Enbridge Semi-Annual Report May 23, 2019, to November 22, 2019

DJ# 90-5-1-1-10099

January 17, 2020

Enbridge Consent Decree (United States v. Enbridge Energy, Limited Partnership, et al., Case 1:16-cv-914)

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Glossary

A listing of many of the acronyms and initialisms in this report

AIWP	Anchor Inspection Work Plan
AIS	Automated Identification System
ALD	Alternative Leak Detection
ALJ	Administrative Law Judge
AMSTEP	Area Maritime Security Training and Exercise Program
APE	Area of Potential Effect
APP	Agricultural Protection Plan
ART	Alarm Response Team
ATC	American Transmission Company
AUV	Autonomous Underwater Vehicle
AVB	Automated Volume Balance
BIWP	Biota Investigation Work Plan
BIA	Bureau of Indian Affairs
CCO	Control Centre Operations
CD	Consent Decree
CGR	Corrosion Growth Rate
CP	Cathodic Protection
CP CIS	Cathodic Protection Close Interval Survey
CRO	Control Room Operator
CWP	Covered Work Period
DOC	Department of Commerce
DOJ	Department of Justice
DPR	Discharge Pressure Restriction
DQA	Data Quality Assessment
DQR	Data Quality Review
DWSMAs	Minnesota Department of Drinking Water Supply Management Areas
EA	Engineering Assessment
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
ESA	Endangered Species Act
eAtoN	Electronic Aids to Navigation
FCC	Federal Communications Commission
FEA	Finite Element Analysis
FHLA	Field Level Hazard Assessment
FMP	Fen Management Plan
FdL	Fond du Lac Band of Lake Superior Chippewa
FR	Future Report
FRE	Features Requiring Excavation
GW	Girth Weld
HCA	High Consequence Area
HDD	Horizontal Directional Drill
ICP	Integrated Contingency Plan
ICS	Incident Command System
IL	Illinois
ILI	In-Line Inspection
ILIMRR	In-Line Inspection Minimum Reporting Requirements
IMT	Incident Management Team
IN	Indiana
IR	Information Request
ITP	Independent Third Party
IVP	Intelligent Valve Placement
L3R	US Line 3 Replacement
LDA	Leak Detection Analyst

LDAM	Leak Detection Alarm Management
LDPIP	Leak Detection Project Integration Plan
LEPC	Local Emergency Planning Committee
MAOP	Maximum Allowed Operating Pressure
MBS	Mass Balance System
MSCA	Mackinac Straits Corridor Authority
MI	Michigan
MDEQ	Michigan Department of Environmental Quality
MN	Minnesota
MDA	Minnesota Department of Agriculture
MDNR	Minnesota Department of Natural Resources
MFL	Magnetic Flux Leakage
MnDOT	Minnesota Department of Transportation
MOP	Maximum Operating Pressure
MP	Milepost
MPCA	Minnesota Pollution Control Agency
MPUC	Minnesota Public Utilities Commission
NA	Not Applicable
ND	North Dakota
NDDH	North Dakota Department of Health
NDE	Non-destructive Examination
NDGF	North Dakota Game and Fish
NDPSC	North Dakota Public Service Commission
NDSWC	North Dakota State Water Commission
NHPA	National Historic Preservation Act
NTSB	National Transportation Safety Board
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historical Properties
NWT	Nominal Wall Thickness
NY	New York
OD	Outside Diameter
OSRO	Oil Spill Response Organization
OMM	Operations & Maintenance Manual
PHMSA	Pipeline Hazardous Materials Safety Administration
P	Paragraph
PI	Pipeline Integrity
PN	Priority Notification
PPR	Point Pressure Restriction
PAWSA	Ports and Waterways Safety Assessment
PT	Pressure Transmitter
PR	Pressure Restriction
PAtoN	Private Aids to Navigation
RDS	Rupture Detection System
RNA	Regulated Navigation Area
ROA	Record of Alarms
ROV	Remote Operated Vehicle
RPR	Rupture Pressure Ratio
SAR	Semi-Annual Report
SAWP	Screw Anchor Work Plan
SCADA	Supervisory Control and Data Acquisition
SCC	Stress Crack Corrosion
SHPO	State Historic Preservation Office
SML	Subject Matter Lead
SOA	Summary of Alarms
SoM	State of Michigan
SRAHC	Saginaw River All Hazards Committee

SRB	Sulfate Reducing Bacteria
STA	Senior Technical Advisor
TT	Temperature Transmitter
TTX	Table Top Exercises
US	United States
USACE	United States Army Corps of Engineers
USCG	United States Coast Guard
USFWS	United States Fish and Wildlife Service
USWM	Ultrasonic Wall Measurement
VCI	Vapor Corrosion Inhibitor
VSR	Verification Status Record
VMRS	Vessel Movement Reporting System
WI	Wisconsin
WCMP	Wisconsin Coastal Management Program
WDNR	Wisconsin Department of Natural Resources
WLOA	Weekly List of Alarms
WMA	Wildlife Management Area
WQC	Water Quality Certification
WT	Wall Thickness

Introduction

Enbridge[1] submits this fifth Semi-Annual Report (also referred to herein as "SAR" or "Report") in electronic and hard copy form in accordance with Section IX, Reporting Requirements, of the Consent Decree entered in *United States v. Enbridge Energy, Limited Partnership, et al.*, Civ. No. 1:16-cv-00914 (referred to herein as "Consent Decree," "Decree," or "CD"). Specifically, this fifth SAR is submitted in accordance with Paragraph (or "P.") 143, which requires Enbridge to submit a SAR documenting Enbridge's compliance with the Consent Decree for the fifth reporting period dated May 23, 2019 to November 22, 2019 (referred to herein as "fifth reporting period" or "Reporting Period 5" or "the reporting period"), no later than six months after the submittal of the fourth SAR. Enbridge's first SAR was submitted on January 18, 2018; the second on July 18, 2018; the third SAR on January 18, 2019; and the fourth SAR on July 18, 2019. This fifth SAR is submitted on January 17, 2020, within six months of the fourth SAR. As per Paragraph 150 of the Consent Decree, this fifth SAR is being served in accordance with Section XVI of the Consent Decree (Notices), and a copy is being supplied to the Independent Third Party (also referred to herein as the "ITP").

This fifth SAR summarizes the requirements in Subsections VII.A-J of the Consent Decree that became due and/or were required to be complied with by Enbridge during the fifth reporting period. This Report is organized by Paragraph and Subparagraph number of the Consent Decree. This SAR addresses, on a Paragraph-by-Paragraph basis, each injunctive requirement of the Consent Decree that became due during the fifth reporting period or for which reporting is required.

In accordance with Paragraph 144, this SAR provides the information that is required to be submitted to the United States under Paragraphs 29, 31, 49, 96, and Subparagraph 110.c, which each have specific SAR requirements. In accordance with Paragraph 144, Enbridge shall discuss, Paragraph-by-Paragraph, such matters as completion of milestones, status of permit applications, operation and maintenance issues, reports to state agencies, number, by type, planned for future repair or mitigation, and any significant changes or issues since the first SAR. Enbridge has reported specific activities encountered during Reporting Period 5 in Paragraph 144 of this Report, where there were problems encountered or anticipated in implementing the requirement (together with implemented or proposed solutions).

Enbridge is compliant with the Consent Decree requirements unless otherwise stated in the applicable section of the SAR, and this SAR includes the information and analysis required by Paragraph 145. Discharge information and post-incident reports required by Paragraphs 146 and 148 also are set forth in this SAR.

Enbridge has also enclosed appendices to this SAR, which provide supporting tables, further information on Enbridge's compliance with the Consent Decree, and/or documents that are required to be submitted to the United States under Section IX. The Table of Contents identifies each of these appendices.

[1] *As used herein, "Enbridge" refers to the following entities: Enbridge Energy, L.P., Enbridge Pipelines (Lakehead) L.L.C., Enbridge Energy Partners, L.P., Enbridge Energy Management, L.L.C., Enbridge Energy Company, Inc., Enbridge Employee Services, Inc., Enbridge Operational Services, Inc., Enbridge Pipelines Inc., and Enbridge Employee Services Canada Inc.*

Summary of Activities

The following summarize some of the activities undertaken by Enbridge, since the start of the Consent Decree, in order to demonstrate compliance:

- Responded to over 850 information requests by the ITP
- Provided over 5500 individual documents demonstrating compliance to the ITP
- Over 150 Enbridge personnel directly involved in ITP compliance verification activities including interviews
- Completed nearly 80 high resolution in-line inspection programs
- Completed over 400 excavations
- Installed 12 new remotely controlled valves
- Completed 53 emergency response practice exercise activities in 2017 through November 22, 2019
- Completed 45 community outreach meetings in 2017 through November 22, 2019

Table Intro-1 in Appendix 1 lists activities that Enbridge considers complete in accordance with P. 203(i) as implemented requirements of the Consent Decree.

Section A – Original US Line 6B

21. [Original US Line 6B]

As reported in the first SAR, the original Line 6B was permanently disconnected from the Enbridge system prior to the Effective Date of the Consent Decree and remains inoperable. This Consent Decree activity is complete. Enbridge continues to monitor Line 6B and will provide updates as warranted in future SARs. There is no update for Reporting Period 5.

Section B – Replacement of Line 3; Evaluation of Replacement of Line 10

22.a [Replacement of Line 3 in the United States]

Enbridge has been vigorously pursuing all avenues to complete the replacement of Line 3 as quickly as possible. As discussed in SARs 1-4, Enbridge obtained a Certificate of Need and Route Permit from the Minnesota Public Utilities Commission ("MPUC"), both of which are required before certain other state and federal approvals may be obtained. At this time, the Certificate of Need and Route Permit are ineffective due to the Minnesota Court of Appeals' ruling that the Environmental Impact Statement ("EIS") is deficient in one respect. Specifically:

- On June 3, 2019, the Minnesota Court of Appeals issued a decision concluding that the EIS for the Line 3 replacement was adequate with respect to all issues that were challenged by Line 3 replacement opponents, except two of the three appellate judges ruled that the EIS failed to adequately consider the potential impact of an oil spill into the Lake Superior watershed. As a result of this ruling, the Minnesota Court of Appeals reversed the MPUC's earlier decision finding the EIS to be adequate, and remanded the EIS back to the MPUC to conduct a further oil spill analyses.

- On July 3, 2019, two petitions for certiorari were filed by Line 3 replacement opponents, requesting the Minnesota Supreme Court's review of the June 3 Minnesota Court of Appeals' decision. The MPUC did not seek Minnesota Supreme Court of the June 3 Minnesota Court of Appeals decision on the one remanded issue; nor did Enbridge.
- On September 17, 2019, the Minnesota Supreme Court denied petitions for review filed by Line 3 replacement opponents.
- On October 8, 2019, on the basis of the June 3 Minnesota Court of Appeals decision, the MPUC issued an order finding the EIS to be inadequate for failure to adequately consider the potential impact of an oil spill into the Lake Superior watershed and directing the Minnesota Department of Commerce ("DOC") to revise the EIS accordingly.
- While outside Reporting Period 5 and as will be further detailed in SAR6:
    - On December 9, 2019, the DOC issued for public review and comment a revised EIS assessing the impact of an oil spill into the Lake Superior watershed. The revised FEIS can be viewed at: https://mn.gov/eera/web/file-list/13765/. The DOC accepted public comments on the second revised FEIS until Jan 6, 2020. The MPUC allowed for reply comments to be submitted until Jan 16, 2020.
    - After review of comments received, the MPUC will issue a decision on the adequacy of the revised EIS. That adequacy decision will be followed by new decisions by the MPUC on the Certificate of Need and Route Permit for the Line 3 replacement, which may include reinstating the prior Certificate of Need and Route Permit decisions.

The status of primary permits and approvals for the Line 3 Replacement project are noted in **Table B-1** in Appendix 1. Additional detail is provided below on the permitting and construction plans.

Permitting:

Minnesota: A number of local, county, state, and federal permits and approvals are required before the replacement of the approximate 340.4-mile segment of Line 3 in Minnesota can proceed. Specifically, Enbridge is awaiting the issuance of the Minnesota approvals that are identified in **Table B-1** in Appendix 1. At this time all permit applications have been filed and are under review. SARs 1-4 detail the steps involved with securing the required authorizations.

North Dakota: As reported in previous SARs, on May 7, 2014, Enbridge received approval to replace Line 3 in North Dakota from the North Dakota Public Service Commission ("NDPSC"). In that year, Enbridge replaced an approximate 15-mile segment of Original Line 3 that extends from the U.S.-Canada border to the first U.S. mainline valve. Enbridge plans to replace the remaining 12.3-mile segment of Line 3 in North Dakota as soon as practicable. In order to proceed with that replacement, Enbridge will be required to file the necessary notifications with the NDPSC, informing the NDPSC that Enbridge intends to proceed with construction under the PSC's certification process. Most of the additional North Dakota Permits required for replacement of that segment have been obtained, except for authorizations under Nationwide Permit 12 at the USACE. Enbridge plans to move forward to replace the small remaining portion of Line 3 in North Dakota concurrently with replacement of the Minnesota section of Line 3.

Wisconsin: As reported in previous SARs, the Original Line 3 extends approximately 14 miles in the State of Wisconsin. Enbridge received from federal, state, and local authorities all approvals and permits necessary for the replacement of that 14-mile segment. Enbridge initiated construction of the replacement in July 2017. Construction of that segment is complete and the replacement, known as "Segment 18," went into service on May 25, 2018.

Construction Plans:

Table B-2 in Appendix 1 identifies key dates regarding Enbridge's plans to construct the Line 3 replacement. As shown in the table and as indicated above, construction of the portion of the Line 3 replacement in the State of Wisconsin has already been completed and was placed into service on May 25, 2018. Construction of the remaining replacement segments in North Dakota and Minnesota will commence following the receipt of the permits described in **Table B-1** that are required for construction.

All mainline pipe has been procured and delivered to the appropriate pipe yards in Minnesota. Design engineering, handled internally by the Enbridge project team, is also substantially complete, although permitting may require minor route revisions or changes to installation methods for specific areas. Enbridge will provide additional details in the next SAR or subsequent SARs as such information becomes available.

22.b [Line 3 Decommissioning]

Within 90 Days after the Original Line 3 is taken out of service (following the construction of the Line 3 replacement and placing the replacement into service), Enbridge will purge remaining oil from Original US Line 3 by running a cleaning pig through the line. Enbridge will complete final clean-out and decommissioning of Original US Line 3 will be complete within one year thereafter, in accordance with Subparagraph 22.b.

