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# memo

Date: April 1, 2016

To: Joel Kanvik

From: Len Leblanc

**Re: Line 5 Replacement Evaluation**

Joel,

Enbridge performed a replacement evaluation of Line 5 in October 2015 using the methodology described in our PI-69 Pipeline Replacement Assessment Procedure. This work was conducted via Enbridge internal planning tabular format; hence this memo is generated to provide further detailed description of the work.

The PI-69 Procedure describes that a 20 repairs/mile over 15 years threshold is a guideline used to gauge whether a Level II evaluation of pipeline replacement viability is warranted. This screening criteria compares the replacement cost/mile to the repair costs. Based on Enbridge's experience with the cost of repairs and costs of replacement, at least 20 repairs/mile are required for justifying more in depth analysis of the economic feasibility of pipe replacement.

The Table below describes the results of the Line 5 future repair predictions for pipe replacement assessment, based on the Line 5 2007/2008 corrosion and 2013/2014 crack ILI results. As can be seen in the forecasted combined crack and corrosion digs/mile in the far right column, the number of digs/mile for all segments is well below the threshold of 20 digs/mile. Also, looking at the forecasted maximum number of corrosion and crack digs/mile across the line, no specific milepost (MP) meets the above threshold with 13 and 11 digs/mile being the highest predicted crack and corrosion digs/mile respectively for all segments.

Therefore, both at the segment level and at the MP level, further evaluation of pipe replacement is not warranted for this pipeline based on the economic analysis in the PI-69 procedure. Enbridge re-evaluates pipelines for replacement as new inline inspection information and repair forecasts are generated and Line 5 will be re-evaluated in the future.

**2016 LRP: Level 1 Analysis – US**

| Line | Segment | Diameter | Vintage | Start MP | End MP | Miles | Total No. of Crack Digs Predicted | Maximum number of crack digs/mile | Total No. of Corrosion Digs Predicted | Maximum number of corrosion digs/mile | 2016 Forecasted Digs per Mile Over 15 years |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | PE-IR | 30 | 1953 | 1098.23 | 1272.25 | 174.02 | 108 | 6 | 205 | 11 | 1.8 |
| | IR-Straits | 30 | | 1272.25 | 1475.62 | 203.37 | 429 | 13 | 51 | 6 | 2.4 |
| | East Straits | 20 | | 1475.62 | 1479.57 | 3.95 | 0 | 0 | 0 | 0 | 0 |
| | West Straits | 20 | | 1475.62 | 1479.57 | 3.95 | 0 | 0 | 0 | 0 | 0 |
| | Straits-BC | 30 | | 1479.57 | 1636.87 | 161.27 | 47 | 3 | 42 | 3 | 0.6 |
| | BC-RW | 30 | | 1636.91 | 1742.34 | 105.43 | 16 | 4 | 99 | 5 | 1.1 |

Regards,

Len Leblanc, Director Pipeline Integrity Systems