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Enbridge Gas Inc.
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VIA EMAIL, RESS and COURIER

December 18, 2019

Christine Long
 Board Secretary
 Ontario Energy Board
 2300 Yonge Street, 27th Floor
 Toronto, ON M4P 1E4

**Re: EB-2019-0172 Enbridge Gas Inc. (“Enbridge Gas”) – Windsor Line
 Replacement Project
 Undertaking Responses and Technical Conference Transcript Corrections**

Dear Ms. Long:

Please find enclosed responses to the undertakings received in the Technical Conference held on December 5, 2019 in the above noted proceeding.

Further, Enbridge Gas has reviewed the Technical Conference transcript and notes there are two substantive corrections to be made:

| As Shown | Correction |
|--|---|
| Page 72, Lines 4-5: “Most of this pipeline is agricultural, so there would be historically <u>corrosion</u> over this pipeline.” | Page 72, Lines 4-5: “Most of this pipeline is agricultural, so there would be historically <u>erosion</u> over this pipeline” |
| Page 91, Lines 12-13: “I believe we would state that it is <u>inadequately</u> protected.” | Page 91, Lines 12-13: “I believe we would state that it is <u>adequately</u> protected”. |

The responses will be filed electronically through the Board’s RESS and copies will be sent to the Board.

Please contact the undersigned if you have any questions.

Yours truly,

(Original Signed)

Vanessa Innis
 Manager, Regulatory Applications & Strategy

cc: Guri Pannu, Sr. Legal Counsel
 EB-2019-0172 Intervenors

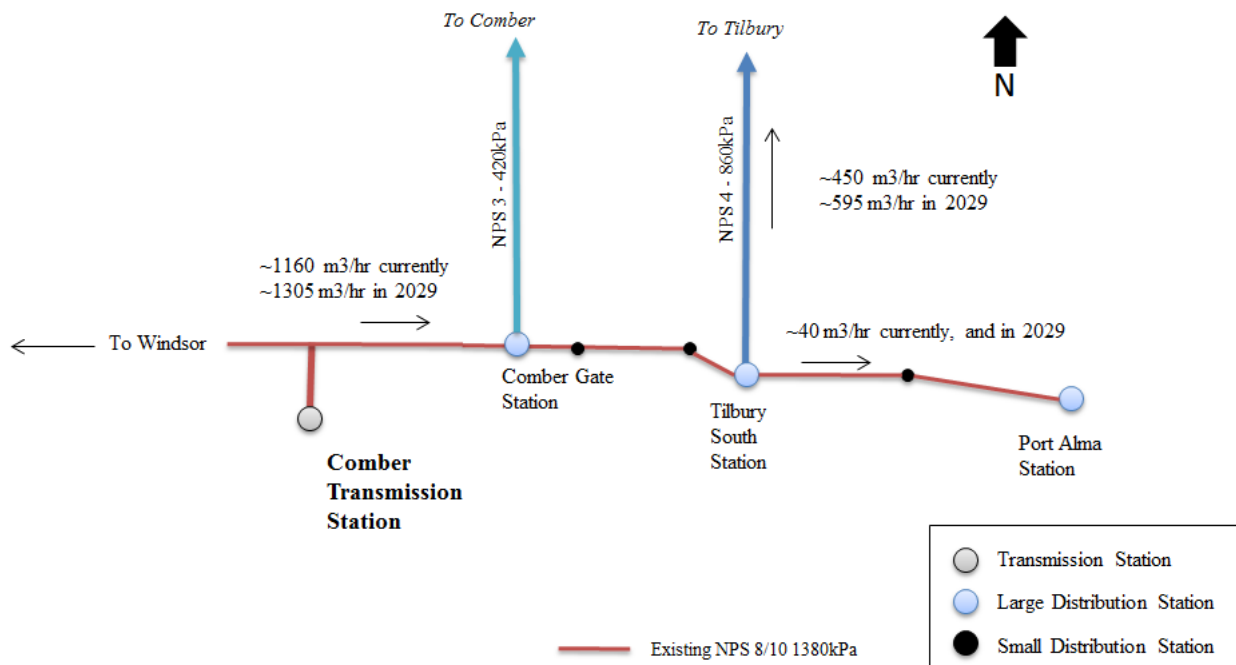
ENBRIDGE GAS INC.

Undertaking Response to FRPO

To provide a specific number for amount of growth forecasted for design day flow for 2029.

Response:

Please see schematic below. The forecast growth east of the Comber Transmission Station is approximately 145 m³/hr. The forecast growth was assumed to be in the Tilbury area. The current and forecast 2029 flows are shown below.