22.c [Original US Line 3 Maximum Operating Pressure ("MOP")]

Enbridge has limited the operating pressure of all Line 3 segments in accordance with MOP values specified at https://www.epa.gov/enbridge-spill-michigan/enbridge-revised-maximum-operating-pressure-values.

Enbridge has not increased operating pressures above the specified MOP values; therefore, hydrostatic pressure tests were neither required to be conducted nor needed to be provided to the US Environmental Protection Agency ("EPA") with associated procedures and results. Enbridge has not exceeded the MOP values submitted to the EPA.

Although not required by the Consent Decree, each month Enbridge has been reporting to the ITP the maximum pressure on Line 3 compared to the maximum allowable pressure on Line 3. During this reporting period, Enbridge discovered that the pressure information voluntarily provided to the ITP in spreadsheet format contained an error. That error merely misidentified a pressure value for Line 3 in the spreadsheet; at no time during Reporting Period 5 did the operating pressure for any Line 3 segments fail to comply with the specified MOP values. Enbridge corrected the reporting error and has reported this reporting error in Paragraph 144 [Section B September 26, 2019 Identified Line 3 MOP Reporting Discrepancies – P. 22].

22.d [Requirements for the Use of Original US Line 3]

Portions of Original US Line 3 remain in service as of December 31, 2017. As a result, in this reporting period, Enbridge implemented the additional requirements specified under Subparagraph 22.d, which pertain to the continued use of Original US Line 3.

(1) The In-Line Inspection ("ILI") of all portions of Original US Line 3 is scheduled on an annual basis, using the most appropriate tools for detecting, charactering, and sizing Crack Features, Corrosion Features, and Geometric Features. The ILI schedule is described in this SAR under Subsection VII.D: In-Line Inspection Based Spill Prevention Program. Enbridge and the ITP and EPA have a difference in interpretation regarding this Paragraph in the Consent Decree. Enbridge, without agreeing that its initial interpretation was incorrect, has agreed to schedule all L3 runs in line with the EPA interpretation going forward service with the exception of the final year of service. This item is included in **Table IX-1** in P. 144 Problems Anticipated in Appendix 1.

(2) The identification, excavation and mitigation or repairs of all Features Requiring Excavation ("FREs") are described in this SAR under Subsection VII.D: In-Line Inspection Based Spill Prevention Program.

(3) Enbridge conducted quarterly cleaning and biocide treatment of Original US Line 3 in 2019 as required in Subparagraph 22.d.(3) of the Consent Decree. During the current reporting period, Enbridge conducted quarterly biocide treatments on the Original US Line 3 as set forth in **Table B-3**.

22.e [Prohibition Regarding the Use of Original US Line 3 Following Replacement]

The Original US Line 3 continues to operate. The following two portions of Line 3 have been replaced to date: (i) a 15.7-mile segment located in North Dakota, which was taken out of service in 2014; and (ii) the 14-mile Segment 18 located in Wisconsin, which was taken out of service in 2018. These two portions of the Original US Line 3 are not used for any operations, including to transport oil, gas, diluent or any hazardous substances.

23 [Line 10 Replacement Evaluation]

This requirement has been met. The September 20, 2017 Line 10 Report, as updated by its April 16, 2018 Revised Line 10 Report, is compliant with the requirement in Paragraph 23 of the Decree.

No further actions were taken during this reporting period.

Section C – Hydrostatic Pressure Testing

No hydrostatic pressure tests were conducted pursuant to the terms of the Consent Decree during this reporting period (i.e., between May 23, 2019 and November 22, 2019). Therefore, the requirements specified in Paragraphs 24, 25, and 26 were not triggered and are not applicable to this SAR.

Section D – In-Line Inspection Based Spill Prevention Program

(I) In-Line Inspections

27 [Timely Identification and Evaluation of All Features]

Enbridge's implementation of the requirements of Subsection VII.D.(I) (Paragraphs 27 to 31) for the timely identification and evaluation of features of significance is set forth in the paragraphs that follow.

Enbridge and the ITP have identified a difference in interpretation regarding the incorporation of circumferential cracking within the CD. Enbridge has also identified difficulties encountered, from a technical perspective, of applying the Consent Decree as written to circumferential cracking. Enbridge, the EPA, and the ITP continue to discuss ways to resolve this challenge and this item is included in **Table IX-1** in P. 144 Problems Anticipated in Appendix 1.

28.a-b [Periodic In-Line Inspections and ILI Schedule]

A complete list of in-line inspection (ILI) programs conducted by Enbridge to identify features of interest for the pipelines in the Lakehead System, during the reporting period for this SAR is provided in **Table D-1**.

Enbridge conducts ILIs on Lakehead System Pipelines using tools identified on the Enbridge Approved ILI Tool List which was submitted to the ITP. All ILIs currently required under Paragraphs 65 and 66 of the Decree for all Lakehead System Pipelines other than Line 2 crack inspections have been completed. The schedule for ILIs to detect crack features on Line 2 is addressed in the "Stipulation and Agreement Regarding Assessment and Payment of Stipulated Penalties Relating to Timeliness of Certain In-Line Inspection" which was filed with the Court on May 2, 2018 (referred to herein as the "ILI Stipulation").

Enbridge and the ITP have identified a difference in interpretation regarding the completion of ILIs for Line 3 on an annual basis within the CD in accordance with P.22.d.(1). Regardless, Enbridge on a go-forward basis, will run each Line 3 tool within 365 days of the previous run with the exception of the final year of service. This item is included in **Table IX-1** in P. 144 Problems Anticipated in Appendix 1.

28.c [Incomplete or Invalid ILI]

Enbridge's contracts with vendors that are retained to conduct ILIs on the Lakehead System reference the In-Line Inspection Minimum Reporting Requirements, ("ILIMRR" version 8.2, version date January 22, 2018). Prior to the Effective Date of the Consent Decree, all approved ILI vendors were sent the In-Line Inspection Reporting Profile Standard, with a version date of February 1, 2017 which contained the Consent Decree reporting requirements. The requirements that vendors must submit Data Quality Assessments ("DQA") according to the deadlines specified in the Consent Decree are specified in both the ILIMRR and In-Line Inspection Reporting Profile Standard. The ILIMRR is incorporated into the ILI vendors' overall contracts with Enbridge. In addition to the ILIMRR, ILI vendor contracts stipulate that all work under the contract is completed in accordance with the terms and conditions of the Consent Decree, and each ILI is contracted through Enbridge's contract Work Order Process.

In addition, Enbridge Lakehead System work order contracts, including those concerning ILIs, contained and continue to contain the following stipulating language:

"The following are specifically made part of this Work Order Contract and all work shall be performed in accordance with the following: Company's Consent Decree in United States of America v. Enbridge Energy, Limited Partnership, et al., Case No. 1:16-CV-914, available at: https://www.epa.gov/sites/production/files/2017-06/documents/enbridgeentered-cd_0.pdf.

There were no incomplete or invalid ILI runs during this reporting period (**Table D-2**).

29 [12-Month ILI Schedule]

Table D-3 includes each consent decree ILI tool run that is scheduled to be initiated on any pipeline during the 12-month period after the reporting period covered by this SAR.

The Required Completion Dates shown in this table are consistent with the re-inspection interval requirements in Paragraphs 65 and 66 of the Consent Decree and the ILI Stipulation agreed to by EPA and Enbridge and filed with the Court on May 2, 2018.

Per the ILI Stipulation, Enbridge has been working with ILI vendors to develop and test a new crack ILI tool to detect Line 2 cracking features, with a particular focus on crack features on or adjacent to the pipeline's long seam weld. The new crack ILI tool development and validation is complete, and Enbridge has submitted its report to the ITP and EPA on November 22, 2019. The commercial ILI dates for this new crack ILI tool are included in **Table D-3.**

30 [ILI Schedule Modification]

ILIs have been performed by Enbridge, as shown **Table D-1**. During this time period there were no failed or partially failed ILI runs that required a re-run, as discussed in Subparagraph 28.c of this SAR.

Table D-4 outlines changes to Tool Runs associated with the previous 12-month Lakehead ILI schedule as reported in SAR4 (November 23, 2018 to May 22, 2019).

31 [ILI Compliance with Tool Specifications]

Enbridge reviewed the vendor-provided Data Quality Assessment ("DQA") reports for each ILI performed and compared the reports against vendor tool specifications and other relevant information. In this SAR, there were no Incomplete or Invalid ILIs (**Table D-5**).

The ILIs that operated outside of the tool specifications are summarized below. The tool performance summaries are provided in **Table D-6** with details available in the Initial ILI Reports and ILI Summary Documents.

Line 3 GF-CR MFL4 (Tool Run ID 6394)

Two caliper arms were faulty from launch, three caliper arms became faulty during the inspection, and four caliper arms broke during the inspection. The full geometry tool specification was achieved for the first 95.73 miles (69.6%) of the inspection. A revised specification was provided from 95.73 miles to the end of the inspection. The ILI data was deemed acceptable.

Line 6A AM-GT Duo CD (Tool Run ID 4804)

There were some instances of speed excursions where the minimum detectable crack length would increase beyond the 1.8" as specified in the vendor's specification in order to maintain a Probability of Detection (POD) of 90%. No abnormal tool rotation was observed in the entire length. Overall, all the POD, Probability of Identification (POI) and Probability of Sizing (POS) of the tool specifications were achieved on the entire inspected pipeline segment. The ILI data was deemed acceptable.

Line 61 PE-FN MFL-A (Tool Run ID 6546)

During this inspection, there was a total metal loss sensor loss of 2.61%. The vendor provided the locations where the stated specification was impacted along with the revised specification. Previous inspection data was utilized in conjunction with the data collected in this inspection to assess the areas of the pipe that were affected by the sensor loss. The ILI data was deemed acceptable.

(II) Review of ILI Data

32.a-c [Initial ILI Reports for Crack, Corrosion and Geometric Features Received]

Table D-7 lists valid ILI tool runs for which the Initial ILI Reports were received during this Reporting Period. Two Initial ILI Reports for Geometry ILI programs on Line 3 CR-PW and Line 3 GF-CR were received past the 60 Day deadline as outlined in CD Paragraph 32.c. These programs were part of the "Catch Up" program. If the proposed modification for Paragraph 58 is adopted as currently drafted, the analyses for these features would be deemed timely. This modification was proposed due to the large quantity of geometry features <2% OD that required analysis as part of this program. Both of these programs were received within the 90 Day extended deadline period applicable under the proposed modification now being discussed by the Parties.

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33 [Priority Features]

33.a [Immediate Priority Feature Notification Requirements]

Enbridge contracts require that vendors notify Enbridge of Priority Features as specified in Subparagraphs 33.a and 33.b.

The immediate priority feature notification requirements are documented in the ILIMRR, which forms part of all Enbridge contracts with vendors, as described above in Subparagraph 28.c.

33.b [Priority Feature Definition]

This information has not changed from the first SAR. Reporting criteria for what are deemed as Priority Features are outlined in the ILIMRR which is a contractual obligation for all ILI vendors (**Table D-8**). The ILI Reporting Profile Standard has been provided to the ITP for compliance verification activities and specifies the following priority notification reporting criteria, which are consistent with Appendix A of the Consent Decree:

1. Features that the ILI Vendor may consider to be an immediate threat to the integrity of the pipeline.
2. Dent or geometric features greater than or equal to 5 percent of the outside diameter (“OD”) of the pipe.
3. Metal loss features with peak depth greater than or equal to 75 percent of the nominal wall thickness of the pipe.
4. Metal loss features forecasted to reach a maximum depth of greater than or equal to 75 percent of nominal wall thickness with 365 calendar days.
5. Metal loss features with an effective area RPR less than or equal to 0.85
6. Unmatched metal loss features with a depth greater than or equal to 50 percent of the nominal wall thickness or actual wall thickness.
7. Crack features that meet or exceed the saturation limit of the crack detection tool.
8. Crack features greater than or equal to 2.5 mm/0.098 inch detected on the internal and external pipe surface at the same location.
9. Priority notification criteria specifically identified in a project work order. For example, the ILIMRR specifies Priority Notification Criteria for Ovalities, Wrinkles or Ovalities associated with Dents with a minimum ID less than or equal to the values shown in ILIMRR Table 3 below. As discussed in Section IX (Reporting Requirements), Enbridge, EPA and the ITP continue to discuss the appropriate application of Appendix A with regards to ovality features. Refer to **Table D-8** for Enbridge’s Priority Notification Criteria for Ovalities and other Deformation Features.

Upon receiving notice of any Priority Feature, Enbridge determines whether the feature was correctly identified and whether the feature was previously repaired or mitigated. After making such a determination, Enbridge then determines whether any Priority Feature is a Feature Requiring Excavation (“FRE”) in accordance with Section VII.D(III) of the Consent Decree. All Priority Features that Enbridge determined to be FREs during this reporting period are summarized in Subparagraph 33.d Table D-10.

Enbridge and the ITP have identified a difference in interpretation of Appendix A with regards to ovality features. Enbridge, the EPA, and the ITP continue to discuss ways to resolve this challenge. This item is included in **Table IX-1** in P. 144 Problems Anticipated in Appendix 1.

33.c-d [Priority Feature Review and Mitigation if Required]

Table D-9 identifies Priority Features for which Enbridge received notification from vendors and/or repaired during this reporting period. Each listed feature is then discussed in greater detail in this section. All priority

features identified within this reporting period were reviewed in accordance with required timelines as per the Consent Decree and repair or mitigation actions were taken if required as indicated in the table.

34, 34. a [Data Quality Review - Preliminary Review of Initial ILI Report]

Initial ILI reports that were received and reviewed during this Reporting Period are reported in Table D-10. With the exception of one (1) report (for Line 3, CR-PW using an MFL4 tool), the preliminary review of the Initial ILI reports received during this reporting period was completed within the 30-day timeframe per Subparagraph 34.a. of the Consent Decree. Three (3) Initial ILI reports (listed under Paragraph 31) were received with minor tool performance deficiencies that did not prevent analysis of the ILI data. The remaining Initial ILI reports received during this Reporting Period met the vendor's specification.

Table D-10 provides a comparison of the Data Quality Review ("DQR") timeline and the requirements in Subparagraph 34.a of the Consent Decree.

34.b [Evaluation of Features Requiring Excavation]

For ILI runs for which no data quality concerns were identified, Enbridge proceeded to evaluate the pipeline segments and/or features against the requirements in Subsection VII.D.(III) of the Consent Decree Paragraph 37 of this SAR identifies the timelines when FREs were identified and placed onto the Dig List during this SAR reporting period.

