silver Maple, ash, and Yellow Birch. The species nests in naturally formed tree cavities or cavities excavated by other species, mainly Downy Woodpeckers and chickadees. It favours small, shallow holes situated at low heights in dead or dying trees, in which it builds a nest lined with moss. Nests are typically situated over standing or slow-moving water. Artificial nest boxes are also readily accepted and perhaps even preferred. Males often build one or more incomplete "dummy" nests. Females usually select one of these to complete, but they may also build an entirely new nest on their own. In any case, several suitable cavities appear to be required in each territory to accommodate all of these nests.	<b>FOD and SWD</b> with standing water.	In Canada, the Prothonotary Warbler is only known to nest in southwestern Ontario, primarily along the north shore of Lake Erie. Over half of the small and declining population is found in Rondeau Provincial Park. In Ontario, the Prothonotary Warbler is found in the warmer climate of the Carolinian deciduous forests.  This species is very rare in Canada, but is actively monitored by a combination of amateurs and professionals. Many occupied sites are prone to blinking on and off. This level of annual fluctuation makes it difficult to ascertain whether there has been a true change in occupied range, but such a change seems unlikely. Fewer than 10 locations are occupied in Canada in any given year (e.g., no more than 8 in 2015).	Panhandle Study Area NHIC, OBBA	<b>No</b>  Suitable deciduous swamps or riparian floodplain forests for nesting were not identified within the Study Area through the background review.	<b>No</b>  Neither species nor suitable was identified during field investigations, however, targeted surveys were not conducted.	<b>No</b>  Species was not identified through the background review.	<b>No</b>  Neither species nor suitable was identified during field investigations, however, targeted surveys were not conducted.

Taxonomy	Species	ESA Status	SARA Status	COSEWIC Status	Preferred Habitat <sup>1,2</sup>	Associated ELC Communities	Known Species Range <sup>1,2</sup>	Source Identifying Species Record	Suitable Habitat Identified During Background Review - Panhandle Regional Expansion	Species/Suitable Habitat Identified During Field Investigations - Panhandle	Suitable Habitat Identified During Background Review - Lemmington Interconnect	Species/Suitable Habitat Identified During Field Investigations - Leamington
Fish	Eastern Sand Darter (Ontario populations) <i>Ammocrypta pellucida</i>	END	THR Schedule 1	THR	The Eastern Sand Darter prefers shallow habitats in lakes, streams, and rivers with clean, sandy bottoms. It often buries itself completely in the sand. It feeds on aquatic insects, but due to its small mouth is limited in the size of prey it can eat.  The preferred habitat of the Eastern Sand Darter is sand-bottomed areas in streams and rivers, and sandy shoals in lakes. Spawning has not been observed in nature but, in the laboratory, Eastern Sand Darter spawned on a mixed sand and gravel substrate. Eastern Sand Darter habitats in Canada have been extensively impacted by land clearing, intensive agriculture, urban development, impoundments, and stream channel modifications.	<b>OAO</b> with sandy bottoms.	In Ontario, the Eastern Sand Darter is found in Lake St. Clair, Lake Erie, West Lake, Big Creek, and in the Grand, Sydenham, Thames, and Detroit rivers. The species may have disappeared from several other rivers in southwestern Ontario. In 2008 it was rediscovered in Big Creek after an absence of more than 50 years.  The Eastern Sand Darter occurs in the Ohio River basin (Ohio, Indiana, Illinois, Kentucky, West Virginia, Pennsylvania), a portion of the lower Great Lakes drainage (Lake Huron, Lake St. Clair and Lake Erie drainages in Michigan, Ohio, New York, Pennsylvania, and Ontario), and farther east in the St. Lawrence River and Lac Champlain drainages (Québec, Vermont, New York). In Ontario, populations have been found in seven southwestern Ontario watersheds as well as lakes Erie and St. Clair.	Panhandle Study Area DFO	<b>Yes</b>  DFO records indicate that this species is present within the Thames River.	<b>No</b>  Species was not identified during field investigations, however, targeted surveys were not conducted within the Thames River; suitable habitat identified and presence should be assumed.	<b>No</b>  Species was not identified through the background review.	<b>No</b>  Neither species nor suitable was identified during field investigations, however, targeted surveys were not conducted.
Fish	Lake Chubsucker <i>Erimyzon sucetta</i>	THR	END Schedule 1	END	In Ontario, the Lake Chubsucker lives in marshes and lakes with clear, still, warmer water and plenty of aquatic plants. This habitat is found in bays, channels, ponds, and coastal wetlands. During the breeding season, from April to early June in Ontario, adults move into marshes where eggs are laid among vegetation in shallower water. The chubsucker eats algae, plankton, molluscs, and aquatic insects.  Lake Chubsuckers prefer clear, still waters with abundant aquatic plants such as marshes, stagnant bays, floodplain lakes, and drainage ditches. Their preferred substrates include gravel, sand, and silt mixed with organic debris.	<b>OAO, SAS, SAM, and SAF</b> with clear, still warm water and an abundance of aquatic plants.	In Canada, the Lake Chubsucker is found at several sites in the Ausable River, Lake St. Clair, Lake Erie, and the Niagara river drainage in southern Ontario.  The Lake Chubsucker is primarily a species of the southeastern United States, but it has two main centers of distribution; the lower coastal plain (Gulf and southeastern Atlantic states), and the southern Great Lakes basin. In Canada, it is known only from the drainages of the Niagara River, and lakes Erie, St. Clair, and Huron in southwestern Ontario.	Panhandle Study Area DFO, NHIC	<b>Yes</b>  DFO records indicate that this species is present within the Thames River, McFarlane Relief Drain, Myers Pump Works Drain and the St. Clair Marsh Complex PSW. The PSW is considered critical habitat for this species.	<b>No</b>  Species was not identified during field investigations, however, suitable habitat was identified and presence should be assumed.	<b>No</b>  Species was not identified through the background review.	<b>No</b>  Neither species nor suitable was identified during field investigations, however, targeted surveys were not conducted.
Fish	Lake Sturgeon (Great Lakes-Upper St. Lawrence River populations) <i>Acipenser fulvescens</i>	END	No Status	THR	The Lake Sturgeon lives almost exclusively in freshwater lakes and rivers with soft bottoms of mud, sand, or gravel. They are usually found at depths of five to 20 metres. They spawn in relatively shallow, fast-flowing water (usually below waterfalls, rapids, or dams) with gravel and boulders at the bottom. However, they will spawn in deeper water where habitat is available. They also are known to spawn on open shoals in large rivers with strong currents.  The species occupies a wide variety of aquatic ecosystem types (e.g., stepped-gradient Boreal Shield rivers, low-gradient meandering Prairie rivers, low gradient Hudson lowland rivers, Great Lakes and associated tributaries). Lake Sturgeon requires a variety of habitats to complete its lifecycle, and the species has evolved to exploit typical upstream to downstream hydraulic and substrate gradients. Hatch is contingent on aeration by flowing water, after which larvae apparently require gravel substrate in which to bury and remain while development continues. Once the yolk sac is absorbed, larvae drift downstream via water currents. Habitat requirements at the age-0 stage are not well understood, but may not be as strict as previously assumed. Aside from the requirement of adequate benthic prey items, the habitat requirements for middle to later life stages (juveniles and adults) are not particularly narrow. Habitat trends vary across the species' range. In some areas, the construction of dams has ceased but, in other areas, it is expected to continue into the foreseeable future. Sediment and water quality has improved in many areas formerly impacted by pollution from the pulp-and-paper industry.	<b>OAO</b> . Large lakes/rivers > 20m deep with soft mud, sand, or gravel bottoms required.	In North America, Lake Sturgeon can be found from Alberta to the St. Lawrence drainage of Quebec and from the southern Hudson Bay to the lower Mississippi. In Ontario, the Lake Sturgeon is found in the rivers of the Hudson Bay basin, the Great Lakes basin, and their major connecting waterways, including the St. Lawrence River. There are three distinct populations in Ontario: Great Lakes - Upper St. Lawrence, Saskatchewan - Nelson River, and Southern Hudson Bay - James Bay.	Panhandle Study Area NHIC	<b>Yes</b>  NHIC records indicate that suitable habitat for this species may be present in the Thames River and Jeannettes Creek.	<b>No</b>  Species was not identified during field investigations, however, suitable habitat was identified and presence should be assumed.	<b>No</b>  Species was not identified through the background review.	<b>No</b>  Neither species nor suitable was identified during field investigations, however, targeted surveys were not conducted.
Fish	Pugnose Minnow <i>Opsopoeodus emiliae</i>	THR	THR Schedule 1	THR	The Pugnose Minnow prefers coastal wetlands, and slow-moving rivers and streams with clear, warm water, little or no current, and abundant vegetation.  In Canada, Pugnose Minnows prefer clear, slow-moving rivers, lakes and stream with abundant aquatic vegetation, but are not necessarily excluded from more turbid waters. Some minnows have been recorded in water bodies with moderately clear to very silty water with substrates of clay, silt, or mud, moderate to abundant vegetation, and little or no current. One specimen was even found in turbid water devoid of vegetation.		The Pugnose Minnow lives in central North America in the rivers and streams of the Mississippi River basin. In Canada, it is at the northern limit of its range and is only found in extreme southwestern Ontario with small populations in Lake St. Clair and the Detroit River.	Panhandle Study Area DFO	<b>Yes</b>  DFO records indicate that this species is present within the Thames River.	<b>No</b>  Species was not identified during field investigations, however, suitable habitat was identified and presence should be assumed.	<b>No</b>  Species was not identified through the background review.	<b>No</b>  Neither species nor suitable was identified during field investigations, however, targeted surveys were not conducted.
Fish	Pugnose Shiner <i>Notropis anogenus</i>	THR	THR Schedule 1	THR	The Pugnose Shiner is found in lakes and calm areas of rivers and creeks having clear water and bottoms of sand, mud, or organic matter. It prefers water bodies with plenty of aquatic vegetation, particularly stonewort ( <i>Chara</i> sp.). Aquatic plants provide hiding places, food, and breeding habitat. The Pugnose Shiner eats aquatic plants, green algae, plankton, and some aquatic insects.  The Pugnose Shiner is usually found over sand and mud in slow-moving, clear, vegetated streams and lakes. It is found in sheltered ponds, wetlands, stagnant channels, and protected bays adjacent to larger waterbodies.	<b>OAO</b> with abundant aquatic vegetation in rivers and creeks with clear water with sand, mud, or organic substrate.	In North America, the Pugnose Shiner is found in several tributaries of the upper Mississippi River, in the upper Red River drainage, and in the Great Lakes drainage. In Canada, the Pugnose Shiner is found only at a few sites in southern Ontario, including the Teeswater River, the old Ausable Channel, the Trent River, and a few coastal wetlands in Lake St. Clair (and some tributaries), Lake Erie, lower Lake Huron, Lake Ontario, and the St. Lawrence River.  The range of the Pugnose Shiner extends from Ontario, south to Illinois, and west to North Dakota. The species has a disjunct distribution and it is often absent from theoretically suitable habitat within its range. In Canada, this species has only been found in four main areas of Ontario: 1) southern Lake Huron drainage; 2) Lake St. Clair; 3) Lake Erie; and 4) eastern Lake Ontario/upper St. Lawrence River drainage. It is assumed to be extirpated from Point Pelee and Rondeau Bay.	Panhandle Study Area NHIC	<b>Yes</b>  DFO records indicate that this species is present within the St. Clair Marsh Complex PSW. The PSW is also considered critical habitat for this species.	<b>No</b>  Species was not identified during field investigations, however, suitable habitat was identified and presence should be assumed.	<b>No</b>  Species was not identified through the background review.	<b>No</b>  Neither species nor suitable was identified during field investigations, however, targeted surveys were not conducted.
Mammals	Eastern Small-footed Myotis <i>Myotis leibii</i>	END	N/A	N/A	In the spring and summer, Eastern Small-footed Bats will roost in a variety of habitats, including in or under rocks, in rock outcrops, in buildings, under bridges, or in caves, mines, or hollow trees. These bats often change their roosting locations every day. At night, they hunt for insects to eat, including beetles, mosquitos, moths, and flies. In the winter, these bats hibernate, most often in caves and abandoned mines. They seem to choose colder and drier sites than similar bats and will return to the same spot each year.		The Eastern Small-footed Bat has been found from south of Georgian Bay to Lake Erie and east to the Pembroke area. There are also records from the Bruce Peninsula, the Espanola area, and Lake Superior Provincial Park. Most documented sightings are of bats in their winter hibernation sites.	Bat Conservation International (BCI)	<b>Yes</b>  Buildings present within the Study Area may provide suitable roosting habitat.	<b>No</b>  Species was not identified during field investigations, however, suitable habitat was identified.	<b>Yes</b>  The proposed pipeline passes through a woodlot that may contain suitable roosting habitat. Buildings present within the Study Area may provide suitable roosting habitat.	<b>No</b>  Species was not identified during field investigations, however, suitable habitat was identified.

Taxonomy	Species	ESA Status	SARA Status	COSEWIC Status	Preferred Habitat <sup>1,2</sup>	Associated ELC Communities	Known Species Range <sup>1,2</sup>	Source Identifying Species Record	Suitable Habitat Identified During Background Review - Panhandle Regional Expansion	Species/Suitable Habitat Identified During Field Investigations - Panhandle	Suitable Habitat Identified During Background Review - Lemmington Interconnect	Species/Suitable Habitat Identified During Field Investigations - Leamington
Mammals	Little Brown Myotis <i>Myotis lucifugus</i>	END	END Schedule 1	END	Bats are nocturnal. During the day they roost in trees and buildings. They often select attics, abandoned buildings, and barns for summer colonies where they can raise their young. Bats can squeeze through very tiny spaces (as small as six millimetres across) and this is how they access many roosting areas. Little Brown Bats hibernate from October or November to March or April, most often in caves or abandoned mines that are humid and remain above freezing.  Their specific physiological requirements limit the number of suitable sites for overwintering. In the east, large numbers (i.e., >3000 bats) of several species typically overwinter in relatively few hibernacula. In the west, there are fewer known hibernacula, and numbers appear lower per site. Females establish summer maternity colonies, often in buildings or large-diameter trees. Foraging occurs over water, along waterways, and forest edges. Large open fields or clearcuts generally are avoided. In autumn, bats return to hibernacula, which may be hundreds of kilometres from their summering areas, swarm near the entrance, mate, and then enter that hibernaculum, or travel to different hibernacula to overwinter.		The Little Brown Bat is widespread in southern Ontario and found as far north as Moose Factory and Favourable Lake.  In Canada, <i>Myotis lucifugus</i> occurs from Newfoundland to British Columbia, and northward to near the treeline in Labrador, Northwest Territories and Yukon.	BCI	Yes  Buildings present within the Study Area may provide suitable roosting habitat.	No  Species was not identified during field investigations, however, suitable habitat was identified.	Yes  The proposed pipeline passes through a woodlot that may contain suitable roosting habitat. Buildings present within the Study Area may provide suitable roosting habitat.	Yes  Species detected during targeted surveys in suitable habitat.
Mammals	Northern Myotis <i>Myotis septentrionalis</i>	END	END Schedule 1	END	Northern Long-eared Bats are associated with boreal forests, choosing to roost under loose bark and in the cavities of trees. These bats hibernate from October or November to March or April.  The Northern Long-eared Bat overwinters in cold and humid hibernacula (caves/mines). Their specific physiological requirements limit the number of suitable sites for overwintering. In the east, large numbers (i.e., >3000 bats) of several species typically overwinter in relatively few hibernacula. In the west, there are fewer known hibernacula, and numbers appear lower per site. Females establish summer maternity colonies in buildings or large-diameter trees. Foraging occurs along waterways, forest edges, and in gaps in the forest. Large open fields or clearcuts generally are avoided. In autumn, bats return to hibernacula, which may be hundreds of kilometres from their summering areas, swarm near the entrance, mate, and then enter that hibernaculum, or travel to different hibernacula to overwinter.	<b>FOC, FOM, FOD, SWC, SWM, and SWD</b> where suitable roosting (i.e. cavity trees and trees with loose bark) habitat is available.	The Northern Long-eared Bat is found throughout forested areas in southern Ontario, to the north shore of Lake Superior and occasionally as far north as Moosonee, and west to Lake Nipigon.  In Canada, <i>Myotis septentrionalis</i> occurs from Newfoundland to British Columbia, and northward to near the treeline in Labrador, Northwest Territories, and Yukon.	BCI, Ministry of Environment, Conservation and Parks (MECP)	Yes  Buildings present within the Study Area may provide suitable roosting habitat.	No  Species was not identified during field investigations, however, suitable habitat was identified.	Yes  The proposed pipeline passes through a woodlot that may contain suitable roosting habitat. Buildings present within the Study Area may provide suitable roosting habitat.	No  Species was not identified during field investigations, however, suitable habitat was identified.
Mammals	Tri-colored Bat <i>Perimyotis subflavus</i>	END	END Schedule 1	END	During the summer, the Tri-colored Bat is found in a variety of forested habitats. It forms day roosts and maternity colonies in older forest and occasionally in barns or other structures. They forage over water and along streams in the forest. Tri-colored Bats eat flying insects and spiders gleaned from webs. At the end of the summer they travel to a location where they swarm; it is generally near the cave or underground location where they will overwinter. They overwinter in caves where they typically roost by themselves rather than part of a group.  The Tri-colored Bat overwinters in cold and humid hibernacula (caves/mines). Their specific physiological requirements limit the number of suitable sites for overwintering. In the east, large numbers (i.e., >3000 bats) of several species typically overwinter in relatively few hibernacula. In the west, there are fewer known hibernacula, and numbers appear lower per site. Females establish summer maternity colonies in buildings or large-diameter trees. Foraging occurs over water, along waterways, and forest edges. Large open fields or clearcuts generally are avoided. In autumn, bats return to hibernacula, which may be hundreds of kilometres from their summering areas, swarm near the entrance, mate, and then enter that hibernaculum, or travel to different hibernacula to overwinter.		This bat is found in southern Ontario and as far north as Espanola near Sudbury. Because it is very rare, it has a scattered distribution. It is also found from eastern North America down to Central America.  In Canada, <i>Perimyotis subflavus</i> occurs in Nova Scotia, New Brunswick, Quebec, and Ontario.	BCI	Yes  Buildings present within the Study Area may provide suitable roosting habitat.	No  Species was not identified during field investigations, however, suitable habitat was identified.	Yes  The proposed pipeline passes through a woodlot that may contain suitable roosting habitat. Buildings present within the Study Area may provide suitable roosting habitat.	Yes  Species detected during targeted surveys in suitable habitat.
Molluscs	Fawnsfoot <i>Truncilla donaciformis</i>	END	END Schedule 1	END	The Fawnsfoot inhabits medium and large rivers with moderate to slow flowing water. It usually inhabits shallow waters (1 to 5 metres deep) with gravel, sand, or muddy bottoms.  The Fawnsfoot is generally found in the lower portions of medium to large rivers.		Fawnsfoot is only found in North America, where it primarily occurs in the Great Lakes and Mississippi drainages. In Canada, this species is limited to tributaries of the Great Lakes. In most areas where Fawnsfoot occurs, it has a patchy distribution and is limited to the lower portions of large rivers.  The Fawnsfoot is widely distributed throughout central North America, occurring in 23 American states and one Canadian province. Historically, this mussel was reported in lakes Huron, St. Clair, and Erie and some of their tributaries. Currently, its distribution is restricted to the lower Thames River and to single sites in the St. Clair delta, Muskrat Creek (Saugeen River drainage), lower Sydenham River, and lower Grand River. At two of these sites, only a single specimen has been found.	Panhandle Study Area - DFO, NHIC	<b>Yes</b>  DFO records indicate that this species is present within the Thames River. The Thames River is also considered critical habitat for this species.	No  Species was not identified during field investigations, however, suitable habitat was identified and presence should be assumed.	No  Species was not identified through the background review.	No  Neither species nor suitable was identified during field investigations, however, targeted surveys were not conducted.
Molluscs	Hickorynut <i>Obovaria olivaria</i>	END	END Schedule 1	END	Hickorynuts live on the sandy beds in large, wide, deep rivers – usually more than 2 or 3 metres deep – with a moderate to strong current. Mussels filter water to find food, such as bacteria and algae. Mussel larvae must attach to a fish, called a host, where they consume nutrients from the fish body until they transform into juvenile mussels and then drop off. In Canada, the fish host of the Hickorynut is the Lake Sturgeon. Presence of the fish host is one of the key features determining whether a body of water can support a healthy Hickorynut population.		The Hickorynut is found within the Great Lakes – St. Lawrence basin and the Mississippi River basin. In Canada, the Hickorynut is found in sporadic locations within the Great Lakes and St. Lawrence basin, from Lake Huron to Quebec City. In Ontario, it is found in the Mississagi River and the Ottawa River.  Historically, the Hickorynut was widely distributed along the large river bottoms of the Mississippi River drainage system and the Great Lakes-St. Lawrence basin. In Canada, current populations are now only found in certain rivers and their tributaries within the Great Lakes-St. Lawrence drainage system, from Lake Huron in southern Ontario to Quebec City in the east. Rivers include the Mississagi River, Ottawa River, St. Lawrence River, and the Saint Francois River.	Panhandle Study Area - DFO	<b>Yes</b>  DFO records indicate that this species is present within the Thames River.	No  Species was not identified during field investigations, however, suitable habitat was identified and presence should be assumed.	No  Species was not identified through the background review.	No  Neither species nor suitable was identified during field investigations, however, targeted surveys were not conducted.

