



# AUC

Alberta Utilities Commission

## **ATCO Gas and Pipelines Ltd. (South)**

**Construction of the S.E. Red Deer 219.1-mm Pipeline  
in the city of Red Deer**

**February 28, 2014**



**The Alberta Utilities Commission**

Decision 2014-050: ATCO Gas and Pipelines Ltd. (South)

Construction of the S.E. Red Deer 219.1-mm Pipeline in the city of Red Deer

Application No. 1610051

Proceeding ID No. 2902

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## **1 Introduction**

1. On November 8, 2013, ATCO Pipelines (ATCO), a division of ATCO Gas and Pipelines Ltd. filed an application with the Alberta Utilities Commission (the AUC or Commission) requesting approval, pursuant to Section 11 of *the Pipeline Act* and Section 4.1 of the *Gas Utilities Act*, for the following:

- Add Line 188 to Licence No. 2029 as a permitted line for the construction of approximately 8.10 (kilometre) km of new 219.1 millimetre (mm) steel pipe; and
- Add Line 189 to Licence No. 2029 as a permitted line for the construction of approximately 0.78 km of new 88.9 mm steel pipeline.

(the “S.E. Red Deer Pipeline”)

2. The S.E. Red Deer Pipeline project involves the construction of 8.10 km of 219.1 mm sweet natural gas pipeline from the existing Nevis Penhold transmission pipeline at 01-01-38-27-W4M to the existing N.E. Red Deer Loop at 04-25-38-27-W4M. The proposed S.E. Red Deer Pipeline would tie into the existing Nevis Penhold transmission pipeline through the proposed Nevis S.E. Red Deer control station at 01-01-38-27-W4M.

3. In addition, ATCO proposed to construct 0.78 km of 88.9-mm sweet natural gas pipeline from the proposed S.E. Red Deer pipeline to the existing Joffre receipt station in 13-12-38-27-W4M.

4. ATCO also proposed to decommission and abandon the existing 168.3-mm Nevis transmission pipeline along 30th Avenue within the city of Red Deer and an existing control station building located at the southeast corner of 30th Avenue and 19th Street, once the proposed pipeline is commissioned and the existing customer taps on the existing line have been relocated to the proposed 219.1-mm S.E. Red Deer pipeline. As part of this work, the existing ATCO Gas Red Deer Gate 3 station will be relocated by ATCO to a location along the proposed S.E. Red Deer pipeline in NW-12-38-27-W4M.

### **1.1 Commission process**

5. The Commission issued information requests to ATCO on November 27, 2013, and ATCO filed its responses on December 23, 2013.

6. On January 10, 2014, the Commission issued a notice of application and indicated a deadline of January 31, 2014 for interested parties to file submissions with the Commission. No objections or concerns were filed.

7. On January 22, 2014, the Commission issued additional information requests to ATCO and ATCO responded on January 31, 2014.

## 1.2 Background

8. In Proceeding ID No. 2322, ATCO Pipelines 2013-2014 General Rate Application, ATCO filed an application with the Commission requesting approval of its 2013 and 2014 revenue requirement which included allowances for capital expenditures related to the S.E. Red Deer Pipeline project. ATCO filed a business case with the Commission outlining the need for the replacement of the Nevis transmission pipeline with the S.E. Red Deer Pipeline together with two other alternatives considered by ATCO.<sup>1</sup>

9. In its business case, ATCO indicated that the S.E. Red Deer Pipeline project was needed as the installation of the S.E. Red Deer pipeline would allow the existing 168.3-mm Nevis transmission pipeline within the city of Red Deer to be removed from high-pressure service. ATCO submitted that this would significantly reduce the risk associated with an aging high-pressure pipeline in proximity to high density urban development.<sup>2</sup> The total estimated capital cost for the proposed project would be \$11,104,000.<sup>3</sup>

10. Although ATCO indicated its preferred alternative was the replacement of the Nevis pipeline with the SE Red Deer Pipeline, as part of its business case two other alternatives were discussed: (1) Performing inline inspection and hydrotesting a portion of the existing Nevis transmission pipeline; and (2) installing a replacement pipeline in a different location.

### 1.2.1 Alternative 1: Perform inline inspection (ILI) and hydrotest a portion of the existing Nevis transmission line<sup>4</sup> (integrity alternative)

11. ATCO stated that to meet the current standards, the 168.3-mm Nevis transmission pipeline would need to be hydrostatically tested. ATCO considered that the total cost of approximately \$5,400,000 should be considered an absolute minimum cost of investment into the existing Nevis transmission pipeline in order to test the line and continue operation. This estimate includes the costs to lower pipelines, expose the pipeline for inspection at the recommended dig sites, complete improvements to run the inline inspection (ILI) tool, run the ILI, complete repairs at a number of locations and complete a hydrostatic test. There is considerable cost uncertainty with this estimate due to the age of the facilities and the unknowns associated with working on a pipeline of this vintage. Further, ongoing expenditures for the existing Nevis transmission pipeline would be required in order to reduce the risk of operating the pipeline in this high consequence location to the extent possible.