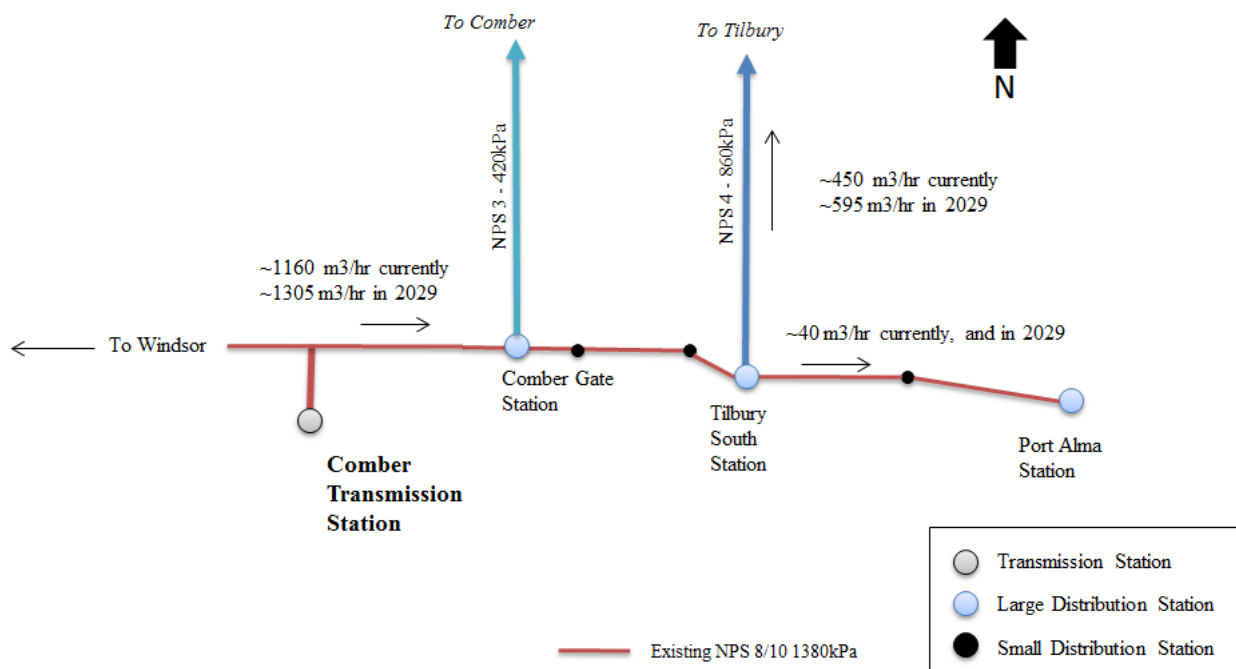
ENBRIDGE GAS INC.

Undertaking Response to FRPO

To provide load currently and in 2029 for transmission flow east of tilbury south station, and to include additional growth from tilbury south station.

Response:

Please see the schematic below. The current and forecasted 2029 flows are shown east of Comber Transmission Station. The schematic also shows the flows east of Tilbury South Station on the Windsor Line, and downstream of Tilbury South Station toward Tilbury. It should also be noted that the forecasted growth in this area was assumed to be in Tilbury.



ENBRIDGE GAS INC.

Undertaking Response to FRPO

To provide an evidence citation for anticipated additional unforecasted growth that is not in attachment 2.

Response:

The issue of a lack of capacity for unforecasted growth is mentioned in the response to Exhibit I.FRPO.15. Enbridge Gas quantified unforecasted demand inquiries in response to Exhibit KT1.5 part b). In addition, Scenarios 2 and 3 in Exhibit KT1.2 show that NPS 4 and 2 piping will restrict capacity for future unforecasted growth, as well as operational and emergency flexibility.

ENBRIDGE GAS INC.

Undertaking Response to FRPO

With reference to the list of projects in KT1.4, attachment 1 and 2, to advise whether these were new pipe or replacement pipe.

Response:

Exhibit KT1.4, Attachments 1 and 2 are specific to the Creekford Road Reinforcement Pipeline Project (EB-2009-0061). This project involved the construction of a new 4.5 km section of NPS 6 pipeline.

ENBRIDGE GAS INC.

Undertaking Response to FRPO

To confirm that it is \$.52 million per Kilometre for the Creekford Reinforcement project.

Response:

Confirmed. As shown in Exhibit KT1.4 Attachment 2 (post construction financial report) the actual cost of the Creekford Road Pipeline Reinforcement Project was \$2,349,732. These costs are specific to the installation of 4.5 km of NPS 6 pipeline for this project. The unit cost per km for the project was approximately \$0.52 million.

ENBRIDGE GAS INC.

Undertaking Response to FRPO

With reference to the project in EB-2010-0329, to advise whether it was new pipe or replacement pipe.

Response:

The project referenced as EB-2010-0329 is the Trenton Area Reinforcement Project. This project involved the construction of approximately 11.7 km of NPS 6 and 1.2 km of NPS 8 natural gas steel pipe. As detailed in pre-filed evidence, the project was a reinforcement project that involved the installation of new facilities (pipe and stations).

For added clarity, the pre-filed evidence as well as response to Board Staff interrogatory #3 filed in EB-2010-0329 shows the estimated costs of the project construction to be \$8.29 million. This total includes the Schedule 6 total of \$5.35 million (pipe)¹ and the Schedule 7 total of \$2.94 million (stations).

The amount recorded in the project's post construction financial report (Condition 1.5) as filed with the OEB on December 19, 2012 was \$6.89 million. This resulted in a variance of \$1.40 million between estimated and actual project cost totals. (Note: the post-construction financial report for the Trenton Area Reinforcement Project was also filed as Attachment 4 to KT1.4).