Taxonomy	Species	ESA Status	SARA Status	COSEWIC Status	Preferred Habitat <sup>1,2</sup>	Associated ELC Communities	Known Species Range <sup>1,2</sup>	Source Identifying Species Record	Suitable Habitat Identified During Background Review - Panhandle Regional Expansion	Species/Suitable Habitat Identified During Field Investigations - Panhandle	Suitable Habitat Identified During Background Review - Lemmington Interconnect	Species/Suitable Habitat Identified During Field Investigations - Leamington
Molluscs	Lilliput <i>Toxolasma parvum</i>	THR	END Schedule 1	END	Unlike many at-risk mussels, Lilliput are found in a variety of soft river bottoms, such as mud, sand, and silt. Lilliputs burrow in these soft materials to filter-feed. This mussel is very sensitive to changes in water quality. Like most mussels, Lilliput females expel their larvae in the gills of host fish, where they live as parasites before forming into free-living mussels. Likely hosts are Johnny Darter, White Crappie, Bluegill, and Green Sunfish.  Lilliput is found in a variety of habitats, from small to large rivers to wetlands and the shallows of lakes, ponds, and reservoirs. It prefers to burrow in soft substrates (river and lake bottoms) made of mud, sand, silt, or fine gravel.		This mussel is found in a small number of rivers flowing into Lake St. Clair, Lake Erie, and Lake Ontario, as well as two wetlands near the western end of Lake Ontario.  Lilliput is only found in North America, where it is widely distributed from the Gulf of Mexico to the Great Lakes basin. In Canada, Lilliput was historically found in southern Ontario in the drainages of lakes St. Clair, Erie, and Ontario. No longer found in over 40 percent of its historical range, Lilliput is now restricted to the Sydenham River, lower Thames River (Baptiste Creek), Ruscom River, Belle River, Grand River, Welland River, 20 Mile Creek (Jordan Harbour), and Hamilton Harbour (Sunfish Pond, Cootes Paradise, and Grindstone Creek).	Panhandle Study Area - NHIC	<b>Yes</b>  DFO records indicate that this species is present within Baptiste Creek.	<b>Yes</b>  Several Lilliput shells observed at margin of Unnamed Non-Flowing Waterbody 002 (SC-07).	No  Species was not identified through the background review.	No  Neither species nor suitable was identified during field investigations, however, targeted surveys were not conducted.
Plants	Dense Blazing Star <i>Liatris spicata</i>	THR	THR Schedule 1	THR	In Ontario, Dense Blazing Star grows in moist prairies, grassland savannahs, wet areas between sand dunes, and abandoned fields. This plant does not do well in the shade and is usually found in areas that are kept open and sunny by fire, floods, drought, or grazing.  Dense Blazing Star is a plant of open tallgrass prairies. It can grow in a range of moisture regimes from dry to very moist.	<b>TPO2, TPS2, SDO, and CUM</b> with moist soils.	Dense Blazing Star is found only in North America. In Canada, it occurs naturally only in southwest Ontario, mainly in the area between Lake St. Clair, Lake Huron, and Lake Erie. There are believed to be 11 to 13 populations in the province with six populations known to have been lost.  Over 90% of all native Dense Blazing Star plants in Canada grow at Walpole Island First Nation (WIFN), with another large population in Windsor. There are ten extant populations in Ontario.	Panhandle Study Area - NHIC	<b>No</b>  Suitable tall grass prairies or cultural meadows were not identified through the background review.	No  Species was not identified during botanical inventory.	No  Species was not identified through the background review.	No  Species was not identified during botanical inventory.
Reptiles	Blanding's Turtle (Great Lakes / St. Lawrence population) <i>Emydoidea blandingii</i>	THR	THR Schedule 1	END	Blanding's Turtles live in shallow water, usually in large wetlands and shallow lakes with lots of water plants. It is not unusual, though, to find them hundreds of metres from the nearest water body, especially while they are searching for a mate or traveling to a nesting site. Blanding's Turtles hibernate in the mud at the bottom of permanent water bodies from late October until the end of April.  In the Great Lakes/St. Lawrence population, Blanding's Turtles are often observed using clear water, eutrophic wetlands. Blanding's Turtles have strong site fidelity but may use several connected water bodies throughout the active season. Females nest in a variety of substrates including sand, organic soil, gravel, cobblestone, and soil-filled crevices of rock outcrops. Adults and juveniles overwinter in a variety of water bodies that maintain pools averaging about 1 m in depth; however, hatchling turtles have been observed hibernating terrestrially during their first winter. Reported mean home ranges generally fall between 10-60 ha (maximum 382 ha) or 1000-2500 m (maximum 7000 m); however, most studies likely underestimate Blanding's Turtle home range size because few have utilized GPS loggers to track daily movements throughout one or more entire active seasons.	<b>SWT2, SWT3, SWD, SWM, MAS2, SAS1, SAM1</b> , where open water is present.	The Blanding's Turtle is found in and around the Great Lakes Basin, with isolated populations elsewhere in the United States and Canada. In Canada, the Blanding's Turtle is separated into the Great Lakes-St. Lawrence population and the Nova Scotia population. Blanding's Turtles can be found throughout southern, central, and eastern Ontario.  In its Canadian range, the Great Lakes/St. Lawrence population of the Blanding's Turtle occurs primarily in southern Ontario (with isolated reports as far north as Timmins) and southern Québec (with isolated reports occurring as far north as the Abitibi-Témiscamingue region and as far east as the Capitale-Nationale region in Québec). Across the North American range, Blanding's Turtles mainly occur in small, isolated subpopulations that maintain a few dozen to approximately 100 turtles.	Panhandle Study Area - NHIC, ORAA	Yes  Marsh and open water communities associated with the St. Clair Marsh Complex PSW, Baptiste Creek, Jeannettes Creek and the Thames River may provide suitable habitat.	No  Species was not identified during field investigations, however, suitable habitat was identified and presence should be assumed.	No  Species was not identified through the background review.	No  Neither species nor suitable was identified during field investigations.
Reptiles	Common Five-lined Skink (Five-lined Skink; Carolinian population) <i>Plestiodon fasciatus</i>	END	END Schedule 1	END	Common Five-lined Skinks like to bask on sunny rocks and logs to maintain a preferred body temperature (28-36°C). During the winter, they hibernate in crevices among rocks or buried in the soil. There are two populations of Common Five-lined Skink in Ontario and they each occupy different types of habitat.  The habitat of the Five-lined Skink varies from region to region and includes rocky outcrops, dunes, fields, and deciduous forests. This species is generally associated with relatively open environments that provide a sufficient covering of debris for shelter. Carolinian populations inhabit the forests around Lakes Erie, St. Clair, and Huron. Five-lined Skinks primarily inhabit clearings such as stabilized sand dunes, open forest areas, and wetlands where they find shelter, most often under plant debris, such as decomposing tree trunks. They also use other items for shelter, including artificial objects such as construction materials, utility poles, and wooden boardwalks. The availability of objects that provide shelter is vital to the Five-lined Skink so it can protect itself against extreme temperatures and desiccation. Since the Five-lined Skink is prone to dehydration, its habitat must include a permanent water body.	<b>SDO, SDS, SDT, TPS, CUS, CUW, FOM, FOD, and MAM</b> where suitable cover and basking habitat is present.	In North America, the Common Five-lined Skink occurs throughout hardwood forests from the Atlantic seaboard to Texas and Minnesota and from southern Ontario to the Gulf of Mexico.  There are two known populations of Five-lined Skinks in Ontario: the Carolinian population, which concentrates near Lakes Erie, St. Clair, and Huron in southwestern Ontario; and the Great Lakes/St. Lawrence population, which occurs along the southern edge of the Canadian Shield, from Georgian Bay to Leeds and Greenville County in south-central Ontario. Between 1995 and 2004, four or five small distinct populations were reported in the Carolinian region, namely those of Point Pelee National Park, Rondeau Provincial Park, Pinery Provincial Park, Oxley Poison Sumac Swamp, and, possibly, Walpole Island.	Panhandle Study Area - NHIC, ORAA	<b>No</b>  Suitable habitat was not identified through the background review.	No  Neither species nor suitable was identified during field investigations, however, targeted surveys were not conducted.	No  Species was not identified through the background review.	No  Neither species nor suitable was identified during field investigations, however, targeted surveys were not conducted.
Reptiles	Eastern Foxsnake (Carolinian population) <i>Pantherophis gloydi</i>	END	END Schedule 1	END	Eastern Foxsnakes in the Carolinian population are usually found in old fields, marshes, along hedgerows, drainage canals, and shorelines. Females lay their eggs in rotting logs, manure, or compost piles, which naturally incubate the eggs until they hatch. During the winter, Eastern Foxsnakes hibernate in groups in deep cracks in the bedrock and in some man-made structures.  Eastern Foxsnakes in the Essex-Kent and Haldimand-Norfolk regions use mainly unforested, early successional vegetation communities (e.g., old field, prairie, marsh, dune-shoreline) as habitat during the active season. Hedgerows bordering farm fields and riparian zones along drainage canals are regularly used. In some areas of intensive farming, these linear habitat strips likely make up the bulk of habitat available for foxsnakes.		The Eastern Foxsnake is only found in Ontario, Michigan, and Ohio. Ontario contains 70% of their range in two distinct populations: the Carolinian population in southwestern Ontario and the eastern Georgian Bay population.  Within Ontario, the species' distribution is highly disjunct, occupying three discrete regions along the Lake Erie-Lake Huron waterway shoreline. The three regional populations from south to north are (1) Essex-Kent, (2) Haldimand-Norfolk, and (3) Georgian Bay Coast.	Leamington Study Area - ORAA Panhandle Study Area - ORAA	<b>Yes</b>  Riparian habitat associated with the St. Clair Marsh Complex PSW, Baptiste Creek, Jeannettes Creek, the Thames River and agricultural drains as well as the various hedgerows present with the Study Area may provide suitable habitat.	<b>Yes</b>  Multiple individuals were observed in suitable habitat.	<b>Yes</b>  Suitable habitat may be present within the strips of riparian vegetation present within the Study Area.	No  Species was not identified during field investigations, however, suitable habitat was identified and presence should be assumed.



Taxonomy	Species	ESA Status	SARA Status	COSEWIC Status	Preferred Habitat <sup>1,2</sup>	Associated ELC Communities	Known Species Range <sup>1,2</sup>	Source Identifying Species Record	Suitable Habitat Identified During Background Review - Panhandle Regional Expansion	Species/Suitable Habitat Identified During Field Investigations - Panhandle	Suitable Habitat Identified During Background Review - Lemmington Interconnect	Species/Suitable Habitat Identified During Field Investigations - Leamington
Reptiles	Massasauga (Carolinian population) <i>Sistrurus catenatus</i>	END	END Schedule 1	END	<p>Massasaugas live in different types of habitats throughout Ontario, including tallgrass prairie, bogs, marshes, shorelines, forests, and alvars. Within all of these habitats, Massasaugas require open areas to warm themselves in the sun. Pregnant females are most often found in open, dry habitats such as rock barrens or forest clearings where they can more easily maintain the body temperature required for the development of their offspring. Non-pregnant females and males forage and mate in lowland habitats such as grasslands, wetlands, bogs, and the shorelines of lakes and rivers. Massasaugas hibernate underground in crevices in bedrock, sphagnum swamps, tree root cavities, and animal burrows where they can get below the frost line but stay above the water table.</p> <p>The Massasauga's habitat varies from wet prairie, sedge meadows, and old fields, to peatlands, bedrock barrens, and coniferous forest; however, each habitat provides physical similarities to meet the species' habitat requirements. Massasaugas require a semi-open habitat to provide both cover from predators and opportunities for thermoregulation (i.e. basking). Hibernation sites are often damp or water-saturated, suggesting that moisture content is a key variable in successful hibernation. Both quantity and quality of Massasauga habitat in Ontario have declined, and in many places continue to decline, due to human encroachment.</p>	TP, BO, MA, FO, AL, RB, and CUM with open areas.	<p>In Canada, the Massasauga is found only in Ontario, primarily along the eastern side of Georgian Bay and on the Bruce Peninsula. Two small populations are also found in the Wainfleet Bog on the northeast shore of Lake Erie and near Windsor. The Massasauga was once more widespread in southwestern Ontario, especially along the shores of the Great Lakes.</p> <p>In Canada, populations of this snake are restricted to four geographically distinct regions within Ontario. The Wainfleet and Ojibway populations in southwestern Ontario are small and completely isolated. It is thought probable that they shared a continuous distribution with Massasaugas in the Bruce Peninsula and eastern Georgian Bay.</p>	Panhandle Study Area - ORAA	No	Neither species nor suitable was identified during field investigations.	Species was not identified through the background review.	Neither species nor suitable was identified during field investigations.
Reptiles	Queensnake <i>Regina septemvittata</i>	END	END Schedule 1	END	<p>The Queensnake is an aquatic species that is seldom found more than a few metres from the water. It prefers rivers, streams, and lakes with clear water, rocky or gravel bottoms, lots of places to hide, and an abundance of crayfish. Queensnakes will often hibernate in groups with other snakes, amphibians, and even crayfish. Suitable hibernation sites (called hibernacula) include abutments of old bridges and crevices in bedrock.</p> <p>Queensnakes are most commonly associated with rocky streams and rivers, but are also occasionally found in marsh, pond, and lake shore habitats. This highly aquatic species is usually found within 3 m of the shoreline and only at sites where there is an abundance of crayfish, its primary food source.</p>	OAO with clear water and rocky or gravel bottoms with lots of places to hide and abundance of crayfish.	<p>In Ontario, the Queensnake is found only in the southwest in Middlesex, Brant, Huron, and Essex counties, and on the Bruce Peninsula. There are fewer than 25 sites where it is known to occur in these areas. The extremely specialized habitat requirements of the Queensnake restrict this species to particular areas, with large gaps of unfavourable habitat in between populations. The snake's home range is quite small, making Queensnakes less likely to move into new areas or areas where it was historically found.</p> <p>The Queensnake is relatively widespread in eastern North America, ranging from southeastern Pennsylvania, western New York and southwestern Ontario, west to southeastern Wisconsin, and south to the Gulf Coast from the Florida panhandle to eastern Mississippi. The Queensnake occurs west of the Niagara Escarpment, from the northern portion of the Bruce Peninsula, south to Lake Erie, and west to Essex County.</p>	Panhandle Study Area - ORAA	Yes	Species was not identified during field investigations, however, suitable habitat was identified and presence should be assumed.	Species was not identified through the background review.	Neither species nor suitable was identified during field investigations, however, targeted surveys were not conducted.
Reptiles	Spiny Softshell <i>Apalone spinifera</i>	END	END Schedule 1	END	<p>Spiny Softshells are highly aquatic turtles that rarely travel far from water. They are found primarily in rivers and lakes but also in creeks and even ditches and ponds near rivers. Key habitat requirements are open sand or gravel nesting areas, shallow muddy or sandy areas to bury in, deep pools for hibernation, areas for basking, and suitable habitat for crayfish and other food species. These habitat features may be distributed over an extensive area, as long as the intervening habitat doesn't prevent the turtles from traveling between them.</p> <p>Spiny Softshell inhabits a wide variety of aquatic habitats, including rivers, marshy creeks, oxbows, lakes, and impoundments. Common habitat features include a soft bottom with sparse aquatic vegetation, as well as sandbars or mudflats. Overwintering sites are generally in well oxygenated lakes and rivers.</p>	OAO characterized as rivers with nearby open sand or gravel nesting areas, shallow muddy or sandy substrates, deep pools, basking areas and suitable habitat for food species.	<p>In Canada, the Spiny Softshell is found only in Quebec and southwestern Ontario in the Lake St. Clair, Lake Erie, and western Lake Ontario watersheds. The majority of Spiny Softshells in Ontario are found in the Thames and Sydenham rivers and at two sites in Lake Erie. The size of the home range of this turtle depends on availability of habitat features such as nesting and hibernation sites. Some turtles travel up to 30 kilometres in a year from one part of their home range to another.</p> <p>Globally, the Spiny Softshell occurs in eastern North America from the New England states through extreme southern Quebec and Ontario, west to Nebraska, south to Texas, and across the Gulf states to the Atlantic. The Canadian population is divided into two geographically distinct subpopulations: a Great Lakes/St. Lawrence subpopulation in southern Quebec and a Carolinian subpopulation in southern Ontario.</p>	Panhandle Study Area - NHIC	Yes	Species was not identified during field investigations, however, suitable habitat was identified and presence should be assumed.	Species was not identified through the background review.	Neither species nor suitable was identified during field investigations, however, targeted surveys were not conducted.
Reptiles	Timber Rattlesnake <i>Crotalus horridus</i>	EXP	EXP Schedule 1	EXP	The preferred habitats for Timber Rattlesnakes in the northern parts of their range are forested areas with rocky outcrops for denning and basking. Granitic escarpments and ledges with accumulations of talus (rock debris) are common characteristics of the communal den within which the snakes hibernate.		<p>This rattlesnake was found along the Niagara Escarpment, primarily in the Niagara area. The most recent confirmed records of this rattlesnake in Ontario are from the Niagara Gorge in the 1940s. This species occurs throughout the eastern and central United States, although it is locally extirpated in many areas.</p> <p>It has not been found anywhere else in Canada since then, and is therefore considered extirpated from Canada.</p>	Panhandle Study Area - NHIC	No	Species is considered extirpated from Ontario.	Species was not identified through the background review.	Species was not identified through the background review.

## Glossary

EXP	ESA - Extirpated - a species that no longer exists in the wild in Ontario but still occurs elsewhere. SARA - Extirpated - a wildlife species that no longer exists in the wild in Canada, but exists elsewhere in the wild.
END	ESA - Endangered - a species facing imminent extinction or extirpation in Ontario which is a candidate for regulation under Ontario's Endangered Species Act. SARA - Endangered - a wildlife species that is facing imminent extirpation or extinction.
THR	ESA - Threatened - a species that is at risk of becoming endangered in Ontario if limiting factors are not reversed. SARA - Threatened - a wildlife species that is likely to become endangered if nothing is done to reverse the factors leading to its extirpation or extinction.
SC	ESA - Special Concern (formerly Vulnerable) - a species with characteristics that make it sensitive to human activities or natural events. SARA - Special Concern - a wildlife species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats.
OMNR	Ontario Ministry of Natural Resources
ESA	Endangered Species Act
SARA	Species at Risk Act (Federal)
Schedule 1	The official list of species that are classified as extirpated, endangered, threatened, and of special concern.
Schedule 2	Species listed in Schedule 2 are species that had been designated as endangered or threatened, and have yet to be re-assessed by COSEWIC using revised criteria. Once these species have been re-assessed, they may be considered for inclusion in Schedule 1.
Schedule 3	Species listed in Schedule 3 are species that had been designated as special concern, and have yet to be re-assessed by COSEWIC using revised criteria. Once these species have been re-assessed, they may be considered for inclusion in Schedule 1.
COSEWIC	Committee on the Status of Endangered Wildlife in Canada - a committee of experts that assesses and designates which wild species are in some danger of disappearing from Canada.

## References

- 1 - Species at Risk . Ontario Ministry of Natural Resources. <http://www.mnr.gov.on.ca/en/Business/Species/index.html>. © Queens Printer For Ontario, 2013.
- 2 - Species at Risk Status Reports. Committed on the Status of Endangered Wildlife in Canada. Ottawa. [http://www.sararegistry.gc.ca/search/advSearchResults\\_e.cfm?stype=doc&docID=18](http://www.sararegistry.gc.ca/search/advSearchResults_e.cfm?stype=doc&docID=18).

ENBRIDGE GAS INC.

Undertaking Response to TFG

To advise where EGI typically sources offsets.

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**Response:**

To date, Enbridge Gas has only purchased offsets for use in compliance programs (e.g., previous provincial Cap and Trade program, federal Output-Based Pricing System). Enbridge Gas has sourced such offsets using external consultants with carbon market expertise, who have connected the Company with counterparties who have government recognized offsets available for sale.

ENBRIDGE GAS INC.

Undertaking Response to TFG

To provide a description of the roles of the environmental inspector.

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**Response:**

Enbridge Gas will retain an Environmental Inspector to support the construction phase of the Project. The Environmental Inspector will have the necessary experience in pipelines, facilities, or major construction projects, be experienced in working with landscape and environmental conditions similar to the Project and will have an in-depth knowledge of major project construction techniques.

The Environmental Inspector will participate in training courses provided by Enbridge Gas (e.g., project specific training, including environmental training) and will complete both Enbridge Gas and Contractor required safety courses.

The Environmental Inspector will monitor construction and prepare daily reports of the activities and conditions that they inspect. The environmental issues and the implementation of mitigation measures will be carefully monitored by the Environmental Inspector. When warranted, applicable resource specialists (e.g., vegetation resource specialist) will be available to assist with site-specific issues (e.g., identification of potential rare plants). If the mitigation measures are not found to be effective, the Environmental Inspector will consult with one or more of Construction Management and the Environmental Advisor as warranted and appropriate. The Environmental Inspector is also responsible for:

- monitoring compliance with environmental commitments;
- confirming approvals are in place and that approval conditions are followed;
- recommending additional or alternative mitigation measures;
- noting potentially adverse environmental effects;
- identifying site-specific issues;
- documenting any pre-existing environmental issues (e.g., previously admixed soils); and,
- determining the status of environmental issues following construction of the pipeline.

Both the Environmental Inspector and Construction Management will communicate with the Contractor, when warranted, regarding implementation of mitigation measures.

The Environmental Inspector will report directly to the Enbridge Gas Environment department (Environment Advisor). The Environmental Inspector will have crew shut-down authority for environmental reasons. It will be the responsibility of the

Environmental Inspector to make recommendations to Construction Management regarding environmental shut-down (e.g., wet weather shut-down).

ENBRIDGE GAS INC.

Undertaking Response to ED

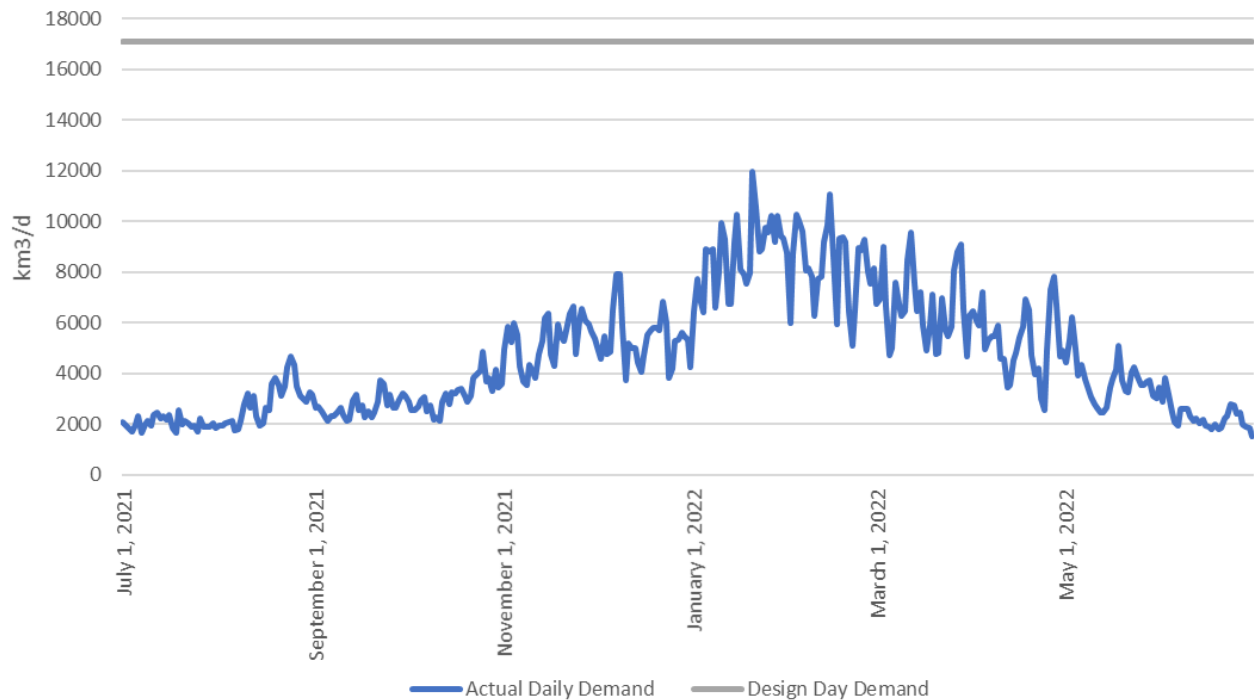
To produce actual figures shown on page 6 for the panhandle area for the most recent year.

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**Response:**

Please see Figures 1 and 2 below.

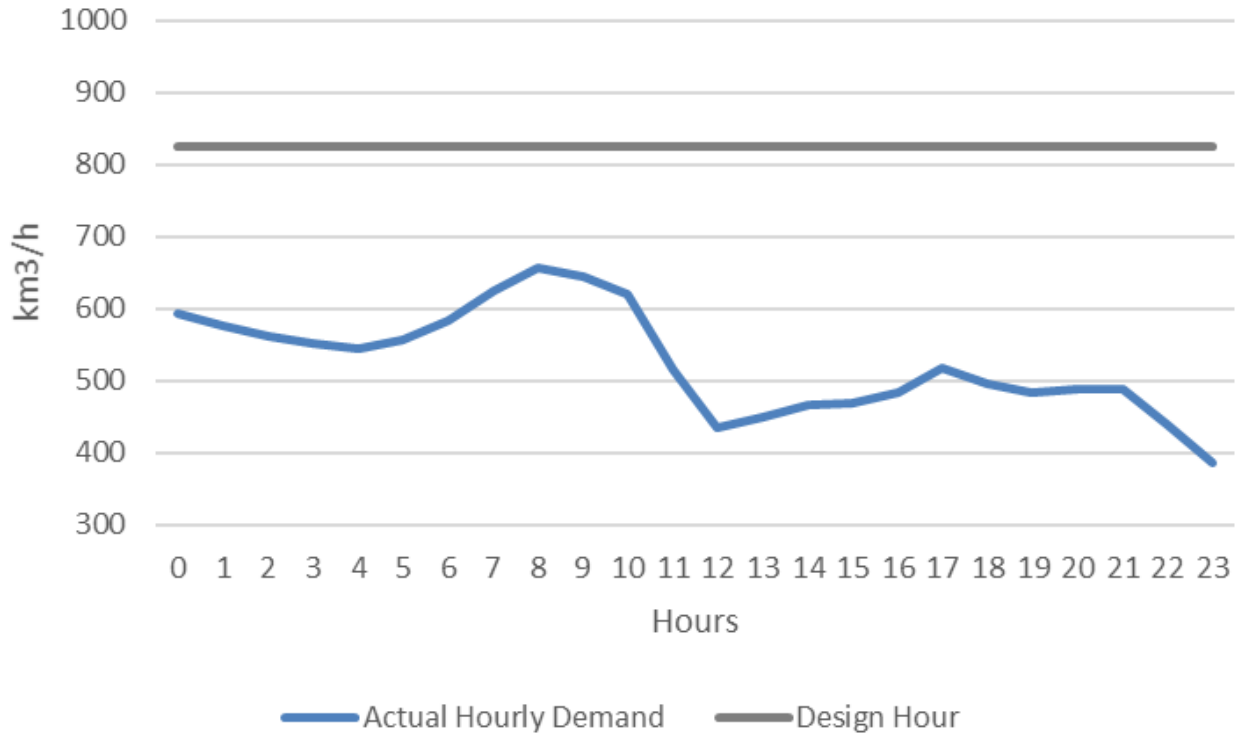
Figure 1: Annual Demand Profile for the Panhandle System, from July 2021 to June 2022, and Design Day Demand<sup>1</sup>



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<sup>1</sup> The peak day demand and peak hour demand from July 2021 to June 2022 occurred within the January 20, 2022, gas day (01/20/22 10:00 am to 01/21/22 9:59 am) at a 30.5 HDD. The design day demand for the Panhandle system is 43.1 HDD, therefore the peak demand day within this period was 12.6 HDD less than the design day demand.

Figure 2: Hourly Demand Profile for the Panhandle System on January 21, 2022, and Design Hour Demand<sup>2</sup>



<sup>2</sup> Design Hour corresponds to the transmission system and its Design Day Demand.

ENBRIDGE GAS INC.

Undertaking Response to ED

To provide another version of JT1.4 showing tax impacts, including with the tax netted out

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**Response:**

Please see Attachment 1 to this response.



**Calculation of Revenue (Distribution Margins)**

**PREP - Panhandle Regional Expansion Project**

**InService Date: Nov-01-2024**

Line	Project Year	(\$000's)	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>
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Distribution costs are recovered from Contract rate classes based on Firm Contract Demand (CD)

The deemed incremental revenue is based on the capacity created by the Project

**Contract Methodology: Total CD \* 12 \* Distribution Margin**

1	Distribution Margin \$/M3 / month	0.097333										
2	Contract Demand 10^3m^3/month		1,623	2,762	3,087	3,412	3,737	4,003	4,003	4,003	4,003	4,003
3	Distribution Margin		\$1,895	\$3,227	\$3,606	\$3,985	\$4,364	\$4,676	\$4,676	\$4,676	\$4,676	\$4,676

**General Service Distribution Margin = Volumes \* Distribution Margin**

4	Distribution Margin \$ / M3 consumed	0.118892										
5	Volume 10 ^3 M^3		2,218	6,610	10,912	15,092	19,120	23,000	24,906	24,906	24,906	24,906
6	Distribution Margin		\$264	\$786	\$1,297	\$1,794	\$2,273	\$2,735	\$2,961	\$2,961	\$2,961	\$2,961
7	Total Distribution Margin		\$2,159	\$4,012	\$4,903	\$5,779	\$6,638	\$7,410	\$7,637	\$7,637	\$7,637	\$7,637
8	Income Tax (rate = 26.5%)		\$572	\$1,063	\$1,299	\$1,532	\$1,759	\$1,964	\$2,024	\$2,024	\$2,024	\$2,024
9	After Tax Total Distribution Margin		\$1,587	\$2,949	\$3,604	\$4,248	\$4,879	\$5,447	\$5,613	\$5,613	\$5,613	\$5,613

ENBRIDGE GAS INC.

Undertaking Response to ED

Re ER IR 1, page 2 table, to provide the table showing annual demand instead of cubic metres per day; if not, to explain why not.

---

**Response:**

Please refer to Table 1 below for the forecast annual demand for the Panhandle System, prepared on a best-efforts basis. The annual demand forecast is not produced at the required level of detail to identify Panhandle System volumes specifically and therefore the following assumptions were made:

General Service Market:

- Forecasted volumes are weather normalized volumes at the OEB-approved 2022 weather normal.
- The forecast portion identified as Panhandle System-related is based on the 15 year trend for the portion of total Union South rate zone volumes from the Windsor & Chatham district areas.