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<sup>1</sup> Exhibit No. 0001.00.ATCOPIPE-2322, Business Case to Replace Nevis Pipeline with the SE Red Deer Pipeline, pages 28 to 32 of 143.

<sup>2</sup> Exhibit No. 0001.00.ATCOPIPE-2322, Business Case to Replace Nevis Pipeline with the SE Red Deer Pipeline, page 28 of 143.

<sup>3</sup> Exhibit No. 0062.01.ATCOPIPE-2322, Response to IR.UCA-AP-21(c), page 35 of 648.

<sup>4</sup> Exhibit No. 0001.00.ATCOPIPE-2322, Business Case to Replace Nevis Pipeline with the SE Red Deer Pipeline, pages 28 to 32 of 143.

12. ATCO provided a detailed breakdown of the estimate to perform an in-line inspection and a pressure test<sup>5</sup> on the existing Nevis transmission pipeline:

**Table 1. Nevis Transmission Pipeline Estimate**

Upgrade line for in-line inspection and code compliance	\$3,310,000
In-line inspection	\$350,000
In-line verification digs	\$160,000
Cut-outs and replacements from ILI	\$300,000
Hydrostatically test line	\$1,280,000
Total Cost	\$5,400,000

13. ATCO stated that the estimated costs included for cut-out and replacement work driven by ILI is approximately \$300,000. This estimate is based on the number of cut-outs and replacements generated through previously completed ILIs on similar pipelines. ATCO considered that there is significant uncertainty as the quantity of cut-outs and replacements needed is unknown until the ILI is completed. Any additional integrity concerns identified during the ILI would cause ATCO to spend additional amounts. The costs to hydrostatically test the line assumes a successful test with no leaks and no cut-outs or replacements required. Any failures during the hydrostatic test would cause ATCO to spend additional funds. ATCO suggested that the costs to upgrade the pipeline for in-line inspection and code compliance would be a one-time cost, while the other costs listed would be incurred at each reassessment<sup>6</sup> and could vary greatly depending on the results of each ILI and hydrostatic test.

### 1.2.2 Alternative 2: Install a replacement pipeline in a different location<sup>7</sup>

14. A second alternative to the proposed 219.1-mm S.E. Red Deer pipeline is to loop the existing 168.3-mm Sylvan Lake transmission pipeline that supplies gas into the Red Deer area from the west side of Red Deer. As compared to the proposed S.E. Red Deer project, there are fewer routing options available to complete the 219.1-mm Sylvan Lake Loop and a difficult crossing of Highway 2 would be involved. The total estimated cost of this alternative is in excess of \$15 million.

### 1.2.3 Alternative 3: Replacement in place<sup>8</sup>

15. In addition to the two alternatives put forward by ATCO as part of its business case in Proceeding ID No. 2322, a third alternative (replacement in the existing right-of-way) was considered in this proceeding, by way of information requests and responses.

16. The existing right-of-way is 6.1 metres wide, and four kilometres of this right-of-way contains the 168.3-mm Nevis transmission pipeline as well as a 219.1-mm ATCO Gas distribution pipeline. There is no space within the existing right-of-way to install a third pipeline, as a result a two-stopper bypass method would be required, and the existing pipeline would need to be removed prior to installing the replacement pipeline. In addition, this right-of-way runs immediately parallel to 30th Avenue in the city of Red Deer and the available working area is

<sup>5</sup> Exhibit No. 0013.00.ATCO-2902, Response to IR.AUC-ATCO-1(g), page 3 of 8.

<sup>6</sup> Exhibit No. 0013.00.ATCO-2902, Response to IR.AUC-ATCO-1(g), page 3 of 8.

<sup>7</sup> Exhibit No. 0001.00.ATCOPIPE-2322, Business Case to Replace Nevis Pipeline with the SE Red Deer Pipeline, pages 28 to 32 of 143.

<sup>8</sup> Exhibit No. 0013.00.ATCO-2902, Response to IR AUC-ATCO-2 (f), page 6 of 8.

very restricted. Since this pipeline is a critical feed for the Red Deer area, service would need to be maintained at all times and the work could only be completed in the summer months. Replacing this pipeline within its existing right-of-way would cost approximately \$12,800,000 (to an accuracy of  $\pm 30$  per cent). Due to the fact that this option is extremely difficult to construct and is more expensive than the selected alternative, it was rejected.