34.c [Resolution of Identified Data Quality Issues]

Enbridge identified quality concerns during its preliminary review of some Initial ILI Reports. Enbridge completed evaluations required to resolve all identified data quality concerns. In some cases, ILI vendors provided re-issued ILI reports to correct and improve the ILI reporting and data quality, as summarized in **Table D-11**. Details regarding data quality issues are reported below, additional details are provided in the ILI Program Summary Document specific to each ILI report.

A number of corrosion programs from one ILI vendor were identified as having a quality issue relating to the calculation of burst pressures. The details of the quality issues are reported in Paragraph 144 [Section D] Alternative Wall Thickness Used for RPR Calculations – P34.c of this SAR Report.

Line 1 CR-PW UMp (Tool Run ID 4045)

During the detailed feature review, Enbridge identified that the ILI vendor didn't follow the ILIMRR in reporting effective depth and effective length. In Issue 2, the ILI vendor updated the implementation of the RSTRENG Effective Area and Modified B31G pressure assessment based on the corrected nominal wall thickness and the corrected average pipe joint wall thickness (USWM WT). The Issue 2 report was received on 07/07/2019. The assessment was completed on 08/07/2019 and the assessment program was approved on 08/07/2019. No FREs were identified in this report.

Line 3 GF-CR MFL4 (Tool Run ID 6394)

Two caliper arms were faulty from launch, three caliper arms became faulty during the inspection, and four caliper arms broke during the inspection. The full geometry tool specification was achieved for the first 95.73 miles (69.6%) of the inspection. A revised specification was provided from 95.73 miles to the end of the inspection. The ILI data was deemed acceptable.

Line 3 CR-PW MFL4 Corrosion (Tool Run ID 6396)

During the detailed feature review, Enbridge identified a data discrepancy between the draft ILI report and the Initial ILI report. Enbridge requested that the vendor review the ILI report to address the discrepancies. The ILI vendor identified and corrected the discrepancies and re-issued the ILI report. ILI Report Issue 2 was received on 09/26/2019. Enbridge proceeded to add FRE's to the Dig list on 10/9/2019 based on information from both the Issue 1 and Issue 2 ILI Reports.

Line 3 CR-PW MFL4 Geometry (Tool Run ID 6396)

There were 8 geometry sensors that were damaged during this inspection. The vendor's stated specification was not impacted by the damaged sensors. The damaged sensors did not impact the peak depth sizing of any geometry features. The ILI data was deemed acceptable.

Line 3 GF-CR UCMp (Tool Run ID 3711)

During the detailed feature review, Enbridge identified that the ILI vendor didn't follow the ILIMRR in reporting effective depth and effective length. The Issue 3 report was received on July 29, 2019. The assessment was completed On August 28, 2019 and the assessment program was approved on August 29, 2019. Two FRE's were identified as a result of this assessment and changes to HCA boundaries between the first issue and final issue.

Line 4 CR-CS DuDi UCM Corrosion (Tool Run ID 2254)

During the detailed feature review, Enbridge identified that the ILI vendor didn't follow the ILIMRR in reporting effective depth and effective length. In Issue 3, the ILI vendor updated the implementation of the RSTRENG Effective Area and Modified B31G pressure assessment based on corrected nominal wall thickness and corrected pipe joint average wall thickness (USWM WT). The Issue 3 report was received on July 22, 2019. The assessment was completed on August 12, 2019 and the assessment program was approved on August 13, 2019. No FREs were identified in this report.

Line 4 CS-DR DuDi UCM Corrosion (Tool Run ID 4465)

During the detailed feature review, Enbridge identified that the ILI vendor didn't follow the ILIMRR in reporting effective depth and effective length. In issue 4, ILI vendor updated the implementation of the RSTRENG Effective Area and Modified B31G pressure assessment based on the corrected nominal wall thickness and the corrected average pipe joint wall thickness (USWM WT). The Issue 4 report was received on July 29, 2019. The assessment was completed on August 28, 2019 and the assessment program was approved on August 28, 2019. No FREs were identified in this report.

Line 4 DN-VG DuDi UCM Corrosion (Tool Run ID 2351)

During the detailed feature review, Enbridge identified that the ILI vendor didn't follow the ILIMRR in reporting effective depth and effective length. In Issue 2, ILI vendor updated the implementation of the RSTRENG Effective Area and Modified B31G pressure assessment based on the corrected nominal wall thickness and the corrected average pipe joint wall thickness (USWM WT). The Issue 2 report was received on 05/08/2019. The assessment was completed on 06/07/2019 and the assessment program was approved on 06/07/2019.

Line 4 DR-FW DuDi UCM Corrosion (Tool Run ID 2346)

During the detailed feature review, Enbridge identified that the ILI vendor didn't follow the ILIMRR in reporting effective depth and effective length. In Issue 2, ILI vendor updated the implementation of the RSTRENG Effective Area and Modified B31G pressure assessment based on the corrected nominal wall thickness and the corrected average pipe joint wall thickness (USWM WT). The Issue 2 report was received on 05/22/2019. The assessment was completed on 06/19/2019 and the assessment program was approved on 06/19/2019.

Line 4 FW-WR DuDi UCM Corrosion (Tool Run ID 4466)

During the detailed feature review, Enbridge identified that the ILI vendor didn't follow the ILIMRR in reporting effective depth and effective length. In Issue 2, ILI vendor updated the implementation of the RSTRENG Effective Area and Modified B31G pressure assessment based on the corrected nominal wall thickness and the corrected average pipe joint wall thickness (USWM WT). The Issue 2 report was received on July 22, 2019. The assessment was completed on August 21, 2019 and the assessment program was approved on August 21, 2019. No FREs were identified in this report.

Line 4 GF-DN DuDi UCM Corrosion (Tool Run ID 6013)

During the detailed feature review, Enbridge identified that the ILI vendor didn't follow the ILIMRR in reporting effective depth and effective length. In Issue 2, ILI vendor updated the implementation of the RSTRENG Effective Area and Modified B31G pressure assessment based on the corrected nominal wall thickness and the corrected average pipe joint wall thickness (USWM WT). The Issue 2 report was received on July 29, 2019. The assessment was completed on August 26, 2019 and the assessment program was approved on August 26, 2019. No FREs were identified in this report.

Line 4 PL-CR DuDi UCM Corrosion (Tool Run ID 2358)

During the detailed feature review, Enbridge identified that the ILI vendor didn't follow the ILIMRR in reporting effective depth and effective length. In Issue 2, ILI vendor updated the implementation of the RSTRENG Effective Area and Modified B31G pressure assessment based on the corrected nominal wall thickness and the corrected average pipe joint wall thickness (USWM WT). The Issue 2 report was received on 05/22/2019. The assessment was completed on 06/18/2019 and the assessment program was approved on 06/19/2019. No FREs were identified in this report.

Line 4 VG-PL DuDi UCM Corrosion (Tool Run ID 2323)

During the detailed feature review, Enbridge identified that the ILI vendor didn't follow the ILIMRR in reporting effective depth and effective length. In Issue 2, ILI vendor updated the implementation of the RSTRENG Effective Area and Modified B31G pressure assessment based on the corrected nominal wall thickness and the corrected average pipe joint wall thickness (USWM WT). The Issue 2 report was received on June 07, 2019. The assessment was completed on July 8, 2019 and the assessment program was approved on July 8, 2019. No FREs were identified in this report. The assessment deadline (July 7, 2019, Sunday) was due on the weekend so that the assessment deadline was extended to the next workday (July 8, 2019, Monday). Therefore, the assessment met the deadline required in the CD.

Line 4 WR-PW DuDi UCM Corrosion (Tool Run ID 2381)

During the detailed feature review, Enbridge identified that the ILI vendor didn't follow the ILIMRR in reporting effective depth and effective length. In Issue 2, ILI vendor updated the implementation of the RSTRENG Effective Area and Modified B31G pressure assessment based on the corrected nominal wall thickness and the corrected average pipe joint wall thickness (USWM WT). The Issue 2 report was received

on 05/22/2019. The assessment was completed on 06/19/2019 and the assessment program was approved on 06/19/2019. No FREs were identified in this report.

Line 5 WNO-WMA MFL3 (Tool Run ID 6386)

There were 6 primary sensors for metal loss detection that were under-responding throughout the inspection, and one sensor that was intermittently noisy. The full tool specification was achieved for areas where there were no adjacent sensor issues. There were 2 channels that were under-responding that were adjacent to each other, and in this case the vendor provided a revised specification for the impacted areas. There was one instance where the tool travelled too fast and the data in this area was degraded. However, there are no indications impacted by this tool speed excursion, and no previously visible/reported indications were found in the overspeed region. Overall, the tool recorded the entire segment and the data were acceptable.

Line 5 ENO-EMA MFL3 (Tool Run ID 6387)

There was one primary sensor for metal loss detection that was non-responsive from the start of the inspection. There were another 6 channels that were under responding throughout the inspection. The full tool specification was achieved for areas where there were no adjacent sensor issues. There were 2 channels that were under-responding that were adjacent to each other, and in this case the vendor provided a revised specification for the impacted areas. There was one instance where the tool travelled too fast and the data in this area was degraded. However, there are no indications impacted by this tool speed excursion, and no previously visible/reported indications were found in the overspeed region. Overall, the tool recorded the entire segment and the data was acceptable.

Line 6A AM-GT Duo CD (Tool Run ID 4804)

There were some instances of speed excursions where the minimum detectable crack length would increase beyond the 1.8" as specified in the vendor's specification in order to maintain a Probability of Detection (POD) of 90%. No abnormal tool rotation was observed in the entire length. Overall, all the POD, Probability of Identification (POI) and Probability of Sizing (POS) of the tool specifications were achieved on the entire inspected pipeline segment. The ILI data was deemed acceptable.

Line 6A AM-GT UMP Corrosion (Tool Run ID 4443)

During the detailed feature review, Enbridge identified that the ILI vendor didn't follow the ILIMRR in reporting effective depth and effective length. In Issue 2, ILI vendor updated the implementation of the RSTRENG Effective Area and Modified B31G pressure assessment based on the corrected nominal wall thickness and the corrected average pipe joint wall thickness (USWM WT) and cleaned up the report by deleting unnecessary features and main spots. The Issue 2 report was received on 09/23/2019. The assessment was completed on 10/23/2019 and the assessment program was approved on 10/24/2019.

Line 6A PE-AM UMP (Tool Run ID 4805)

There were 2 wall thickness sensors that had continuous echo loss throughout the entire inspection. The 2 sensors were not adjacent to each other. The vendor stated tool performance specifications were achieved for the entire inspection. The tool specified POD, POI and POS could be met in this tool run and the data was acceptable.

Line 61 PE-FN GEMINI Caliper (Tool Run ID 4610)

During the detailed feature review, Enbridge identified that the ILI vendor didn't follow the ILIMRR in reporting deformation feature dimensions. In the Issue 2, the dent dimensions were adjusted, and 8 new dents have been identified and added. The Issue 2 report was received on July 16, 2019, the assessment was completed on August 12, 2019 and the program was approved on August 13, 2019.

Line 61 PE-FN MFL-A (Tool Run ID 6546)

During this inspection, 2.61% of the pipeline had a reduced POD and POS. The vendor provided the locations where the stated specification was impacted along with the revised specification. Previous inspection data was utilized in conjunction with the data collected in this inspection to assess the areas of the pipe that were affected by the sensor loss. The ILI data was deemed acceptable.

Line 67 GF-CR UC (Tool Run ID 4614)

There were isolated locations where the inspection tool experienced rotation that exceeded the maximum limit. No effect on the data quality was detected. The data for the inspection was recorded by all but one channel, however, the vendor's stated specification was achieved over the entire inspection. The ILI data was deemed acceptable.

34.d [ILI Data Quality Evaluation Timelines]

As outlined in the CD, all ILI data quality evaluations must be completed within 180 Days after the ILI tool is removed from the pipeline at the conclusion of any ILI investigation. During the reporting period of this SAR, all data was reviewed in a timely manner. As outlined in the **Table D-12**, Enbridge completed data reviews for the runs (*see* "Yes" in "Quality Evaluations Completed Within 180 Days" column), and data reviews were ongoing for the runs for which the 180 Day period was still open at the end of this reporting period (*see* "FR" in "Quality Evaluations Completed Within 180 Days" column). Additional details regarding data review for some listed runs can be found in SAR5 Paragraph 34.c above (see "NA" in "Quality Evaluations Completed Within 180 Days" column).

34.e [Discrepancies between Two Successive ILI Runs]

Potential data quality concerns that specifically related to the previous assessment of the line segment were identified during Enbridge's preliminary review of some of the initial ILI Reports identified in **Table D-13**. Details of these discrepancies are reported below **Line 1 GF-CR GEMINI MFL (Run ID 4502).**

The 2019 BHGE GEMINI MFL report had decreased feature density compared to the previous 2014 BH Vectra MFL. Based on the explanation from ILI Vendor, the feature density discrepancy is due to the tool sizing algorithm difference. Based on the preliminary trending, the 2019 MFL results matched with NDE results very well for both reported depth and RPR. There is no further action required.

Line 3 CR-PW DuoCD Crack (Run ID 6395)

The 2019 DuoCD crack inspection reported a smaller feature population compared to the previous crack inspection. The decrease in the feature population can be attributed to the Segment 13 pipe replacement.

Line 3 GF-CR MFL4 Geometry (Run ID 6394)

There was in increase in the reported feature population between the 2018 and 2019 geometry inspections. The increase in the feature population was due to a change in the reporting threshold from 1% to 0.5%.

Line 10 EB-ENR USWM+ Corrosion (Run ID 4555)

In the 2019 BHGE USWM+ reported an increased feature population when compared to the previous wall measurement corrosion inspection. The increase in the feature population is attributed to the increased resolution of the 2019 inspection.

Line 61 PE-FN MFL-A Corrosion (Run ID 6546)

The MFL-A inspection reported an increased feature population when compared to the previous magnetic corrosion inspection. The increased feature population can be attributed to the increased resolution of the MFL-A tool.

Line 67 GF-CR UC Crack (Run ID 4614)

The 2019 UC inspection identified a smaller feature population than the 2014 UCM inspection. Many of the features from the 2014 inspection are considered borderline features as they have estimated depths around 39 mil. The depth of 39 mils is associated with the crack tools depth detection threshold. The feature population differences are caused by the measurement tolerances of the crack tools and the fact that the features are at the depth detection threshold and were conservatively reported in the 2014 inspection. No further action is required in this program.

34.f-g [Investigative Digs]

There were 15 investigative digs, meeting the Consent Decree definition, completed during the SAR reporting period. These were completed for the Line 01 CR-PW NDT UMP (Metal Loss) ILI program due to a potential data quality issue as outlined by the ILI vendor.