Contract Market:

- Contract firm volumes are based on the aggregate of contracts that are identified as being serviced utilizing the Panhandle system.

Table 1 - Panhandle System Annual Demand Forecast

/U

	Historical Actuals (10 <sup>3</sup> m <sup>3</sup> )				Forecast (10 <sup>3</sup> m <sup>3</sup> )										
	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
General Service Firm (Total System Demand)	753,845	731,168	722,988	745,583	743,906	753,714	747,668	745,176	743,525	745,406	739,717	737,366	735,470	737,603	732,428
Contract Firm (Total System Demand)	770,910	811,445	882,882	1,013,088	977,963	1,039,895	1,310,552	1,348,293	1,384,033	1,419,774	1,455,515	1,491,256	1,526,997	1,562,737	1,598,478
<b>Total System Demand Forecast</b>	<b>1,524,754</b>	<b>1,542,613</b>	<b>1,605,870</b>	<b>1,758,670</b>	<b>1,721,868</b>	<b>1,793,609</b>	<b>2,058,220</b>	<b>2,093,469</b>	<b>2,127,559</b>	<b>2,165,180</b>	<b>2,195,232</b>	<b>2,228,621</b>	<b>2,262,467</b>	<b>2,300,340</b>	<b>2,330,906</b>
General Service Firm (Total Incremental Demand)	-	(22,677)	(8,180)	22,594	(1,677)	9,809	(6,046)	(2,492)	(1,651)	1,881	(5,689)	(2,352)	(1,895)	2,133	(5,175)
Contract Firm (Total Incremental Demand)	-	40,535	71,437	130,206	(35,125)	61,932	270,657	37,741	35,741	35,741	35,741	35,741	35,741	35,741	35,741
<b>Total Incremental Demand Forecast</b>	<b>-</b>	<b>17,858</b>	<b>63,258</b>	<b>152,800</b>	<b>(36,802)</b>	<b>71,741</b>	<b>264,611</b>	<b>35,249</b>	<b>34,090</b>	<b>37,621</b>	<b>30,052</b>	<b>33,389</b>	<b>33,845</b>	<b>37,873</b>	<b>30,566</b>
<b>Total Incremental Demand Forecast (Cumulative)</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>(36,802)</b>	<b>34,939</b>	<b>299,550</b>	<b>334,799</b>	<b>368,888</b>	<b>406,510</b>	<b>436,562</b>	<b>469,951</b>	<b>503,797</b>	<b>541,670</b>	<b>572,236</b>

ENBRIDGE GAS INC.

Undertaking Response to ED

To provide an approximate, average, all-in capital cost per customer to connect new developments in the panhandle region, if possible; if not, to indicate why.

---

**Response:**

Enbridge Gas does not track all-in capital costs for customer service connections for the Panhandle System region in the manner sought by ED. Further, the Company cautions against drawing conclusions based on estimated approximate averages in this regard as the specific costs of customer service connections varies widely depending upon several factors, including timing/season, geographic conditions, and size/scale of associated facilities.

ENBRIDGE GAS INC.

Undertaking Response to ED

To provide a table expressing attachments and average use per customer, to reconcile attachments with the forecast incremental demand for the stage 2 analysis

---

**Response:**

The customer attachment forecast and average use per customer used in the stage 2 analysis can be found in Tables 1 and 2 below, respectively.

/U

Table 1: Customer Attachment Forecast used in Stage 2 Analysis

	<b>2024</b>	<b>2025</b>	<b>2026</b>	<b>2027</b>	<b>2028</b>	<b>2029</b>
<b>Residential Attachments</b>	1,454	1,424	1,394	1,333	1,277	1,222
<b>Small Commercial Attachments</b>	114	109	107	102	99	94
<b>Large Commercial Attachments</b>	4	4	4	4	4	4
<b>Small Industrial Attachments</b>	0	1	0	1	0	1

Table 2: Normalized Average Consumption (NAC) used in Stage 2 Analysis

	<b>m<sup>3</sup>/year</b>
<b>Residential NAC</b>	2,052
<b>Small Commercial NAC</b>	8,165
<b>Large Commercial NAC</b>	130,358
<b>Small Industrial NAC</b>	15,032

Table 3 below displays the difference in the customer attachment forecast used in the stage 2 analysis, compared to the customer attachment forecast provided in the response at Exhibit I.ED.2, Table 1. The difference is not material.

Table 3: Customer Attachment Variance – Stage 2 vs Exhibit I.ED.2, Table 1

	2024	2025	2026	2027	2028	2029
Residential Attachments	0	0	0	0	0	0
Commercial Attachments	3	1	2	1	2	0
Industrial Attachments	(3)	(1)	(2)	(1)	(2)	0

The average use per customer in the stage 2 analysis cannot be directly compared to the average use per customer in the response at Exhibit I.ED.2, as the former is presented in annual m<sup>3</sup> consumption while the latter is m<sup>3</sup>/hr demand.

ENBRIDGE GAS INC.

Undertaking Response to ED

To provide the referenced figures as demand day rather than demand hour figures

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**Response:**

See below for the figures provided at Exhibit I.ED.2 p. 2, restated in m<sup>3</sup>/day (rather than m<sup>3</sup>/hr).

/U

Residential: 0.89 m<sup>3</sup>/h = 17.8 m<sup>3</sup>/d

Commercial/Industrial: 9.72 m<sup>3</sup>/h = 194.4 m<sup>3</sup>/d

ENBRIDGE GAS INC.

Undertaking Response to ED

To file the aggregate demand for Stellantis (subject to confidentiality obligations)

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**Response:**

The requested information can be found in the response at Exhibit I.PP.5 c), Table 1.



ENBRIDGE GAS INC.

Undertaking Response to ED

To make best efforts to restate the table at ED 3, page 2, using cubic metres per hour

---

**Response:**

Table 1 below reflects Table 2 from Exhibit B, Tab 1, Schedule 1 restated in m<sup>3</sup>/h. Additionally, as requested in Exhibit JT1.23, Table 1 below also provides Greenhouses broken out on a best effort basis.

Table 1: Panhandle System Design Day Demand Forecast

	Historical Actuals (m3/h)			FORECAST (m3/h)								
	Winter 19/20	Winter 20/21	Winter 21/22	Winter 22/23	Winter 23/24	Winter 24/25	Winter 25/26	Winter 26/27	Winter 27/28	Winter 28/29	Winter 29/30	Winter 30/31
General Service Firm	406,888	392,665	394,201	391,613	394,043	396,435	398,744	400,989	403,139	405,207	407,174	409,045
Greenhouse - Firm Contract Only	254,499	285,050	323,048	█	█	█	█	█	█	█	█	█
Power Generators - Firm Contract only	112,411	112,768	112,504	112,543	112,543	173,668	207,808	207,808	207,808	207,808	207,808	207,808
Large Commercial/Industrial - Firm Contract only	75,999	79,207	66,569	█	█	█	█	█	█	█	█	█
Total System Demand Forecast	849,798	869,690	896,323	943,478	989,066	1,072,984	1,129,832	1,152,478	1,175,028	1,197,496	1,219,862	1,242,134
General Service Firm	24,316	(11,115)	1,935	(4,604)	2,430	2,393	2,308	2,246	2,150	2,068	1,967	1,871
Greenhouse - Firm Contract Only	44,773	32,494	38,288	█	█	█	█	█	█	█	█	█
Power Generators - Firm Contract only	(23,574)	1,216	(149)	(537)	-	61,125	34,141	-	-	-	-	-
Large Commercial/Industrial - Firm Contract only	(4,425)	3,788	(12,557)	█	█	█	█	█	█	█	█	█
Total Incremental Demand Forecast	41,090	26,383	27,517	42,573	45,588	83,918	56,848	22,646	22,550	22,468	22,366	22,272
Total Incremental Demand Forecast (Cumulative)	-	-	-	42,573	88,161	172,079	228,926	251,573	274,123	296,591	318,957	341,228

ENBRIDGE GAS INC.

Undertaking Response to ED

To restate the table at ED 3, page 3, using TJ's per day

---

**Response:**

Please see Table 1 below for a restated version of Exhibit I.ED.3 c), Table 2, that includes an additional column for Power Generation Demand expressed in TJ per day.

Table 1: Natural Gas-fired Power Generation on the Three Highest Demand Days

Year	Date	Power Generation Demand (10 <sup>3</sup> m <sup>3</sup> /day)	Power Generation Demand (TJ/d)*
2022	20-Jan-2022	2311	90.9
2022	21-Jan-2022	1549	60.9
2022	14-Feb-2022	1774	69.8
2021	5-Feb-2021	11	0.4
2021	15-Feb-2021	7	0.3
2021	16-Feb-2021	14	0.6
2020	13-Feb-2020	64	2.5
2020	26-Feb-2020	44	1.7
2020	27-Feb-2020	48	1.9
2019	29-Jan-2019	654	25.4
2019	30-Jan-2019	684	26.6
2019	31-Jan-2019	1492	58.0
2018	04-Jan-2018	1258	49.0
2018	05-Jan-2018	1563	60.9
2018	16-Jan-2018	1545	60.2
2017	6-Jan-2017	1639	63.6
2017	7-Jan-2017	302	11.7
2017	13-Mar-2017	69	2.7
2016	4-Jan-2016	2198	84.7
2016	17-Jan-2016	1112	42.8
2016	18-Jan-2016	1128	43.5
2015	19-Feb-2015	3215	123.1
2015	20-Feb-2015	3578	137.0
2015	23-Feb-2015	3172	121.4
2014	21-Jan-2014	4261	162.2
2014	22-Jan-2014	4241	161.4
2014	11-Feb-2014	4114	156.6
2013	21-Jan-2013	1854	70.1
2013	22-Jan-2013	3229	122.1
2013	23-Jan-2013	2822	106.7

**NOTES:**

\*The conversion to TJ/d was completed using the System Wide Average Heating Valve relevant for the specific winter year.

ENBRIDGE GAS INC.

Undertaking Response to ED

To restate the table at ED 3, page 2, showing greenhouses broken out from the contract firm

---

**Response:**

Table 1 below reflects Table 2 from Exhibit B, Tab 1, Schedule 1 with Greenhouses broken out on a best effort basis.

Table 1: Panhandle System Design Day Demand Forecast

	Historical Actuals (TJ/d)			FORECAST (TJ/d)								
	Winter 19/20	Winter 20/21	Winter 21/22	Winter 22/23	Winter 23/24	Winter 24/25	Winter 25/26	Winter 26/27	Winter 27/28	Winter 28/29	Winter 29/30	Winter 30/31
General Service Firm	317	308	310	306	308	310	312	314	315	317	319	320
Greenhouse - Firm Contract Only	159	179	203	█	█	█	█	█	█	█	█	█
Power Generators - Firm Contract only	105	106	106	106	106	163	195	195	195	195	195	195
Large Commercial/Industrial - Firm Contract only	59	62	52	█	█	█	█	█	█	█	█	█
<b>Total System Demand Forecast</b>	<b>640</b>	<b>656</b>	<b>672</b>	<b>698</b>	<b>730</b>	<b>802</b>	<b>849</b>	<b>863</b>	<b>878</b>	<b>892</b>	<b>906</b>	<b>921</b>
General Service Firm	19	-9	2	-4	2	2	2	2	2	2	2	1
Greenhouse - Firm Contract Only	28	20	24	█	█	█	█	█	█	█	█	█
Power Generators - Firm Contract only	-22	1	0	-1	0	57	32	0	0	0	0	0
Large Commercial/Industrial - Firm Contract only	-3	3	-10	█	█	█	█	█	█	█	█	█
<b>Total Incremental Demand Forecast</b>	<b>21</b>	<b>16</b>	<b>16</b>	<b>26</b>	<b>32</b>	<b>72</b>	<b>47</b>	<b>15</b>	<b>14</b>	<b>14</b>	<b>14</b>	<b>14</b>
<b>Total Incremental Demand Forecast (Cumulative)</b>				<b>26</b>	<b>58</b>	<b>130</b>	<b>177</b>	<b>192</b>	<b>206</b>	<b>220</b>	<b>235</b>	<b>249</b>

ENBRIDGE GAS INC.

Undertaking Response to ED

To restate the table at ED 3, page 4, adding another row to show actual amounts for power generation demand from the highest winter demand day, historic

---

**Response:**

Please see Table 1 below for a restated version of Exhibit I.ED.3 d), Table 3, that includes Actual Power Generation Demand from the highest historic winter demand day.

Table 1: Power Generation Demands, Design and Actual (historical)

	Design Day Demands (TJ/d)									
	Winter 12/13	Winter 13/14	Winter 14/15	Winter 15/16	Winter 16/17	Winter 17/18	Winter 18/19	Winter 19/20	Winter 20/21	Winter 21/22
Power Generators - Firm Only (TJ/d)	108	108	129	130	131	131	127	105	106	106
Actual Power Generation Demands Historical (TJ/d) on highest winter demand day	122	161	123	44	64	61	27	2	1	91



ENBRIDGE GAS INC.

Undertaking Response to ED

To confirm whether the cited figure was applied to the full greenhouse demand in the general service category.

---

**Response:**

Confirmed.

The peak hour reduction savings, shown in the response at Exhibit I.ED.7, Attachment 3, includes all greenhouse customers in the general service category.

ENBRIDGE GAS INC.

Undertaking Response to ED

To confirm which of these was applied to the greenhouse measures and to ask posterity whether that should be adjusted because those greenhouse measures are so highly temperature-dependent

---

**Response:**

All greenhouse measures reduce energy consumption and energy peak for the Industrial HVAC end-use (Exhibit I.ED.7, Attachment 4, p. 3). The hours-use factor for this end-use has been developed using a weather-related load shape, which takes into consideration temperature dependency, and therefore no additional adjustments are required.

ENBRIDGE GAS INC.

Undertaking Response to ED

To make best efforts to add to the chart that appears at ED 7, attachment 3, two columns: one for cubic metres per day peak hour reduction, and two, for cubic metres per day base case; if not for the whole table, to provide the information for the greenhouse improvements

---

**Response:**

Please see Attachment 1 to this response for a restated version of Exhibit I.ED.7, Attachment 3, with an additional column added representing the conversion of peak hour reduction to peak day. For clarity, as stated in the response to Exhibit I.ED.7 d), the scope of Posterity's analysis was for general service customers on the distribution network within the Leamington, Kingsville and Wheatley area. The focus of the analysis was on peak hour, and therefore the model was calibrated only for peak hour. The peak hour values are simply being converted to peak day via a conversion factor, to allow for comparison to the project need.

There is no measure level base case as Posterity's analysis represents the total savings potential available based on the subset of customers in the analysis. The base case would be the total demand of those customers.

Measure Name	Peak Hour Reduction (m3/hr) by 2029	m3/day Reduction by 2029 *
Com   Adaptive Thermostats	0.0	0.00
Com   Air Curtains	-	-
Com   Boilers - Advanced Controls (Steam Systems)	2.4	0.00
Com   CEE Tier 2/Energy Star Clothes Washers	0.0	0.00
Com   Condensing Boiler   Std	23.7	0.02
Com   Condensing Make Up Air Unit	4.8	0.00
Com   Condensing Storage Water Heater	-	-
Com   Demand Control Kitchen Ventilation	4.8	0.00
Com   Demand Control Ventilation	4.6	0.00
Com   Demand controlled Circulating Systems	0.1	0.00
Com   Destratification	51.1	0.04
Com   Dock Door Seals	-	-
Com   Drain Water Heat Recovery (DWHR)   Retro	0.0	0.00
Com   Drain Water Heat Recovery (DWHR)  New	0.0	0.00
Com   Energy Efficient Laboratory Fume Hood	92.8	0.07
Com   Energy Recovery Ventilation and Ventilation (Enhanced)	6.8	0.01
Com   ENERGY STAR Dishwasher	0.8	0.00
Com   ENERGY STAR Fryer (84% eff)	3.4	0.00
Com   ENERGY STAR Griddle (74% eff)	1.5	0.00
Com   ENERGY STAR Steam Cooker	2.3	0.00
Com   Furnace Tune-Up	0.0	0.00
Com   Gas Convection Oven	-	-
Com   Gas Fired Heat Pump	1.0	0.00
Com   Gas Fired Rooftop Units	8.8	0.01
Com   Heat Recovery Ventilator	3.4	0.00
Com   High Efficiency Condensing Furnace AFUE 95% from 80% code	-	-
Com   High Efficiency Underfired Boilers	2.0	0.00
Com   HOTEL OCCUPANCY CONTROLS (HVAC + LIGHTING)	-	-
Com   Ice Rink Heat Recovery	-	-
Com   Infrared Heaters	0.7	0.00
Com   Low Flow Pre-Rinse Spray Nozzle	2.5	0.00
Com   Ozone Laundry Treatment	2.4	0.00
Com   Roof Insulation/Ceiling Insulation (R25 Code to R35)	-	-
Com   Solar Water Preheat (Pools/DHW)	0.4	0.00
Com   Steam System Optimization	-	-
Com   Super High Perf Glazing   New	-	-
Com   Super High Perf Glazing   RET	-	-
Com   Super-High Efficiency Furnaces (Emerging Tech)	-	-
Com   Wall Insulation	20.4	0.02
Ind   Air Compressor Heat Recovery	1.7	0.00
Ind   Boiler Tune Up	-	-
Ind   Boiler Upgrade	250.7	0.20
Ind   Direct Contact Water Heaters	69.0	0.05
Ind   Gas Turbine Optimization	0.2	0.00
Ind   Greenhouse Envelope Improvements	75.7	0.06
Ind   HE HVAC Controls	91.3	0.07
Ind   HE HVAC Units	0.8	0.00
Ind   HE Stock Tank	0.5	0.00
Ind   High Efficiency Burners	17.7	0.01
Ind   High Efficiency Furnaces	-	-
Ind   High Efficiency HVAC Fans (Gas)	592.2	0.47
Ind   Improved Controls -Process Heating Gas	3.2	0.00
Ind   Insulation - Steam	3.8	0.00
Ind   Loading Dock Seals	91.3	0.07
Ind   Process Heat Improvements	63.8	0.05
Ind   Process Heat Recovery (Gas)	5.7	0.00
Ind   Process Optimization (Gas)	0.1	0.00
Ind   Recommissioning	0.0	0.00
Ind   Solar Walls	4.6	0.00
Ind   Steam Leak Repairs	-	-
Ind   Steam Trap Repair	1.0	0.00
Ind   Steam Turbine Optimization	0.2	0.00
Ind   VAV Conversion Project (Gas)	325.2	0.26
Ind   Ventilation Optimization (Gas)	7.5	0.01
Res   Adaptive Thermostat	5.5	0.00
Res   Air Sealing	964.6	0.76
Res   Attic Insulation	131.7	0.10
Res   Basement Wall Insulation	167.9	0.13
Res   Condensing Boiler	175.4	0.14
Res   Condensing Storage Water Heater	-	-
Res   DHW Recirculation Systems	-	-
Res   Drain Water Heat Recovery	-	-
Res   Early Hot Water Heater Replacement	-	-
Res   Energy Star Clothes Dryer	-	-
Res   Energy Star Windows	-	-
Res   Floor Insulation	-	-
Res   Furnace Tune Up	-	-
Res   Heat Recovery Ventilator	44.7	0.04
Res   Heat Recovery Ventilator 0% Baseline	558.3	0.44
Res   Heat Recovery Ventilator 55% Baseline	278.0	0.22
Res   High Efficiency Condensing Furnace	-	-
Res   High Efficiency Gas Pool Heater	-	-
Res   Solar Water Preheat (Pools/DHW)	-	-
Res   Tankless Water Heater	-	-
Res   Wall Insulation	344.1	0.27
Res   Whole Home Building Envelope	1,479.9	1.16
Shift Heating Off Peak	877.4	0.69
	<b>6,874.3</b>	<b>5.4</b>

\* Assumed a 20hr factor and Heating Value of 39.32 MJ/m3

ENBRIDGE GAS INC.

Undertaking Response to ED

To make best efforts to provide the scaling factor for greenhouses used in the prosperity model; to convert the data to cubic metres per day

---

**Response:**

The scaling factors requested are provided in the response at Exhibit I.ED.7, Attachment 1, p. 3. Greenhouses are captured within the Industrial Sector under the Agriculture Segment. These scaling factors were applied to the Union South region of Posterity's IRPA model to match to the proportion of accounts in the Leamington area based on consumption.

ENBRIDGE GAS INC.

Undertaking Response to ED

To recalculate the indicated figure to address the full greenhouse demand as part of the general service, or adjusting the peak factor to address this weather-dependent demand

---

**Response:**

Please refer to responses at Exhibit JT1.25 and Exhibit JT1.26. Full greenhouse demand within the general service customer set and weather dependent assumptions have already been captured within the existing analysis.

ENBRIDGE GAS INC.

Undertaking Response to ED

To clarify Enbridge's understanding how co2 is absorbed and sequestered from plants in greenhouses

---

**Response:**

Enbridge Gas understands that carbon dioxide is absorbed by plants and used to create plant matter through the process of photosynthesis. Use of carbon dioxide in greenhouses is described in detail by the Ontario Ministry of Agriculture and Farming Affairs Factsheet titled *Carbon Dioxide in Greenhouses* (December 2002).<sup>1</sup>

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<sup>1</sup> <http://omafra.gov.on.ca/english/crops/facts/00-077.htm>

ENBRIDGE GAS INC.

Undertaking Response to ED

To provide Enbridge's internal estimate of gas prices (under advisement)

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**Response:**

Enbridge Gas does not produce internal forecasts of natural gas prices. Enbridge Gas purchases the ICF Base Case natural gas forecast for use when evaluating long-term gas supply procurement opportunities. Please see the response to Exhibit I.PP.11. Enbridge Gas is not able to produce the forecast information sought by ED at this time.

For the natural gas price used in the stage 2 analysis, please see the response at Exhibit I.STAFF.15 c) part iii.



ENBRIDGE GAS INC.

Undertaking Response to ED

To provide the source for the NRCAN pricing for heating oil and propane

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**Response:**

The sources used in the stage 2 analysis can be found at the following links:

/U

Heating Oil:

2022 –

[https://www2.nrcan.gc.ca/eneene/sources/pripri/prices\\_bycity\\_e.cfm?productID=7&locationID=19&frequency=W&priceYear=2022&Redisplay=](https://www2.nrcan.gc.ca/eneene/sources/pripri/prices_bycity_e.cfm?productID=7&locationID=19&frequency=W&priceYear=2022&Redisplay=)

2023 –

[https://www2.nrcan.gc.ca/eneene/sources/pripri/prices\\_bycity\\_e.cfm?productID=7&locationID=19&frequency=W&priceYear=2023&Redisplay=](https://www2.nrcan.gc.ca/eneene/sources/pripri/prices_bycity_e.cfm?productID=7&locationID=19&frequency=W&priceYear=2023&Redisplay=)

Propane:

2022 –

[https://www2.nrcan.gc.ca/eneene/sources/pripri/prices\\_bycity\\_e.cfm?productID=6&locationID=19&frequency=W&priceYear=2022&Redisplay=](https://www2.nrcan.gc.ca/eneene/sources/pripri/prices_bycity_e.cfm?productID=6&locationID=19&frequency=W&priceYear=2022&Redisplay=)

2023 –

[https://www2.nrcan.gc.ca/eneene/sources/pripri/prices\\_bycity\\_e.cfm?productID=6&locationID=19&frequency=W&priceYear=2023&Redisplay=](https://www2.nrcan.gc.ca/eneene/sources/pripri/prices_bycity_e.cfm?productID=6&locationID=19&frequency=W&priceYear=2023&Redisplay=)

ENBRIDGE GAS INC.

Undertaking Response to ED

Re the table at Pollution Probe 5, page 2, to add a column indicating whether there is a commitment letter or an indemnity letter.

---

**Response:**

Please see Table 1 below. To preserve confidentiality of customer-specific commercially sensitive information that could divulge the nature and timing of investment decisions, Enbridge Gas is seeking confidential treatment of redacted content in Table 1.

Table 1

Customer	TJ/day	Contract Start Date	Contract End Date	Commitment Type
	1.4	1-Nov-23	31-Oct-28	Distribution Contract
	2.4	1-Nov-23	31-Oct-40	Distribution Contract
	1.6	1-Nov-23	31-Oct-28	Distribution Contract
	57.7	16-Jul-24	15-Jul-29	Distribution Contract
	3.1	N/A	N/A	Letter of Indemnity
	19.0	N/A	N/A	Letter of Indemnity
	1.1	N/A	N/A	Commitment Letter
	2.3	N/A	N/A	Commitment Letter
	2.1	N/A	N/A	Commitment Letter
	2.8	N/A	N/A	Commitment Letter
	0.8	N/A	N/A	Commitment Letter
	2.8	N/A	N/A	Commitment Letter
	2.8	N/A	N/A	Commitment Letter
	1.2	N/A	N/A	Commitment Letter
	5.7	N/A	N/A	Commitment Letter
	1.0	N/A	N/A	Commitment Letter
	0.9	N/A	N/A	Commitment Letter
	2.4	N/A	N/A	Commitment Letter
	3.5	N/A	N/A	Commitment Letter
	3.5	N/A	N/A	Commitment Letter
	3.2	N/A	N/A	Commitment Letter
	11.3	N/A	N/A	Commitment Letter
	1.8	N/A	N/A	Commitment Letter
	1.8	N/A	N/A	Commitment Letter
	1.8	N/A	N/A	Commitment Letter
	10.6	N/A	N/A	Commitment Letter
	0.8	N/A	N/A	Commitment Letter
	1.4	N/A	N/A	Commitment Letter
	1.0	N/A	N/A	Commitment Letter
	1.7	N/A	N/A	Commitment Letter
	0.4	N/A	N/A	Commitment Letter
	1.4	N/A	N/A	Commitment Letter
	6.8	N/A	N/A	Commitment Letter
	3.3	N/A	N/A	Commitment Letter
	0.1	N/A	N/A	Commitment Letter
	1.7	N/A	N/A	Commitment Letter

Distribution Contract Total (TJ/day)	63.1
Letter of Indemnity Total (TJ/day)	22.1
Commitment Letter Total (TJ/day)	82.2
<b>Total Commitments (TJ/day)</b>	<b>167.3</b>

ENBRIDGE GAS INC.