¹ Schedule 6 (pipe) filed as Attachment 3 to KT1.4. Schedule 7 (stations) was not included as an attachment to the response to KT1.4.

ENBRIDGE GAS INC.

Undertaking Response to FRPO

With reference to the bottom of Attachment 4, to confirm a unit cost of \$.52 million per Kilometre.

Response:

As noted in the response to Exhibit JT1.6, Attachment 4 to Exhibit KT1.4 is the post-construction financial report for the Trenton Area Reinforcement Proceeding.

The actual project cost total was \$6.89 million. The project involved the installation of 12.9 km of pipe (11.7 km NPS 6 and 1.2 km NPS 8). Based on the total length, the unit cost per km of the project was approximately \$0.53 million.

ENBRIDGE GAS INC.

Undertaking Response to FRPO

With reference to the same project, to confirm the unit cost, the size of the pipe, and the length.

Response:

The Milverton Rostock Wartburg Community Expansion Project (EB-2015-0179) consisted of 47.4 km of new piping. Of this total, 20.5 km of NPS 4 steel piping was installed. The remaining length of pipe installed (26.9 km) was plastic - 4.1 km of NPS 4 and 22.8 km of NPS 2.

The total estimated capital cost of the project (Year 1) is \$5.03 million. As shown at Exhibit KT1.4 Attachment 5, p. 2, this total includes all capital costs associated with the project.

For the purpose of this response, Enbridge Gas has calculated the unit cost per km for this project based on the 20.5 km of NPS 4 steel pipe. The estimated cost to construct this section of pipe was \$3.29 million which equates to a unit cost per km of approximately \$0.16 million.

ENBRIDGE GAS INC.

Undertaking Response to FRPO

To advise whether there were any other 2, 4, or 6 inch project in that time frame.

Response:

In addition to the projects provided in response to Exhibit KT1.4, FRPO requested that Enbridge Gas look for more examples of NPS 2, 4 or 6 steel pipeline projects.

Although Enbridge Gas found no further examples where it filed NPS 2, 4, or 6 steel pipeline projects with the OEB in the past five years, as noted below it is able to provide an average unit cost to install these sizes of steel pipeline in the Windsor Region over the past five years. This type of work involves new general infill expansion as well as enhancements to existing pipelines such as small replacements.

The averages include:

- NPS 2 – unit cost to install \$624 per metre with an average project length of 144 metres;
- NPS 4 – unit cost to install \$725 per metre with average project length of 555 metres; and,
- NPS 6 – unit cost to install \$720 per metre with average project length of 2,095 metres.

Based on the lengths and overall scope (e.g., mobilization/de-mobilization, temporary yard for operations related to construction) of the averages listed above, these are not a suitable comparator to the Windsor Line Replacement Project.

ENBRIDGE GAS INC.

Undertaking Response to FRPO

To provide the unit cost for the Windsor project.

Response:

The costing detail provided for the three projects identified in response to Exhibit KT1.4 does not include indirect overheads. As shown at Exhibit I.EP.3, Attachment 1, the total estimated cost of the Windsor Replacement Project without indirect overheads is \$92.7 million.

Further shown in Exhibit I.EP.3, Attachment 1, the total cost of the mainline section of the Windsor Replacement Project is \$89.1 million (including indirect overheads) and \$77.4 million (without indirect overheads).

The mainline section of the project includes the installation of 64 km of NPS 6 steel pipeline at a cost of \$77.4 million. The unit cost per km for the mainline portion of the Windsor Replacement Project is approximately \$1.21 million.

ENBRIDGE GAS INC.

Undertaking Response to FRPO

To confirm whether the three projects referred to are representative of steel high-pressure rural projects.

Response:

The three projects are:

- i) Creekford Road Reinforcement Project (EB-2009-0061) – Purpose of this project was to increase capacity of the existing high-pressure pipeline system located in the former Township of Kingston. The project involved installing 4.5 km of NPS 6 steel pipe primarily along existing road allowances.
- ii) Trenton Area Reinforcement Project (EB-2010-0329) – Purpose of this project was to meet additional natural gas service from the Department of National Defense and to manage the security of supply to Canadian Forces Base Trenton. The project involved installing approximately 4.5 km of NPS 6 pipeline with a MOP of 3450 kPa; 1.2 km of NPS 8 pipeline with a MOP of 1210 kPa; and, 7.2 km of NPS 6 pipeline with a MOP of 1210 kPa, for a total of 12.9 km of piping. This piping was installed in the City of Quinte West.
- iii) Milverton Rostock Wartburg Community Expansion Project (EB-2015-0179) – Purpose of this project was to meet the demands for natural gas in this area. As stated in pre-filed evidence, “The NPS 4 steel pipeline will go north within the road allowance of County of Perth Road and Perth East Township Road 130 for approximately 17 km. The pipeline will travel northwest approximately 4 km within the road allowance of County Road 119 and 131 to the Community of Milverton. At the south end of Milverton there will be a Distribution Regulating station installed to reduce the pressure of the pipeline. Distribution Regulating stations will be installed to reduce pressures of the pipelines to Rostock and Wartburg.” In addition to the steel pipeline and regulating stations, the project also involved the installation of distribution plastic mains.