During the Data Quality Review of the Line 1 CR-PW NDT UMP ILI report, some potential data quality concerns were identified with the features that were reported. The Data Quality Review identified that the ILI vendor likely misclassified 42 features as internal corrosion and not as stable manufacturing features. This misclassification was likely a result of the ILI vendor not having access to inspection results from other ILI technologies that had previously been run on this segment. As a result of further discussion with the ILI vendor, Enbridge added 15 of the 42 features identified by the ILI tool to the Dig List as part of an investigative dig program. The remaining 27 features were placed on hold pending the results of the investigative dig program. The investigative dig program field results confirmed that the features were stable manufacturing features and were indeed misclassified. The ILI vendor agreed to revise and re-issue the report based on the field NDE results. A preliminary “Issue 2.0” report was received on February 18, 2019 with all of the incorrect features properly re-classified and as a result, no FREs were identified for this entire program. The final Issue 2.0 report was received on July 8, 2019 and approved on August 7, 2019 as part of the alternative wall thickness re-issued reports identified in Paragraph 144 [Section D] Alternative Wall Thickness Used for Burst Pressure Calculations – P. 34.c of this SAR Report.

(III) Identification of Features Requiring Excavation

35 [Evaluation of Each Feature in Initial ILI Report for Feature Requiring Excavation]

Following each ILI tool run, Enbridge evaluated each feature identified in the Initial ILI Report to determine if the feature was an FRE.

36 [Feature Requiring Excavation Definition]

With respect to Crack and Corrosion features, Enbridge applies three methods to identify an FRE:

1. Enbridge estimates the lowest pressure at which the feature is predicted to rupture or leak (i.e. Predicted Burst Pressure) using the procedures set forth in Subsection VII.D.(IV) of the Consent Decree.
2. Enbridge estimates the amount of time remaining until the feature is predicted to rupture or leak (i.e. Remaining Life) using the procedures set forth in Subsection VII.D.(VI) of the Consent Decree.
3. Enbridge considers other unique characteristics of a feature using the criteria set forth in Subsection VII.D.(V) of the Consent Decree. The records of these methods being applied are in the Assessment Sheets for each ILI tool run and were referenced in the Compliance Registry Forms database.

With respect to Geometric and Intersecting or Interacting features, Enbridge considers unique characteristics of the feature using the criteria set forth in Subsection VII.D.(V) of the Consent Decree. The records of this criteria being applied are in the Assessment Sheets for each ILI tool run and were referenced in the Compliance Registry Forms.

37 [Deadlines for Adding Features Requiring Excavation on the Dig List]

Following each successful Consent Decree ILI tool run, Enbridge identified all Crack, Corrosion, and Geometric features detected by the ILI tool runs that are FREs. Enbridge added such features to an electronic list of features scheduled for excavation and repair or mitigation (i.e. Dig List) in accordance with the schedule outlined in Paragraph 37 of the Consent Decree. This listing does not include features that EPA/ITP may consider FREs due to differing interpretations of CD provisions such as those relating to Paragraph 58 and circumferential cracks.

All FREs identified based on their Predicted Burst Pressure or their Remaining Life were added to the Dig List within 5 days of calculating the Predicted Burst Pressure and the Remaining Life of the features in accordance with Subsection VII.D.(IV) of the Consent Decree.

All FREs identified based on interacting or intersecting criteria were added to the Dig List within 5 days of completing the preliminary review of the initial ILI reports, in all cases where the preliminary review did not identify any data quality concerns related to the feature.

Table D-14 provides a list of the FREs that were identified during the reporting period of this SAR. Priority notifications FREs are excluded from this table as they are included in Paragraph 33 of this SAR. ILI tool runs that did not discover any FREs are excluded from this table. Details on the process to identify FREs are included within the ILI Assessment Sheets.

38 [Dig List Actions]

Enbridge has complied with the requirements of Paragraph 38, as set forth in the Subparagraphs below.

38.a [Excavation and Repair Deadlines]

For each FRE placed on the Dig List, Enbridge established excavation and repair deadlines that accounted for the level of threat posed by the feature and that complied with the dig criteria deadlines specified in Subsection VII.D.(V) of the Consent Decree. If a feature met more than one dig-selection criteria, Enbridge set the excavation and repair deadline in accordance with the shortest applicable timetable set forth in Subsection VII.D.(V) of the Consent Decree. In some cases, dig deadlines were extended per the provisions provided in Paragraph 49 such as when completing a dig in the winter is less detrimental to the environment or when a dig was particularly complex.

38.b [Establish Pressure Restrictions if Required]

All pressure restrictions (PRs) required for FREs are established pursuant to Subsection VII.D.(V) of the Consent Decree.

In cases where an FRE is subject to more than one PR under Subsection VII.D.(V) of the Consent Decree; Enbridge established the PR that results in the lowest operating pressure at the location of the feature.

The "Point Pressure Restriction (PPR) values" requirements were satisfied by limiting the discharge pressure at the nearest upstream pump station to a level that assured compliance with the PPR value at the location of the feature.

39.a-b [Field Measurements of Excavated Features]

During the reporting period of this SAR, Enbridge followed its processes to excavate and repair or mitigate and record field measurements for all crack and geometry features, and all corrosion features with depth greater than 10% in accordance with Subsection VII.D.(V) of the Consent Decree. Ten percent (10%) is the general corrosion ILI tool detection depth threshold.

During excavations for FREs and any additional segments of pipeline, including investigative digs pursuant to Subparagraph 34.e of the Consent Decree, Enbridge obtained and recorded field measurements of all applicable features on the excavated segments and these were stored in OneSource as per Paragraph 77. All approved Non-destructive examination ("NDE") reports were uploaded to the Enbridge Shared Drive for ITP access.

During the reporting period of this SAR, Enbridge did not discover any pipe segments that contained a high volume of unreported features as denoted in the Consent Decree. Hence, the requirements of Subparagraph 39.a were not applicable for this SAR.

During this SAR reporting period, the FREs repaired and planned for repair are listed in **Table D-15**.

Please note that Priority Features that were repaired are reported in **Table D-9** under Paragraph 33.c-d, therefore they are not reported in **Table D-15**.

40 [Field Data Comparison to ILI Data]

Complete ILI programs with the associated Consent Decree digs completed within the reporting period for this SAR are listed in **Table D-16**.

Within 30 Days after completing excavation of all Features Requiring Excavation identified on a pipeline based on any Initial ILI Report, Enbridge completed an analysis of field data obtained during all excavations conducted and determined whether field data indicated that the ILI tool tended to understate the actual severity of features on the excavated sections of the pipeline ("ILI tool depth bias").

As reported in Paragraph 40, SAR 4, three ILI programs were incorrectly identified as requiring additional excavations as the result of an applied depth bias to the original program. The digs from the affected programs have been cancelled as reported in **Table D-17**: P. 40 Cancelled Digs and the OneSource and eDig records have been corrected to avoid future confusion.

During the reporting period, Enbridge, EPA and the ITP discussed refinements to when excavations of FREs would be deemed "completed." The parties currently appear to agree on this issue of interpretation going forward. This item is included in **Table IX-1** in P. 144 Problems Anticipated in Appendix 1.

41 [ILI Electronic Records]

For each ILI investigation conducted during this reporting period, Enbridge maintained electronic records relating to ILI data, including but not limited to all 14 categories of information listed in Paragraph 41 of the Consent Decree.

Enbridge procedures require that such ILI data records be maintained for at least 5 years after termination of the Consent Decree.

(IV) Predicted Burst Pressure/Fitness for Service

42 [Predicted Burst Pressure]

Enbridge calculated the Predicted Burst Pressure of all Crack[2] and Corrosion features identified by ILI tools, in accordance with the requirements of Subsection VII.D.(IV) of the Consent Decree.

43 [Predicted Burst Pressure Definition]

Enbridge calculated the Predicted Burst Pressure of ILI features in accordance with the inputs and procedures in Appendix B of the Consent Decree[2]. Enbridge calculated the Predicted Burst Pressure of NDE features, as described in Paragraph 144 [Section D] Crack and Corrosion Field Burst Pressure Calculations per Appendix B in the Consent Decree – Paragraph 43.

The ILI assessment sheets documented all ILI feature Burst Pressure calculations, including the methodology and all the inputs as stated above.

44.a-b [Initial Predicted Burst Pressure Calculations and Initial Remaining Life Calculations]

Table D-18 summarizes the timelines for completing initial Predicted Burst Pressure calculations and initial Remaining Life calculations for all Crack[3] or Corrosion features identified in reports that were received within the reporting period. Refer to **Table D-7** under Paragraph 32.a-c for a list of all valid ILI runs with reports received within the reporting period.

As shown in **Table D-18**, all calculations were completed no later than the earlier of either: (1) eight weeks after completing data quality review with respect to the feature and/or pipeline section where the feature is located; or (2) 175 Days after the ILI tool was removed from the pipeline at the conclusion of the ILI run. One initial Remaining Life calculation occurred beyond the eight-week deadline on the Line 01 CR-PW UC (Crack) program. Details for this Remaining Life calculation are reported in Paragraph 145 [Section D] Line 01, CR-PW, UC GW93520 Remaining Life Deadline – P. 44.b(1) of this SAR Report.

45 [Retention of Electronic Records]

Enbridge maintains electronic records documenting all Predicted Burst Pressure calculations, and all Remaining Life calculations, including inputs and dates the calculations were completed with respect to particular features, until five years after termination of the Consent Decree.

[2] *Enbridge has not applied Appendix B to evaluate circumferential Crack features as it is not suitable for such features.*
[3] *Enbridge has not applied Appendix B to evaluate circumferential Crack features as it is not suitable for such features.*

(V) Dig Selection Criteria

46.a-d [Dig Selection Criteria]

Where Enbridge has identified features meeting dig selection criteria, it has within set timeframes, excavated, and repaired or mitigated such features in accordance with Tables 1 through 5 of the Consent Decree. A summary of each dig and the related timeframes are provided in **Table D-19**. The feature repair and mitigation of the Priority Notification features are reported in Subparagraphs 33.c-d **Table D-9** and therefore are not included in **Table D-19.** Digs cancelled during this reporting period are included in **Table D-17: Cancelled Digs.**

During each excavation required under this Paragraph, Enbridge inspected all excavated portions of the pipeline and collected field measurements of features on excavated portions of the pipeline. Enbridge determined, based on an analysis of field measurement values of feature length and depth and other relevant field observations, whether excavated portions of the pipeline contained any additional features not previously identified on the dig list that satisfy one or more of the dig selection criteria.

At the time of excavation, Enbridge repaired or mitigated the features based on an analysis of field measurement values for feature length and depth or other field observations, regardless of whether the feature was placed on the Dig List based on an analysis of ILI-reported values for feature length and depth.

Where applicable, Enbridge established pressure restriction requirements and imposed PPRs in accordance with Consent Decree requirements[4] as summarized in (**Table D-20**). Note that when the imposition deadline of a PPR was a weekend day or United States Federal holiday, the deadline was moved to the following business day in accordance with Definition (m) of the Consent Decree.

46.e [Alternate Plans and Alternate Interim Pressure Restrictions]

Enbridge implemented Alternate Plan #5 to extend a corrosion dig repair/mitigation timeline during the reporting period of this SAR. The details can be seen in Paragraphs 46.g – 46.h. Totals for all Alternate Plans and Alternate Interim Pressure Restrictions are provided in **Table D-21.**

46.f [Saturated Signal Crack Feature]

No Alternate Plan was submitted for a Crack feature within the reporting period.

46.g [Alternate Plans and Alternate Interim Pressure Restrictions]

Enbridge has complied with the requirements of paragraph 46.g for Alternate Plans submitted during this SAR reporting period. During the period covered by this SAR, Enbridge submitted one Alternate Plan (Alternate Plan #05) on May 29, 2019, as authorized by Subparagraph 46.d. The details of the Alternate Plan are summarized in **Table D-22.**

46.h [Alternate Plans and Temporary Pressure Restrictions]

The Alternate Plan #05 submitted contained, as one element of the Plan, a proposed temporary pressure restriction, consistent with Paragraph 46.h.

[4] *Enbridge has not applied Appendix B to evaluate circumferential Crack features as it is not suitable for such features.*

46.i. [Compliance with applicable laws and regulations]

The details associated with Alternate Plan #05 as submitted complies with applicable laws and regulations.

46.j [Alternate Plans and Alternate Pressure Restrictions Implementation]

Enbridge has begun implementing the Alternate Plan as described in the written notifications submitted to EPA pursuant to Subparagraph 46.g(2). The initial notification was submitted on December 12, 2018 and has since been supplemented following additional communications with EPA and the ITP.

46.k [Documentation Maintenance]

Enbridge has maintained all documentation relating to the selection and implementation of the Alternate Plan. Enbridge is prepared to make such documents available to EPA upon request, consistent with the requirements of Section X (Information Collection and Retention).

46.l [Description of Alternate Plans and Alternate Pressure Restrictions]

Enbridge implemented one Alternate Plan during the reporting period of this SAR. Details for this Alternate Plan as well as other active Alternate Plans are shown in **Table D-21, Table D-22 and Table D-23.**

47 [Dig-Selection Criteria and Pressure Restriction Requirements for Crack Features]

Enbridge has set schedules for the excavation and repair or mitigation of each Crack feature that meets one (or more) of the Dig Selection Criteria set forth in Table 1 of the Consent Decree, in accordance with the timeframes specified in column 2 of Table 1, and the PR requirements specified in column 3 of Table 1. The Crack features that meet the above criteria were summarized in **Table D-24** and PPRs of crack FREs are listed in **Table D-25.**

Enbridge also issued dig packages to excavate and repair or mitigate Crack features that intersected or interacted with Corrosion features, dents, or other Geometric features, and established appropriate pressure restrictions for such interacting features, as provided in Table 5 and Paragraph 59 of the Consent Decree.[5] For more information about these interacting features, see Paragraph 59 in this SAR. These features are not included in **Table D-24** and **Table D-25**, but they are detailed in P. 58 and P. 59.

Table D-25 lists the pressure restrictions imposed due to these criteria as applicable to this SAR.

As the parties have discussed at length, Enbridge believes that the consent decree was not drafted to address circumferential cracking, which historically has not occurred within the Lakehead system. In addition, the Decree allows Enbridge discretion in selecting the tools most appropriate to address different types of features.