Undertaking Response to PP

Re table 1 in IR PP 5, on a best-efforts basis, recognizing they are estimated dates, to identify any corresponding dates to the obligations that are identified in this table.

---

**Response(s):**

Please see Table 1 below. To preserve confidentiality of customer-specific commercially sensitive information that could divulge the nature and timing of investment decisions, Enbridge Gas is seeking confidential treatment of redacted content in Table 1.

It is important to note that distribution contracts do not expire. They are evergreen (i.e., automatically renew annually) unless a customer provides notice to Enbridge Gas that they wish to terminate the contract prior to the end of the “Initial Term” of the contract, or prior to the annual renewal date of the contract. Enbridge Gas has no such basis (i.e., customer notice) for which to assume that existing distribution contracts will not be renewed.

Table 1

Customer	TJ/day	Contract Start Date	Contract End Date	Commitment Type	Requested In-service Date (LOI/CL)	Expiry Date (LOI/CL)*
	1.4	1-Nov-23	31-Oct-28	Distribution Contract	n/a	n/a
	2.4	1-Nov-23	31-Oct-40	Distribution Contract	n/a	n/a
	1.6	1-Nov-23	31-Oct-28	Distribution Contract	n/a	n/a
	57.7	16-Jul-24	15-Jul-29	Distribution Contract	n/a	n/a
	3.1	N/A	N/A	Letter of Indemnity	1-Aug-23	n/a
	19.0	N/A	N/A	Letter of Indemnity	1-Sep-23	n/a
	1.1	N/A	N/A	Commitment Letter	1-Jan-23	31-Dec-22
	2.3	N/A	N/A	Commitment Letter	1-Nov-23	31-Oct-23
	2.1	N/A	N/A	Commitment Letter	1-Nov-23	31-Oct-23
	2.8	N/A	N/A	Commitment Letter	1-Nov-23	1-Nov-22
	0.8	N/A	N/A	Commitment Letter	1-Nov-23	31-Oct-23
	2.8	N/A	N/A	Commitment Letter	1-Nov-23	31-Oct-23
	2.8	N/A	N/A	Commitment Letter	1-Nov-23	31-Oct-23
	1.2	N/A	N/A	Commitment Letter	1-Nov-23	31-Oct-23
	5.7	N/A	N/A	Commitment Letter	1-Nov-23	31-Oct-23
	1.0	N/A	N/A	Commitment Letter	1-Nov-23	31-Oct-23
	0.9	N/A	N/A	Commitment Letter	1-Nov-23	31-Oct-23
	2.4	N/A	N/A	Commitment Letter	1-Nov-23	31-Oct-23
	3.5	N/A	N/A	Commitment Letter	1-Nov-23	31-Oct-23
	3.5	N/A	N/A	Commitment Letter	1-Nov-23	31-Oct-23
	3.2	N/A	N/A	Commitment Letter	1-Nov-23	31-Oct-22
	11.3	N/A	N/A	Commitment Letter	1-Dec-23	30-Nov-23
	1.8	N/A	N/A	Commitment Letter	1-Jan-24	1-Jan-23
	1.8	N/A	N/A	Commitment Letter	1-Jan-24	1-Jan-23
	1.8	N/A	N/A	Commitment Letter	1-Jan-24	1-Jan-23
	10.6	N/A	N/A	Commitment Letter	1-Apr-24	1-Oct-23
	0.8	N/A	N/A	Commitment Letter	1-Aug-24	31-Jul-23
	1.4	N/A	N/A	Commitment Letter	1-Aug-24	31-Jul-23
	1.0	N/A	N/A	Commitment Letter	1-Aug-24	31-Jul-23
	1.7	N/A	N/A	Commitment Letter	1-Nov-24	31-Oct-23
	0.4	N/A	N/A	Commitment Letter	1-Nov-24	31-Oct-24
	1.4	N/A	N/A	Commitment Letter	1-Nov-24	31-Oct-24
	6.8	N/A	N/A	Commitment Letter	1-Sep-25	31-Aug-24
	3.3	N/A	N/A	Commitment Letter	1-Nov-25	31-Oct-25
	0.1	N/A	N/A	Commitment Letter	1-Nov-26	31-Oct-26
	1.7	N/A	N/A	Commitment Letter	1-Nov-27	31-Oct-27

Distribution Contract Total (TJ/day)	63.1
Letter of Indemnity Total (TJ/day)	22.1
Commitment Letter Total (TJ/day)	82.2
<b>Total Commitments (TJ/day)</b>	<b>167.3</b>

**NOTE:**

\*If a CL expires, or if the estimated in-service date cannot be met, the CL is expected to be renewed with the customer with a revised in-service date.

ENBRIDGE GAS INC.

Undertaking Response to PP

To file IRP-related information filed at panhandle region stakeholder outreach session

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**Response:**

Please see Attachments 1 and 2 to this response.



# Panhandle Regional Expansion Project

## Virtual Information Session #2



# Welcome to the Panhandle Regional Expansion Project

## Virtual Information Session #2

- This virtual information session is open from February 14 to February 28, 2022.
- Explore the website for more detailed information.
- Fill out the [comment form](#) by February 28, 2022, where you can also submit questions, comments and sign-up to receive future Project updates.
- Download the full presentation [here](#).
- Review the pipeline routes on the [interactive mapping tool](#).

## Our Commitment

- Enbridge Gas provides safe and reliable delivery of natural gas to more than 3.8 million residential, commercial, and industrial customers across Ontario.
- Enbridge Gas will carefully consider all input. They are committed to involving community members and will provide up-to-date information in an open, honest and respectful manner.
- Enbridge Gas is committed to environmental stewardship and conducts all of its operations in an environmentally responsible manner.



## Purpose of Virtual Information Session

- Provide an update on the Project, including the assessment of alternatives that resulted in the selected preferred routes for the transmission pipelines and the introduction of the preliminary preferred routes for the distribution pipelines.
- Provide a safe alternative to an in-person meeting.
- Inform landowners, Indigenous communities, municipalities, stakeholders, and regulatory authorities about the Panhandle Regional Expansion Project and gather feedback about the assessment and selection of the transmission and distribution pipeline routes.
- Give everyone the chance to participate in the process to complete the Environmental Report, which will be included in the Ontario Energy Board application.
- Provide an opportunity to identify any unknown constraints and review draft plans to mitigate impacts to the local community and the environment.
- Create a space for you to ask questions and / or provide comments to Enbridge Gas or AECOM.



## **Panhandle Regional Expansion Project**

The Panhandle Transmission System serves residential, commercial, industrial, greenhouse and power generation customers across Southwestern Ontario. In order to accommodate additional demand for affordable and reliable natural gas in Windsor, Essex County and Chatham-Kent, Enbridge Gas is proposing to increase the capacity of the system via the Panhandle Regional Expansion Project. This Project will address the current and future growth needs of the local area.



## Indigenous People Policy

- Enbridge Gas recognizes the diversity of Indigenous Peoples who live where we work and operate. They understand from history the destructive impacts on the social and economic wellbeing of Indigenous Peoples. Enbridge Gas recognizes and realizes the importance of reconciliation between Indigenous communities and the broader society. Positive relationships with Indigenous Peoples, based on mutual respect and focused on achieving common goals, will create positive outcomes from Indigenous communities. Enbridge Gas commits to pursue sustainable relationships with Indigenous Nations and groups in proximity to where Enbridge Gas conducts business. To achieve this, Enbridge Gas will govern itself by the following principles:
  - Enbridge Gas recognizes the legal and constitutional rights of Indigenous Peoples, and the importance of the relationships between Indigenous Peoples and their traditional lands and resources. They 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. Enbridge Gas commits to ensuring that Enbridge Gas projects and operations are carried out in an environmentally responsible manner.
  - Enbridge Gas understands the importance of the United Nations Declaration of the Rights of Indigenous Peoples in the context of existing Canadian law and the commitments that the government has made to protecting the rights of Indigenous Peoples.

## Indigenous People Policy

- Enbridge Gas engages in forthright and sincere consultation with Indigenous Peoples about their projects and operations through processes that seek to achieve early and meaningful engagement. Indigenous engagement helps define projects that may occur on lands traditionally occupied by Indigenous Peoples.
- Enbridge Gas commits to working with Indigenous Peoples to achieve benefits for them resulting from Enbridge Gas' projects and operations, including opportunities in training and education, employment, procurement, business development, and community development.
- Enbridge Gas fosters an understanding of the history and culture of Indigenous Peoples among their employees and contractors, in order to create better relationships between Enbridge Gas and Indigenous communities.
- The commitment is a shared responsibility involving Enbridge Gas and its affiliates, employees and contractors. They will conduct business in a manner that reflects the above principles. Enbridge Gas will provide ongoing leadership and resources to effectively implement the above principles, including the development of implementation strategies and specific action plans. Enbridge Gas commits to periodically review this policy so that it remains relevant and respects Indigenous culture and varied traditions.

# Environment, Health and Safety Policy

## Enbridge Gas' commitment

- Enbridge Gas is committed to protecting the health and safety of all individuals affected by our activities.
- Enbridge Gas will provide a safe and healthy working environment and will not compromise the health and safety of any individual.
- Enbridge Gas' goal is to have no incidents and mitigate impacts on the environment by working with stakeholders, peers, and others to promote responsible environmental practices and continuous improvement.
- Enbridge Gas is committed to environmental protection and stewardship and we recognize that pollution prevention, biodiversity and resource conservation are key to a sustainable environment.
- All employees are responsible and accountable for contributing to a safe working environment, for fostering safe working attitudes, and for operating in an environmentally responsible manner.

## AECOM's commitment

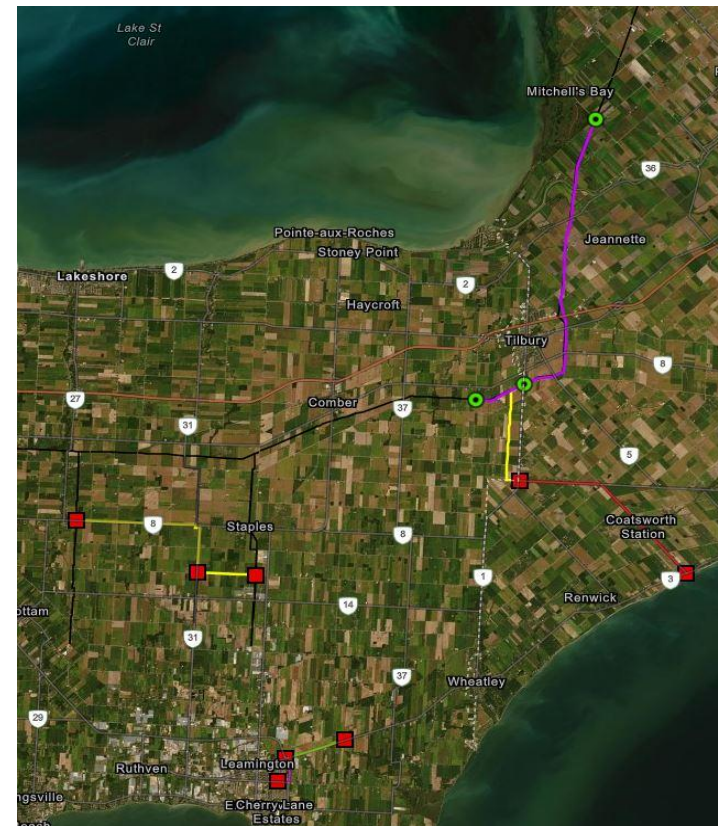
- "Safety for Life" defines AECOM's commitment to achieving zero work-related injuries and / or illnesses; preventing damage to property and the environment; and maintaining an environmentally friendly and sustainable workplace.
- AECOM has adopted "Life Preserving Principles" to help demonstrate the commitment of AECOM's Safety for Life program.

## **Integrated Resource Planning (IRP)**

- As the energy landscape continues to evolve, there is a growing interest in low-carbon alternatives to meet energy needs.
- IRP is a framework through which Enbridge Gas reviews alternative approaches to meeting energy needs, before building new infrastructure such as:
  - Delivering more energy without adding new pipelines using liquefied or compressed natural gas.
  - Lowering energy use through effective energy efficiency programs.
  - Displacing conventional natural gas with carbon-neutral renewable natural gas and hydrogen.
- As Enbridge Gas continues to lead the transition to a low-carbon future, they are dedicated to exploring IRP alternatives where they are in the best interest of communities, the environment and the company, while considering safety and reliability, cost-effectiveness, optimization, risk management and public policy.

# Proposed Transmission Pipelines

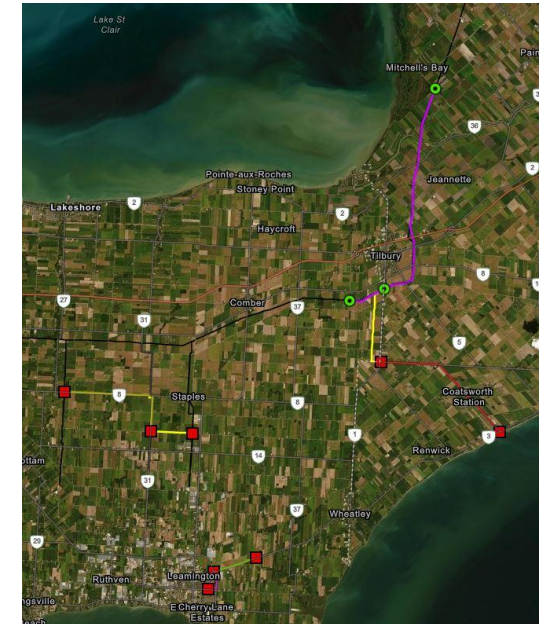
- **Panhandle Loop:** Approximately 19 km of new pipeline which loops – or parallels – the existing 20-inch Panhandle Pipeline. The new pipeline will be 36 inches in diameter and located adjacent to an existing pipeline corridor between Richardson Side Road in the Municipality of Lakeshore, and Enbridge Gas’ existing Dover Transmission Station in the Municipality of Chatham-Kent.
- **Leamington Interconnect:** Approximately 12 km of new pipeline, 16 inches in diameter, adjacent to or within an existing road allowance on public or private property to connect the existing Leamington North Lines to both the Kingsville East Line and the Leamington North Reinforcement Line, located in the Municipality of Lakeshore, Town of Kingsville and Municipality of Leamington.



[View the interactive mapping tool](#)

# Proposed Distribution Pipelines

- **Talbot Road Reinforcement:** Construction of a new distribution pipeline up to 8 inches in diameter travelling adjacent to or within an existing road allowance, on public or private property along Talbot Road East in the Municipality of Leamington. The pipeline will be approximately 3.2 km in length.
- **Oak Street and Essex Road 33 Reinforcement:** Construction of a new distribution pipeline up to 6 inches in diameter travelling adjacent to or within existing road allowances on public or private property along Oak Street East and County Road 33 in the Municipality of Leamington. The pipeline will be approximately 1.9 km in length.
- **Wheatley Lateral Reinforcement (formerly Wheatley Interconnect):** Construction of a new distribution pipeline up to 8 inches in diameter starting from Enbridge Gas' Wheatley Road station and travelling west then south in an easement on private property to Goodreau Line. The pipeline will then travel east to a new proposed station at the intersection of Wheatley Road and Goodreau Line (preferred route). From this location, the new distribution line will travel east along Goodreau Line before turning southeast on Coatsworth Road to Talbot Trail (preliminary preferred route). The pipeline will be approximately 16.1 km in length and all new pipelines on Goodreau Line and Coatsworth Road would either travel adjacent to or within existing road allowances on public or private property. The pipeline will be located in the Municipality of Lakeshore and Municipality of Chatham-Kent.



[View the interactive mapping tool](#)

**If approved by the Ontario Energy Board, construction of the proposed transmission and distribution pipelines is planned to begin as early as Spring 2023 and is proposed to be in service by Fall 2023.**



# Environmental Report Process

- The environmental study and Environmental Report will be completed as per the Ontario Energy Board’s “Environmental Guidelines for the Location, Construction and Operation of Hydrocarbon Pipelines and Facilities in Ontario (2016).”

## The study will:

- Undertake consultation to understand the views of interested and potentially impacted parties.
- Consult with Indigenous communities to understand interests and potential impacts.
- Be conducted during the earliest phase of the Project.
- Present pipeline routing options and outline the evaluation process to select preferred pipeline routes.
- Identify potential impacts of the Project.
- Develop environmental mitigation and protective measures to avoid or minimize potential impacts.
- Develop an appropriate environmental inspection, monitoring and follow-up program.



# Ontario Energy Board (OEB) Review and Approval Process

- An OEB Leave-to-Construct application and approval is required in order for the Project to proceed. The OEB is Ontario's independent regulator of the electricity and natural gas sectors who protect consumers and makes decisions that serve the public interest.
- The application to the OEB will include information on the Project including:
  - The need for the Project;
  - Environmental Report and mitigation measures;
  - Facility alternatives;
  - Project costs and economics;
  - Pipeline design and construction;
  - Land requirements; and
  - Consultation with Indigenous communities.



The OEB will then hold a public hearing to review the Project. If the OEB determines that the Project is in the public interest it will approve construction of the Project.

Additional information about the OEB process can be found at: [www.oeb.ca](http://www.oeb.ca)

# Preferred Route Selection Process

The preferred routes will be selected and confirmed through a five-step process.



## Develop Routing Parameters

- Establish a study area.
- Establish routing objectives. For example:
  - Follow a reasonably direct path between start and end points.
  - Avoid sensitive environmental and socio-economic features, where possible.
  - Parallel (loop) existing linear infrastructure.
  - Follow existing lot and property lines.
- Create an inventory of environmental and socio-economic features.

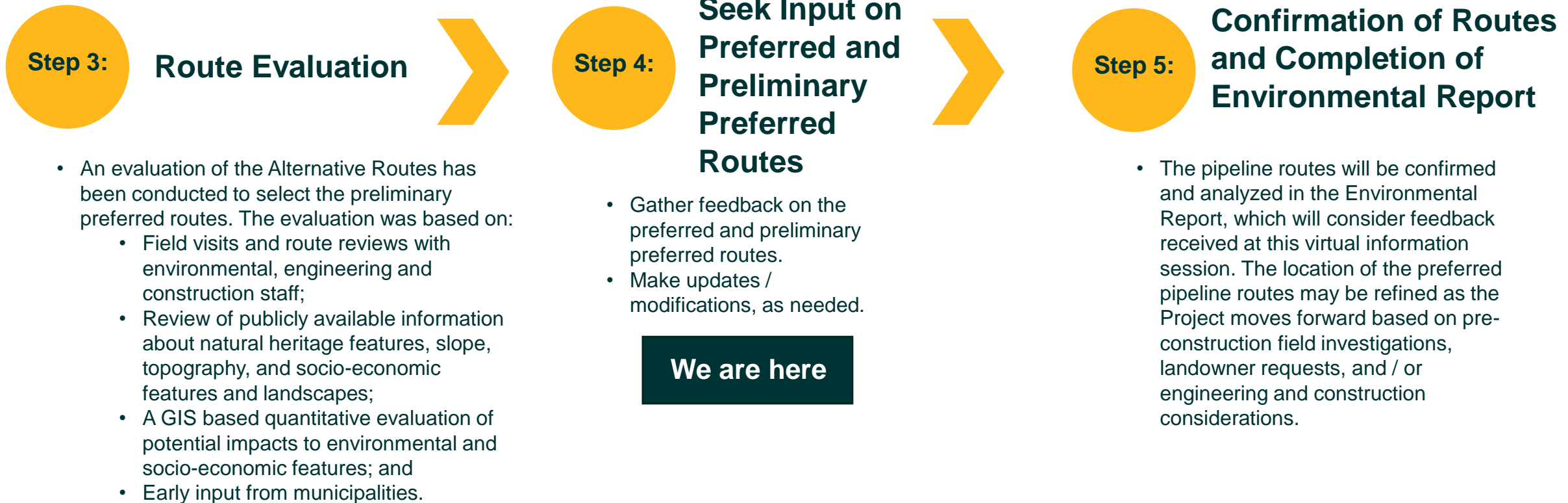


## Identify Alternative Routes in the Study Area

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

# Preferred Route Selection Process

The preferred routes will be selected and confirmed through a five-step process.



# Transmission Pipeline Route Evaluation

## Methodology

During virtual information session #1, a Preliminary Preferred Route for the Panhandle Loop and a Preliminary Preferred and two alternative routes were presented for the Leamington Interconnect. These routes have since been confirmed as Preferred Routes. These routes were selected as preferred using quantitative and qualitative methods.

## Quantitative

A Geographic Information System (GIS), a computer-base mapping system, was used to determine the impacts of the preliminary preferred and alternative routes on a number of different categories, including: agricultural, aquatics, route characteristics, socio-economic, terrestrial features and groundwater resources.

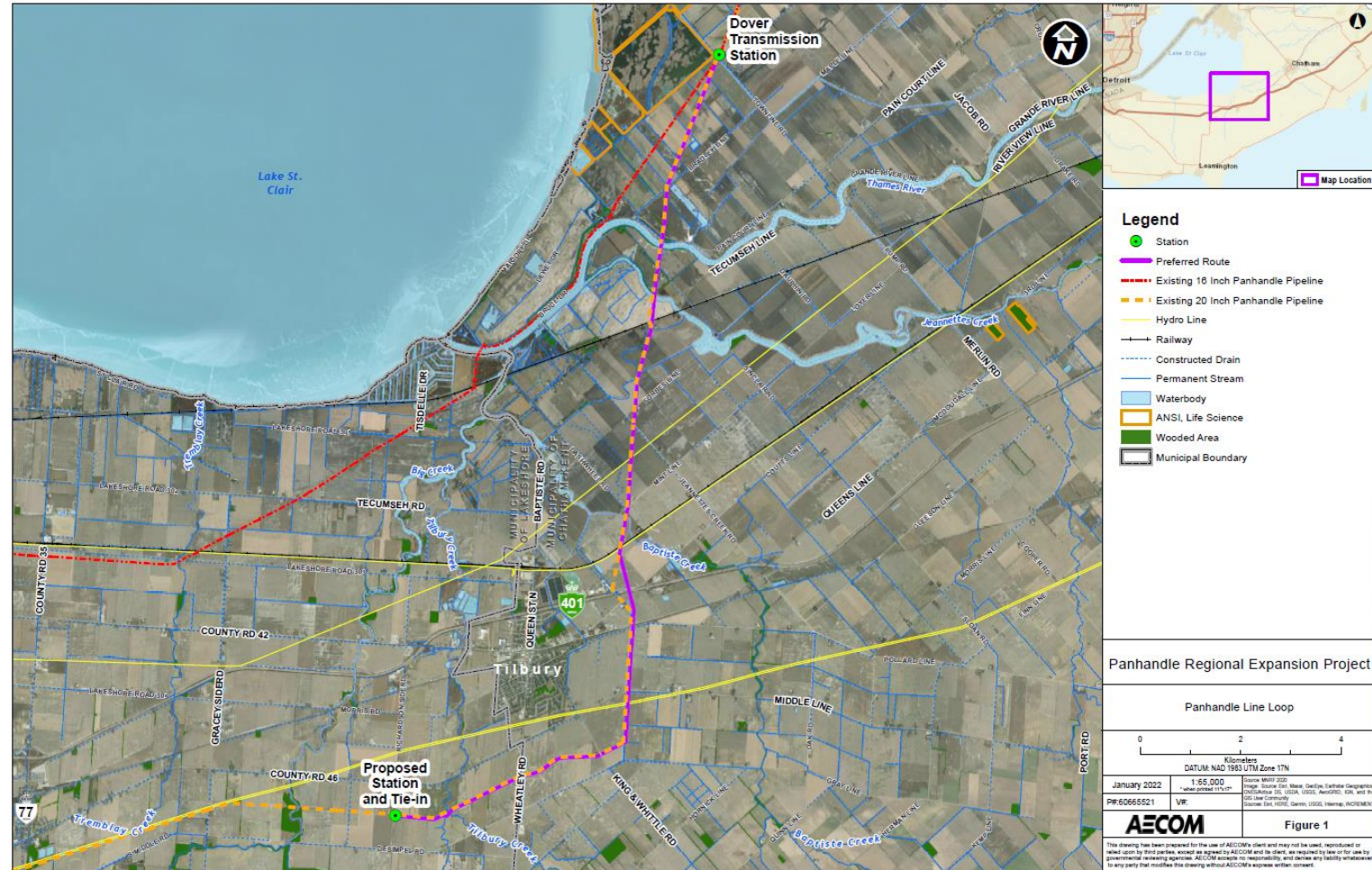
## Qualitative

A review of the comments received to date from the interested and potentially affected parties, and the experience of the Project Team in routing linear infrastructure.