Each of the three projects involved the installation of steel pipe, however, the scope and location of each of these projects varied. Costing for pipeline projects varies throughout Enbridge Gas’ service area. For this reason, Enbridge Gas submits these projects are not an effective comparator to the Windsor Replacement Project. Enbridge

Gas is not aware of a project of similar size and scope within the Windsor area that would provide an effective comparator.

In addition, due to the length of the Windsor Line replacement there are inherent complexities and differences which contribute to a higher unit price. These include, but are not limited to various permit approvals, traffic management, short construction window for such a large project (requirement for multiple crews), multiple test sections and, abandonment of existing NPS 10 pipeline.

ENBRIDGE GAS INC.

Undertaking Response to FRPO

To file a material price list for 2, 4, and 6-inch steel, subject to confidential handling.

Response:

The average historical price for steel pipe is included here. These costs represent an aggregate of all pipe purchased at these diameters and comprise all wall thicknesses and coating types. The average historical price is typically used to develop high level cost estimates (conceptual).

NPS 2 – \$39/m
NPS 4 – \$56/m
NPS 6 – \$100/m

For larger scale projects, Enbridge Gas generally requests a project specific quote from a pipe mill for steel pipe costs when developing cost estimates. The milled steel pipe cost used for the NPS 6 in this application was \$50/metre. In order to respond to Exhibit KT1.6, Enbridge Gas requested a milled steel pipe cost for NPS 4 and received a price of \$36/metre.

ENBRIDGE GAS INC.

Undertaking Response to FRPO

To provide a simulation of pressure drop using one greenhouse at 2,000 cubic metres per hour with 4-inch design.

Response:

The table below shows the expected design day pressures on the Windsor Line east of Comber Transmission Station with one 2,000 m³/hour customer at Port Alma, assuming NPS 4 east (Scenario 2) for the winter of 2029/30. For added clarity, the pressures shown in the chart below are the pressures at each station location on the Windsor Line heading east.

| All NPS 4 East - One 2,000 m ³ /hr customer located at Port Alma | | | |
|---|------------------------|---|--|
| Station | Minimum Inlet (kPa) | 2029/30 Design Day Inlet Pressure (kPa) | Capacity Remaining in 2029/30 (m ³ /hr) |
| Comber Gate | 1172 | 3011 | 9000 |
| Tilbury South | 1035 | 2872 | 4250 |
| Port Alma | 1000 | 2742 | 2700 |

Note: The capacity remaining in the table assumes no additional load elsewhere on the system except the 2,000 m³/hour customer at Port Alma.

ENBRIDGE GAS INC.

Undertaking Response to FRPO

To provide the cost estimate and differentials between scenarios 1, 2, and 3.

Response:

Scenario 1 reflects the proposed design filed in the Windsor Line Replacement Project leave to construct application and evidence (all NPS 6). The cost estimate for the mainline section for this scenario is \$77.4 million (please see response to Exhibit I.EP.3 and Exhibit JT1.20).

Scenario 2 consists of using NPS 6 pipe west of the T north of Comber and installing NPS 4 pipe east of the T to Port Alma. As noted in response to Exhibit KT1.6, the estimated cost difference between NPS 6 and NPS 4 pipe is only 2%. Based on this, the estimated cost to construct the mainline section for this scenario is \$76.1 million.

Scenario 3 utilizes NPS 6 pipe west of the T north of Comber, NPS 4 pipe to the Tilbury South Station and reduces to NPS 2 east of Tilbury South to Port Alma. The estimated cost to construct the mainline section for this scenario is \$74.0 million.

Each of the three scenarios listed above are defined in Exhibit KT1.2. The high-level mainline cost estimates provided do not include indirect overheads (note: station and service-related costs are also not included).

ENBRIDGE GAS INC.

Undertaking Response to FRPO

To provide data on all customer demand east of Comber in the last two years, including customer(s)' distance east of the T in the intersection north of the Comber transmission station, and redacted as appropriate.

Response:

Enbridge Gas received unforecasted inquiries east of Comber, but not directly on the Windsor Line being replaced. Enbridge Gas received four inquiries in the Port Alma and surrounding area for firm demands of 2,600 m³/hour, 2,250 m³/hour, 1,800 m³/hour and 1,350 m³/hour. The Windsor Line would be able to feed similar customer requests in the future as they are in the area supplied by the Windsor Line through Port Alma. The approximate distance to the Port Alma Station from Comber Transmission Station is 32.2 km. The unforecasted loads have been identified to provide an idea of the type of inquiries Enbridge Gas has received in the area that are not included in the forecast filed at Exhibit C, Tab 3, Schedule 1, Appendix 2. The unforecasted loads reiterate the importance of requiring flexibility in the design of the pipeline (i.e. NPS 6) in order to meet the unforecasted demands of potential customers.

ENBRIDGE GAS INC.

Undertaking Response to Energy Probe

To advise the number of regulators being replaced out of the 399.

Response:

All service regulators will be replaced including first stage cut and intermediate pressure cut.

ENBRIDGE GAS INC.

Undertaking Response to Energy Probe

To make best efforts to locate and, if found, file the document justifying this pipeline project to senior management.