[5] *Enbridge and EPA have identified a potential disagreement regarding interpretation of Subsection VII.D.(V) as applied to certain interacting or intersecting features addressed by P59 and Table 5. The discussion of Enbridge's compliance activities here and elsewhere is based on Enbridge's interpretation of requirements for intersecting or interacting features. Similarly, Enbridge does not interpret the CD to cover interacting or intersecting circumferential crack features.*

48 [Crack Feature Mitigation Timelines]

During this reporting period, Enbridge determined the deadline for each feature repair / mitigation as the shortest deadline specified in Tables 1, 3, or 5 of the Consent Decree, and Enbridge established the lowest operating pressure at the location of the feature which is subject to more than one pressure restriction.

49 [Dig Timeline Extensions]

During this reporting period, Enbridge extended the dig deadline for one FRE from 180 days to 365 days based on CD Paragraph 49.a from the Line 1 CR-PW 2018 NDT UC inspection. An FRE identified on GW98280 from the Line 1 CR-PW 2018 NDT UC inspection was added to the dig list on 02/14/2019 as Dig ID 25343 and had an original excavation due date of 08/13/2019 (180 Days, in an HCA). The excavation was located in a wetland area which required extensive matting to be installed in order to allow excavation crews to access the site. Enbridge determined that the likelihood that the feature will result in a leak or rupture is low. In order to substantially reduce potential adverse impacts of the excavation on the wetland ecosystems, Enbridge decided to postpone the excavation and perform it during winter months as outlined in CD Paragraph 49.a. As a result, the excavation due date was extended to 02/14/2020 (365 Days) and a new pressure restriction, limiting the maximum operating pressure at the location, was imposed for the feature on 07/11/2019 prior to expiration of the 180-Day period as per CD Paragraph 49.

50 [Corrosion Features]

Enbridge has set schedules for the excavation and repair or mitigation of each Corrosion feature that meets one (or more) of the Dig Selection Criteria set forth in Table 2 of the Consent Decree, in accordance with the timeframes specified in column 2 of Table 2 for corrosion features located in any HCA, and the timeframes specified in column 3 of Table 2 for corrosion features not located within an HCA. The Corrosion features that meet the above criteria are summarized in **Table D-26** and the associated PPRs are listed in **Table D-27**.

Enbridge has identified that 3 excavations on Line 61 were FREs due to inaccurate Maximum Operating Pressures ("MOPs") on the EPA website. Enbridge is currently working with the EPA to resolve this inaccuracy.

Enbridge also issued dig packages to excavate and repair or mitigate Corrosion features that intersect or interact with Crack features, dents, or other Geometric features, and established appropriate pressure restrictions for such interacting features, as provided in Table 5 and Paragraph 59 of the Consent Decree.[6] For more information about these interacting features, see Paragraph 59 in this SAR. These features are not included in **Table D-26.**

51 [Corrosion Feature Mitigation Timelines]

During this reporting period, Enbridge determined the deadline for each feature repair / mitigation as the shortest deadline specified in Tables 2, 3, or 5 of the Consent Decree, and Enbridge established the lowest operating pressure at the location of the feature which is subject to more than one pressure restriction.

[6] *Enbridge and EPA have identified a difference in interpretation regarding Subsection VII.D.(V) as applied to certain interacting or intersecting features addressed by P59 and Table 5. The discussion of Enbridge's compliance activities here and elsewhere is based on Enbridge's interpretation of requirements for intersecting or interacting features.*

52 [Corrosion Feature Pressure Restrictions]

Enbridge established PRs within the timeframes identified in Paragraph 51 Table 2 of the Consent Decree and specified in Subparagraphs 52.a and 52.b (i.e. within 2 days after determining that any Corrosion feature had a depth greater than 80 percent of the wall thickness of the joint where the feature is located, or within 2 days after determining that any feature had a RPR less than 1.00 or a Predicted Burst Pressure that is less than 1.39 x MOP).

Table D-27 lists the PRs imposed due to these criteria in this reporting period of the SAR. Note that where the imposition deadline for PPRs was on a weekend or United States Federal holiday, the imposition deadlines were moved to the following business day in accordance with Definition (Par. 10.m) of the Consent Decree.

53 [Dig Selection Criteria for Axial Slotting, Axial Grooving, Selective Seam Corrosion and Seam Weld Anomaly A/B Features]

During this reporting period, Axial Slotting, Axial Grooving and Selective Seam Corrosion, and Weld Anomaly A/B FREs were identified, as listed in **Table D-28**.

54 [Pressure Restrictions for Axial Slotting, Axial Grooving, Selective Seam Corrosion and Seam Weld Anomaly A/B Features]

During this reporting period, PRs required as a result of Axial Slotting, Axial Grooving, Selective Seam Corrosion features and Seam Weld anomaly A/B features were imposed, as identified in **Table D-29**, in accordance with Table 3 of the Consent Decree.

55 [Dig Selection Criteria for Dents and other Geometric Features]

Enbridge excavated and repaired or mitigated each dent that met one or more of the Dig Selection Criteria set forth in Table 4 of the Consent Decree and established pressure restrictions for identified interacting dents as provided in Paragraph 57. Enbridge shall meet the timeframes specified in column 2 of Table 4 of the Consent Decree for features located within an HCA, or timeframes specified in column 3 of Table 4 in the Consent Decree for features not located within an HCA.

56 [Dent Mitigation Timelines]

Enbridge determined the deadline of a geometry feature repair or mitigation as the shortest deadline as identified in **Table D-30**. The same process provides that Enbridge will establish the PR resulting in the lowest operating pressure at the location of the feature that was subject to more than one pressure restriction.

57 [Dent Feature Pressure Restrictions]

Enbridge established PRs for dents within the timeframes identified in Paragraph 57 of the Consent Decree. There were no dent features requiring PRs identified during the reporting period of this SAR.

58 [Dig Selection Criteria for Interacting Features]

Within 30 days after receiving any Initial ILI Report, Enbridge reviewed OneSource (i.e. the integrated database specified under Paragraph 74 of this SAR) for the purpose of determining whether any feature reported by the ILI tool intersected or interacted with a feature of a different feature type that was detected during a previous ILI Tool Run but not repaired or mitigated. Enbridge excavated and repaired all such

intersecting/interacting features that met the dig selection criteria set forth in Table 5 of the Consent Decree, within the applicable timeframes identified in columns 2 and 3 of Table 5.[7] Enbridge also established PRs as provided in Table 5 and Paragraph 59 of the Consent Decree. For more information, see the discussion in the following Paragraph (Paragraph 59) of this SAR. **Table D-31** lists the intersecting/interacting features that were identified for excavation.

Enbridge, the ITP, EPA and DOJ are working to resolve differences in interpretation in regard to this Paragraph. As a result of extensive discussions and negotiations between Enbridge, the ITP, EPA and DOJ, Enbridge has requested that ILI vendors report all deformations down to the tool tolerance of the geometric ILI tool. Historical consent decree geometric ILI reports have been revisited by the ILI vendors to add the small geometric features less than 2% that were not previously reported. All 26 of the historical consent decree geometric ILI reports were received from the ILI vendors in advance of the 12/15/2019 deadline agreed to as part of the proposed Paragraph 58/59 CD Modification. Enbridge has also updated geometric ILI work orders to request that the vendor report all deformation down to tool tolerance for all runs after March 31, 2019. Enbridge, the ITP, EPA and DOJ continue to discuss a modification to the Consent decree regarding geometric features less than 2% that will resolve the interpretation differences in relation to this Paragraph. This item is included in **Table IX-1** in P. 144 Problems Anticipated in Appendix 1.

59 [Pressure Restrictions for Interacting Features]

Except when described in the discussion of Paragraph 46 above, Enbridge established the PRs within the timeframes identified in Table 5 and specified in Subparagraphs 59.a and 59.b of the Consent Decree for each interacting feature identified during the period of this SAR.[8] Within two days after determining that any intersecting or interacting Crack, and/or Corrosion feature had a Predicted Burst Pressure that is less than 1.25x Established MOP, Enbridge limited operating pressure at the location of the feature to not more than 80 percent of the Predicted Burst Pressure, as identified in **Table D-32**. Within two days after determining that any dent had an indication of cracking, metal loss or a stress riser, Enbridge limited operating pressure at the location of such feature to not more than 80 percent of the highest actual operating pressure at the location of the feature over the last 60 days.

Pressure restrictions can be removed upon completion of feature repair. Pressure restriction removal is a safety critical process that is completed at Enbridge's discretion and there is no requirement to remove a pressure restriction within a certain period after a feature is repaired.

Enbridge, the ITP, EPA and DOJ continue to discuss a modification to the Consent Decree regarding geometric features less than 2% that will resolve the interpretation differences in relation to this Paragraph. This item is included in **Table IX-1** in P. 144 Problems Anticipated in Appendix 1.

[7] *Enbridge and EPA have identified a difference in interpretation regarding Subsection VII.D.(V) as applied to certain interacting or intersecting features addressed by P. 59 and Table 5. The discussion of Enbridge's compliance activities here and elsewhere is based on Enbridge's interpretation of requirements for intersecting or interacting features.*

[8] *Enbridge and EPA have identified a difference in interpretation regarding Subsection VII.D.(V) as applied to certain interacting or intersecting features addressed by P. 59 and Table 5. The discussion of Enbridge's compliance activities here and elsewhere is based on Enbridge's interpretation of requirements for intersecting or interacting features.* Features covered by EPA's potential interpretation have been addressed in information exchanges between the Parties, and are subject to a proposed modification being developed by the Parties.

(VI) Remaining Life Determinations/Re-inspection Intervals

60 [Remaining Life]

Enbridge completed the Remaining Life calculation for all detected crack and corrosion features that did not meet any of the dig selection criteria. These calculations are in the ILI Assessment Sheets. As reported in Paragraph 44.a-b of this SAR, all Remaining Life calculations were completed no later than the earlier of either: (1) eight weeks after completing data quality review with respect to the feature and/or pipeline section where the feature is located; or (2) 175 Days after the ILI tool was removed from the pipeline at the conclusion of the ILI run. One initial Remaining Life calculation occurred beyond the eight-week deadline on the Line 01 CR-PW UC (Crack) program. Details for this Remaining Life calculation are reported in Paragraph 145 [Section D] Line 01, CR-PW, UC GW93520 Remaining Life Deadline – P. 44.b(1) of this SAR Report. **Table D-33** summarizes the remaining life calculations completed during this reporting period.

61 [Remaining Life Clarifications]

Paragraph 61 provides instances where the remaining life does not need to be calculated for a feature. Pursuant to Paragraph 61, Enbridge does not always calculate the remaining life for repaired or mitigated crack features. Enbridge does not utilize the other exception criteria provided in Paragraph 61.

62 [Operating Pressure Used when Determining the Remaining Life of Crack Features]

Enbridge monitors and records the actual operating parameters of pipeline or pipeline segment pressure monthly to be used in the Crack feature Remaining Life Calculation as outlined in the Lakehead System Integrity Remediation process:

a. In determining the number and magnitude of pressure cycles, Enbridge uses the worst cycling quarter between the most recent valid Crack ILI tool run and the immediately prior valid Crack ILI run. The worst cycling quarter reflects the worst combination of cycling frequency and cycling magnitude for the applicable line or line segment during the period between the successive ILI runs.

b. Enbridge did not increase the operating pressure limit in any segment of a Lakehead System pipeline after determining the Remaining Life of unrepaired Crack features in accordance with this Paragraph 62.

63 [Crack Feature Remaining Life Calculations]

Enbridge used a fatigue crack growth model and a Stress Crack Corrosion (“SCC”) crack growth model and determined the remaining life with the model yielding the fastest projected growth rate and the shortest Remaining Life.

The application of fatigue crack growth model and SCC growth model to yield the fastest projected growth rate and the shortest Remaining Life is illustrated in the ILI Assessment sheets.

Paragraph 44 of the Consent Decree discusses how all calculations are completed within the required timeframes. **Table D-34** summarizes the remaining life calculations completed during this reporting period.

64 [Corrosion Growth Rate]

Enbridge used a Corrosion Growth Rate (“CGR”) based on back-to-back corrosion runs (if available), or a historical CGR estimate for newly constructed pipeline or pipeline segment with no less than 0.005 inch per year. The application of a CGR based on back-to-back corrosion runs, or a historical CGR estimate for

newly constructed pipeline or pipeline segment with no less than 0.005 inch per year, is illustrated in more detail in the ILI Assessment sheets.

65 [Maximum Interval between Successive ILIs Based on Half-Life Criteria]

Other than crack inspections for Line 2, the maximum interval between successive ILIs to assess Crack and Corrosion features did not exceed one-half of the shortest Remaining Life of any unrepaired Crack or Corrosion feature in the pipeline, calculated as described in Subsection VII.D.(VI) as of the end of the reporting period for this SAR. Crack inspections for Line 2 are governed by the Stipulation filed with the Court on May 2, 2018. Under the Stipulation, no crack inspections on Line 2 are due until 2020.

66 [Maximum Interval between Successive ILIs – Not to Exceed Five Years]

Other than crack inspections for Line 2, Enbridge determined the interval between successive Crack, Corrosion and Geometry ILIs. The maximum interval between successive ILIs does not exceed 5 years for all Lakehead pipeline segments. The 12-month ILI schedule (May 23, 2019 – May 22, 2020) is included in Paragraph 29 of this SAR and the ILI runs completed during the reporting period of this SAR are included in Paragraph 28. Crack inspections for Line 2 are governed by the Stipulation filed with the Court on May 2, 2018. Under the Stipulation, no crack inspections on Line 2 are due until 2020.

Enbridge and the ITP have identified a difference in interpretation regarding the completion of ILIs for Line 3 on an annual basis within the CD. Enbridge has agreed on a go-forward basis to run the Line 3 tools within 365 days of the previous run. Challenges identified in meeting this agreement are reported in Paragraph 144 [Section D] Line 3 CR-PW 2019 Duo CD Crack Inspection – P. 28.a-b and P. 66 of this SAR Report.

Section E – Measures to Prevent Spills in the Straits of Mackinac

67 [Applicability]

A discussion of Enbridge's implementation of the requirements of Subsection VII.E (Paragraphs 67 to 73) to the two Line 5, 4.09-mile, 20-inch diameter pipelines (referred to herein as the "Dual Pipelines") that cross the Straits of Mackinac ("Straits") is set forth in the following sections.