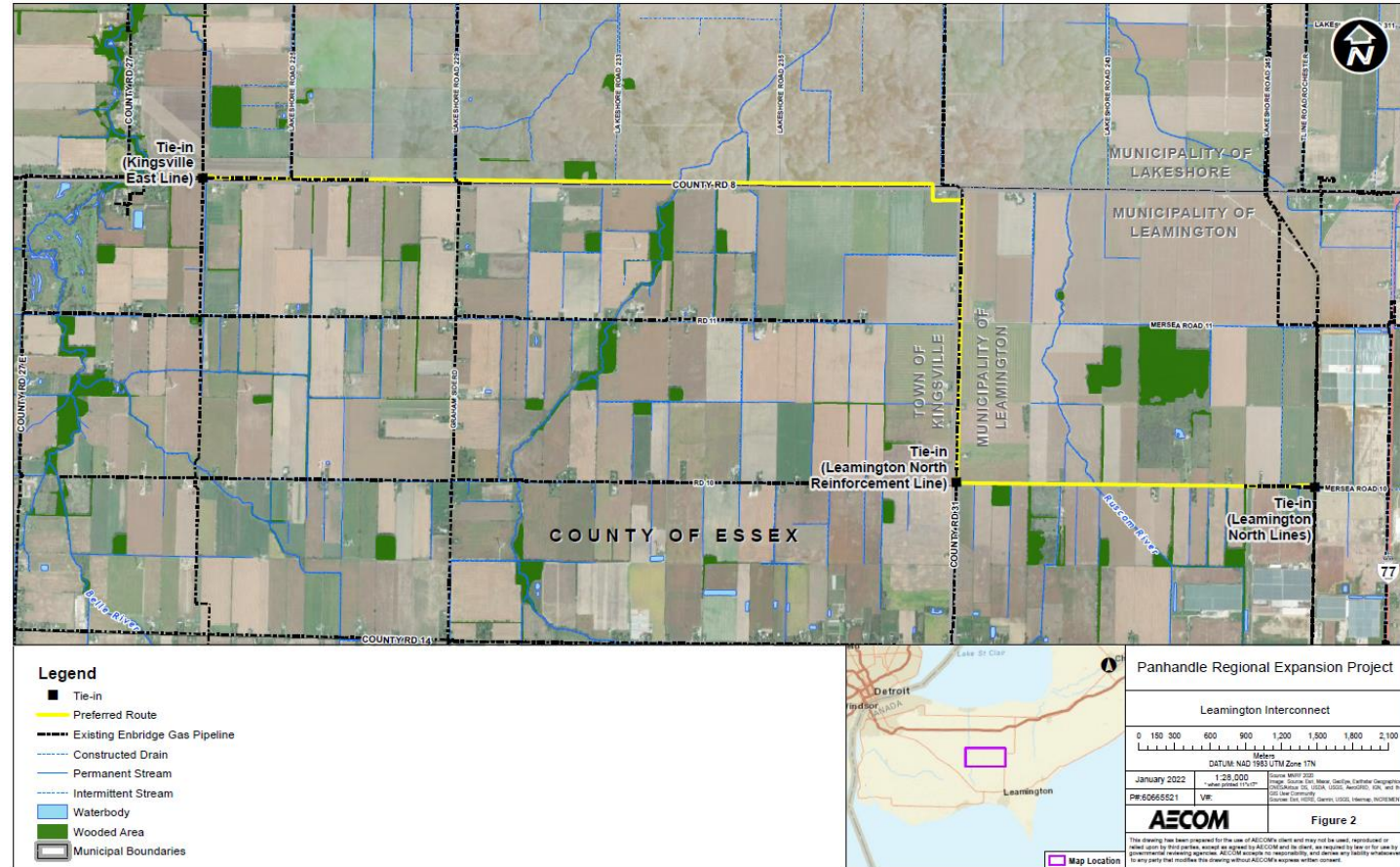
# Preferred Route: Panhandle Loop

- New natural gas pipeline 36 inches in diameter and 19 km in length.
- Route will loop – or parallel – the existing 20-inch Panhandle Pipeline located between Richardson Side Road and Enbridge Gas’ Dover Transmission Station.
- Key considerations for selecting the preferred route:
  - The route parallels an existing pipeline right-of-way (RoW).
  - It leverages an existing Enbridge Gas RoW, allowing for overlapping easements and reducing disturbance to new properties and farms.
  - A technically viable route avoids introduction of new environmental and social impacts to habitats and properties in the area.
  - Installation of the existing pipeline occurred with no long-term impacts to the environment.



# Preferred Route: Leamington Interconnect

- New natural gas pipeline 16 inches in diameter and 12 km in length connecting the existing Leamington North Lines to both the Kingsville East Line and the Leamington North Reinforcement Line.
- Located adjacent to or within an existing road allowance on public or private property.
- Key considerations for selecting the preferred route:
  - The route parallels existing road allowances and utilities.
  - The route offers the most room for construction and staging due to the slope / topography of the area being flat and there are no deep ditches impacting construction.
  - It has the least direct impacts to homes, utilities, traffic and local access.





## Transmission Pipeline Route Evaluation

Features	Leamington Preliminary Preferred Route	Leamington Alternative Route 1	Leamington Alternative Route 2
<b>Potential Impacts to Agricultural Features</b>			
Prime Agricultural Land (ha)	120	109	95
Tile Drainage (ha)	84	78	69
<b>Potential Impacts to Aquatic Features</b>			
Conservation Authority Regulated Lands (ha)	54	39	31
Watercourse / Drain Crossings	9	9	10
Watercourses with Identified SAR	0	0	0
<b>Route Characteristics</b>			
Length (m)	11,982	10,748	9,407
Slope (m)	<5	<5	<5
<b>Potential Impacts to Socio-Economic Features</b>			
Archaeological Sites (within 1 km of the route)	0	0	1
Homes (#)	7	23	17
Petroleum Wells (# within 250 m)	0	0	0
Socio-economic Features (schools, churches, community centres (# within 1 km))	1 recreational centre, 1 cemetery, 1 golf course	1 recreational centre and 1 golf course	0





## Transmission Pipeline Route Evaluation Continued

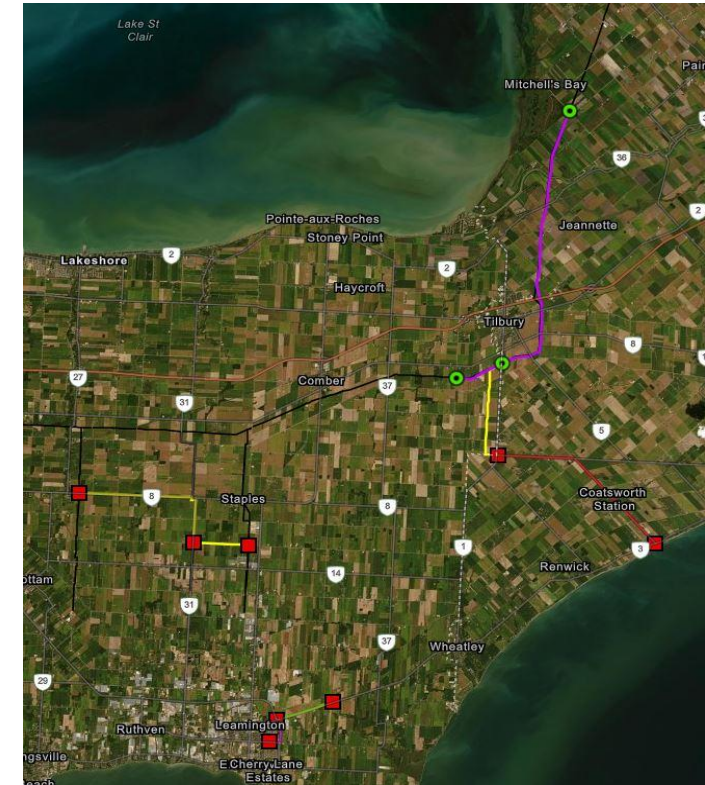
Features	Leamington Preliminary Preferred Route	Leamington Alternative Route 1	Leamington Alternative Route 2
<b>Potential Impacts to Terrestrial Features</b>			
ANSI (ha)	0	0	0
Wooded Areas (ha)	2	2	1
Wetlands (Provincially / Locally Significant)	0	0	0
<b>Potential Impacts to Groundwater Resources</b>			
Water Wells (within 100 m)	19	20	15
<b>Overall Route Evaluation</b>	<b><i>Preferred</i></b>	<b><i>Moderately Preferred</i></b>	<b><i>Least Preferred</i></b>
	<ul style="list-style-type: none"> <li>Although this route has the potential to impact the most agricultural and natural environmental features, it reduces disturbance to homes (impacts 7) and farm operations in the area by running parallel to existing road allowances and utilities.</li> <li>Most room within road allowance to allow for feasibility of construction and staging.                             <ul style="list-style-type: none"> <li>Slope / topography is flat and there are no deep ditches impacting construction.</li> </ul> </li> <li>Less watercourse / drain crossings than Leamington Alternative Route 2.</li> <li>Less water wells than Leamington Alternative Route 1.</li> <li>Route does not impact any known archaeological sites.</li> </ul>	<ul style="list-style-type: none"> <li>Less watercourse / drain crossings and known archaeological sites than Leamington Alternative Route 2.</li> <li>Current road allowance is narrow and does not have adequate room for construction.</li> <li>Potential impacts to homes (23) and farm operations.</li> <li>Impacts more agricultural and natural environment features than Leamington Alternative Route 2.</li> </ul>	<ul style="list-style-type: none"> <li>Although this alternative impacts the most watercourses / drain crossings, it is the shortest route and crosses less wooded areas, prime agricultural land, tile drainage, and conservation authority regulated land.</li> <li>Current road allowance is very narrow with steep slopes on either side and existing utilities make feasibility of construction a challenge.</li> <li>Potential impacts to homes (17) and farm operations.</li> </ul>

# Proposed Distribution Pipelines

As noted at the first virtual information session, Enbridge Gas is proposing to construct distribution pipelines to connect new large-volume customers to the Panhandle Transmission System. Distribution pipelines are being proposed at several locations based on customer needs.

It should be noted that portions of the Wheatley Interconnect that were presented at virtual information session #1 now form part of the distribution pipelines being proposed and has since been confirmed as a preferred route.

The evaluation of these routes will include feedback gathered from this virtual information session and will be included in the Environmental Report, which can be reviewed and commented on during the Ontario Energy Board's approval process.

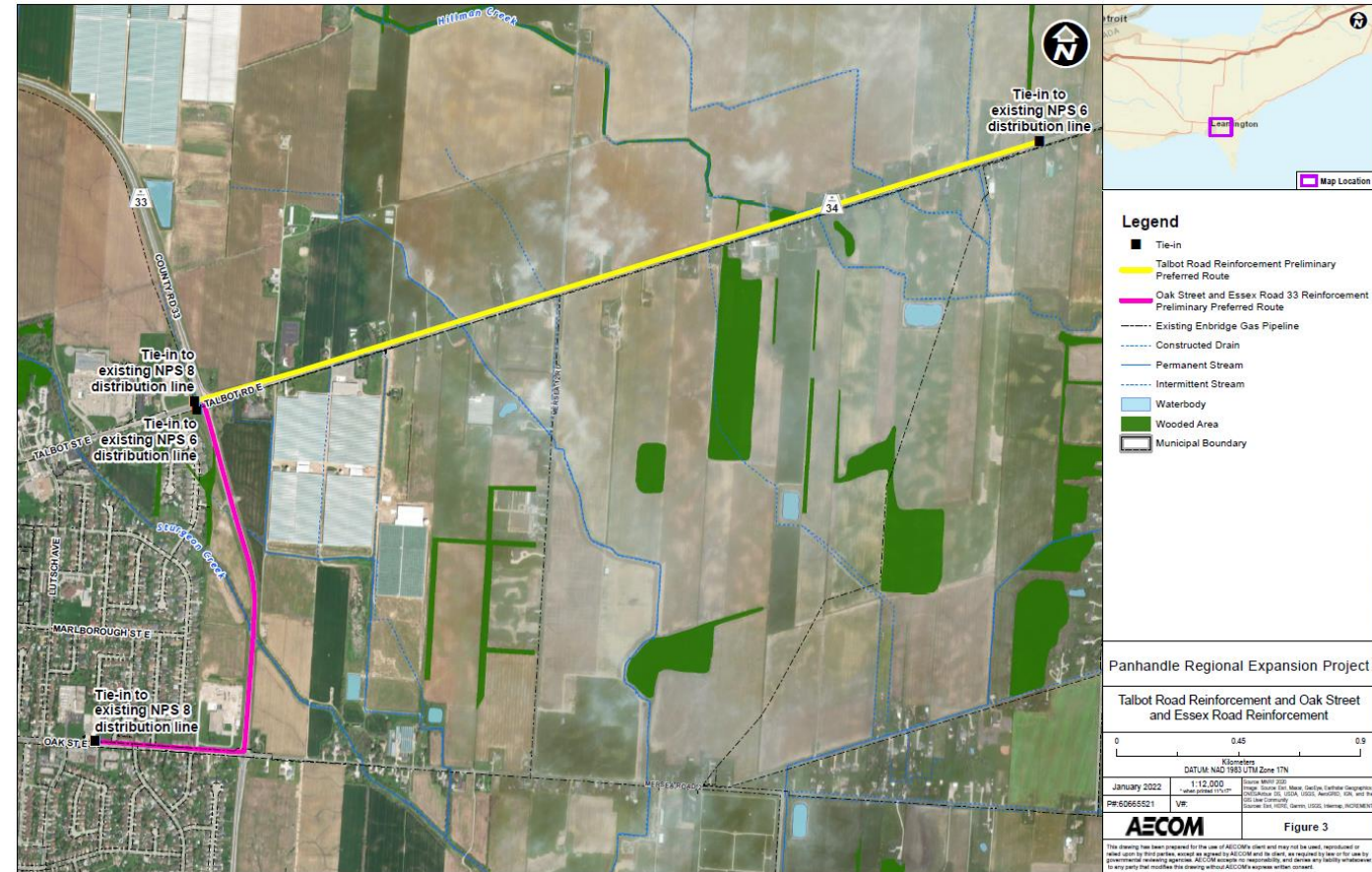


[View the interactive mapping tool](#)

# Talbot Road and Oak Street and Essex Road 33 Reinforcements

- **Talbot Road Reinforcement:** New distribution pipeline up to 8 inches in diameter and 3.2 km in length.
- Located adjacent to or within an existing road allowance on public or private property.
- **Oak Street and Essex Road 33 Reinforcement:** New distribution pipeline up to 6 inches in diameter and 1.9 km in length.
- Located adjacent to or within existing road allowances on public or private property.

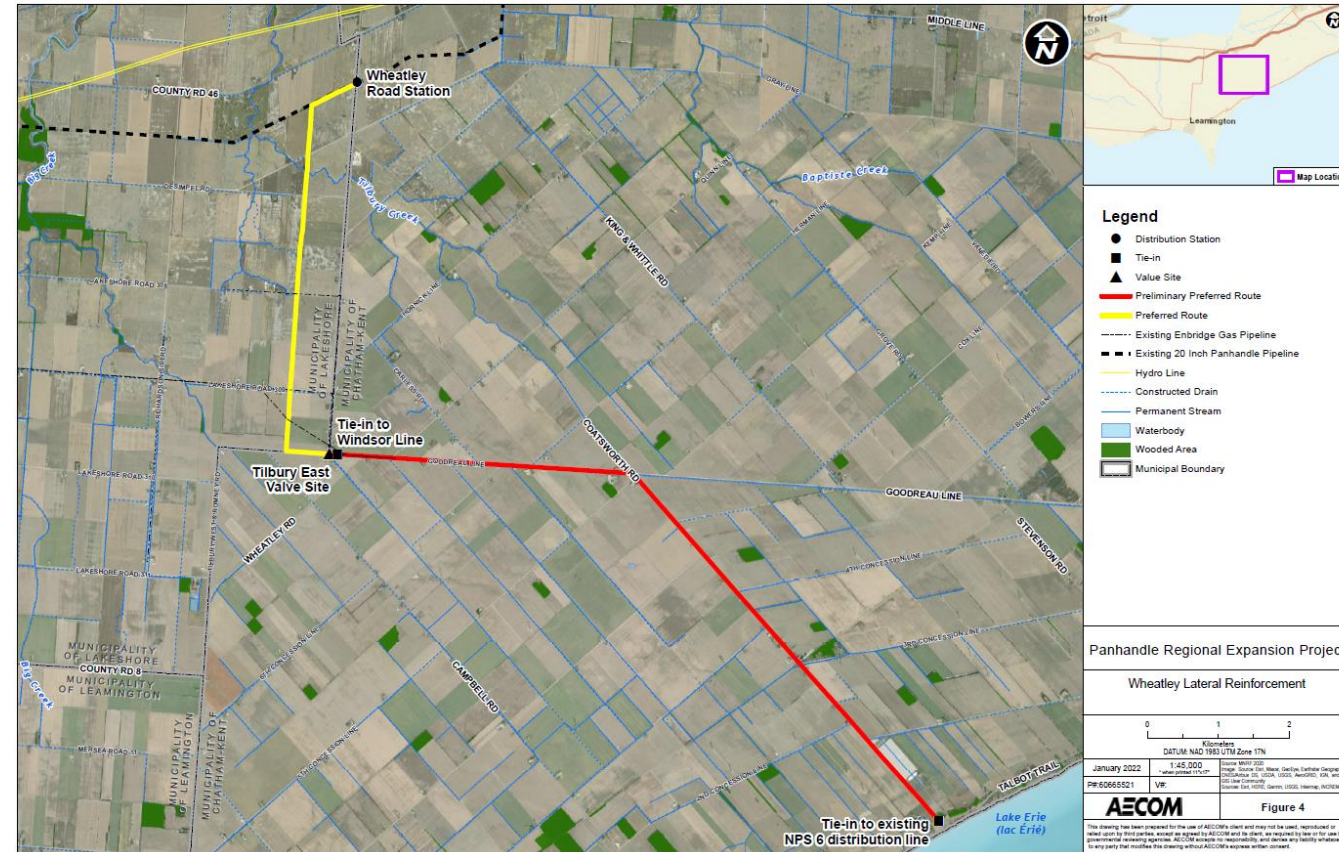
The routes have been selected as they are the most direct routes using road allowances.





# Wheatley Lateral Reinforcement

- New pipeline up to 8 inches in diameter and 16.1 km in length.
- Preferred Route (yellow line, 6 km in length)
  - Presented as Wheatley Interconnect in virtual information session #1.
  - Located in an easement on private property that is parallel to Wheatley Road.
  - Key considerations for selecting the preferred route:
    - Upon consultation with the municipalities, Wheatley Road cannot accommodate a pipeline due to existing utilities.
    - Route avoids the need for lane closures and traffic disruption on Wheatley Road, a main artery into the Town of Wheatley.
- Preliminary Preferred Route (red line, 10.1 km in length)
  - Located adjacent to or within existing road allowances on public or private property.
  - The route has been selected as it is the most direct route using road allowances.



# Agricultural Soils and Maintaining Agricultural Drainage Systems

- The Project will be constructed, in part, on agricultural land within the Project study area.

## Potential Effects

- Damaged and severed tile drains.
- Subsoil mixing, compaction, and rutting.
- Loss of organic matter / degraded soil structure.
- Decreased soil quality / agricultural capability.
- Erosion.
- Temporary drainage issues.
- Spread of soil pests / diseases.



## Example Mitigation Measures

- Enbridge Gas will develop and implement a sampling program on agricultural easements along the pipeline route for potential pests and / or diseases that are known to the area, where appropriate.
- The entire outside boundaries of the work space necessary for construction of the Project will be staked at regular intervals.
- Landowners will be contacted prior to construction to confirm the location and type of existing drains. Any future drainage plans will also be discussed.
- Field tile will be temporarily re-routed during pre-construction activities where required to ensure proper drainage during construction.
- Construction activities will be temporarily halted on agricultural lands where excessively wet soil conditions are encountered.
- Damaged and severed drains will be repaired following construction. After repair and prior to backfilling, landowners will be invited to inspect and approve the repair. Any on-going field tile issues resulting from pipeline construction will be addressed by Enbridge Gas as required.
- A post-construction cover crop program will be available to landowners.

## Socio-Economic Considerations

- The Project will be constructed parallel to existing road allowances on private property, agricultural land, land regulated by Hydro One, Lower Thames Valley Conservation Authority and Essex Region Conservation Authority.

## Potential Effects

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



## Example Mitigation Measures

- Access to residences, businesses and farm fields will be maintained during construction.
- Construction will be restricted to daylight hours and adhere to applicable noise by-laws.
- A Traffic Control Plan will be developed if potential disruption to traffic could occur.
- Fencing will be placed at appropriate locations to limit access to the work area.
- A water well monitoring program will be developed.
- Measures will be implemented to control dust during construction.
- Areas cleared for construction will be re-vegetated.
- A designated Enbridge Gas representative will be available prior to and throughout construction.

# Aquatic Resource Considerations

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

## Potential Effects

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

## Example Mitigation Measures

- Conduct surveys for waterbodies to assess potential impacts to aquatic species / habitat.
- Obtain all agency permits and approvals, including development of environmental mitigation measures for site specific habitat / species.
- Limit in-channel construction, where possible, and conform to fish timing window guidelines.
- If in-channel construction is required, protect aquatic species and manage sedimentation and turbidity.
- Restore and seed areas to establish habitat and reduce erosion.
- Replant vegetation along waterways as soon as possible following construction.



## Terrestrial Resource Considerations

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

### Potential Effects

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



### Example Mitigation Measures

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



# Cultural Heritage and Archaeology Considerations

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

## Potential Effects

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



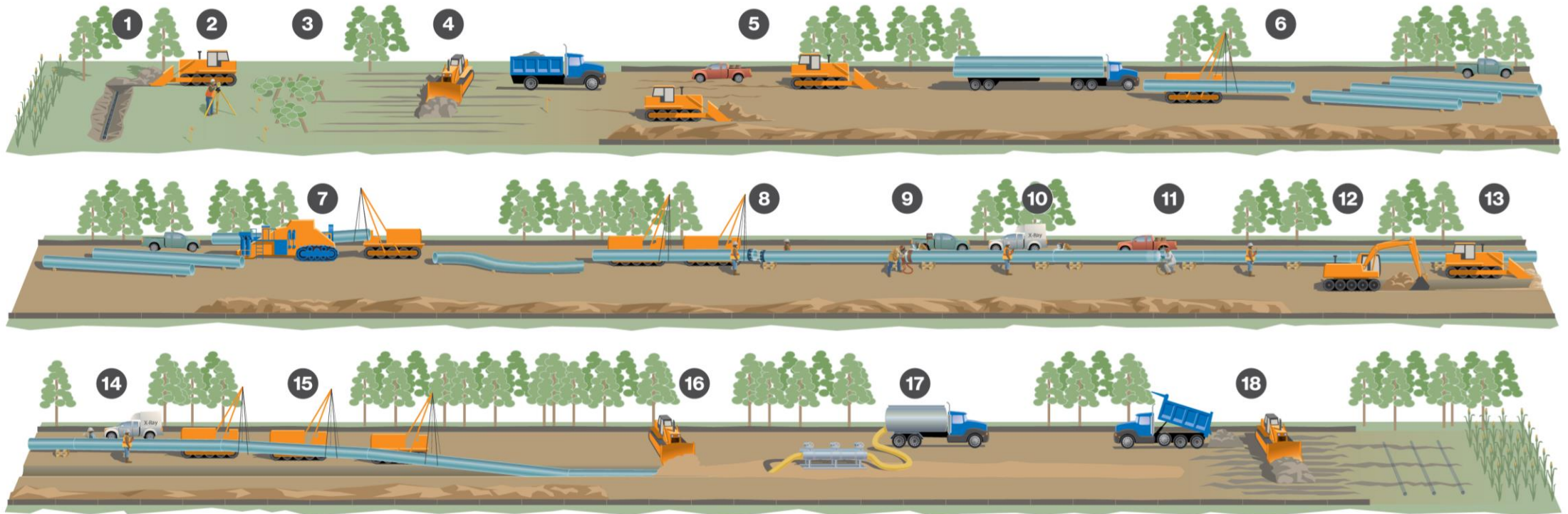
## Example Mitigation Measures

- Complete archaeological assessments of the construction right-of-way, with review and comment from the Ministry of Heritage, Sport, Tourism and Culture Industries (MHSTCI).
- Complete cultural heritage assessments (for built heritage features and cultural heritage landscapes) of the construction right-of-way, with review and comment from MHSTCI.
- Report any previously unknown archaeological, paleontological or historical resources uncovered, or suspected of being uncovered, during excavation.

## **Access and Land Requirements**

- Once a preferred route is selected, an Enbridge Gas Land Agent will begin discussions with landowners for the appropriate land rights necessary for the construction of the pipeline.
- Enbridge Gas is committed to working with all directly affected landowners in anticipation of acquiring early access agreements, where necessary, in order to gather essential information, including but not limited to, land survey data, environmental, archaeological and property site features, along with negotiating the necessary land rights.
- These land rights will consist of permanent easements and / or temporary land rights. The temporary land rights are only required during Project construction activities.
- Enbridge Gas will have a Land Agent available to each landowner during all pipeline construction activities.
- The Land Agent will keep all landowners informed of the progress of the Project and assist with any concerns that may arise as a result of the construction activities.

# General Construction Overview



- |                                   |  |                              |  |  |  |
|-----------------------------------|--|------------------------------|--|--|--|
| <b>1.</b> Pre-construction tiling | <b>4.</b> Right-of-way topsoil stripping | <b>7.</b> Field bending pipe | <b>10.</b> X-ray or ultrasonic inspection, weld repair | <b>13.</b> Padding trench bottom               | <b>16.</b> Backfilling                                   |
| <b>2.</b> Surveying and staking   | <b>5.</b> Front-end grading              | <b>8.</b> Lining-up pipe     | <b>11.</b> Field coating                               | <b>14.</b> Final inspection and coating repair | <b>17.</b> Hydrostatic testing                           |
| <b>3.</b> Clearing                | <b>6.</b> Stringing pipe                 | <b>9.</b> Welding process    | <b>12.</b> Digging the trench                          | <b>15.</b> Lowering pipe                       | <b>18.</b> Site restoration and post-construction tiling |

# General Construction Overview

## Site preparation (1-5)

- Survey and staking crews will delineate project boundaries and install safety fencing, where required.
- The construction team will clear brush and other vegetation to permit construction.
- A grading crew prepares the construction area for access by construction equipment.

## Installing the new pipeline (6-16)

- Once area has been prepped, a hydraulic hoe will excavate the trench, which will then be prepared for the installation of the new pipeline.
- The stringing crew lays pipe on wooden skids or boxes adjacent to trench area.
- The pipe is prepped, welded into continuous lengths and inspected before the pipeline is lowered into the trench. Crews also install pipes under obstacles such as roads or watercourses by directional drilling.

## Finishing construction (17-18):

- The pipeline is tested hydrostatically with water from a suitable local source and is disposed of appropriately. Upon completion, the pipeline is dried, purged of air and prepared for delivery of the product.
- The construction crew backfills the originally excavated subsoil over the pipe in the trench. Any surplus backfill material will be removed from the construction area.
- A clean-up crew is responsible for the restoration of the land. In natural areas, restoration includes re-seeding and removing erosion and sediment controls. In developed areas the clean-up crew undertakes landscaping plans developed for site restoration.