Response:

As stated in response to Exhibit I.STAFF.2, the “Windsor Line was officially endorsed as a high operational risk in April of 2017”. Please see Attachment 1 for a copy of the relevant section outlining the risks associated with the existing Windsor Line in the “Union Gas OMS LG Quarterly Review” (dated June 23, 2017). Attachment 1 illustrates the risks (i.e., expenditures and outages) of one section of the Windsor Line.

Also attached is the Windsor Line Replacement approved Project Charter (see Attachment 2). This document, which received sign off approval on October 3, 2018, identifies the scope of the replacement project at the time this Project Charter was completed. Due to timing, there are some differences in overall scope and specific details of the Windsor Line Replacement Project between the Project Charter and the leave to construct application and evidence as filed with the OEB on August 9, 2019. The scope of the LTC is broader and covers replacement costs that are more than the 20 km section of pipeline that was noted as a risk in 2017 and 2018.

OMS Tabled Reports

Operations Steering Committee – June 23, 2017

New Risk #3

Risk Name = Condition of Section 2 of the Windsor Line

Risk Rank = Risk II

Likelihood = L4

Consequence = C3, Reliability and Financial

Risk Owner = Shawn Khoshaien

Proposed Mitigation Lead = Angela Scott

Risk Description = The age and condition of the existing Windsor Line has led to numerous outages and unplanned repairs. There is a section (section 2) of approximately 20km that has been identified as an elevated risk. Left as is, the outages and unplanned repairs will continue on this section.

Justification of Risk = The existing Windsor Line is 1950s vintage, unrestrained, coupled, transmission line with a large history of leakage and weldability issues. There are currently 10 active C-leaks and 2 inoperable mainline valves. Recent leaks have resulted in an average capital expenditure of \$150,000 to repair and have cause outages of as many as 180 customers.

Proposed Mitigation Plan = Mitigation plan under review. The replacement of the Risk II portion (section 2) of the Windsor line is scheduled for 2019 at a cost of approximately \$15 million dollars.





2020 Windsor Line Replacement Project Project (TBA)

Project Charter

Standard

| | |
|------------------------|------------------|
| Document ID: | |
| Document Owner: | Neil Quenneville |
| Version #: | 1 |
| Version Date: | 2018-06-19 |
| Effective Date: | 2018-06-19 |

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DOCUMENT VERSION REGISTER

| Version # | Version Date [yyyy-mm-dd] | Author / Department | Reviewer / Department | Approved By / Department | Approval Date [yyyy-mm-dd] | <ul style="list-style-type: none"> • Change Area [Section and Title] ○ Change Description |
|-----------|------------------------------|---------------------|-----------------------|--------------------------|-------------------------------|---|
| <#.#> | <yyyy-mm-dd > | <Author> | <Reviewer> | <Approver> | <yyyy-mm-dd > | <ul style="list-style-type: none"> • <Change Area> ○ <Change Description> |

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APPROVALS

| Position Title / Department | Name | Signature | Date |
|---------------------------------------|------------------|-----------|----------------|
| Project Sponsor | Neil Quenneville | | Oct 3, 2018 |
| Asset Performance / Executive Sponsor | Mike Shannon | | 2018 OCT 03 |
| Project Director | Dave Lamoureux | | Oct 3/18 |
| Manager/Director/VP (as applicable)* | Mike Shannon | | 2018 OCT 03 |

*Signoff in accordance with ASL



TABLE OF CONTENTS

| | |
|---|------------|
| DOCUMENT VERSION REGISTER | II |
| APPROVALS..... | III |
| 1 CHARTER OVERVIEW | 1 |
| 2 BUSINESS SCOPE / REQUIREMENTS..... | 1 |
| 2.1 SCOPE BOUNDARIES | 3 |
| 2.2 KEY COMMERCIAL DRIVERS | 3 |
| 2.3 ASSUMPTIONS AND DEPENDENCIES..... | 3 |
| 3 FUNDING AUTHORITY..... | 4 |
| 4 PROJECT SCOPE | 4 |
| 4.1 PIPELINE SCOPE..... | 4 |
| 4.2 FACILITY SCOPE | 4 |
| 4.2.1 <i>Interconnection</i> | 4 |
| 4.2.2 <i>Pump Station Scope</i> | 4 |
| 4.2.3 <i>Terminal Scope</i> | 4 |
| 4.2.4 <i>Processing Plant Scope</i> | 4 |
| 4.3 WIND PROJECT SCOPE..... | 4 |
| 4.4 SOLAR FARM SCOPE | 5 |
| 4.5 ALTERNATIVE ANALYSIS (IF AVAILABLE) | 5 |
| 5 PROJECT SCHEDULE | 5 |
| 6 PROJECT COST ESTIMATE..... | 6 |
| 7 PROJECT RISKS | 6 |
| 8 APPENDICES..... | 7 |
| 8.1 APPENDIX A: DOU | 7 |