68 [Span Management Program]

68.a [Integrity Protection from Currents, Ice, Spans or Vessel Anchors – Span Management Program]

Protection from Currents and Ice

Enbridge operates and maintains the Dual Pipelines to ensure that neither ice nor currents impair the integrity of either pipeline. The Dual Pipelines are continuously submerged at a depth below the surface of the Straits where ice flows do not form and they are buried near the shoreline areas, which eliminates the potential for impairment of the integrity of the Dual Pipelines caused by ice. As a precaution, Enbridge also monitors the ice data published on the United States Coast Guard ("USCG") website and performs routine surveys of the shoreline areas to ensure ice does not impair the Dual Pipelines.

Independent studies completed by Dynamic Risk Assessment Systems, Inc. (final report published on State of Michigan website at https://mipetroleumpipelines.com/document/alternatives-analysis-straits-pipeline-

final-report) have confirmed that there is no risk to the Dual Pipelines from ice on the deeper portions of the pipelines and the burial medium protects the pipelines from ice in the shallow portions. Burial conditions are further confirmed through periodic visual inspections using Remote Operated Vehicle ("ROV") and Autonomous Underwater Vehicle ("AUV") surveys. These inspections are conducted bi-annually, with the next set of inspections due to be scheduled in 2020.

Protection of Spans

In addition to ensuring the Dual Pipelines are not threatened by ice flows, Enbridge operates and maintains the Dual Pipelines to ensure the pipelines are well-supported in areas where the pipeline is suspended above the lake bed ("spans"), in compliance with the conditions of the 1953 Easement with the State of Michigan, so as to eliminate any potential impairment of the integrity of the Dual Pipelines caused by currents.

As mentioned above, per the Consent Decree Paragraph 68.f requirements, Enbridge performs periodic visual inspections of the Dual Pipelines every two years to assure that span lengths do not exceed prescribed thresholds. Enbridge's next planned underwater visual inspection is to be conducted in 2020, pursuant to the twenty-four (24) month maximum interval prescribed in Consent Decree Paragraph 68.f.

Though Enbridge completed no additional ROV or AUV inspections pursuant to span management in 2019, Enbridge did use divers to verify and validate prior site inspection information gathered and used for anchor installation planning. Accordingly, the scope of Enbridge's 2019 Screw Anchor Work Plan ("SAWP") anchor installation work was based on the analyses conducted in 2016, 2017, and 2018 as reported in SAR1 and SAR3.

The 2019 screw anchor installation construction fell just beyond the SAR4 reporting period, however, Enbridge was engaged in project planning and contractor procurement activities during the first two quarters of 2019. These activities continued into the SAR5 reporting period until Line 5 Straits underwater activities commenced on May 29, 2019, with a kickoff meeting involving Enbridge personnel and its contractors in Mackinaw City, MI.

Screw anchor preparation work started shortly after the commencement of the SAR5 reporting period, on May 31, 2019, with dock-side Line 5 barge preparation. The Line 5 barge was the marine vessel used by the marine contractor as a platform for underwater construction activities. Subsequently, on June 1, 2019, the Line 5 barge traversed into the Straits open water to begin underwater pre-installation activities. At that time, Enbridge was still awaiting completion of US Army Corps of Engineers ("USACE") permitting process to commence anchor installations, as described in SAR4 P. 68.b Screw Anchor Support. Accordingly, Enbridge's initial Covered Work Period ("CWP") 5 execution activities focused on SAWP pre-installation coating inspection and anchor location verification work. This was followed by anchor site coating visual inspections and repairs conducted as per the Anchor Inspection Work Plan implemented by Enbridge pursuant to an agreement with the State of Michigan. These activities occupied the Line 5 barge activities until Enbridge received USACE permit on September 20, 2019 allowing it to install the remaining 54 screw anchors.

Following receipt of the USACE permit, Enbridge transitioned Line 5 barge activities to SAWP installation activities, fulfilling its commitment to EPA to commence anchor installation works within 48 hours of receiving the USACE permit.

In 2019, Enbridge installed thirty-four (34) screw anchors pursuant to the Consent Decree. **Table E-1** summarizes the Consent Decree screw anchors installed to date. In aggregate with prior years' installation activities, Enbridge has installed fifty-three (53) anchors of a total seventy-three (73) planned span inspection analysis anchors.

Enbridge anticipates installation of the remaining twenty (20) screw anchors will occur during the 2020 work season with progress reporting included in the SAR7 reporting period.

Protection from Vessel Anchor Strikes

The Consent Decree requires that Enbridge operate and maintain the Dual Pipelines to reduce the risk of a vessel's anchor puncturing, dragging or otherwise damaging the pipelines. In contrast to other sections of the Consent Decree that provide for specific actions within specific timeframes, Paragraph 68.a of the Consent Decree provides no details about any specific measures that may have been contemplated or any timelines. Enbridge has led and supported a number of initiatives aimed at reducing the risk of vessel anchor strikes within the Straits. Before briefly summarizing these efforts, Enbridge believes it would be useful to review three factors that define the context in which anchor strike risk reduction efforts are being identified and pursued.

First, the risk of an anchor strike that might result in a release is already very low, as evidenced by the fact that there has only been one documented strike in the over 66 years that the Dual Pipelines have been operated and it did not result in a release. The Dynamic Risk report concludes that the annual risk of a failure of the Dual Pipelines from all risks combined is 0.045%, underscoring that the risk from an anchor strike, just one of the potential risks, is exceedingly low. In fact, about 40% of each of the Dual Pipelines are buried, and as to that portion of the pipelines the risk of an anchor strike is virtually zero. This information is not offered to suggest that efforts to reduce the anchor strike risk are not important; to the contrary, these are important safety efforts. Rather, it is offered to put the matter in context and to underscore that any implemented anchor strike risk reduction measures could reduce risk from a starting point that is exceedingly low to begin with.

Second, Enbridge's ability as a pipeline operator to reduce anchor strike risk is inherently constrained by the fact it cannot control or regulate the actions of vessel operators and must work in an environment where there is already a significant regulatory presence by the US Coast Guard ("USCG"), which has jurisdiction over vessels that traverse the Straits. The State of Michigan, as the owner of the lake bottom on which the Dual Pipelines rest, also has a significant interest in steps Enbridge might take to protect the Dual Pipelines from anchor strike risks. Thus, much of what Enbridge has done to address anchor strike risk has implicated the need for it to consult with both the USCG and the State. Enbridge has done so extensively and consistently on numerous occasions during the term of the Consent Decree, as demonstrated in prior SARs, several letters written to EPA in recent months in response to IRs on the anchor strike provision in the Consent Decree and as will be further recounted in a forthcoming submission to be made to EPA and ITP in January 2020 as a follow-up to a December 18, 2019 meeting on this matter. It also bears note that during the first year of the Governor Whitmer Administration, which commenced January 1, 2019, the State's participation with Enbridge on anchor strike risk reduction or other Dual Pipeline matters has been quite limited. For example, and as discussed further below, the new Administration has not expended funds provided by Enbridge to the State of Michigan as per a 2018 agreement to install cameras to monitor vessel anchor deployments in the Straits. In addition, the Michigan Attorney General has been focused on the closure of the Dual Pipelines, having initiated a lawsuit against Enbridge in a Michigan Circuit Court in Lansing toward that end in late June 2019. Enbridge has opposed that legal effort and the case is currently pending before the Court on cross-motions for summary disposition.

Third, Enbridge has been working hard, and expending substantial resources, to entirely eliminate any anchor strike risk by moving toward constructing a tunnel under the Straits into which a replacement pipeline would be located, allowing for de-activation of the Dual Pipelines. The tunnel plans are reflected in a 2018 Tunnel Agreement (and other ancillary agreements) reached with the State in December 2018. During the SAR5 reporting period, Enbridge expended millions of dollars on geo-technical preparation work. Much of that work has now been completed, allowing Enbridge to begin the work of preparing permit applications for the tunnel, defining specifications and making other pre-construction preparations in anticipation of

beginning construction as soon as possible. Further, Enbridge has been pursuing litigation with the State of Michigan in which Enbridge has supported the constitutionality of the 2018 Michigan statute establishing a Mackinac Straits Corridor Authority to oversee construction, and eventually assume ownership, of the tunnel. The Attorney General had opined that the statute was unconstitutional. On October 31, 2018, the Michigan Court of Claims ruled in Enbridge's favor and the matter is now on appeal. While the tunnel and replacement line are not Paragraph 68 measures**,** the fact that this ultimate solution is being aggressively pursued, in coordination with the State, cannot be overlooked in any assessment of Enbridge's measures to reduce anchor strike risk.

Turning to specific anchor strike reduction measures, Enbridge has recounted its efforts in prior SARs and will not review its actions prior to the current SAR period in any detail here. In **Table E-2**, Enbridge has summarized the mitigation measures undertaken up to the time of its May 31, 2019 meeting with EPA shortly following the outset of the SAR5 reporting period. These included installation of the *Guardian: protect* vessel communication system at Enbridge's Mackinaw Station in December 2017; preparation of a detailed study of anchor strike reduction options (including vessel communication options) that was finalized in June 2018; support for the establishment by the USCG of a no-anchor Regulated Navigation Area ("RNA") for the Straits by the USCG, formally authorized on October 1, 2018; provision of $200,000 to the State of Michigan in November 2018 for use in installing cameras able to monitor vessel compliance with the RNA as per an October 3, 2018 agreement with the State; support for Governor Whitmer's May 2019 directive to the Michigan Department of Natural Resources to adopt rules requiring large vessels to verify that no anchors are dragging before passing through the Straits; and continued extensive discussions with the USCG and other stakeholders on these and related matters. As discussed at a December 18, 2019 meeting with EPA and the ITP's attorney, and as noted above, Enbridge will be submitting a letter to EPA/ITP in January 2020 further detailing its work toward full implementation of the *Guardian: protect* communication system over a period of months leading up to its submission of an August 30, 2019 application to the USCG to broadcast to AIS-equipped vessels, discussed further below.

Specific Actions Taken During SAR5 Reporting Period

During the current SAR reporting period, on May 23, 2019, Enbridge met with the USCG to discuss USCG's plans for holistic monitoring of the Straits and to gain an understanding of USCG's expectations of Enbridge related to execution of that holistic plan, including potential for implementation of vessel monitoring capabilities. In regard to vessel monitoring, Enbridge's goal in the use of the *Guardian: protect* vessel communication system is to broadcast electronic information identifying the location of the Dual Pipelines to vessels within the RNA that are equipped with AIS communication. In addition, for any vessel that shows any signs of anchor deployment, a more targeted warning message would be broadcast. As discussed further below, Enbridge focused during this reporting period on further advancing toward full implementation of the *Guardian: protect* system and other systems (patrol boats and cameras) that would be used in coordination with *Guardian: protect* to provide the holistic approach to reducing vessel anchor strike risk.

In response to meetings with Enbridge on anchor strike risk reduction, USCG indicated that following completion of its planned Ports and Waterways Safety Assessment ("PAWSA") on the Straits, it would have a better understanding of the operational risks associated with marine traffic in the Straits, and would subsequently make a decision on how identified risks, which could include vessel anchor strikes on the Dual Pipelines, may be mitigated. On June 27, 2019, Enbridge inquired of USCG to obtain a point of contact regarding permitting *Guardian: protect.* On July 1, 2019, USCG responded, indicating that they would inquire with their Navigation Center and subsequently update Enbridge. On July 23, 2019, Enbridge submitted a commitment letter to USCG reiterating its intention to proceed with a demonstration of the *Guardian: protect* currently installed for the Dual Pipelines at the Mackinaw Station.

Enbridge then participated with other stakeholders in a 2-day public meeting on July 24-25 sponsored by the USCG in connection with that agency's launch of the PAWSA. The USCG PAWSA activity included:

- identification that the Straits stakeholders' greatest concern is hydrocarbon or hazardous material release into the Straits' aquatic resources ;
- identification of the greatest potential sources of risk to the Straits aquatic resources: vessel traffic mixing, commercial fishing vessel quality, and the proficiency of small craft operators using the Straits
- identification of potential mitigating strategies for the identified risk areas, including potentially having USCG establish a vessel movement reporting system ("VMRS") within this Straits' Regulated Navigation Area as a means of authorizing and managing the movement of vessels

On August 13, 2019, at Enbridge's prior request, USCG forwarded Private Aids to Navigation ("PAtoN") and eAtoNs application templates to Enbridge for use in preparing its *Guardian: protect* system communications permit application. Additionally, on August 29, 2019, USCG responded to Enbridge's prior request for a point of contact to assist Enbridge with application filing.

On August 30, 2019, Enbridge submitted its USCG PAtoNs and eAtoNs applications to the USCG. The applications sought permission to broadcast the following messages, which were developed in coordination with the vendor of *Guardian: protect* based on messages the system was programmed to broadcast in other areas:

"REGULATED AREA:33CFR165.944C***NO ANCHORING"

and

"REGULATED AREA:33CFR165.944***PIPELINE AREA".

Following outreach from USCG regarding a minor error in GPS information formatting, Enbridge re-submitted its applications on September 3, 2019. Enbridge met with USCG on October 3, 2019 to further discuss Enbridge's intended *Guardian: protect* use and system parameters. At that meeting, Enbridge discussed the proposed contents of the *Guardian: protect* message. Enbridge inquired with USCG regarding the status of the permit applications on November 13, 2019 and used the ensuing exchange of correspondence to provide USCG additional information it requested regarding the AIS transmitters, including the number and precise location and size of transmitters.

Following further recent communication with the USCG outside the SAR5 reporting period, Enbridge understands that its *Guardian: protect* applications remain pending for review at USCG headquarters in Washington, DC. Assuming that the USCG grants the pending applications, Enbridge will then promptly submit a required application to the Federal Communications Commission. Only after that application is granted will Enbridge be able to broadcast messages to vessels in the Straits. Enbridge anticipates reporting further on the status of its applications and implementation plans in the SAR6 reporting period.

During the SAR5 reporting period, Enbridge also met with associations of vessel operators in the United States and Canada to gather information from them that will be useful in the implementation of *Guardian: protect*. Specifically, on October 4, 2019, Enbridge met with the Lake Carriers' Association ("LCA"), composed of major US vessel operators on the Great Lakes. At that meeting, Enbridge discussed the patrol vessels and cameras, along with the proposed message that would be broadcast by *Guardian: protect*. LCA did not object to the message and suggested that Enbridge consider telephoning vessel captains in a situation in which it may be necessary to alert a captain to an anchor that is deployed where it should not be. LCA also suggested that Enbridge conduct outreach to meet with vessel captains, which Enbridge will do if its *Guardian: protect* applications to the USCG and FCC are granted.

Enbridge also met shortly after the SAR5 reporting period with the association of Canadian vessel operators, which is known as the Marine Chamber of Commerce. Enbridge looks forward to providing details about the meeting and the matters covered in subsequent SARs.