## Next Steps

Enbridge Gas will evaluate the feedback received from the virtual information session, make updates as required and finalize the pipeline route evaluation. The final evaluation will be included in the Environmental Report (ER), which will be completed in early 2022. You will have the opportunity to review and provide feedback on the ER by signing up to receive future Project information.

## Project Schedule



# Thank you!

Thank you for participating in virtual information session #2. If you have feedback or comments, please complete the [comment form](#) by February 28, 2022.

**Mark Van der Word**

Senior Environmental Planner

AECOM

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email: [panhandle@virtualengagement.ca](mailto:panhandle@virtualengagement.ca)



For more information about the proposed Project, please visit our Project website at:  
[www.virtualengagement.ca/panhandle](http://www.virtualengagement.ca/panhandle)



# Panhandle Regional Expansion Project

## Virtual Information Session



## Welcome

- This virtual information session is open from November 17 to December 3, 2021.
- Watch the short video above to learn about the Project and what's included in this virtual information session.
- Explore the website for more detailed information.
- Fill out the [comment form](#) by December 3, 2021, where you can also submit questions, comments and sign-up to receive future Project updates.
- Download the full presentation.
- Review the pipeline routes on the [interactive mapping tool](#).

## Our Commitment

- Enbridge Gas provides safe and reliable delivery of natural gas to more than 3.7 million residential, commercial, and industrial customers across Ontario.
- Enbridge Gas will carefully consider all input. They are committed to involving community members and will provide up-to-date information in an open, honest and respectful manner.
- Enbridge Gas is committed to environmental stewardship and conducts all of its operations in an environmentally responsible manner.



## Purpose of the Virtual Information Session

- Provide a safe alternative to an in-person meeting.
- Inform landowners, Indigenous communities, municipalities, stakeholders, and regulatory authorities about the Panhandle Regional Expansion Project and gather feedback on the preliminary preferred pipeline routes.
- Give everyone the chance to participate in the process to complete the Environmental Report, which will be included in the Ontario Energy Board application.
- Provide an opportunity to identify any unknown constraints and review draft plans to mitigate impacts to the local community and the environment.
- Create a space for you to ask questions and / or provide comments to Enbridge Gas or AECOM.



## **Panhandle Regional Expansion Project**

The Panhandle Transmission System serves residential, commercial, industrial, greenhouse and power generation customers across Southwestern Ontario. In order to accommodate additional demand for affordable and reliable natural gas in Windsor, Essex County and Chatham-Kent, Enbridge Gas is proposing to increase the capacity of the system via the Panhandle Regional Expansion Project. This Project will address the current and future growth needs of the local area.



# Indigenous People Policy

- Enbridge Gas recognizes the diversity of Indigenous Peoples who live where we work and operate. They understand from history the destructive impacts on the social and economic wellbeing of Indigenous Peoples. Enbridge Gas recognizes and realizes the importance of reconciliation between Indigenous communities and the broader society. Positive relationships with Indigenous Peoples, based on mutual respect and focused on achieving common goals, will create positive outcomes from Indigenous communities. Enbridge Gas commits to pursue sustainable relationships with Indigenous Nations and groups in proximity to where Enbridge Gas conducts business. To achieve this, Enbridge Gas will govern itself by the following principles:
  - Enbridge Gas recognizes the legal and constitutional rights of Indigenous Peoples, and the importance of the relationships between Indigenous Peoples and their traditional lands and resources. They 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. Enbridge Gas commits to ensuring that Enbridge Gas projects and operations are carried out in an environmentally responsible manner.
  - Enbridge Gas understands the importance of the United Nations Declaration of the Rights of Indigenous Peoples in the context of existing Canadian law and the commitments that the government has made to protecting the rights of Indigenous Peoples.

# Indigenous People Policy

- Enbridge Gas engages in forthright and sincere consultation with Indigenous Peoples about their projects and operations through processes that seek to achieve early and meaningful engagement. Indigenous engagement helps define projects that may occur on lands traditionally occupied by Indigenous Peoples.
- Enbridge Gas commits to working with Indigenous Peoples to achieve benefits for them resulting from Enbridge Gas' projects and operations, including opportunities in training and education, employment, procurement, business development, and community development.
- Enbridge Gas fosters an understanding of the history and culture of Indigenous Peoples among their employees and contractors, in order to create better relationships between Enbridge Gas and Indigenous communities.
- The commitment is a shared responsibility involving Enbridge Gas and its affiliates, employees and contractors. They will conduct business in a manner that reflects the above principles. Enbridge Gas will provide ongoing leadership and resources to effectively implement the above principles, including the development of implementation strategies and specific action plans. Enbridge Gas commits to periodically review this policy so that it remains relevant and respects Indigenous culture and varied traditions.

# Environment, Health and Safety Policy

## Enbridge Gas' commitment

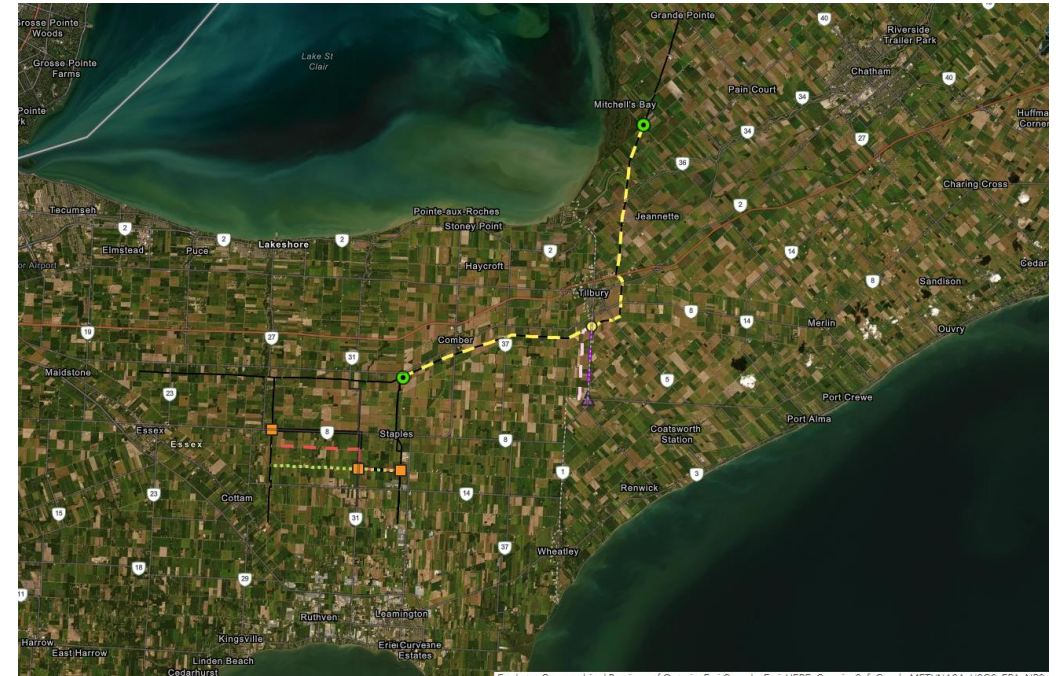
- Enbridge Gas is committed to protecting the health and safety of all individuals affected by our activities.
- Enbridge Gas will provide a safe and healthy working environment and will not compromise the health and safety of any individual.
- Enbridge Gas' goal is to have no incidents and mitigate impacts on the environment by working with stakeholders, peers, and others to promote responsible environmental practices and continuous improvement.
- Enbridge Gas is committed to environmental protection and stewardship and we recognize that pollution prevention, biodiversity and resource conservation are key to a sustainable environment.
- All employees are responsible and accountable for contributing to a safe working environment, for fostering safe working attitudes, and for operating in an environmentally responsible manner.

## AECOM's commitment

- "Safety for Life" defines AECOM's commitment to achieving zero work-related injuries and / or illnesses; preventing damage to property and the environment; and maintaining an environmentally friendly and sustainable workplace.
- AECOM has adopted "Life Preserving Principles" to help demonstrate the commitment of AECOM's Safety for Life program.

# Proposed Pipelines

- Panhandle Loop: 23 km of new natural gas pipeline which loops – or parallels – the existing 20-inch Panhandle Pipeline located between Enbridge Gas’ Comber Transmission Station, located in the Municipality of Lakeshore, and its Dover Transmission Station, located in the Municipality of Chatham-Kent. The new pipeline will be up to 42-inches in diameter and is proposed to be located adjacent to an existing pipeline.
- Leamington Interconnect: Construction of a new pipeline up to 16 inches in diameter adjacent to or within an existing road allowance on public or private property to connect the existing Leamington North Lines to both the Kingsville East Line and the Leamington North Reinforcement Line. The pipeline will be 12 km in length and would be located in both the Municipality of Lakeshore and Municipality of Leamington.

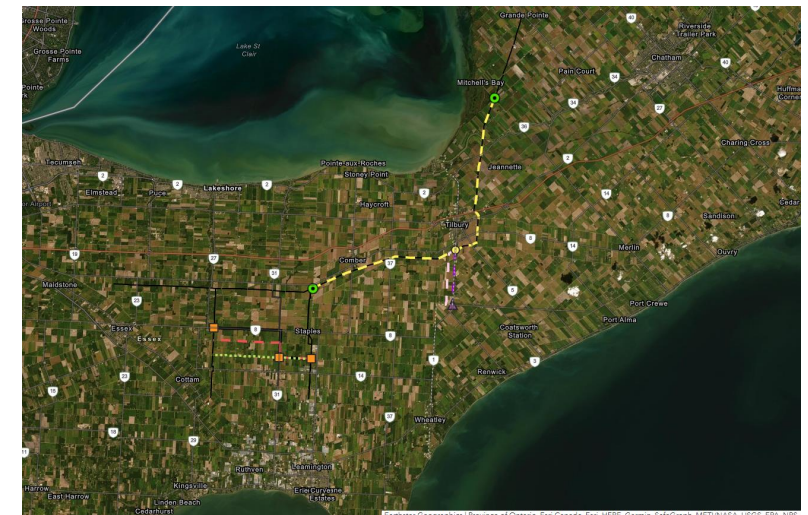


[Click here to view the interactive mapping tool.](#)

# Proposed Pipelines

- **Wheatley Interconnect:** Construction of a new pipeline up to 16 inches in diameter to connect the Tilbury East Valve Site to the Wheatley Road Station on public and private property adjacent to or within an existing road allowance. The pipeline will be 6 km in length and would be located within the Municipality of Chatham-Kent and the Municipality of Lakeshore.
- **Distribution Pipelines:** Enbridge Gas will construct several distribution pipelines connecting new large-volume customers to the Panhandle Transmission System. Design and location of these pipelines is subject to individual customer commitments. Enbridge Gas will share further details on these pipelines at a later date.

If approved by the Ontario Energy Board, construction of the proposed pipelines is planned to begin as early as Spring 2023 and is proposed to be in service by Fall 2023.



[Click here to view the interactive mapping tool.](#)

## **Integrated Resource Planning (IRP)**

- As the energy landscape continues to evolve, there is a growing interest in low-carbon alternatives to meet energy needs.
- IRP is a framework through which Enbridge Gas reviews alternative approaches to meeting energy needs, before building new infrastructure such as:
  - Delivering more energy without adding new pipelines using liquefied or compressed natural gas.
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  - Displacing conventional natural gas with carbon-neutral renewable natural gas and hydrogen.
- As Enbridge Gas continues to lead the transition to a low-carbon future, they are dedicated to exploring IRP alternatives where they are in the best interest of communities, the environment and the company, while considering safety and reliability, cost-effectiveness, optimization, risk management and public policy.



# Environmental Report Process

- The environmental study and Environmental Report will be completed as per the Ontario Energy Board’s ‘Environmental Guidelines for the Location, Construction and Operation of Hydrocarbon Pipelines and Facilities in Ontario (2016).’

## The study will:

- Undertake consultation to understand the views of interested and potentially impacted parties.
- Consult with Indigenous communities to understand interests and potential impacts.
- Be conducted during the earliest phase of the Project.
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- The application to the OEB will include information on the Project including:
  - The need for the Project;
  - Environmental Report and mitigation measures;
  - Facility alternatives;
  - Project costs and economics;
  - Pipeline design and construction;
  - Land requirements; and
  - Consultation with Indigenous communities.



The OEB will then hold a public hearing to review the Project. If the OEB determines that the Project is in the public interest it will approve construction of the Project.

Additional information about the OEB process can be found at: [www.oeb.ca](http://www.oeb.ca)

# Preferred Route Selection Process

The preferred routes will be selected through a five-step process.

## Step 1:

### Develop Routing Parameters

- Establish a study area.
- Establish routing objectives. For example:
  - Follow a reasonably direct path between start and end points.
  - Avoid sensitive environmental and socio-economic features, where possible.
  - Parallel (loop) existing linear infrastructure.
  - Follow existing lot and property lines.
- Create an inventory of environmental and socio-economic features.



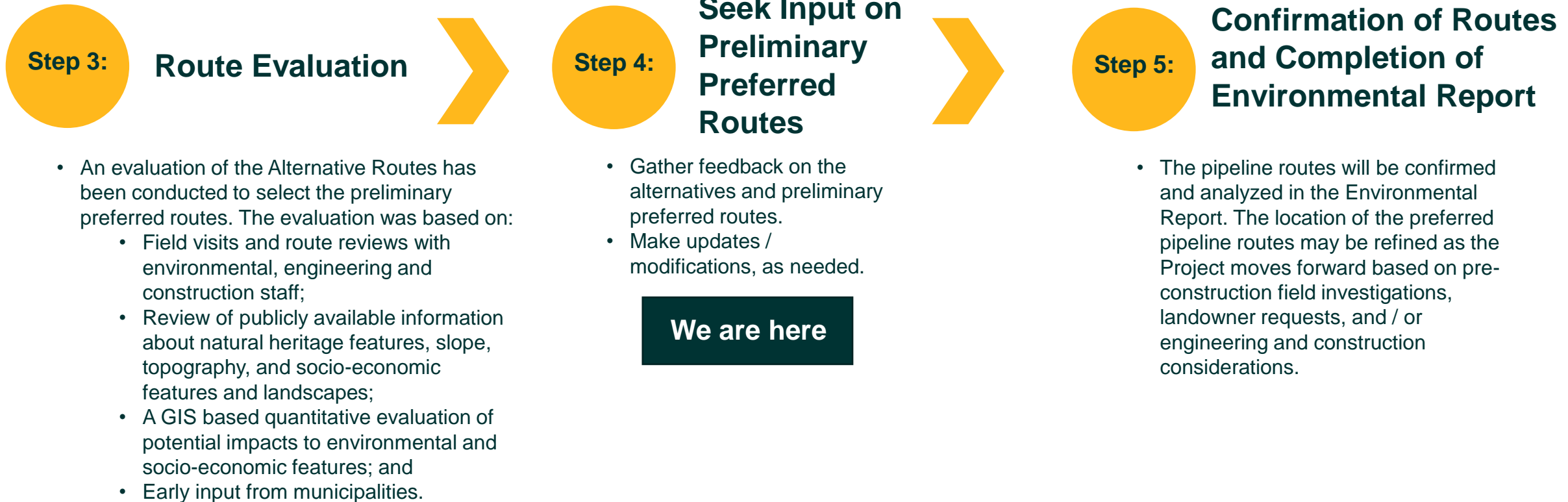
## Step 2:

### Identify Alternative Routes in the Study Area

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

# Preferred Route Selection Process

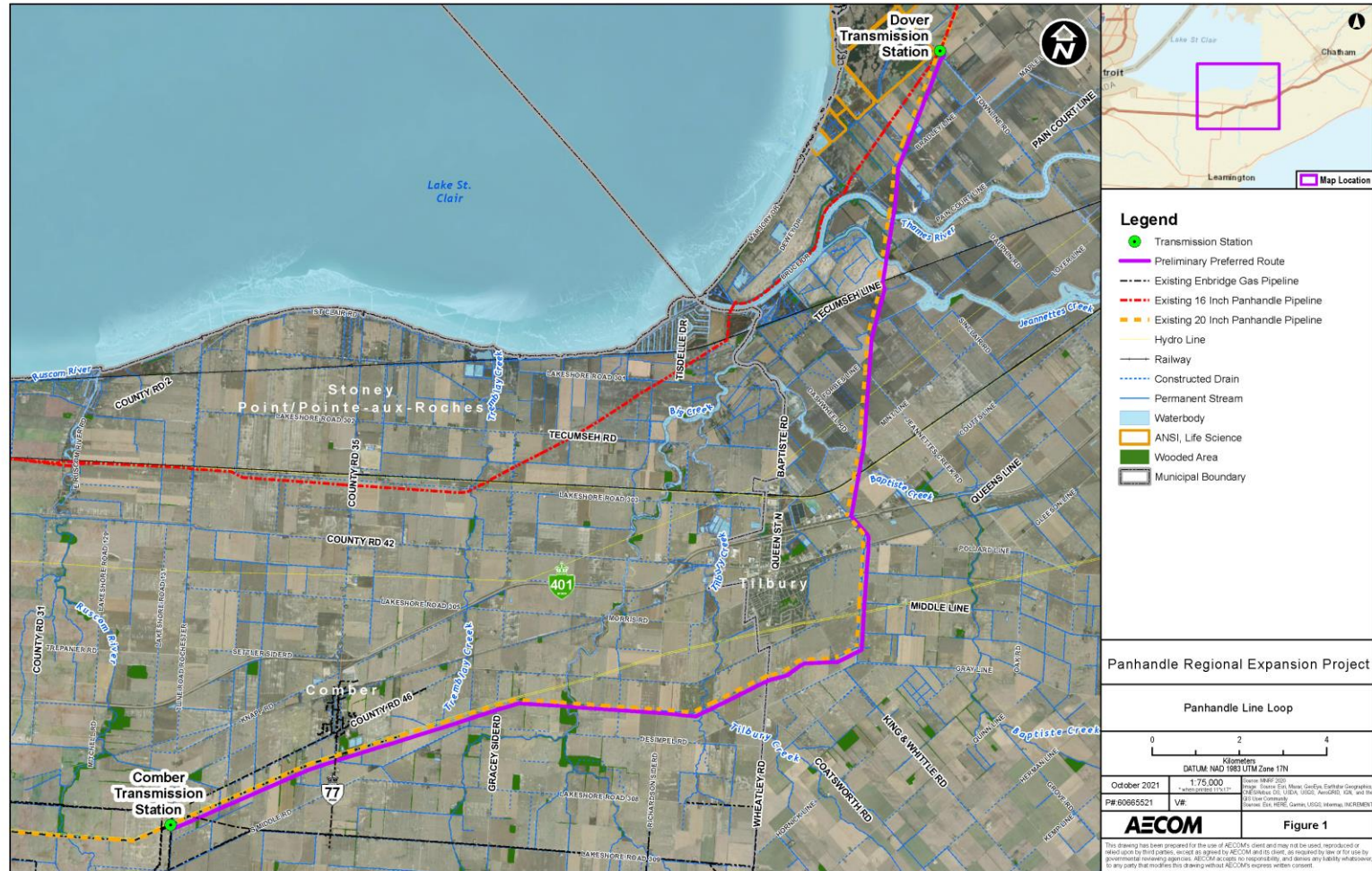
The preferred routes will be selected through a five-step process.





# Panhandle Loop

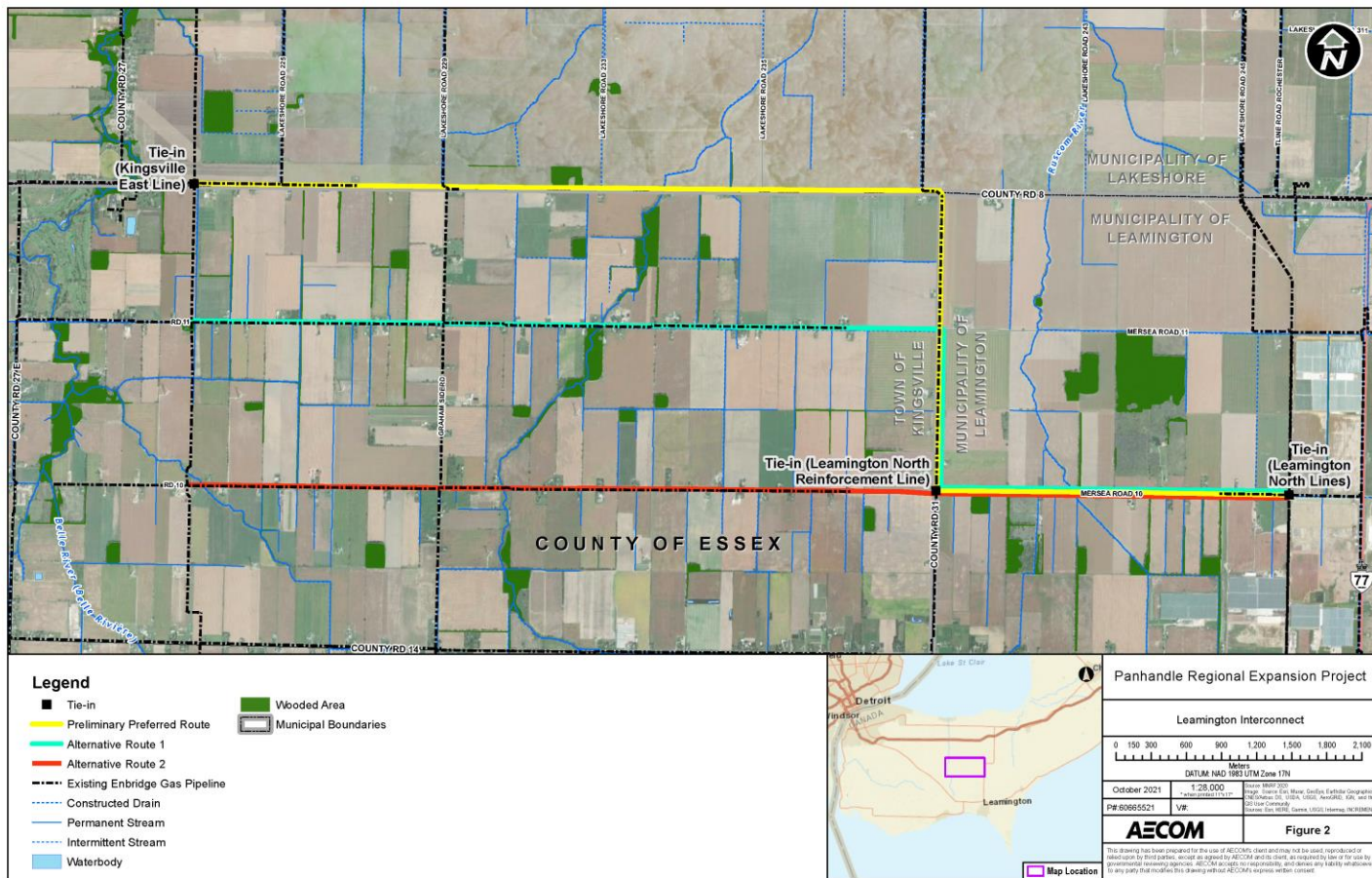
- New natural gas pipeline up to 42 inches in diameter and 23 km in length located adjacent to an existing pipeline.
- Route will loop – or parallel – the existing 20-inch Panhandle Pipeline located between Enbridge Gas' Comber Transmission Station and Dover Transmission Station.
- Key considerations for selecting the preliminary preferred route:
  - The route parallels an existing pipeline right-of-way (RoW).
  - It leverages an existing RoW reducing disturbance to new properties and farms.
  - It is a shorter technically feasible route reducing schedule and cost.
  - Installation of the existing pipeline occurred with no long-term impacts to the environment.
  - The route avoids introduction of new environmental and social impacts to habitats and properties in the area.





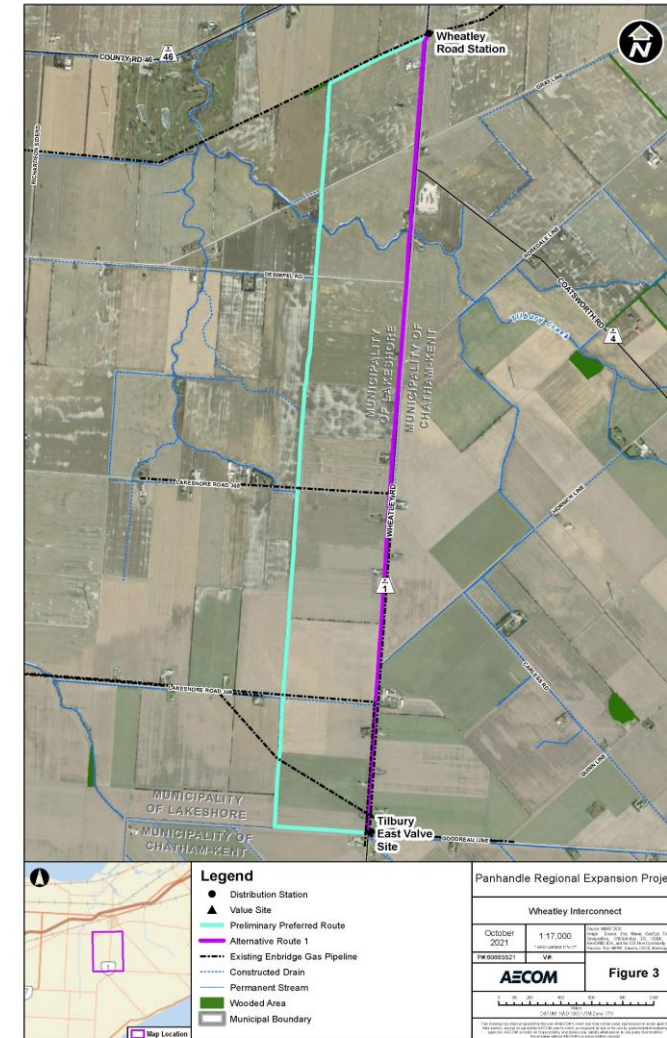
# Leamington Interconnect

- New natural gas pipeline up to 16 inches in diameter and 12 km in length connecting the existing Leamington North Lines to both the Kingsville East Line and the Leamington North Reinforcement Line.
- Located adjacent to or within an existing road allowance on public or private property.
- Key considerations for selecting the preliminary preferred route:
  - The route parallels existing road allowances and utilities.
  - The route offers the most room for construction.
  - It has the least direct impacts to homes, utilities, and farm operations in the area.
  - The slope / topography is flat and there are no deep ditches impacting construction.
  - Route has minimal impacts to woodlots and environmental habitat within the area.