#### 1.2.4 ATCO 2013-2014 General Rate Application

17. In Decision 2013-430,<sup>9</sup> the Commission approved the forecast capital expenditure related to the Nevis transmission pipeline replacement, as follows:

122. The Commission finds ATCO Pipelines' proposed replacement of the Nevis pipelines to be warranted given the age of the pipeline (installed in 1956). The Commission considers that the replacement of the Nevis pipeline is required due to its non-compliance with Canadian Standard Association (CSA) code requirements and when that removing an existing high pressure line from service that is over 60 years old will reduce the risks of pipeline failure. Further, if ATCO Pipelines kept the Nevis pipeline into service, it would be required to invest at least \$5.4 million to hydrostatically test the Nevis pipeline. Because a hydrostatic pressure test can only verify the short term integrity of the pipeline, completing an in-line inspection and a pressure test every five years would be required. Given the age of the pipeline, the incremental costs of bringing the existing pipeline up to CSA requirements, the challenges associated with hydro-testing a pipeline in an urban setting, and having reviewed the forecast costs in the business case, the Commission approves the forecast capital expenditure for the southeast Red Deer replacement in the test years, as filed.

#### 1.2.5 History respecting administration of pipeline standards

18. The first version of the CSA standard for pipelines was issued in 1968 and was referred to as CSA Z184 Gas Transmission and Distribution Piping Systems.

19. In 1999, CSA Z184 was replaced by CSA Z662. Several revisions to CSA Z662 have been issued since 1999, including the current version CSA Z662-11. The CSA Z662-03 included a non-mandatory (informative) Annex N - Guideline for Pipeline Integrity Management Programs.

20. In July 2006, the Alberta Energy and Utilities Board (EUB), the AUC's predecessor, issued Directive 041, specifying that CSA Z662 Annex N would now be a mandatory requirement. Prior to Directive 041, Annex N was used only as a pipeline integrity management guidance document.

## 2 Record of the existing 168.3-mm Nevis transmission pipeline

21. ATCO stated that the existing 168.3-mm Nevis transmission pipeline was installed in 1956. The available records<sup>10</sup> show that the six-5/8" OD x 0.188" WT, Grade A, API 5L pipe used for the Nevis transmission is likely from two bulk purchase orders, 5506-R<sup>11</sup> and 4719-R.<sup>12</sup>

<sup>9</sup> Decision 2013-430: ATCO Pipelines 2013-2014 General Rate Application, Application No. 1609158, Proceeding ID No. 2322, December 4, 2013, page 30 of 128.

<sup>10</sup> Exhibit No. 0013.00.ATCOPIPE-2902, Response to IR.AUC-ATCO-2(a), page 5 of 8.

<sup>11</sup> Exhibit No. 0014.00.ATCOPIPE-2902, Response to IR.AUC-ATCO-2(a), Attachment 1.

<sup>12</sup> Exhibit No. 0015.00.ATCOPIPE-2902, Response to IR.AUC-ATCO-2(a), Attachment 2.



The majority of the pipeline is likely from purchase order 5506-R, which has an electric resistance welded long seam, and underwent a mill hydrostatic pressure test of 1,200 pounds per square inch (psi). The remaining portion of the pipeline is likely from purchase order 4719-R, which is seamless, and was hydrostatically tested at the mill to 1,000 psi.

22. ATCO stated that radiography records are not available from when the pipeline was installed in 1956; however, it is likely that critical welds were radiographed. There are two types of welding rod listed on the work order; the majority of the welding rod is used for electric arc welding, while there are small amounts of welding rod that would be used for oxyacetylene welding. Based on Northwestern Utilities Limited (NUL) (the predecessor to ATCO) historical practices, it is likely that the 168.3-mm Nevis transmission pipeline mainline was electric arc welded, and branches or laterals were oxyacetylene welded. It is unlikely that formal welding procedures were in place in 1956. Standard practices based on ASA B31.8 (now ASME B31.8) would have been used.

23. ATCO stated that in 1965, NUL applied to the Department of Mines and Minerals<sup>13</sup> to increase the maximum operating pressure (MOP) of the Nevis transmission pipeline from 500 psi (3,450 kPa) to 680 psi (4,690 kPa). The application to increase the operating pressure stated that in 1956, the Nevis transmission pipeline was field pressure tested to 500 psi (3,450 kPa). No documentation was found to confirm the field test pressure or medium, however, it was likely tested with gas or air. In 1965, as per ASA B31.8-63, the line was approved to operate at a MOP of 680 psi (4,690 kPa) without further testing.