In addition to continuing its efforts toward implementation of the *Guardian: protect* system, during the SAR5 reporting period Enbridge also moved forward to implement its plan to place two patrol vessels in the Straits for the purpose of monitoring the deployment of anchors by other vessels traversing the Straits. The deployment of such vessels began on October 11, 2019. The vessels began with daytime monitoring but expanded to include nighttime monitoring on Nov. 19, 2019.

Further, Enbridge is now in the process of deploying cameras capable of monitoring whether vessels have potentially deployed an anchor in the RNA**.** Enbridge decided to move forward with this plan once it appeared that the State was not yet spending the $200,000 in funds Enbridge provided in November 2018 to install such cameras. The initial monitoring camera, which commenced operation November 19, 2019, is mounted on an existing communications tower at Enbridge's Mackinaw City Station, located on the south end of the Dual Pipelines, west of the Mackinac Bridge. The location of future cameras that will be located on Enbridge property has been determined while the location of future cameras that will not be located on Enbridge property is being determined.

Enbridge intends to use information on vessel locations generated from the *Guardian: protect* system in conjunction with the patrol vessels and cameras to create a coordinated system of vessel anchor monitoring and, assuming its USCG and FCC applications are granted, messaging to vessels.

Enbridge has also responded during the SAR5 reporting period to EPA and ITP concerns that have been raised about the pace of its implementation of *Guardian: protect*. Specifically, on July 2, 2019, EPA issued an information request to Enbridge regarding compliance to Paragraph 68.a requirements. The information request indicated that EPA was concerned with the speed of Enbridge's progress relative to full implementation of mitigation measures, particularly the *Guardian: protect* system. Enbridge responded to the EPA information request via August 9, 2019 response letter submitted on its behalf by Steptoe, Enbridge's external counsel. Enbridge, through Steptoe, also submitted a supplemental information letter regarding the *Guardian: protect* system to ITP/EPA on September 30, 2019.

In response to Enbridge's August 9, 2019 information request response, EPA issued an e-mail information request to the Steptoe legal team on September 19, 2019. On October 18, 2019, Enbridge submitted its response to questions that were raised by EPA on September 19, 2019 concerning Enbridge's efforts to implement the *Guardian: protect* system. In addition, in the same correspondence, Enbridge provided EPA with an update with respect to other measures that Enbridge has or will implement to mitigate the risk of a vessel anchor striking the Line 5 Dual Pipelines. Although outside the SAR5 reporting period, EPA and Enbridge have exchanged further correspondence on these matters with Enbridge providing an initial response on December 23, 2019 to EPA's November 27 IR addressed to *Guardian: protect* issues. Copies of all of these and the other above-referenced letters are attached to this SAR5 and thus the contents of these letters will not be repeated here. As noted above, Enbridge will be providing a further response in January 2020.

As previously reported, in the SAR4 reporting period, on May 21, 2019, the National Transportation Safety Board ("NTSB") issued a Marine Accident Brief detailing the April 1, 2018 anchor strike incident about which Enbridge has also previously reported. The Brief identified that the probable cause of the anchor strike was the failure of the anchor detail to secure the barge's starboard anchor, and the improper adjustment of the anchor brake band after the engineering crew replaced the brake liner, the combination of which allowed the anchor and chain to pay out under way.

The USCG, which we understand is conducting its own investigation into the third-party anchor strike, has not yet released its report.

Enbridge is awaiting the USCG report and will, based on the findings of that report, assess whether or not the report includes lessons learned for operators in the Straits that can be used to reduce the risk of a future anchor strike.

68.b [Screw Anchor Support]

In prior SAR reports, Enbridge has provided details about the progress and timing of its work to comply with the Paragraph 68.b. screw anchor installation requirements. As discussed further below, as of September 20, 2019, that paragraph of the Consent Decree has been modified through the Third Modification, which was approved by the Court on that day.

During the SAR5 reporting period, on June 24, June 26 and July 1, 2019 the US Army Corps of Engineers (USACE) issued information requests to Enbridge concerning Enbridge's then-pending application to install screw anchors. Enbridge submitted its response to these requests on July 23. The USACE subsequently granted the permit application, issuing Permit Number LRE-2010-00463-56-N18 on September 20, 2019. The Permit provides Enbridge with "blanket" approval to install and excavate lakebed areas as required for anchor installation, coating inspection, and coating repairs until December 31, 2022.

Up until the time that the USACE Permit was issued, Enbridge work activities in the Straits in 2019 were focused on implementation of the Anchor Inspection Work Plan ("AIWP"), which was developed in coordination with the State of Michigan. Under the AIWP, Enbridge inspected the status of coating at points on the Dual Pipelines where screw anchors had previously been installed, and effectuated repairs as needed.

On September 21, 2019, Enbridge transitioned to Screw Anchor Work Plan (SAWP) installation activities, fulfilling its commitment to EPA to commence anchor installation works within 48 hours of receiving the USACE permit. (Enbridge had previously received the State of Michigan permits necessary to install screw anchors but could not proceed until the USACE Permit was received.) By the end of the work season in November 2019, Enbridge had installed 34 new screw anchors on Line 5 in the Straits. Aggregated with the prior screw anchor installation works, Enbridge has installed 53 out of 73 visual inspection analysis proposed screw anchors. The screw anchor installation work undertaken by Enbridge during the SAR5 reporting period was done consistent with the terms of the Third Modification of the Consent Decree, which as noted was approved by the Court overseeing the Consent Decree on September 20, 2019. That Third Modification described the locations where screw anchors were to be installed.

Diver pre-installation activity in 2019 identified one unsupported span that had extended to eighty-one (81) feet, six (6) feet longer than the maximum allowable span length of seventy-five (75) feet as specified in the Consent Decree. The span had previously been identified in 2018 and measured 58 ft. Further, on the north side of this span, the sandy lake bottom supporting the pipeline had shortened to less than forty (40) feet, which is less than the length of sandy lake bottom required to provide adequate support for the pipeline, as specified under the Third Modification. Enbridge mitigated this span by relocating a previously proposed anchor that had not yet been installed, EAP-5, to a location that would address both changes to the lakebed topography.

Enbridge 2019 diver pre-installation inspection activities also identified one additional area where anchor re-location might act as a preventative measure against future lakebed changes. Accordingly, EAP-15 was installed approximately 21 feet to the north of the location set forth in Table 1 of Attachment A of the Third Modification.

Enbridge 2019 diver pre-installation inspection activities further identified one area where the bottom conditions of the lake bed will prevent installation of the screw anchor at the location originally agreed upon by the parties. As a result, Enbridge has proposed moving the location of the screw anchor, known as EAP-6, approximately 8 feet to the north, where Enbridge is able to install the anchor safely.

The proposed specific locations of the anchors to be installed in 2019 were provided to the marine contractor, Ballard, as well as the ITP prior to commencement of work. ITP has expressed no concern to Enbridge with the proposed locations.

Enbridge anticipates resumption of SAWP installation activities during the 2020 work season. Enbridge will update EPA/ITP on its progress in the SAR7 reporting period.

68.c [Periodic Visual Inspections]

Enbridge's compliance with Subparagraph 68.c initial underwater visual inspection of each of the Dual Pipelines no later than July 31, 2016 and survey of biota were previously reported in Enbridge's SAR1. Since that time, SAR 68.c reporting has focused on the span management requirements of Paragraph 68.c.

As reported in SAR3 and SAR4, Enbridge executed underwater visual inspections pursuant to 68.c in 2018 using ROV between July 16, 2018 and July 24, 2018 and using AUV between June 27, 2018 and July 22, 2018. Detailed span information can be found in the 2018 Ballard Reports submitted to EPA via correspondence from Steptoe on September 21, 2018.

Consent Decree Paragraph 68.f requires Enbridge to conduct periodic underwater visual inspections of each of the Dual Pipelines at intervals not to exceed 24 months, until termination of the Consent Decree. Accordingly, Enbridge's next ROV/AUV inspections will occur during the 2020 work season, outside of the SAR5 and SAR6 reporting periods. Enbridge will report on the findings of the 2020 underwater visual inspections in the SAR7 reporting.

68.d [Underwater Inspection Repairs]

Anchor installation for the 2019 program began September 21, 2019 with a target program completion date of October 1, 2019. Enbridge communicated to EPA, via correspondence from Steptoe issued August 9, 2019 that it "appears doubtful that Enbridge will be able to meet the October 1, 2019, deadline for installation of all 54 anchors".

Despite the improbable likelihood of installing all of the required anchors, Enbridge installed 34 new screw anchors on Line 5 in the Straits in 2019. Aggregated with the prior screw anchor installation works Enbridge has installed 53 out of 73 proposed screw anchors.

Please refer to **Table E-1** for information on screw anchor installation year and location.

68.e [Screw Anchor Report]

Per Paragraph 68.e. of the Consent Decree, Enbridge is required to submit a final report to the EPA within 60 days of completion of the SAWP, summarizing the findings of the underwater visual inspections and associated repair work (anchor installations).

As reported in SAR3 and SAR4, because Enbridge received federal and state permits for fewer than all of the planned screw anchors at the time of construction kickoff, it was unable to complete installation of the remaining screw anchors, EPA allowed Enbridge to satisfy Paragraph 68.e. requirements by preparing an interim report outlining the screw anchor installation work completed to date, including any deviations from the 2018 SAWP. The 2018 SAWP Interim Report would then be supplemented with a final report following the completion of the screw anchor installations in 2019. Enbridge submitted the original version of the 2018 SAWP Interim Report to EPA on August 31, 2018, and submitted a revised version on September 21, 2018 to capture revisions clarifying information provided in a table summarizing screw anchor installation locations, as agreed to during a September 13, 2018 conference call between EPA, ITP, and Enbridge.

As noted above, during the SAR5 construction period, Enbridge did not receive federal permitting in enough time to install all the remaining 54 screw anchors. Enbridge was able to install 34 screw anchors before adverse weather conditions forced a halt to the project execution activities.

Per EPA 2018 SAWP approval conditions, Enbridge is required to, "within 60 days of Enbridge's completion of the activities required by the Work Plan…submit to EPA a Final Report, summarizing its activities and identifying and justifying any deviations from the procedures in the Work Plan." As Enbridge has not completed all the SAWP activities, Enbridge will prepare a 2019 SAWP Interim Report for submission to EPA. Enbridge will supplement this report with an SAWP Final Report following completion of SAWP work activities.

68.f [Periodic Visual Inspections of the Dual Pipelines]

Enbridge plans to complete another underwater visual inspection of each of the Dual Pipelines on or before July 31, 2020. Following that inspection, Enbridge will complete any necessary repairs in accordance with Subparagraph 68.d, and will prepare and submit any required reports in accordance with Subparagraph 68.e.

69.a [Biota Investigation]

On August 14, 2017, Enbridge initiated implementation of the biota investigation work in accordance with the schedule set out in the Biota Investigation Work Plan ("BIWP"), as described in Subparagraph 69.b and approved by the EPA on June 13, 2017. The BIWP identified the necessary steps for Enbridge to further study the impact of biota and mussels on the Dual Pipelines. This work included review of the potential for the biota to create a corrosive environment and the potential impact of the weight of the biomass on the pipelines.

The timing of Enbridge's implementation of the BIWP is discussed in more detail in Subparagraph 69.c, including Enbridge's submission of the final Biota Investigation report to EPA.

69.b [Biota Investigation Work Plan]

Enbridge's compliance with Paragraph 69.b was previously reported in Enbridge's first SAR.

69.c [Biota Work Plan Implementation]

Enbridge implemented the BIWP in accordance with the schedule approved by EPA, as reported in the first SAR. In accordance with Subparagraph 69.c, Enbridge submitted a final report to EPA on March 29, 2018, summarizing the results of the Biota Investigation.

The final Biota Investigation report concludes that mussels and other biota have not impaired the Dual Pipelines; therefore, Enbridge is not required under Subparagraph 68.c to supplement the final Biota Investigation report with a proposed work plan.

On May 31, 2018, Enbridge provided responses to subsequent ITP information requests related to the Biota Investigation issued on May 3, 2018. As a matter of information, a copy of the final Biota Inspection report was provided to the State of Michigan on April 6, 2018.

The ITP issued a report, dated July 27, 2018, documenting their final review of the Enbridge March 29, 2018 BIWP Report. The ITP included a recommendation that the EPA approve the Enbridge report upon one of the following conditions:

- *That Enbridge provide additional factual evidence, along with an explanation of the technical basis, for the conclusion that there is no evidence that the biota is providing a more hospitable environment for the colonization of SRBs on the external coating of the pipelines*
- *That Enbridge revise their conclusions to align more accurately with the facts.*

On March 11, 2019, Enbridge submitted revisions to the BIWP report to the EPA addressing the ITP's recommendations. On March 12, 2019, the ITP recommended to the EPA that they approve Enbridge's submitted revisions.

70 [In-Line Inspections of the Dual Pipelines]

Enbridge's compliance with Paragraph 70 was previously reported in the first SAR. Enbridge considers this requirement to be complete; however, Enbridge will provide relevant updates, if any, in future SARs.

71 [Investigation and Repair of Axially-aligned Features]

Enbridge's compliance with Paragraph 71 was previously reported in the first SAR. As indicated in the first SAR, Enbridge completed a hydrostatic pressure test. Enbridge considers this requirement to be complete; however, Enbridge will provide relevant updates, if any, in future SARs.

72 [Pipeline Movement Investigation]

Enbridge's compliance with Paragraph 72 was previously reported in the first SAR. Enbridge continues to conduct annual circumferential crack inspections in accordance with the Pipes Act. No Features Requiring Excavation have been identified as a result of those inspections. Further reporting specific to the ILI inspections and corresponding assessment and results is included in SAR3, Section D.

73 [Quarterly Inspections Using Acoustic Leak Detection Tool]

During the SAR5 reporting period and as shown in **Table E-3**, Enbridge conducted inspections on each of the Dual Pipelines using an acoustic ILI tool that is capable of detecting sounds associated with small leaks as the tool travels through the pipelines, as shown in the following table.

The acoustic inspections of the Dual Pipelines conducted during this reporting period did not identify any auditory signals that are indicative of small leaks on the Dual Pipelines.

Section F – Data Integration

74 [Feature Integration Database]

Enbridge has operated and maintained the feature integration database, referred to as "OneSource," for all pipelines in the Lakehead System since August 14, 2013. OneSource integrates information about corrosion, crack and geometry features from multiple in-line investigations of the pipelines and field measurement devices. OneSource enables pipeline integrity-management personnel to identify and track any changes to any feature detected by an ILI tool on successive investigations (i.e. Tool Runs) of the pipeline. In addition, the Feature Match Macro tool uses data from OneSource and permits pipeline integrity personnel to identify and track changes to features detected by successive tool runs, including enabling personnel to evaluate features detected by different types of ILI tools that may overlap or otherwise interact.