# Wheatley Interconnect

- A new 16-inch natural gas pipeline located adjacent to or within an existing road allowance on public or private property connecting the Tilbury East Valve Site to the Wheatley Road Station.
- Key considerations for selecting the preliminary preferred route:
  - The route parallels existing property boundaries and drainage features, which limits the number of properties impacted during construction.
  - It is located at the back of agricultural fields to avoid impacts to woodlots and hedgerows.
  - The route limits impacts to residential and farm entrances.
  - It avoids the need for lane closures and traffic disruption on Wheatley Road.



# Agricultural Soils and Maintaining Agricultural Drainage Systems

- The Project will be constructed, in part, on agricultural land within the Project study area.

## Potential Effects

- Damaged and severed tile drains.
- Subsoil mixing, compaction, and rutting.
- Loss of organic matter / degraded soil structure.
- Decreased soil quality / agricultural capability.
- Erosion.
- Temporary drainage issues.
- Spread of soil pests / diseases.



## Example Mitigation Measures

- Enbridge Gas will develop and implement a sampling program on agricultural easements along the pipeline route for potential pests and / or diseases that are known to the area, where appropriate.
- The entire outside boundaries of the work space necessary for construction of the Project will be staked at regular intervals.
- Landowners will be contacted prior to construction to confirm the location and type of existing drains. Any future drainage plans will also be discussed.
- Field tile will be temporarily re-routed during pre-construction activities where required to ensure proper drainage during construction.
- Construction activities will be temporarily halted on agricultural lands where excessively wet soil conditions are encountered.
- Damaged and severed drains will be repaired following construction. After repair and prior to backfilling, landowners will be invited to inspect and approve the repair. Any on-going field tile issues resulting from pipeline construction will be addressed by Enbridge Gas as required.
- A post-construction cover crop program will be available to landowners.



## Socio-Economic Considerations

- The Project will be constructed parallel to existing road allowances on private property, agricultural land, land regulated by Hydro One, Lower Thames Valley Conservation Authority and Essex Region Conservation Authority.

## Potential Effects

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



## Example Mitigation Measures

- Access to residences, businesses and farm fields will be maintained during construction.
- Construction will be restricted to daylight hours and adhere to applicable noise by-laws.
- A Traffic Control Plan will be developed if potential disruption to traffic could occur.
- Fencing will be placed at appropriate locations to limit access to the work area.
- A water well monitoring program will be developed.
- Measures will be implemented to control dust during construction.
- Areas cleared for construction will be re-vegetated.
- A designated Enbridge Gas representative will be available prior to and throughout construction.

# Aquatic Resource Considerations

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

## Potential Effects

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

## Example Mitigation Measures

- Conduct surveys for waterbodies to assess potential impacts to aquatic species / habitat.
- Obtain all agency permits and approvals, including development of environmental mitigation measures for site specific habitat / species.
- Limit in-channel construction, where possible, and conform to fish timing window guidelines.
- If in-channel construction is required, protect aquatic species and manage sedimentation and turbidity.
- Restore and seed areas to establish habitat and reduce erosion.
- Replant vegetation along waterways as soon as possible following construction.



## Terrestrial Resource Considerations

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

### Potential Effects

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



### Example Mitigation Measures

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

# Cultural Heritage and Archaeology Considerations

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

## Potential Effects

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



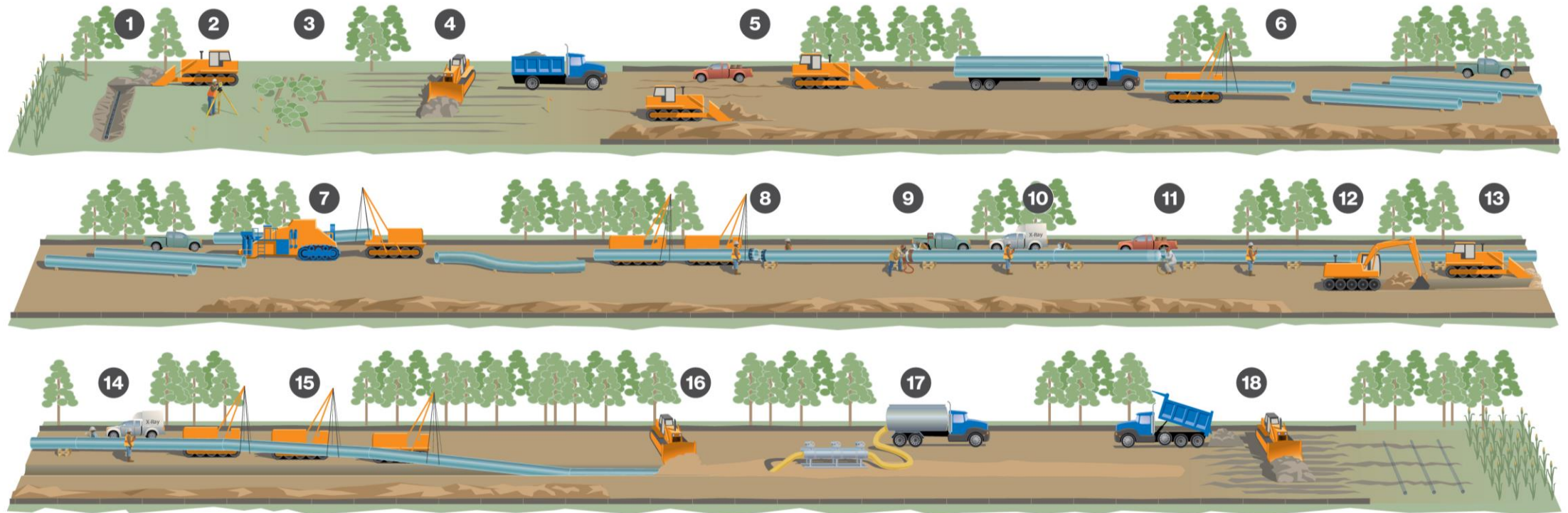
## Example Mitigation Measures

- Complete archaeological assessments of the construction right-of-way, with review and comment from the Ministry of Heritage, Sport, Tourism and Culture Industries (MHSTCI).
- Complete cultural heritage assessments (for built heritage features and cultural heritage landscapes) of the construction right-of-way, with review and comment from MHSTCI.
- Report any previously unknown archaeological, paleontological or historical resources uncovered, or suspected of being uncovered, during excavation.

## **Access and Land Requirements**

- Once a preferred route is selected, an Enbridge Gas Land Agent will begin discussions with landowners for the appropriate land rights necessary for the construction of the pipeline.
- Enbridge Gas is committed to working with all directly affected landowners in anticipation of acquiring early access agreements, where necessary, in order to gather essential information, including but not limited to, land survey data, environmental, archaeological and property site features, along with negotiating the necessary land rights.
- These land rights will consist of permanent easements and / or temporary land rights. The temporary land rights are only required during Project construction activities.
- Enbridge Gas will have a Land Agent available to each landowner during all pipeline construction activities.
- The Land Agent will keep all landowners informed of the progress of the Project and assist with any concerns that may arise as a result of the construction activities.

# General Construction Overview



- |                                   |  |                              |  |  |  |
|-----------------------------------|--|------------------------------|--|--|--|
| <b>1.</b> Pre-construction tiling | <b>4.</b> Right-of-way topsoil stripping | <b>7.</b> Field bending pipe | <b>10.</b> X-ray or ultrasonic inspection, weld repair | <b>13.</b> Padding trench bottom               | <b>16.</b> Backfilling                                   |
| <b>2.</b> Surveying and staking   | <b>5.</b> Front-end grading              | <b>8.</b> Lining-up pipe     | <b>11.</b> Field coating                               | <b>14.</b> Final inspection and coating repair | <b>17.</b> Hydrostatic testing                           |
| <b>3.</b> Clearing                | <b>6.</b> Stringing pipe                 | <b>9.</b> Welding process    | <b>12.</b> Digging the trench                          | <b>15.</b> Lowering pipe                       | <b>18.</b> Site restoration and post-construction tiling |

# General Construction Overview

## Site preparation (1-5)

- Survey and staking crews will delineate project boundaries and install safety fencing, where required.
- The construction team will clear brush and other vegetation to permit construction.
- A grading crew prepares the construction area for access by construction equipment.

## Installing the new pipeline (6-16)

- Once area has been prepped, a hydraulic hoe will excavate the trench, which will then be prepared for the installation of the new pipeline.
- The stringing crew lays pipe on wooden skids or boxes adjacent to trench area.
- The pipe is prepped, welded into continuous lengths and inspected before the pipeline is lowered into the trench. Crews also install pipes under obstacles such as roads or watercourses by directional drilling.

## Finishing construction (17-18):

- The pipeline is tested hydrostatically with water from a suitable local source and is disposed of appropriately. Upon completion, the pipeline is dried, purged of air and prepared for delivery of the product.
- The construction crew backfills the originally excavated subsoil over the pipe in the trench. Any surplus backfill material will be removed from the construction area.
- A clean-up crew is responsible for the restoration of the land. In natural areas, restoration includes re-seeding and removing erosion and sediment controls. In developed areas the clean-up crew undertakes landscaping plans developed for site restoration.

## Next Steps

Enbridge Gas will evaluate the feedback received from the virtual information session, make updates as required and finalize the pipeline route evaluation. The final evaluation will be included in the Environmental Report (ER), which will be completed in early 2022. You will have the opportunity to review and provide feedback on the ER by signing up to receive future Project information.

## Project Schedule





# Thank you!

Thank you for participating in the virtual information session. If you have feedback or comments, please complete the [comment form](#) by December 3, 2021.

**Mark Van der Word**

Senior Environmental Planner

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For more information about the proposed Project, please visit our Project website at:  
[www.virtualengagement.ca/panhandle](http://www.virtualengagement.ca/panhandle)

ENBRIDGE GAS INC.

Undertaking Response to ED

To advise (a) the penalty to be paid if the 58 TJ's per day is cancelled before acceptance of any incremental gas; (b) to advise the NPV of the incremental revenue included in the stage 1 DCF analysis associated with the flow from this incremental power generation demand. If the question cannot be answered, to advise and explain why.

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**Response(s):**

- a) No such penalty is contemplated within the customer's contract as Enbridge Gas has no reason to expect that the customer will not require the incremental firm services sought.
- b) The 58 TJ/day referenced in the initial undertaking has been updated to 89 TJ/day, as per the request at Exhibit I.ED.24. The incremental revenue associated with the 89 TJ/day of power generation has an NPV impact of approximately \$56 million.

/U

ENBRIDGE GAS INC.

Undertaking Response to ED

To provide data for the average peak reduction for industrial customers by 2030 as a percentage of the base case, and if possible, to provide the percentage on a cubic metres per hour, cubic metres per day basis.

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**Response:**

The peak hour reduction (m<sup>3</sup>/hr) for industrial customers by 2030 from Scenario B is approximately 4.2% of the base case peak hour consumption. Posterity's analysis was focused on peak hour reductions, and the values can be converted to m<sup>3</sup>/day using a conversion factor. Because the conversion factor is static, the average peak day reduction percentage (relative to the base case) is the same as the average peak hour reduction percentage. Please see Table 1 below.

Table 1

	<b>2030</b>
Sum of Hourly Peak Consumption (m <sup>3</sup> /hr)	39,730
Sum of Scenario B Hourly Peak Reduction (m <sup>3</sup> /hr)	1,686
<b>Peak Reduction as % of Peak Consumption</b>	<b>4.2%</b>

ENBRIDGE GAS INC.

Undertaking Response to ED

To provide data for the average ratio for residential customers between the achievable annual savings and the achievable peak savings, in relation to cubic metres per hour and cubic metres per day.

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**Response:**

Annual savings and peak hour savings for the residential sector have been provided in Table 1 below. However, it would not be meaningful to calculate a ratio between the two, as the units are not the same. For more clarity on converting annual savings to peak hour savings based on end-use, please see the response to Exhibit I.ED.7 Attachment 4.

Table 1

	<b>2030</b>
Sum of Scenario B Potential Savings (m <sup>3</sup> )	6,725,021
Sum of Scenario B Hourly Peak Reduction (m <sup>3</sup> /hr)	5,335

ENBRIDGE GAS INC.

Undertaking Response to ED

To make best efforts to provide the base case general service space heating demand in 2023 broken down by residential and non-residential, if possible.

---

**Response(s):**

Please see Table 1 below for a breakdown of space heating demand between Residential and Non-Residential.

Table 1

<b>Space Heating Demand</b>	<b>Non-Residential</b>	<b>Residential</b>
Total Consumption (m <sup>3</sup> )	52,589,984	28,223,033
Total Hourly Peak Consumption (m <sup>3</sup> /hr)	44,578	19,350

ENBRIDGE GAS INC.

Undertaking Response to ED

To make best efforts to estimate the diversity in the reduction and overall demand due to diversity of these new customers, based on existing customers

---

**Response:**

The total demand of contracts that have been executed and/or in negotiation set out in the response to Exhibit I.STAFF.24 a), is 131.2 TJ/d. Enbridge Gas is unable to forecast the exact diversity of forecast incremental demand until it is realized due to customer location, equipment type, and actual operation. Diversification for these customer types is not applied to forecast demands due to the potential range in variation. Once the customers are connected to the system, only then are the demands included in the diversification based on actual customer consumption. However, to be responsive and on a best-efforts basis, the Company has applied the updated historical diversification assumptions to the incremental contracts that have been executed and/or in negotiation. Based on these assumptions, the 131.2 TJ/d would be increased to 132 TJ/d which is an increase of approximately 0.8 TJ/d. However, the Company cautions against drawing conclusions based on this estimate, due to the potential variability noted above.

/U

ENBRIDGE GAS INC.

Undertaking Response to OEB STAFF

**Staff Follow-up Question #1**

**Reference:**

Enbridge Gas Response to Interrogatory FRPO.13

**Preamble:**

Enbridge Gas stated in its response to interrogatory FRPO.13: *"If the [Brighton Beach GS (BBGS)] pressure constraint was to be reduced, the new pressure constraint would shift to West Windsor Power Generation ("WWPG"). WWPG is located immediately adjacent to BBGS with the same delivery pressure constraint of 1724 kPag. Many other distribution stations in the City of Windsor near BBGS have similar pressure constraints."*

The responses goes on to say, *"The distribution system downstream of the Leamington North Gate operates at 1,900 kPag"*.

**Questions:**

- a) Are the "many other distribution stations in the City of Windsor near BBGS" that have similar pressure constraints as BBGS driven by customers for which Enbridge Gas has a minimum pressure obligation? Please explain in detail.
- b) Are firm transportation contracts for customers served via the Panhandle System containing minimum pressure obligation restricted to power generation customers?
- c) What is the driver for the distribution system downstream of the Leamington North Gate Station that operates at 1,900 kPag? Is the driver for the operating pressure the size of the distribution pipe downstream of the Leamington North Gate Station or customers minimum pressure requirements? Please explain in detail.
- d) Do all of Enbridge Gas's firm contract customers served by the Panhandle System have a minimum pressure obligation in their transportation contracts.
- e) Enbridge Gas provides contract transportation service to BBGS, East Windsor Cogeneration Centre, West Windsor Power Plant, Windsor-Essex Power Plant plus other large and small-scale gas-fired generators in the Windsor-Essex Region served via the Panhandle System. Enbridge Gas in its response to FRPO.13 indicates that it has a minimum pressure obligation of 1,724 kPag (250 psig) to BBGS and the West Windsor Power Plant. OEB staff understands that gas-fired generation stations using combustion turbines require a turbine inlet natural gas pressure greater than 1,724 kPag.
  - i. What is the range of actual delivery pressure to each of the aforementioned gas-fired generation customers?
  - ii. Which of the gas-fired generators have their own on-site compression capability?

**Response(s):**

- a) Yes. Figure 1 below shows the transmission, distribution and customer stations in the vicinity of Brighton Beach Generation Station (BBGS) which is labelled #1.

Each transmission, distribution or customer station has a minimum pressure that must be maintained by the Panhandle Transmission system into the station for the station to operate as designed and to be able to provide the required pressure to the downstream customer or distribution system served. This is termed the “minimum inlet pressure”.

The minimum inlet pressure must be higher than the station outlet pressure to account for pressure losses through the station equipment.

The stations in the Windsor area near BBGS are shown in Figure 1 as #2 to #11. The minimum inlet pressures of these stations range from 1,670 kPag to 2,206 kPag. The customers with high delivery pressures are shown in yellow squares. The delivery pressure to these customers is based on the customers’ specific equipment requirements.

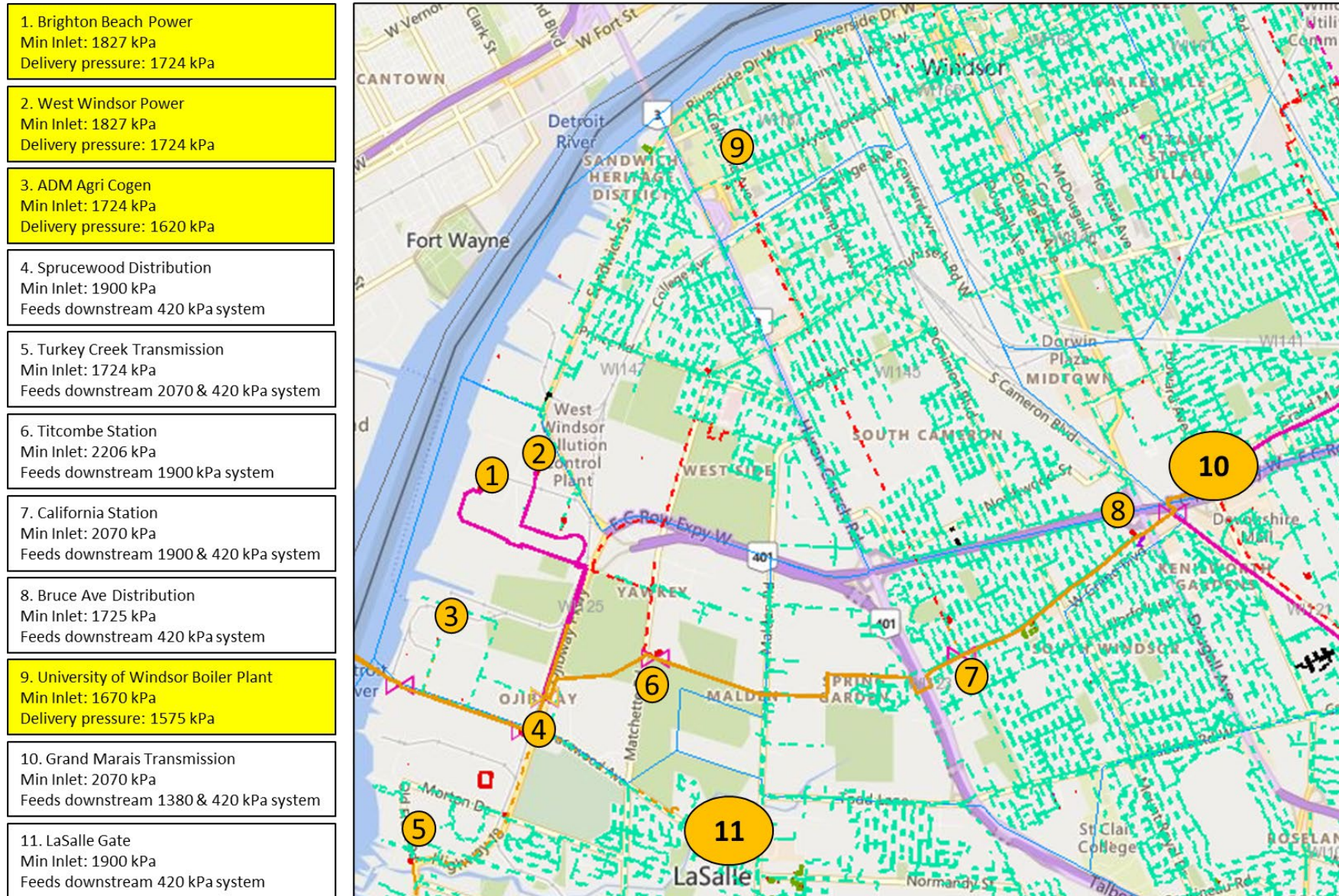
The BBGS, WWPG and ADM Agri Cogen stations are “unregulated” which means there is only measurement at the station and not pressure regulation. Unregulated pressure provides the customer with full line pressure and reduces the minimum inlet pressure to a value as low as possible to maintain the delivery pressure to the customer. There is no capacity gain possible by rebuilding these stations with a lower minimum pressure as the measurement cannot be removed.

The other distribution or transmission stations in the area all have a minimum inlet pressure in a similar range and also feed downstream distribution systems ranging in pressures from 1,380 to 2,070 kPa. The pressure in the NPS 16 Panhandle Line cannot drop below these minimum inlet pressures and maintain station operation and required downstream system pressures to customers.

The constraint itself acts as a measure in the hydraulic modelling to ensure that all other transmission, distribution or customer station (or unregulated customer) minimum inlets are met. This is part of the hydraulic design criteria set out in Exhibit B, Tab 2, Schedule 1, Page 5, where it is stated that Enbridge Gas must operate within flow and minimum inlet pressure constraints at meter and regulating stations and must operate above customers minimum contractual delivery pressures.



Figure 1: Transmission, distribution and customer stations in the vicinity of Brighton Beach Generation Station (BBGS)



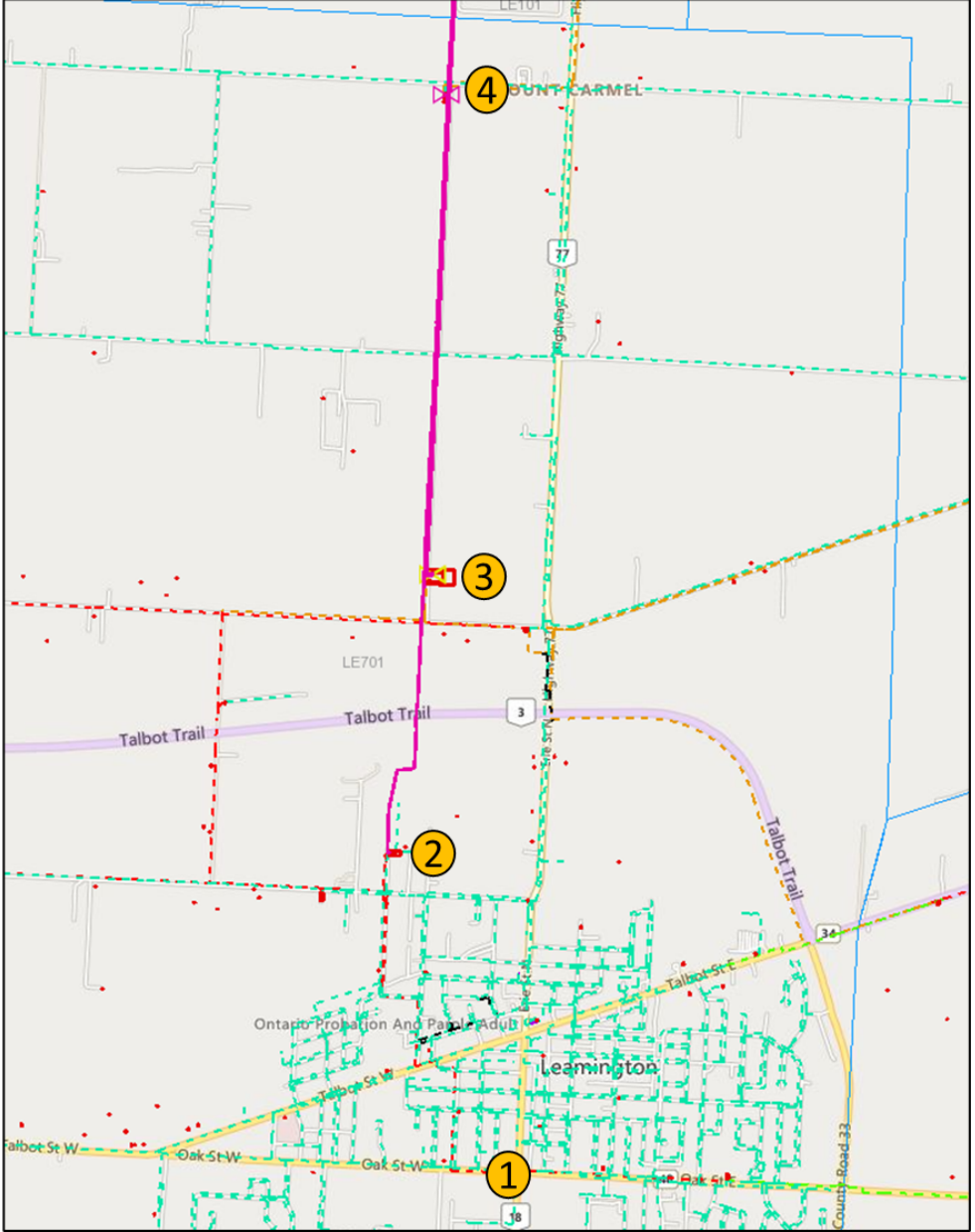
- b) No, minimum delivery pressure obligations are not restricted to power generation customers served via the Panhandle System. All distribution contracts, firm or interruptible, have a minimum delivery pressure obligation stated within the distribution contract parameters. The minimum delivery pressure specified in distribution contracts can vary depending on customer requirements and are not limited to power generation customers.
- c) The driver is both to maintain pressure in the distribution system and to maintain customer minimum pressure requirements. Figure 2 below shows the transmission, distribution and customer stations in the vicinity of the Leamington North Gate Station (labelled as #2). The customers with high delivery pressures are shown in yellow squares. The Leamington North Gate Station regulates pressure from the 6,040 kPa Leamington North Lines to both a 1,900 kPag and 420 kPag distribution network. The downstream 1,900 kPag network serves the Highbury Canco food processing plant at a delivery pressure of 1,550 kPag (labelled as #1 in Figure 2).