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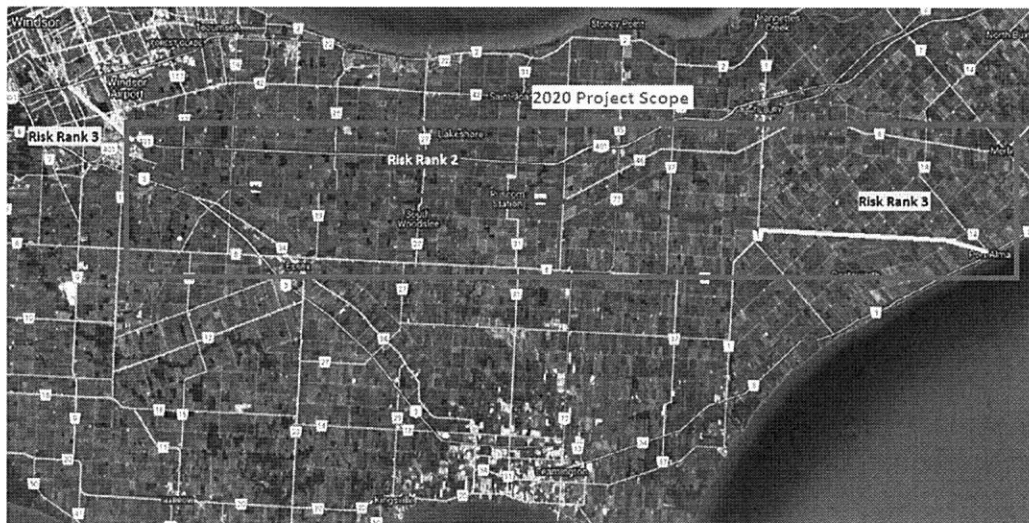


1 CHARTER OVERVIEW

| | |
|---|------------------|
| Project Name: | |
| Business Development Number | N/A |
| AFE Number | |
| Proposed Project In-Service Date | 2020-11-01 |
| Project Development Budget | \$ 88.0MM |
| Sponsor | Neil Quenneville |
| VP – Business Unit | Mike Shannon |
| Project Leader | Rob Marson |
| Customer(s) | N/A |

2 BUSINESS SCOPE / REQUIREMENTS

This project is a Risk Based Replacement Project. The existing Windsor Line is classified as a Transmission line and it is 1940s vintage. The joining method for the pipe is unrestrained and coupled, with a history of leakage and weldability issues. The limits of this project are from the Sandwich Compressor Station to the Port Alma Station. It will involve laying 64km of pipe and abandoning in place 61.4km.



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This project has been deemed a RR2 (L4-C3) from Sandwich to Wheatley Rd 1, and a RR3 (L4C2) from Wheatley Rd 1 to Port Alma.

The following highlight the justification found through engineering assessment:

- This project contains 16 active C-leaks and 3 inoperable mainline valves (Manning, Comber Trans, and Belle River Rd)
- Average capital expenditure of \$150,000 to repair the last several B-leaks on this line
- Only able to install top mount fittings on this pipe, but not full encirclement fittings due to pipe condition
- Known sections of exposed/shallow pipe (less than 0.6m)
- Aerial crossings
- Sections of main not in easement
- Unrestrained dresser couplings throughout
- the high likelihood of an incident occurring, large customer impact, high capital expenditure to repair, employee and public safety risks, and integrity concerns.
- The customer impact of the first phase, regardless of degree day, is 167 interruptions.

The new pipeline being installed will be NPS 6 S and test to a maximum operating pressure of 3450 kPa and this will provide an additional capacity up to 40,000 m³/h over the existing line; which will help to continue to serve the growing demands of the greenhouse market. This will be achieved by feeding both directions from Sandwich Compressor and Port Alma, also a connection at Comber Station at the higher pressure. This will provide the following growth benefits:

- Creates more capacity on the NPS 20 Panhandle to serve the greenhouse market in Kingsville-Leamington
- Creates capacity in the County Rd 46 corridor (close to Hwy 401) for greenhouse/commercial/industrial customers to build their facilities

Should this project be rejected or deferred, one of the many active C-leaks on this line could escalate.

- Results in high out-of-plan capital expenditures to repair, and large customer impacts due to the lacking operable mainline valves on this stretch of pipe

Key assumptions: It is assumed that until corrective action is taken, leaks will continue to develop on this pipe due to the poor condition, limited depth of cover, exposed pipe, aerial crossings, and coupled joints. The key risks include employee, public, and environmental safety.



2.1 SCOPE BOUNDARIES

This project will include everything to ensure proper operation of the new line from Sandwich Compressor to Port Alma at the 3450 kPa. This will mean feeding stations, lateral take-off stations, HP services with remote first stage cuts, services from first stage cuts to house with meter sets.

2.2 KEY COMMERCIAL DRIVERS

The new pipeline being installed should be tested as NPS 6 S 3450 kPa and this will provide excess Capacity up to 40,000 m3/h; which will help to continue to serve the growing demands of the greenhouse market. This will be achieved by feeding both directions from Sandwich Compressor and Port Alma, also a HP tie in at Comber Station at the higher pressure. This will have the below growth benefits:

- Creates more capacity on the NPS 20 Panhandle to serve the greenhouse market in Kingsville-Leamington
- Creates capacity in the County Rd 46 corridor (close to Hwy 401) for greenhouse/commercial/industrial customers to build their facilities

2.3 ASSUMPTIONS AND DEPENDENCIES

The Following is Assumed to be True

It is assumed that until corrective action is taken, leaks will continue to develop on this pipe due to the poor condition, limited depth of cover, exposed pipe, aerial crossings, and coupled joints.