24. ATCO stated that in 1956, NUL followed the applicable code of the time, that being ASA B31.8 in constructing the 168.3-mm Nevis transmission pipeline. Field pressure testing was not required prior to pipeline commissioning; however, the pipe may have been hydrostatically tested at the mill to 1,000 psi (6,894 kPa = 1.46 x MOP), and critical welds were likely radiographed. While there was one leak caused by a line hit in 1965, there are no records of failures of the Nevis transmission pipeline due to pipeline defects. The pipe specifications meet the current Class 3 location requirements at a stress level of 40 per cent at an MOP of 4,690 kPa, and the pipeline has operated safely at the licensed MOP since its installation.

25. In its response to information requests, ATCO stated that the 168.3-mm Nevis transmission pipeline was not hydrostatically tested to a level that would stabilize imperfections or defects which may have been present at the time of installation or may have accumulated in the pipeline since installation.<sup>14</sup>

26. The pipeline was not hydrostatically tested in the field to 1.4 times the MOP as currently required by Canadian Standards Association (CSA) Standard Z662-11 in a Class 3 location. It was likely tested with air or gas to the original MOP, and then the MOP was upgraded without subsequent testing. While this was allowed by code at the time, ATCO stated that it does not meet current CSA standards.

27. ATCO stated that the pipe material does not meet current line pipe specifications (e.g. CSA Z245.1). The long seam type is low-frequency electric resistance welded (ERW),

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<sup>13</sup> Exhibit No. 0016.00.ATCOPIPE-2902, Response to IR.AUC-ATCO-2(a), Attachment 3.

<sup>14</sup> Exhibit No. 0023.00.ATCOPIPE-2902, Response to IR.AUC-ATCO-5(b), page 2 of 5.

which is known to frequently have seam defects. This era of pipe is known to have manufacturing defects.

28. The pipeline does not meet minimum depth of cover requirements as required by the *Pipeline Rules* in five locations.

29. The primary causes of piping failure applicable to the 168.3-mm Nevis transmission pipeline that require evaluation<sup>15</sup> are:

- metal loss
- cracking
- external interference
- material or manufacturing
- construction

## 2.1 Low-frequency electric resistance welded pipe

30. The majority of the Nevis transmission pipeline has been identified as low-frequency ERW pipe. In this application, ATCO made reference to work prepared for ATCO by Kiefner and Associates, Inc. Kiefner and Associates, Inc. prepared a final report on the Urban Pipelines Replacement Project-Integrity option<sup>16</sup> for ATCO that indicates low-frequency ERW pipe has been the subject of a number of regulatory actions in the U.S. as the following paragraphs from The Pipeline and Hazardous Materials Safety Administration's (PHMSA) reports and research website<sup>17</sup> states:

Electric resistance welded (ERW) pipe is longitudinally welded pipe. A failure in the weld seam of this type of pipe can propagate for a distance along the pipe and can quickly release large quantities of product to the environment. Low-frequency (LF) ERW pipe installed prior to 1970 in particular can be susceptible to such failures. PHMSA issued advisory bulletins in 1988 and in 1989 on LF ERW pipe that was prone to failure, alerting industry of the need to have a monitoring and replacement program for LF ERW pipe. PHMSA conducted further studies in 2000 and 2003 on ERW pipe. Integrity management regulations have special provisions for evaluation of integrity threats for this type of pipe.

31. ASME B31.8S and U.S. *Code of Federal Regulations* 49 CFR Part 192 Subpart O require an assessment of the threat of low-frequency ERW pipe because associated defects cannot automatically be considered to be stable.

32. Other problems that are associated with pre-1970 low-frequency ERW pipe arise from the metallurgy used at the time. High sulfur content in the steel tended to form manganese sulfide inclusions that lowered toughness, caused hook cracks and lack of grain size control which led to coarse grained low-toughness heat affected zones.

33. The Kiefner report stated that the low-frequency ERW pipe in gas pipelines not subjected to a sufficiently high-pressure test is susceptible to failure, and potentially low stress failure, due

<sup>15</sup> Exhibit No. 0023.00.ATCOPIPE-2902, Response to IR.AUC-ATCO-5(a-b), page 2 of 5.

<sup>16</sup> Exhibit No. 0030.09.ATCOPIPE-1995, ATCO Pipelines - UPR Project Application - Integrity Option, Appendix 4A – Pages 67 to 71.