The 1,900 kPag distribution system that is downstream of the Leamington North Gate station (#2) is also interconnected with the other Leamington-Kingsville laterals through the County Road 18 Station (#3), Mersea Gate station (not shown in Figure 2), Kingsville East Gate station (not shown in Figure 2) and the Essex Transmission station (not shown in Figure 2).

This 1,900 kPag network makes up the backbone of the greenhouse market growth within this area. To maintain capacity in this 1,900 kPag distribution system and continue to serve the high-pressure customer, the network needs to operate as close to 1,900 kPag as possible. Thus, the regulating stations feeding this system must have a minimum inlet pressure above 1,900 kPag.

Figure 2: Transmission, distribution and customer stations in the vicinity of the Leamington North Gate Station

- 1. Highbury Canco  
Min Inlet: 1600 kPa  
Delivery pressure: 1550 kPa
- 2. Leamington North Gate Station  
Min Inlet: 2275 kPa  
Feeds downstream 1900 & 420 kPa system
- 3. County Road 18 Station  
Min Inlet: 2275 kPa  
Feeds downstream 1900 system
- 4. Conc 6 Station  
Min Inlet: 2550 kPa  
Feeds downstream 1900 system



- d) Yes. All contract rate customers have a minimum delivery pressure specified within their distribution contract parameters. The minimum delivery pressure obligation for each customer varies, depending on the type of customer and the gas-fired equipment they have on site.
- e)
  - i. The available actual range of station inlet pressures for the four major power generators are provided in Table 1 below. The data from 2015 to present was reviewed to determine the actual ranges. The minimum and maximum pressures do not occur on the same day.

Table 1

<b>Power Generator</b>	<b>Actual Measured Minimum Pressure (kPag)</b>	<b>Actual Measured Maximum Pressure (kPag)</b>
Brighton Beach Generating Station	1911.6	2920.4
West Windsor Power Station	1838.8	2162.6
TransAlta Generating Station	2018.5	3676.5
East Windsor Cogen	2003.4	3100.8

- ii. None of the gas-fired generators have shared with Enbridge Gas that they have the ability to run on-site compression.

ENBRIDGE GAS INC.

Undertaking Response to OEB STAFF

**Staff Follow-up Question #2**

**References:**

Enbridge Gas Response to Interrogatory OEB Staff.12  
 EB-2022-0088, Exhibit D, Tab 1, Schedule 1, p. 1

**Preamble:**

A comparison of the project costs for the Panhandle Loop and the Panhandle Reinforcement Project is set out in the below table.

Table 1

Item No .	Description	(a) Current Project Panhandle Loop	(b) Comparison Forecast (2017 PRP) (EB-2016-0186)	(c) Comparison Actual 2017 PRP (EB-2016-0186)	(d) =(a) - (c) Variance to Actual
	<i>Pipeline Diameter Length (km)</i> <i>Pipeline Material</i>	<i>NPS 36</i> <i>19km Steel</i>	<i>NPS 36</i> <i>40km Steel</i>	<i>NPS 36</i> <i>40km Steel</i>	
1	Materials	56,600,000	23,800,000	24,480,000	32,120,000
2	Labour	124,100,000	203,754,000	202,374,000	(78,274,000)
3	Contingency	19,200,000	34,133,000		19,200,000
4	Interest During Construction	3,500,000	2,781,000	1,837,000	1,663,000
5	Total Direct Capital Cost	203,400,000	264,468,000	228,691,000	(25,291,000)
6	Indirect Overheads	43,200,000	-		43,200,000
7	Total Project Cost	246,600,000	264,468,000	228,691,000	17,909,000
8	Total Cost per km	12,979,000	6,612,000	5,717,000	7,262,000
9	Material Cost per km	2,979,000	595,000	612,000	2,367,000
10	Labour, External permitting and land, and Outside Services per km	6,532,000	5,094,000	5,059,000	1,473,000

The proposed project costs for the Dawn to Corunna project are set out in the table below.

Table 2

<u>Item #</u>	<u>Description</u>	<u>Pipeline Costs</u>	<u>Ancillary Costs</u>	<u>Total Costs</u>
1.0	Materials	\$11,800,354	\$36,643,592	\$48,443,946
2.0	Construction & Labour	\$51,310,846	\$28,993,020	\$80,303,866
3.0	External Permitting & Lands	\$15,322,222	\$0	\$15,322,222
4.0	Outside Services	\$19,230,385	\$15,702,325	\$34,932,710
5.0	Direct Overheads	\$1,295,000	\$0	\$1,295,000
6.0	Contingency	\$13,180,351	\$10,816,348	\$23,996,699
7.0	IDC	\$2,093,000	\$0	2,093,000
<b>8.0</b>	<b>Project Cost</b>	<b>\$114,232,158</b>	<b>\$92,155,285</b>	<b>\$206,387,443</b>
9.0	Indirect Overheads & Loadings	\$26,277,051	\$18,085,209	44,362,260
<b>10.0</b>	<b>Total Project Costs</b>	<b>\$140,509,209</b>	<b>\$110,240,494</b>	<b>\$250,749,703</b>

**NOTE:**

The total costs set out in Table 1 include abandonment of the existing seven CCS compressor units K701-K703 and K705-K708 amounting to \$14.5 million.

**Questions:**

- a) Please separate the Panhandle Loop costs into pipeline costs and ancillary costs, as applicable, using the same itemized cost descriptions as in Table 1 to allow for a comparison of only the pipeline costs between the Panhandle Loop and the Dawn to Corunna project.
- b) In response to this question:
  - i. Please provide a table, using the same itemized cost description as in Table 1, separately comparing the pipeline costs between the Panhandle Loop and the Dawn to Corunna project. OEB staff is seeking to compare the material and labour costs per km of the Panhandle Loop and a recent proposed project.
  - ii. Please include a discussion of any material differences between the two projects that would lead to significant cost differences with respect to the pipeline only costs, as applicable.

**Response(s):**

a) & b)

/U

Please see Table 1 at Exhibit E, Tab 1, Schedule 1. Please see the Table 1 below comparing the pipeline costs between the Panhandle Loop and the Dawn to Corunna project.

Table 1: Project Cost Comparison – Pipeline Costs (\$ Millions)

Item No.	Description	(a) Proposed Project Panhandle Loop (EB-2022-0157)	(b) Current Forecast Dawn to Corunna (EB-2022-0086)	(c) = (a) - (b) Variance to Actual
	<b>Pipeline Diameter</b>	<b>NPS 36</b>	<b>NPS 36</b>	
	<b>Length</b>	<b>19 km</b>	<b>20 km</b>	
	<b>Pipeline Material</b>	<b>Steel</b>	<b>Steel</b>	
1	Materials	28.3	26.1	2.2
2	Labour	150.8	123.1	27.7
3	Contingency	13.9	2.6	11.3
4	Interest During	6.4	3.7	2.7
5	<b>Total Direct Capital Cost</b>	<b>199.5</b>	<b>155.5</b>	<b>44.0</b>
6	Indirect Overheads	48.0	33.4	14.6
7	<b>Total Project Cost</b>	<b>247.5</b>	<b>188.9</b>	<b>58.6</b>
8	Total Cost per km	13.0	9.4	3.6
9	Material Cost per km	1.5	1.3	0.2
10	Labour, External permitting and land, and Outside Services per km	7.9	6.2	1.7
11	<b>Total Ancillary Facilities Direct Capital Cost</b>	<b>89.7</b>	<b>127.1</b>	<b>(37.4)</b>
12	Ancillary Facilities Indirect Overheads	20.8	23.3	(2.5)
13	<b>Total Ancillary Facilities Project Cost</b>	<b>110.5</b>	<b>150.4</b>	<b>(39.9)</b>
14	<b>Total Project Cost (Mainline and Ancillary Facilities) \$ Millions</b>	<b>358.0</b>	<b>339.3</b>	<b>18.7</b>

NOTES:

- The proposed Project mainline estimate is inclusive of the Richardson Sideroad end point valve site.
- The proposed Project has a more complex mainline scope with eight (8) trenchless crossings compared to one (1) trenchless crossing for the Dawn to Corunna Replacement Project.
- Reduced contingency for the Dawn to Corunna Replacement Project due to its current stage of development/execution.

Table 1

- ii. Variances in estimated costs per kilometer between the NPS 36 Panhandle Loop and the NPS 36 Dawn to Corunna pipeline are primarily related to labour and contingency costs and can be attributed to the complexity of the Panhandle loop and differences in the timing of estimate development and their respective class level at the time of filing:
- The Panhandle loop has a more complex mainline scope with eight (8) trenchless crossings compared to one (1) trenchless crossing for the Dawn to Corunna project.
  - The Panhandle loop mainline estimate is inclusive of the Richardson sideroad end point valve site.
  - The cost estimate for Dawn to Corunna was completed in Q2 2023 just before commencing construction and with executed contracts, requiring less contingency. The cost estimate for the Panhandle Loop was completed in Q2 2023, one year before the construction start date, using a contingency that accounts for uncertainty in contracts and market conditions.



ENBRIDGE GAS INC.

Undertaking Response to OEB STAFF

**Staff Follow-up Question #3**

**References:**

Enbridge Gas Response to Interrogatory OEB Staff.15 (c) Enbridge Gas Response to Interrogatory ED.14 (a) Exhibit E, Tab 1, Schedule 1, p. 7

**Preamble:**

Enbridge Gas noted that the natural gas price of \$0.14/m<sup>3</sup> used in the Stage 2 DCF analysis is the 2021 average effective price determined using the posted effective price on the OEB's website.

Enbridge Gas noted that the Stage 2 NPV energy cost savings are estimated to be in the range of approximately \$214 million over a period of 20 years to \$335 million over 40 years.

**Question:**

Please advise whether the Stage 2 NPV energy cost savings would be in the range of approximately \$182 million over a period of 20 years to \$284 million over 40 years if the 2022 average effective price (\$0.26/m<sup>3</sup>) was used in the analysis instead. If this is not correct, please provide the correct NPV energy cost savings using the 2022 average effective price for natural gas.

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**Response(s):**

Enbridge Gas cannot confirm the updated Stage 2 NPV energy cost savings would be in the range of approximately \$182 million over 20 years to \$284 million over 40 years if the 2022 average effective price of natural gas of \$0.26/m<sup>3</sup> was used. The Stage 2 NPV energy cost savings results would be in the range of \$237 million over 20 years to \$370 million over 40 years. However, this scenario does not align with the prices used for the alternative fuels. As noted in Exhibit E, Tab 1, Schedule 6, the alternative fuel prices are the average posted prices for the 12 month period ending March 2023.

/U

ENBRIDGE GAS INC.

Undertaking Response to Middle Road Farms Limited (Courey Corporation)

To advise a calculated figure for pressure drop in the existing pipeline between Wheatley Road and Richardson Sideroad.

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**Response(s):**

Please refer to Table 1 and Figure 1 below.

/U

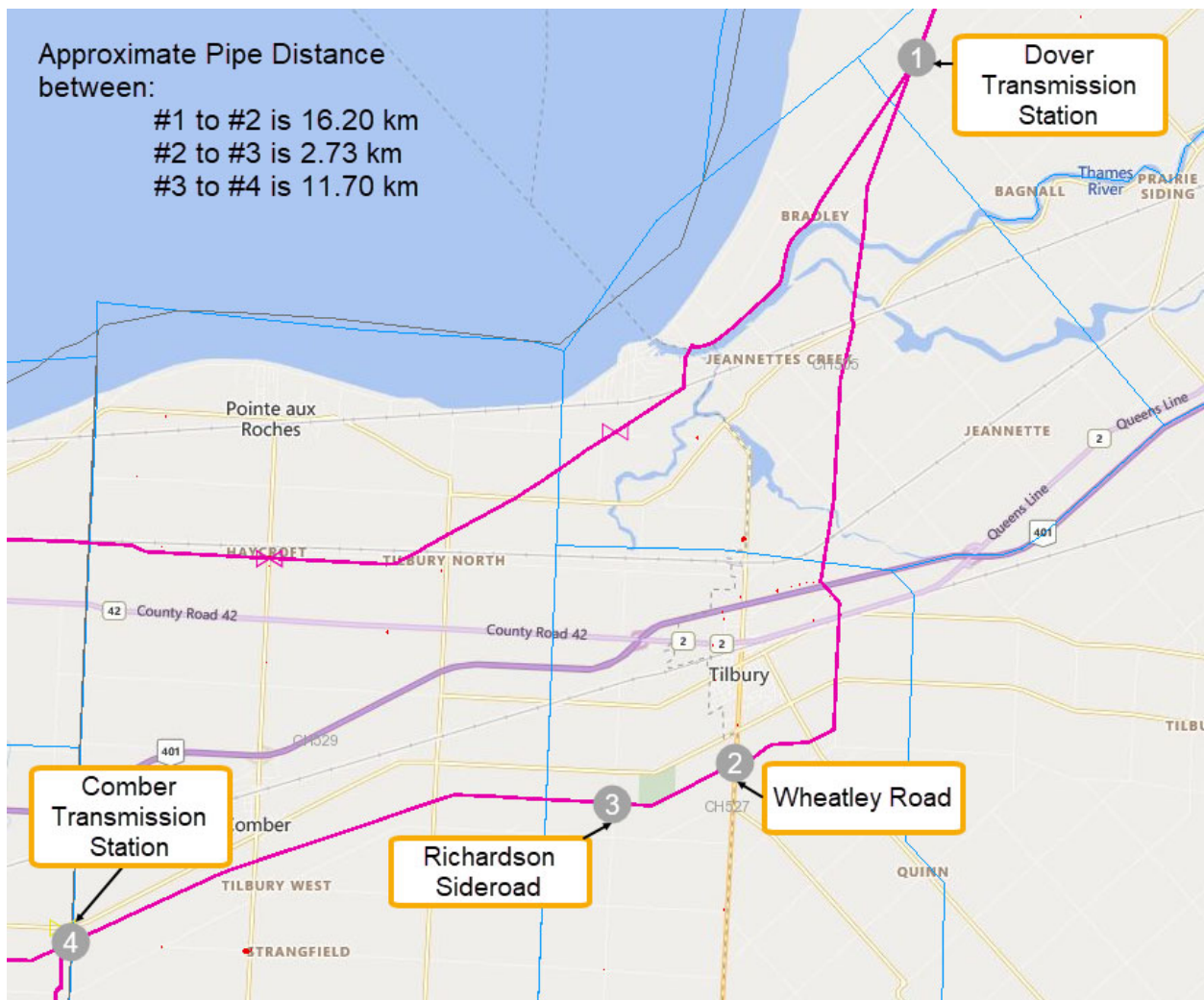
Since the year of interest was not specified in the request, results from two winters were provided: Winter 2021/2022 and 2024/2025 (which is the first year where incremental capacity is needed).

Please note that the Panhandle System's minimum inlet pressure at the Brighton Beach Power Generation station and at Leamington North Gate Station cannot be maintained under the Winter 2024/2025 scenario in Table 1. This information is shown in more detail at Exhibit B, Tab 2, Schedule 1, Attachment 1.

Table 1: Pressure Drop between Dover Transmission and Comber Transmission Stations without the Proposed Project

Winter Year	Pressure Drop from Location to Location (kPag)		
	Dover Transmission to Wheatley Road [#1 to #2]	Wheatley Road to Richardson Sideroad [#2 to #3]	Richardson Sideroad to Comber Transmission [#3 to #4]
Winter 2021/2022	728	134	627
Winter 2024/2025	1270	254	1342

Figure 1: Map of Station Locations Provided in Table 1



ENBRIDGE GAS INC.

Undertaking Response to Middle Road Farms Limited (Courey Corporation)

To produce data showing pressures at Wheatley Road now, and the pressure drop that would be experienced at Richardson Sideroad without this extension past Wheatley Road

**Response(s):**

Table 1 below shows the minimum pressure at Dover Transmission, Wheatley Road, Richardson Sideroad and Comber Transmission along the existing NPS 20 Panhandle Line. /U

Table 2 below shows the pressure drop between the same key points between Dover Transmission and Comber Transmission. Please refer to Figure 1 in the response at Exhibit JT2.9 for a visual representation of the locations.

Tables 1 and 2 include the pressure and pressure drop from:

- a) The current Winter 2021/2022 without the proposed Project.
- b) The future Winter 2028/2029, with an NPS 36 Panhandle Loop terminated at Wheatley Road instead of Richardson Sideroad.

Shortening the NPS 36 Panhandle loop of the existing NPS 20 Panhandle Line to Wheatley Road does not provide enough capacity to serve the 5-year demand forecast through Winter 2028/2029. Ending the NPS 36 Panhandle loop at Wheatley Road decreases the proposed Project's capacity by 26 TJ/d.

Table 1: Minimum pressure at Wheatley Road and Richardson Sideroad along NPS 20 Panhandle Line

<b>Project to Wheatley Road Only</b>		<b>Pressure (kPag)</b>	
		<i>Wheatley Road</i>	<i>Richardson Sideroad</i>
	<b>Winter Year</b>		
Current System	Winter 21/22	5135	5001
Year 5 of Project	Winter 28/29	5739	5443

Table 2: Pressure drop between Wheatley Road and Richardson Sideroad

<b>Project to Wheatley Only</b>		<b>Pressure Drop from Location to Location (kPag)</b>
<b>Winter Year</b>		<i>Wheatley Road to Richardson Sideroad [#2 to #3]</i>
Current System	Winter 21/22	134
Year 5 of Project	Winter 28/29	296

ENBRIDGE GAS INC.

Undertaking Response to Middle Road Farms Limited (Courey Corporation)

To provide a table showing pressures and flows for a typical summer day for the 2025-26 operating year, for a typical winter day for the same period, and the peak design day.

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**Response(s):**

Table 1 provides the flow and minimum pressure results at the Dawn Compressor Station, Dover Transmission Station, Wheatley Road, Richardson Sideroad and Comber Transmission Station for a typical day in Summer 2026, typical winter day in 2025/2026, and Design Day for Winter 2025/2026 for each of the following scenarios:

- Existing System (without the Proposed Project)
- System with the Proposed Project

Please see Figure 1 in the response to Exhibit JT2.9 for a visual representation of the area.

It is important to note there are no stations, direct connected customers, or take-offs to any downstream distribution system between Dover Transmission Station and Comber Transmission Station. The NPS 20 Panhandle Line between Dover Transmission and Comber Transmission stations delivers natural gas to customers at and west of Comber Transmission Station in the Windsor and Leamington Kingsville markets.

**Table 1: Flow and Minimum Pressure for the Existing System and with the Proposed Project for Winter 2025/2026 and Summer 2026**

	Existing System		System with Proposed Project	
	Flow (10 <sup>3</sup> m <sup>3</sup> /d)	Pressure (kPag)	Flow (10 <sup>3</sup> m <sup>3</sup> /d)	Pressure (kPag)
<b>Typical Summer Day (Summer 2026)</b>				
Dawn Compressor Station	7703	4827	7703	4827
Dover Transmission Station (to NPS 20)	3813	4783	3813	4783
Wheatley Road	3813	4619	3813	4776
Richardson Side Road	3813	4591	3813	4774
Comber Transmission Station	3813	4468	3813	4655
<b>Typical Winter Day (Winter 2025/2026)</b>				
Dawn Compressor Station	15858	5971	15858	6040
Dover Transmission Station (to NPS 20)	10197	5833	10197	5897
Wheatley Road	10197	4888	10197	5865
Richardson Side Road	10197	4710	10197	5860
Comber Transmission Station	10197	3843	10197	5176
<b>Design Day (Winter 2025/2026)</b>				
Dawn Compressor Station	Pressures are too low; the model will not solve with only the existing infrastructure.		19428	6040
Dover Transmission Station (to NPS 20)			13088	5820
Wheatley Road			13088	5769
Richardson Side Road			13088	5760
Comber Transmission Station			13088	4559

ENBRIDGE GAS INC.

Undertaking Response to Middle Road Farms Limited (Courey Corporation)

To provide a table showing pressures and flows at the three locations of Dawn, Wheatley Road, and comber transmission for summer day, winter day, and peak design day.

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**Response(s):**

Table 1 below summarizes the minimum system pressures and flows at Dawn Compressor Station, Dover Transmission Station, Wheatley Road, Richardson Sideroad and Comber Transmission Station for each typical summer day in 2026, a typical winter day in 2025/2026, and Design Day for winter 2025/2026. /U

“Existing Pipeline” refers to the current system without any reinforcement, and “New Pipeline” refers to the NPS 36 Loop from Dover Transmission to Wheatley Road instead of Richardson Sideroad (2.72 km shorter than the proposed Project).

It is important to note there are no stations, direct connected customers, or take-offs to any downstream distribution system between Dover Transmission Station and Comber Transmission Station. The NPS 20 Panhandle Line between Dover Transmission and Comber Transmission stations delivers natural gas to customers at and west of Comber Transmission Station in the Windsor and Leamington Kingsville markets.

As shown in the two scenarios below, looping from Dover Transmission to Wheatley Road reduces pressure drop between Dover Transmission to Wheatley Road. The un-looped sections of the NPS 20 Panhandle Line maintain higher pressure drop including the segments from Wheatley Road to Richardson Sideroad, and subsequently to Comber Transmission.

When results from Table 1 are compared to the results detailed within Exhibit JT2.11, Table 1 (ending the loop at Richardson Sideroad), terminating the loop at Richardson Sideroad reduces the pressure drop from 252 kPag to 9 kPag, bringing additional pressure to Comber Transmission to serve downstream markets.

Furthermore, as shown in Exhibit JT2.10 Table 3, looping from Dover Transmission to Richardson Sideroad compared to terminating at Wheatley Road, provides an incremental 26 TJ/d of system capacity and can serve the minimum 5-year shortfall of 156 TJ/d.



Table 1: Showing minimum pressures and flows of the existing pipeline system to the Proposed Project but ending the NPS 36 loop at Wheatley Road, with 2025/2026 forecast demands

<b><u>Demands from 2025/2026</u></b>	Existing Pipeline		New Pipeline <i>(Loop ending at Wheatley Road)</i>	
	Flow (km <sup>3</sup> /d)	Pressure (kPag)	Flow (km <sup>3</sup> /d)	Pressure (kPag)
<b>Typical Summer Day (Summer 2026)</b>				
Dawn Compressor Station	7703	4827	7703	4827
Dover Transmission to Leamington	3813	4783	3813	4783
Wheatley Road	3813	4619	3813	4776
Richardson Side Road	3813	4591	3813	4748
Comber Transmission Station	3813	4468	3813	4628
<b>Typical Winter Day (Winter 2025/2026)</b>				
Dawn Compressor Station	15858	5971	15858	6040
Dover Transmission to Leamington	10197	5833	10197	5897
Wheatley Road	10197	4888	10197	5866
Richardson Side Road	10197	4710	10197	5716
Comber Transmission Station	10197	3843	10197	5014
<b>Design Day (Winter 2025/2026)</b>				
Dawn Compressor Station	Pressures are too low; the model will not solve with only the existing infrastructure.		19428	6040
Dover Transmission to Leamington			13088	5822
Wheatley Road			13088	5772
Richardson Side Road			13088	5520
Comber Transmission Station			13088	4258

ENBRIDGE GAS INC.

Undertaking Response to Middle Road Farms Limited (Courey Corporation)

To identify the equipment that would be located at that location and why it required 100 by 100 metres

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**Response(s):**

This land will be primarily used for the safe operation and maintenance of Enbridge Gas pipelines and will connect the new NPS 36 pipeline to the existing NPS 20 pipeline. The following items will be installed at the site:

- A launcher/receiver to allow for in-line inspection of the NPS 36 pipeline;
- Valves, operators, piping and electrical controls to allow for remote operation and monitoring of the valve site while improving safe operation of the Panhandle System;
- A building to house electrical controls with a backup generator;
- Access roads to allow for safe access and egress at the site for operational support vehicles, equipment and/or personnel; and,
- Fencing around the perimeter of the area.

Additional items may be installed as necessary. The proposed dimensions provide the necessary space to house on-site equipment, and for their safe access.

ENBRIDGE GAS INC.

Undertaking Response to Middle Road Farms Limited (Courey Corporation)

To confirm plans regarding the wind break of trees on the edge of the property, next to Richardson Sideroad, both for the tie-in station and the mobilization yard, and whether a grave stand hard pad is required.

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**Response(s):**

Tree removal from the windbreak along Richardson Sideroad will be necessary but will be limited to the two areas required to provide access to the proposed valve site and mobilization yard. Each access area will be approximately 12 metres in width and Enbridge Gas is committed to working with the landowner on tree replacement.

A gravel pad is not required for the mobilization yard.

ENBRIDGE GAS INC.

Undertaking Response to Middle Road Farms Limited (Courey Corporation)

To explain methodology to allow Enbridge to function on a 200-metre north-south dimension and either 150 or 100 east-west dimension, bisected by a four-foot-deep ditch.

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**Response(s):**

Temporary land use is typically planned along proposed construction routes to safely prepare, load, and unload required mechanical equipment outside of the active construction areas.

The specific area proposed at the property is directly in line with the anticipated pipeline installation easement and allows for construction supplies and equipment to be staged or stored for access and use along the pipeline construction route.

The ditch referenced lies between the proposed station and the pipeline construction. Access for the station construction would be typically from the north side of the ditch from a newly installed road access if approved by municipal officials. Access for pipeline construction would be from south side of the ditch.

ENBRIDGE GAS INC.

Undertaking Response to Middle Road Farms Limited (Courey Corporation)

To advise Enbridge policy of changing its approach when a small parcel of land is unusually destroyed.

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**Response(s):**

Enbridge Gas does not have a formal policy in place governing its approach to the acquisition of land. Acquisition of land is evaluated on a case-by-case basis specific to each project.

Enbridge Gas is not aware of any recent instances where project construction has caused a parcel of land to be “unusually destroyed”.

Enbridge Gas values its relationships with landowners and seeks to avoid and/or mitigate the impacts of construction on stakeholders, lands and the environment. Where property is damaged, or landowners incur losses as a result of project construction the Company is committed to working directly with landowners to address their concerns, make reparations and/or compensate them as may be appropriate.