Union Gas will be self performing to complete engineering, procurement, project and construction management

Project will be submitted to the OEB under the ICM for cost recovery



3 FUNDING AUTHORITY

This project is intended to be an ICM submission. The costs required are \$5M in 2019 for pre-work, lands etc. The 2020 costs are estimated at ~\$100M, at this time.

4 PROJECT SCOPE

This project will include everything to ensure proper operation of the new line from Sandwich Compressor to Port Alma at the 3450 kPa. This will mean feeding stations, lateral take-off stations, ~413 HP services with remote first stage cuts, ~413 services from first stage cuts to house with meter sets

4.1 PIPELINE SCOPE

6" Steel YJ, operating at 3450 kPa. Tie in location on west end is Sandwich Compressor Station, modifications are required to feed this line with 3450 kPa. Tie in location on East is Port Alma Station, modifications are required to feed this line with 3450 kPa. There are also numerous lateral stations that will need to be rebuilt to handle the new pressure of this line and continue to feed 420 kPa systems with customers.

4.2 FACILITY SCOPE

4.2.1 Interconnection

N/A

4.2.2 Pump Station Scope

N/A

4.2.3 Terminal Scope

N/A

4.2.4 Processing Plant Scope

N/A

4.3 WIND PROJECT SCOPE

N/A



4.4 SOLAR FARM SCOPE

N/A

4.5 ALTERNATIVE ANALYSIS (IF AVAILABLE)

| Alternative Considered | Reason for Rejecting |
|---|--|
| NPS 6 S 3450 kPa MOP (Excess Capacity: up to 40,000 m3/h) | Recommended |
| NPS 8 S 3450 kPa MOP (Excess Capacity: up to 95,000 m3/h) | Cost prohibitive |
| NPS 6 S 1900 kPa MOP (Excess Capacity: up to 25,000 m3/h) | Value added to utilize 3450kPa for additional capacity at incremental cost |
| NPS 8 S 1900 kPa MOP (Excess Capacity: up to 56,000 m3/h) | Cost prohibitive |
| NPS 6 PE 420 kPa MOP (Excess Capacity: up to 2,500 m3/h) | This option would not allow for growth |
| NPS 4 PE 420 kPa MOP (Excess Capacity: approx. 250 m3/h) | This option would not allow for growth |

5 PROJECT SCHEDULE

| Activity ID | Activity Name | Start | Finish |
|---|-----------------------------|------------------|------------------|
| MPPROJ-32 Windsor Line Replacement | | 11-Sep-18 | 02-Nov-20 |
| MPPROJ-32.1 Project Milestones | | 11-Sep-18 | 02-Nov-20 |
| PFU-MIL-1000 | Project Start | 11-Sep-18 | |
| PFU-MIL-1010 | OEB Submission | 01-May-19 | |
| PFU-MIL-1020 | Long Lead Materials Ordered | 19-Nov-19 | |
| PFU-MIL-1030 | OEB Approval | | 31-Dec-19 |
| PFU-MIL-1040 | Complete all Land Rights | | 14-Apr-20 |
| PFU-MIL-1050 | Permits Received | | 14-Apr-20 |
| PFU-MIL-1060 | Start Construction | 01-May-20 | |
| PFU-MIL-1070 | Project In-Service | | 02-Nov-20 |

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6 PROJECT COST ESTIMATE

This is a class 5 level estimate for the proposed work of abandoning the Existing NPS 10 between Sandwich Compressor and Port Alma and installing a new NPS 6 pipeline.. This includes costs for the service replacements and for station rebuilds and tie-overs. The known scope for this project is conceptual with very limited project parameters provided. For this reason a contingency of 25% has been applied.

| Component | Reference Estimate \$MM |
|--|-------------------------|
| Management | 1.8 |
| Land | 1.6 |
| Environment | 1.0 |
| Engineering | 1.5 |
| Procurement | 7.1 |
| Construction | 56.6 |
| Total Base Cost Estimate | 69.6 |
| Contingency | 18.4 |
| Total Project Capital Cost including Escalation | 88.0 |

7 PROJECT RISKS

| Category | Constraint |
|---|--|
| Standards (Government, Industry, other) | CSA Z662 and Ontario Regulation O.Reg 210 will be used to design all facilities. |
| Engineering and Design | Self performing design |
| Regulatory | Ontario Energy Board will be the approving Authority |
| Other (Public Consultation, Land, Environment, Safety, Weather, Geography, Construction, Technology etc.) | Replacement pipeline will be installed in road allowance or easement. |

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8 APPENDICES

8.1 APPENDIX A: FACILITY REVIEW DOCUMENT

[Facility Review Document - Windsor Line.docx](#)

ENBRIDGE GAS INC.

Undertaking Response to Energy Probe

To advise the overall maintenance cost of the line over the last three years and what it is expected to be over the next three years.