<sup>17</sup> <http://opsweb.phmsa.dot.gov/pipelineforum/reports-and-research/seam-weld/>.

to fatigue growth of cold welds, hook cracks, cracks arising from off-set seam edges, as well as from selective seam corrosion. Such susceptibility is significantly enhanced by occasional pressure excursions over the normal maximum operating stress. None of these failure mechanisms can be ruled out for much of the ERW pipe in ATCO's existing Nevis transmission pipeline. Electromagnetic Acoustic Transducer (EMAT) tools being developed to detect stress corrosion cracking in gas pipelines are unlikely to detect manufacturing flaws in low-frequency ERW pipe because the low toughness restricts the defects to a small size prior to failure. Therefore, where neither the mill test nor the field pressure test<sup>18</sup> can be confirmed to have been to a sufficiently high pressure, a hydrostatic test is the only means to remove critical defects and assure defect stability.

## 2.2 External corrosion direct assessment reports

34. An external corrosion direct assessment (ECDA) report<sup>19</sup> on the 168.3-mm Nevis transmission pipeline was completed in 2008/2009 by Corpro Canada Inc. (Corpro) on behalf of ATCO Pipelines. The report recommended six areas for excavation to further inspect potential corrosion and coating damage on the Nevis transmission pipeline.<sup>20</sup> The report also includes a depth of cover survey and five locations on the Nevis transmission pipeline were identified as not having sufficient cover; four at road crossings and one field location. In 2013, ATCO completed verification digs<sup>21</sup> on three of the high ranking locations of corrosion risk, which have been recently inspected and coating repair undertaken.

35. The 2013 Corpro ECDA report,<sup>22</sup> dated September 12, 2013, stated that based on the inspections conducted during the direct assessment on the Nevis transmission pipeline it can be concluded that the pipeline at all three locations is in excellent condition.

36. The five locations where the existing 168.3-mm Nevis transmission pipeline does not meet depth of cover code requirements<sup>23</sup> as per Section 20 of the *Pipeline Rules*,<sup>24</sup> which were identified by the 2008/2009 Corpro ECDA report are described in the table below:

**Table 2. ECDA Report**

Location	Chainages (m)	Length of shallow pipe (m)	Existing pipe Depth (m)	Code requirement, per <i>Pipeline Rules</i> pipe depth (m)
North Side Vanier Drive	384.9 to 439.5	~55	0.78	1.10
South Side Vanier Drive	384.9 to 439.5	~55	0.98	1.10
South Side Lees Street	1716.2 to 1743.6	~30	0.92	1.10

<sup>18</sup> Exhibit No. 0030.09.ATCOPIPE-1995, ATCO Pipelines - UPR Project Application - Integrity Option, Appendix 4A – Pages 67 to 71.

<sup>19</sup> Exhibit No. 0061.01.ATCOPIPE-2322, Response to IR.AUC-AP-76(b) Attachment, pages 481 to 530 of 964.

<sup>20</sup> Exhibit No. 0001.00.ATCOPIPE-2322, Business Case to Replace Nevis Pipeline with the SE Red Deer Pipeline, pages 28 of 143.

<sup>21</sup> Exhibit No. 0013.00.ATCO-2902, Response to IR.AUC-ATCO-2(c) & 2(d), pages 5 & 6 of 8.

<sup>22</sup> Exhibit No. 0017.00.ATCO-2902, Response to IR.AUC-ATCO-2(c)-Attachment.

<sup>23</sup> Exhibit No. 0013.00.ATCO-2902, Response to IR.AUC-ATCO-2(g), page 6 of 8.

<sup>24</sup> [http://www.qp.alberta.ca/documents/Regs/2005\\_091.pdf](http://www.qp.alberta.ca/documents/Regs/2005_091.pdf).

South Side 60 Street	5481.0 to 5512.8	~30	0.67	1.10
Unnamed Field	5939.4 to 5979.7	~40	0.79	0.80

### 3 S.E. Red Deer Pipeline

#### 3.1 Environmental assessment

37. ATCO has retained Golder Associates environmental consultants to complete an environmental protection plan<sup>25</sup> for the pipeline construction activities. Golder Associates would have an environmental inspector on-site as required for the duration of the pipeline construction activities to ensure compliance with the recommendations set out in the environmental protection plan.

38. ATCO stated that it would comply with the Code of Practice in accordance with the *Water Act* and the environmental protection plan for proposed wetland crossings along the pipeline route. Notification to Alberta Environment and Sustainable Resource Development under the Code of Practice for wetland and waterbody crossings along the proposed route would be submitted closer to the construction start date.

39. ATCO stated that the proposed 219.1-mm S.E. Red Deer pipeline would tie into ATCO's existing 219.1-mm Nevis Penhold transmission pipeline of Permit and Licence No. 2029, Line 61 through the proposed Nevis S.E. Red Deer control station in 01-01-38-27-W4M. ATCO engaged the services of Acoustical Consultants Inc. to complete a noise impact assessment for the proposed Nevis S.E. Red Deer control station.<sup>26</sup> The noise impacts assessment stated that the predicted cumulative sound levels would be below the permissible sound levels of AUC Rule 012: *Noise Control* (AUC Rule 012).

40. ATCO stated that once the proposed 219.1-mm S.E. Red Deer pipeline is commissioned, ATCO would work with ATCO Gas to convert the existing customer feeds from the existing 168.3-mm Nevis transmission pipeline to the proposed 219.1-mm S.E. Red Deer Pipeline. This would involve relocating the existing ATCO Gas Red Deer Gate 3 station to a new location in NW-12-38-27-W4M. In response to information request, ATCO submitted a noise impact assessment for the proposed Red Deer Gate 3 station,<sup>27</sup> completed by Acoustical Consultants Inc., dated December 23, 2013. The noise impacts assessment stated that the predicted cumulative sound levels would be below the permissible sound levels of AUC Rule 012.

41. ATCO stated that the proposed 88.9-mm Joffre receipt station would connect the existing Joffre receipt station and the proposed S.E. Red Deer pipeline. No changes would be made to the existing equipment, gas velocity, or noise produced at this station.

<sup>25</sup> Exhibit No. 0006.00.ATCO-2902, EPP.

<sup>26</sup> Exhibit No. 0007.00.ATCO-2902, NIA-Nevis SE Red Deer Control Station.

<sup>27</sup> Exhibit No. 0019.00.ATCO-2902, NIA-Red Deer Gate 3 Station.

42. The selected alignment for the S.E. Red Deer Pipeline project runs parallel to an existing high voltage power line. ATCO submits that this alignment will ensure that developed is limited along the proposed route.<sup>28</sup>

### **3.2 Consultation**

43. ATCO stated that the consultation with all affected and potentially affected landowners and occupants along the right of way was completed in accordance with AUC Rule 020: Rules Respecting Gas Utility Pipelines (AUC Rule 020). ATCO has obtained confirmation of non-objection for the proposed pipeline from all landowners and occupants along the right-of-way.

44. ATCO stated that notification packages<sup>29</sup> were sent to all landowners within line-of-sight of the proposed pipeline, who were not already consulted as directly affected parties. Since the proposed pipeline route is on private lands within newly annexed city of Red Deer limits, alignment approval was acquired from the City of Red Deer on September 25, 2013. In addition, this project was advertised in the Red Deer Advocate on September 6, 2013.

45. ATCO stated that all potentially affected parties were given a detailed description of the proposed visual appearance, equipment to be contained within and noise produced by the proposed Nevis S.E. Red Deer control station and Red Deer Gate 3 station.

46. In its submission, ATCO stated that the requirements of the consultation and notification program were met and that no outstanding objections or concerns remain in regard to the application.

## **4 Commission analysis and findings**

47. ATCO identified that the 168.3-mm Nevis transmission pipeline is subject to conditions that require its ongoing safe operation to warrant assessment with respect to the integrity of the pipeline system. These conditions include the age and location of the pipeline, the pipe manufacturing process and uncertainty respecting the pipe specifications and initial pressure testing.

48. CSA Z662 provides guidance with respect to the assessment of these conditions as follows:

### **10.3.1 Integrity of existing pipeline systems**

#### **10.3.1.1**

Where the operating company becomes aware of conditions that can lead to failures in its pipeline systems, it shall conduct an engineering assessment to determine which portions can be susceptible to failures and whether such portions are suitable for continued service.

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<sup>28</sup> Exhibit No. 0001.00.ATCOPIPE-2322, Business Case to Replace Nevis Pipeline with the SE Red Deer Pipeline, page 29 of 143.

<sup>29</sup> Exhibit No. 0009.00.ATCO-2902, Sample Notification Package.

**Notes:**

- (1) *Examples of conditions that can lead to failures include*
  - (a) *mechanical damage that can develop into failures under sustained operation;*
  - (b) *mill defects not detected during the manufacturing process;*
  - (c) *corrosion;*
  - (d) *stress corrosion cracking;*
  - (e) *coating damage;*
  - (f) *coating deterioration;*
  - (g) *unstable slopes; and*
  - (h) *the presence of low-frequency (less than 1 kHz) electric resistance welded pipe in areas with significant cyclic loadings.*
  
- (2) *Guidelines for pipeline system integrity management programs are contained in Annex N.*

49. It is clear to the Commission that ATCO identified conditions for engineering assessment in relation to a potential failure including consideration of the age of the pipeline, the proximity of the pipeline to urban development, the lack of records respecting post-construction pressure testing, the potential for pipe manufacturing defects related to low-frequency ERW pipe and potential corrosion.