Response:

The decision to replace the Windsor Line as proposed is based on integrity issues as described throughout the pre-filed evidence and the interrogatory responses. Enbridge Gas does not track costs on a per pipeline basis and as such provides an estimate of the maintenance costs as requested in the table below.

| | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 |
|--------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Total | \$203,085 | \$169,185 | \$250,485 | \$381,000 | \$685,000 | \$857,000 |

For the estimated values in 2020, 2021 and 2022, Enbridge Gas expects an increase in leak repair costs in each year. Enbridge Gas also expects rectifiers would be replaced in 2021 and 2022. The estimated costs shown in the table include, but are not limited to, such things as leak surveys, leak monitoring, leak repairs, rectifier replacements and station maintenance.

In addition to the estimated costs in the above table for 2020, 2021 and 2022, it is expected there would be an incremental cost of \$10 million to \$18 million in 2020 through 2022 to address the depth of cover issues.

ENBRIDGE GAS INC.

Undertaking Response to FRPO

To provide the classification in the last three years of the types of leaks that have been found.

Response:

Please see the table below. Upon further review of the classification of the leaks, Enbridge Gas determined there were a total of 20 leaks in 2017, 24 in 2018 and 34 in 2019.

| | A | B | C |
|------|---|---|----|
| 2017 | 1 | 5 | 14 |
| 2018 | | 1 | 23 |
| 2019 | | 8 | 26 |

ENBRIDGE GAS INC.

Undertaking Response to Energy Probe

To provide the chart in a different more useable format.

Response:

As noted in the transcript, the chart is in a useable format and can be enlarged by using the zoom feature in a pdf viewer. Please see Attachment 1 for a reproduction of the table on more than one page.

TOTAL ESTIMATED PROJECT COSTS

| Windsor Line Replacement | Mainline | Stations | Services | Total |
|---------------------------------|---|--|---|--------------|
| Materials | \$4,164,000 This cost consists of : - the pipe mill quote for new NPS 6 pipe - mainline fittings, estimate based on recent vendor pricing - a scrap credit for the abandoned existing NPS 10 | \$1,572,000 This includes the aggregated cost of all fittings in each station based on typical drawings and materials. Unit pricing is based on recent material purchases. | \$133,000 Based on standard material costs from sourced vendors. | \$5,869,000 |
| Construction and Labour | \$62,521,000 Costs are based on vendor and contractor courtesy quotes. - contractor + construction risk items + change order and weather allowance = 48,688,000\$ - direct internal project expenses and wages = 465,000\$ - external labour / 3rd party vendors = 12,068,000\$ - permanent easement, temporary land use = 1,300,000\$ | \$9,031,000 Costs are based on vendor and contractor courtesy quotes. - contractor + construction risk items + change order and weather allowance = 7,537,000\$ - direct internal project expenses and wages = 41,000\$ - external labour / 3rd party vendors = 953,000\$ - land purchase, and temporary land use = 500,000\$ | \$2,515,000 Average cost per meter for labour is based on most recent average for District work. Assumes the local alliance partner will complete this work. This is an all in cost. | \$74,067,000 |

| | | | | |
|--|--|---|---|----------------------|
| Contingencies | \$9,975,000 Contingency is 15% per class 4 estimate. Has been our standard to file with 15% contingency. | \$1,591,000 Contingency is 15% per class 4 estimate. Has been our standard to file with 15% contingency. | \$397,000 Contingency is 15% per class 4 estimate. Has been our standard to file with 15% contingency. | \$11,963,000 |
| Interest During Construction | \$725,000 Calculated using estimated cashflow with interest rate of 3.39%, the OEB prescribed interest rate in effect at the time the estimate was completed. | \$120,000 Calculated using estimated cashflow with interest rate of 3.39%, the OEB prescribed interest rate in effect at the time the estimate was completed. | \$0 No IDC as assumed service work will occur after project is in service. | \$845,000 |
| Estimated Incremental Project Capital Costs | \$77,385,000 | \$12,314,000 | \$3,045,000 | \$92,744,000 |
| Indirect Overhead | \$11,729,000 Calculated using indirect overhead rate of 15% on materials, construction and labour, and contingencies estimates. [Refer to EP-6 once response is complete] | \$1,866,000 Calculated using indirect overhead rate of 15% on materials, construction and labour, and contingencies estimates. [Refer to EP-6 once response is complete] | \$466,000 Calculated using indirect overhead rate of 15% on materials, construction and labour, and contingencies estimates. [Refer to EP-6 once response is complete] | \$14,061,000 |
| Total Estimated Project Capital Costs | \$89,114,000 | \$14,180,000 | \$3,511,000 | \$106,805,000 |

ENBRIDGE GAS INC.

Undertaking Response to OEB Staff

To provide further information on the numbers for residential.

Response:

For the years in which higher residential forecast is identified, it is due to specific residential developments identified near the Windsor Line. When specific growth is forecasted, and the growth is higher than historical growth in an area, Enbridge Gas will add the growth at that local area to ensure all facilities are adequate.

ENBRIDGE GAS INC.

Undertaking Response to OEB Staff

To provide information on the number re: industrial attachments, small.

Response:

The industrial forecasts in 2020 and 2021 are for a specific industrial park development that was forecasted near the Windsor Line. When specific growth is forecasted, and the growth is higher than historical growth in an area, Enbridge Gas will add the growth at that local area to ensure all facilities are adequate.