50. The Commission considers that the following CSA Z662 clauses to assess existing pipeline systems are fundamental and informative in the analysis process for the proposed pipeline replacement:

**3.3.3.1**

Engineering assessments of the integrity of existing pipeline systems shall include consideration of their design, material, construction, operating and maintenance history, and expected operating conditions.

**Notes:**

- (1) *Reference should be made to the records required in Clauses 5.7, 6.1.5, 7.6.3, 7.14.9, 7.15.11, 8.8.7, 9.9.4, 9.9.5, 10.4, and 16.5.2.*
- (2) *Risk assessment (see Annex B), pipeline system integrity management programs (see Annex N), and reliability-based design and assessment (RBDA) (see Annex O) can provide valuable information and guidance for the engineering assessment.*

**3.3.3.2**

Factors to consider when conducting an engineering assessment on an existing pipeline system can include the following:

- (a) design basis of the pipeline, including service fluid, operating pressure and temperature range, and the general and site-specific loading conditions that are anticipated throughout its design life;
- (b) construction and testing specifications;
- (c) condition of the piping, including type, dimensions, and dimensional uncertainty of defects;
- (d) mechanism or mode of imperfection formation, growth, and failure;
- (e) material properties;
- (f) service history and future service conditions;
- (g) appropriateness of repair methods;
- (h) external influences;

- (i) consequences of failure; and
- (j) hazards and consequences of failure

### 3.3.3.3

Where the information required in Clauses 3.3.3.1 and 3.3.3.2 is not available, the operating company shall conduct inspections or testing, or make conservative assumptions that can be supported by rational analysis and valid system experience, to enable the engineering assessment to be carried out.

#### Notes:

- (1) *Examples of inspection and testing include in-line inspection (see Annex D), pressure testing (see Clause 10.3.9), test excavations to verify coating type and condition effectiveness of cathodic protection, and testing pipe samples for mechanical properties.*
- (2) *NACE SP 0502 for external corrosion, NACE SP 0204 for stress corrosion cracking, and NACE SP 0206 for internal corrosion of normally dry gas pipelines provide guidance for determining piping condition using a methodology such as direct assessment.*

51. The Commission understands that ATCO endeavoured to assess information identified in clauses 3.3.3.1 and 3.3.3.2 of CSA Z662, but found that the full extent of that historic information specified in the current standard was not required by the standards in place at the time of the installation, and is not reliably available. Consequently, the Commission accepts that the provisions of section 3.3.3.3 to make conservative assumptions, and to conduct inspections and testing, is appropriate for the 168.3-mm Nevis transmission pipeline. Clause 3.3.3.3 provides examples of methods to conduct inspections and testing including in-line inspection, pressure testing, test excavations to verify coating type and condition, effectiveness of cathodic protection and testing pipe samples for mechanical properties. Clause 3.3.3.3 elaborates that NACE SP 0502 for external corrosion provides guidance for determining piping condition using a methodology such as direct assessment.

52. The Commission observes that NACE SP 0502 is a standard practice document describing a pipeline external corrosion direct assessment methodology that is intended to prevent external corrosion defects from growing to a size that would be large enough to impact structural integrity. This process uses direct assessment involving one or more excavations to expose the pipe surface after indirect assessments have been conducted to identify locations where the most severe corrosion related concerns have been identified. Applications for the ECDA process are described in NACE SP 0502 as follows:

- 1.1.6** ECDA applications can include but are not limited to assessments of external corrosion on pipeline segments that:
  - 1.1.6.1** Cannot be inspected using other inspection methods (such as ILI or pressure testing).
  - 1.1.6.2** Have been inspected using other inspection methods as a method of managing future corrosion.
  - 1.1.6.3** Have been inspected with another inspection method as a method of establishing a reassessment interval.
  - 1.1.6.4** Have not been inspected using other inspection methods when managing future corrosion is of primary interest.

53. The Commission observes that Corrpro completed an ECDA report on the 168.3-mm Nevis transmission line for ATCO. The indirect assessment portion of the report identified one 40-metre section where five excavations were recommended and one additional excavation location to investigate areas of potential corrosion concern. Direct assessment excavations at three sites were conducted and coating repairs were completed. It is noteworthy that Corrpro concluded that the 168.3-mm Nevis transmission pipeline was in excellent condition at those locations. The Commission concludes from the Corrpro ECDA report that corrosion defects do not appear to be a significant concern respecting the integrity of the 168.3-mm Nevis transmission pipeline. This conclusion is also supported by the absence of leak reports associated with the pipeline due to pipe defects or corrosion since it was installed in 1956.

54. The Corrpro report also included a depth of cover survey which identified five locations, four at road crossings and one field location, where the pipeline had marginally less cover than the current standards in the *Pipeline Rules*. The Commission observes that replacing the pipeline would solve this problem.

55. The Commission concurs with ATCO that ECDA surveys provide useful information about pipeline metal loss, the integrity of the pipeline coating and pipeline depth in circumstances where in-line inspection is not feasible, such as is the case for the 168.3-mm Nevis transmission pipeline. The Commission notes that ATCO has pointed out in this application,<sup>30</sup> the limitations of the ECDA methodology with reference to a report prepared by Kiefner and Associates, Inc., which was submitted by ATCO in its Urban Pipelines Replacement Proceeding ID 1995. In that information response, ATCO identified that ECDA is not capable of evaluating material and manufacturing imperfections, cracking, seam toughness or other imperfections not coincident with coating damage. In order to fully assess those potential imperfections on a pipeline with the characteristics, history and record uncertainty exhibited on the 168.3-mm Nevis transmission pipeline, ATCO considered that an in-line inspection procedure would be of assistance to complete a more thorough analysis of the pipe condition. Subsequent to an in-line inspection, ATCO proposed that a hydrostatic pressure test should be conducted to identify any near critical manufacturing or construction defects.

56. Annex N describes options to assess imperfections as follows:

### **N.10.3 Imperfections**

The options that may be used to reduce the frequency of failure and damage incidents associated with imperfections (e.g., metal loss, cracking, and material, manufacturing, and construction defects) include the following, as applicable:

- (a) temporary or permanent reductions in the established operating pressure;
- (b) close-interval surveys;
- (c) coating assessment surveys;
  
- (d) improved performance of cathodic protection systems;
- (e) repair or rehabilitation of external coatings;
- (f) improved internal corrosion mitigation and monitoring methods (see Clauses 9.10.2 and 9.10.3);
- (g) installation of liners;
- (h) in-line inspection programs;
- (i) pressure testing as specified in Clause 10.3.9;

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<sup>30</sup> Exhibit 23, IR response AUC-ATCO-6(a-c).



- (j) improved quality measures for manufacturing, design, construction, and operation; and
- (k) assessment, repair, rehabilitation, and replacement programs.

57. ATCO indicated,<sup>31</sup> and the Commission agrees, that CSA Annex N is not prescriptive as to the specific method that should be used to eliminate hazards or imperfections. Given the specific historic and metallurgy circumstances associated with the 168.3-mm Nevis transmission pipeline, the Commission concurs with ATCO's recommendation that further in-line inspection and hydrostatic pressure testing would reduce the risks on this pipeline. It is apparent that ATCO gave appropriate consideration to the CSA Z662 Annex N guidelines to assess and refine its risk analysis, and to consider potential piping imperfections.

58. The Commission accepts that the existing piping configuration is not conducive to either in-line inspection or hydrostatic pressure testing without significant capital expenditures. In that respect, the Commission concurs with ATCO that replacing the pipeline and relocating it to a location paralleling an existing electric facility in more of a utility corridor type of location is appropriate.

59. The Commission has reviewed ATCO's application and accepts that there are integrity threats on the existing Nevis transmission pipeline that could present risks towards worker and public safety, the environment, emergency repair response times and supply to customers. The Commission finds the S.E. Red Deer Pipeline project in order to ensure both public safety and security of supply for ATCO's customers.

60. The Commission has reviewed the application and has determined that it meets the requirements, including the public involvement and consultation requirements of AUC Rule 020. The Commission observes, in this respect, ATCO Pipelines' confirmation that there are no outstanding public or industry objections or concerns. The Commission also finds that information in the application submitted by ATCO fulfills the requirements of AUC Rule 012.

61. The Commission accepts ATCO's statement that Golder Associates would have an environmental inspector on-site as required for the duration of the pipeline construction activities to ensure compliance with the recommendations set out in the environmental protection plan. In addition, the Commission accepts ATCO's statement that the notification to Alberta Environment and Sustainable Resource Development under the Code of Practice for wetland and waterbody crossings along the proposed route will be submitted closer to the construction start date.

62. Based on the foregoing, the Commission considers the project to be in the public interest in accordance with Section 17 of the *Alberta Utilities Commission Act*.

## 5 Decision

63. Pursuant to Section 11 of the *Pipeline Act*, Section 4.1 of the *Gas Utilities Act*, the Commission approves the amendment to Permit and Licence No. 2029 and grants ATCO the amended permit and licence as set out in Appendix 1 – Gas Utility Pipeline – Permit and Licence No. 2029 - February 28, 2014 (Appendix 1 will be distributed separately).

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<sup>31</sup> Exhibit 23, AUC-ATCO-5(a-b).

Dated on February 28, 2014.

**The Alberta Utilities Commission**

*(original signed by)*

Tudor Beattie, QC  
Commission Member