75 [Integrity Management Personnel Access to Feature Integration Database]

Enbridge integrity management personnel, including, but not limited to, personnel responsible for identifying FREs, are able to access and view OneSource from their desktop computers and laptops. Personnel are able to search for and view a schematic image of each joint of each Lakehead System pipeline. The information provided with each schematic image has not changed from the information as presented in the first SAR.

A difficulty encountered when implementing this requirement is related to the ITP's access to the OneSource data. Currently, data covering all of the Enbridge-owned pipelines is included in OneSource – it is not limited only to the Lakehead System Pipelines that are subject to the terms of the Consent Decree. While this allows Enbridge to access and store the OneSource data consistently across its entire pipeline system, Enbridge is unable to provide a gateway to the ITP that includes only OneSource data for Lakehead System Pipelines covered by the Consent Decree. Enbridge has demonstrated that the data required under Paragraph 75 is readily accessible to personnel responsible for identifying FREs.

76 [Successive ILI Data Sets]

Enbridge's compliance with this Paragraph is fully explained in Enbridge's first SAR, and Enbridge's compliance with Paragraph 76 has not changed since the submission of the first SAR. As explained in the first SAR, with respect to each type of ILI Tool, the OneSource includes at least two successive ILI data sets – one data set from the most recently completed ILI Tool Run and another data set from the second most-recently completed ILI Tool Run.

77 [Update of OneSource Database]

The dates used to demonstrate Enbridge's compliance with this Paragraph are explained in Enbridge's first SAR and are still applicable to this SAR. Enbridge provided a demonstration of compliance regarding Paragraph 77 on October 23, 2018. Enbridge completed all field investigations of the Consent Decree excavations related to the particular ILI Tool Runs and uploaded the NDE reports within 60 Days into OneSource after the field excavation report was quality reviewed and approved by Enbridge as summarized in **Table F-1**: P. 77 OneSource NDE Updates.

As reported in SAR4 Paragraph 144, an NDE report OneSource upload date for dig ID 23020 GW 154730 from the Line 5 PE-IR 2017 USCD+ program was incorrectly recorded in OneSource as 6/5/2019.

Enbridge has fully complied with Paragraph 77, as per its interpretation of that Paragraph, by timely uploading to OneSource all NDE data for FRE digs that are subject to the Consent Decree requirements. Enbridge's discussions with EPA concerning the parties' interpretation of Paragraph 77, together with Paragraph 40, remains ongoing. Such discussions concern whether Paragraph 77 can reasonably be interpreted to require NDE data from non-FRE features to be uploaded to OneSource. Enbridge believes that such discussions will lead to the resolution of this issue. This item is included in **Table IX-1** in P. 144 Problems Anticipated in Appendix 1.

Details of the investigation into this discrepancy are reported in Paragraph 144 [Section F] Line 5 PE-IR 2017 USCD+ NDE Report OneSource Load Data Re-Upload – P77.d of this SAR report.

78 [Mandatory Use of Data Integration Database to Prepare Dig List]

78.a [OneSource ILI Updates]

All new ILI reports have been uploaded to OneSource within 29 days after Enbridge's receipt of the Initial ILI report. The dates upon which the various ILI reports were received by Enbridge and uploaded to OneSource during this SAR reporting period are listed in **Table F-2**.

78.b [OneSource Interacting Features]

Enbridge completes ILI data review for the purpose of identifying any overlapping, or otherwise interacting, features that may qualify as FREs (in reference to Paragraph 35), within 180 days after the ILI tool is removed from the pipeline, as outlined in the "Lakehead System Integrity Remediation Process" Table 2,

Step 7.0. The FREs resulting from this review are summarized in Paragraph 58. **Table F-3** summarizes the reviews completed during this reporting period.

Section G – Leak Detection and Control Room Operations

(I) Assessment of Alternative Leak Detection Technologies

79-80 [Create and Submit ALD Report]

This requirement had been met and considered complete. No further update is required at this time or in future SARs.

(II) Report on Feasibility of Installing External Leak Detection System at the Straits of Mackinac

81-83 [Create and Submit ALD Mackinac Report]

This requirement had been met and considered complete. No further update is required at this time or in future SARs.

(III) Requirements for New Lakehead Pipelines and Replacement Segments

84 [Applicability]

The New US Line 3 is considered a "New Lakehead Pipeline" as defined in Paragraph 84.a. Design requirements set forth in Subsection VII.G.(III) were applied to Enbridge's mainline leak detection equipment standard, which was followed in the design engineering phase of the Line 3 Replacement project ("L3R").

Enbridge responded to ITP's request in September 2019 to provide pertinent L3R design artifacts as it relates to Section G - Leak Detection for verification.

Other than the ongoing L3R project, there were no other Replacement Segments or New Lakehead Pipeline projects executed during this reporting period.

85 [Installation of Flowmeters]

The L3R project has designed the New US Line 3 to include flow meters which will be installed at all locations where oil (a) enters into the pipeline, (b) leaves the pipeline, or (c) passes through a pump station. Once the flowmeters are installed, they will be commissioned on the Supervisory Control and Data Acquisition ("SCADA") system and integrated into MBS and Rupture Detection System ("RDS"), to continuously monitor flow data under all conditions, including during Startup and Shutdown.

As required by Paragraph 89.a, Enbridge conducted the API 1149 MBS Leak Detection performance estimation based on L3R project design available at the time. The inputs for the estimation are confirmed to be accurate for this reporting period. Based on the results of the API 1149 calculation, additional flow meters are not required on segments that are expected to hold volumes of oil exceeding 45,000 cubic meters ("m3"). Details on MBS segmentation and API 1149 performance estimation are available in Paragraphs 88 through 89 below.

Enbridge will perform the requirements specified in Paragraph 90 to demonstrate compliance with Leak Detection sensitivity design and construction within the timing specified therein.

86 [Installation of Flowmeters on Pipelines that Utilize In-line Batch Interface Tools]

The New US Line 3 has been designed to operate without the use of batch interface tools for the purpose of physically separating products in the pipeline; therefore, the requirement set forth under this Paragraph will not be applicable to L3R project.

87 [Installation of Other Instrumentation]

The L3R project has designed the New US Line 3 to include installation of the following instrumentation:

- Pressure transducer/transmitter will be installed at locations and segments as required by Paragraph 87.a.
- Skin-based temperature transducer/transmitter will be installed at locations and valve segments as required by Paragraph 87.b.

Once the instrumentation is installed on the new US Line 3, they will be commissioned on the SCADA system, and integrated into MBS and RDS to continuously provide real-time pressure and temperature data, including during Startup and Shutdown periods.

88 [Establishment of Material Balance System ("MBS") Segments]

Enbridge's definition of "MBS Segment" aligns with the definition in Paragraph 88.

The New US Line 3 will have MBS segments that are expected to have volumes of oil exceeding 45,000 m3. Enbridge has conducted API 1149 calculations to estimate the sensitivity performance of the MBS Leak Detection System on the New US Line 3 during periods when fluid in the segment is in a steady state. The API 1149 calculation conducted was based on L3R project design available at the time, which remains accurate for this reporting period. At this time, the established MBS segments remain as designed, based on the results of the API 1149 calculation, which demonstrated compliance with the leak detection sensitivity requirements in Paragraph 89 below.

89 [Leak Detection Sensitivity Requirements]

Enbridge used the criteria set forth in API Publication 1149, November 1993 ("Pipeline Variable Uncertainties and Their Effects on Leak Detectability") to estimate the ability of the MBS Leak Detection System to achieve each of the targets during periods when the fluid in the MBS Segment is in Steady State. The API 1149 calculation conducted was based on L3R project design available at the time, which remains accurate for this reporting period. The API 1149 calculation results demonstrated that MBS Leak Detection System would achieve each of the targets set forth in the Leak Detection Design and Construction Target for New US Line 3 table under this Paragraph of the Consent Decree.

Paragraph 89.b is not applicable for this reporting period as there were no Replacement Segments or New Lakehead Pipelines other than the L3R project.

90 [Demonstration of Compliance with Leak Detection Sensitivity Design and Construction Requirements]

There is nothing to report on this Paragraph until the construction of the New US Line 3 is complete and initial line fill is commenced. Once the New US Line 3 is constructed and commissioned, Enbridge will prepare and coordinate the planning and execution of testing to demonstrate compliance with the leak detection sensitivity design and construction requirements defined in this Paragraph.

There are no Replacement Segments or New Lakehead Pipelines for this reporting period other than the L3R project.

91 [Establishment and Optimization of Alarm Thresholds]

There is nothing to report on this Paragraph until the construction of the New US Line 3 is complete and commissioned into the pipeline control and leak detection systems. Also, other than the L3R project, there are no Replacement Segments or New Lakehead Pipelines for this reporting period.

Once the New US Line 3 is constructed and commissioned, Enbridge will undertake the appropriate steps to ensure that requirements set forth in this Paragraph are met.

(IV) Leak Detection Requirements for Pipelines within the Lakehead System

92 [Operation of MBS Leak Detection System]

Enbridge maintains continuous and uninterrupted leak detection capability at all times on active Lakehead System Pipelines, including during periods of start-up and shutdown, except as exempted under Paragraph 93. Enbridge's continuous and uninterrupted leak detection capability is achieved through several measures including architectural, procedural, and quality controls. Since the Effective Date of the Consent Decree, leak detection alarm thresholds for steady state operations have been met and continue to meet the minimum alarm thresholds set forth in the table at Paragraph 91.

93 [Temporary Suspension of MBS Leak Detection Capabilities]

Enbridge continues to track the three categories of temporary MBS suspension that are specified in Subparagraphs 93.a-c. Ultrasonic flowmeter maintenance and flowmeter outage workflows are monitored to track, and coordinate planned (i.e., scheduled maintenance or repairs) and unplanned (i.e., unexpected failures beyond Enbridge's control) outages from start to finish. The ILI tool run procedure also ensures tracking of station flowmeter bypasses when in-line tools are being run, consistent with Paragraph 93.

Please refer to **Table G-1** for a list of occurrences of each type of instrumentation outage during this reporting period, including the reason(s) for any such outages.

94 [Overlapping MBS Segments]

Enbridge's overlapping volume balance algorithm automatically establishes and maintains leak detection capability in the event of a temporary loss or suspension of MBS leak detection capability within one or more MBS segments due to intermediate flow meter (i.e., flow meters not located in either injection or delivery) outage. The overlapping volume balance algorithm continues to maintain leak detection capability in overlapping MBS segments impacted by the outage until the leak detection capability is restored in all MBS segments.

95 [Alternative Leak Detection Requirements]

Enbridge implements and maintains an API 1130[9]-compliant alternative leak detection (ALD) procedure in the event of any outage of MBS leak detection capability occurring as a result of the circumstances described in Subparagraphs 95.a and 95.b. Enbridge continuously operates the ALD method until the flowmeter outage is resolved and the MBS segments are restored to operation. Enbridge provided additional information to the ITP on September 20, 2019, as a follow up to the SAR4 evaluation demonstrating compliance with this paragraph of the Consent Decree.

[9] *API 1130 – American Petroleum Institute Recommended Practice for Computational Pipeline Monitoring for Liquids*

96 [Reporting of MBS Outages]

There is one reportable Bypass of ILI Tool event for the SAR5 reporting period that exceeded the Time Period to Restore MBS segment to Operation.

This event was highlighted in the December 5, 2019 Monthly Technical Meeting with the ITP and EPA and is described in Paragraph 144 '[Section G] October 26, 2019 ILI bypass event at L1 Viking station, exceeded 4-hour outage – P96' of this document.

Enbridge ensures that it restores leak detection capability as soon as practicable following any outage in an MBS segment even though the overlapping section continues to provide leak detection capability. This is achieved by following and continually improving Enbridge procedures and processes to track and manage planned and unplanned flow meter outages and ILI tool runs.

97 [Reporting Requirements]

Refer to **Table G-1** for a table identifying the number of occurrences by type where MBS was temporarily suspended.

98 [Tolling Requirements]

In accordance with Paragraph 98, Enbridge tolls the 4-hour time period for restoring the MBS segment to operation (as specified in and allowed under the table at Paragraph 97 in the CD) during any occurrence of an unplanned shutdown during the in-line tool run. The tolling period applied by Enbridge begins when the pipeline is shut down and ends when pipeline operation is resumed. To comply with this Paragraph, Enbridge tracks station flowmeter bypasses when in-line tools are being run.

During this reporting period, there was one event that occurred on October 26, 2019, on Line 1 Plummer ("PL"). The PL station bypass started at 07:25 MST and ended at 15:00 MST. During this time period, tolling was applied for 3 hours and 45 minutes, with a resulting bypass time of 3 hours and 50 minutes bypass.

99 [Installation of New Equipment at Remotely-Controlled Valves]

Table G-2 outlines the three projects (excavations) that triggered the requirements of Paragraph 99, and these projects have installed the pressure and/or temperature transmitters in the reporting period. These projects were determined to trigger Paragraph 99 according to the guidance outlined in the July 2018 Enbridge interpretation document entitled "Interpretation of Consent Decree Paragraphs 99, 100, 124". As agreed during the March 13, 2019 meeting with the ITP, the updated Paragraph 99 Project Logbook will be provided within two weeks after release of SAR5.

100 [Requirements for Valve Excavation]

During the reporting period, no projects or excavations were applicable to the Paragraph 100 exemptions of being conducted for emergency purposes or having functionally identical equipment.

101 [Transient-State Sensitivity Analysis]

Enbridge performed the transient-state sensitivity analysis required under Paragraph 101 on November 19, 2017, which was within 180 days of Effective Date. Enbridge considers this to be complete and no further reporting is required for this Semi-Annual Report.

102 [Rupture Detection System Alarm]

The intent of the Rupture Detection System ("RDS") is to focus on detecting large releases with a very quick onset. Enbridge continuously operates the RDS at all times on all Lakehead System Pipelines during both steady-state and transient-state conditions. The RDS is integrated with Enbridge's SCADA system and MBS Leak Detection System.

A difference in interpretation of this Paragraph remains pertaining to whether Enbridge was obligated to include a factor based on an abnormal increase in flow rate when designing its RDS. Enbridge maintains that the RDS system has been compliant with the requirements of this section since implementation of the system, however, the parties have interpreted the requirements differently. However, within this reporting period, Enbridge has continued implementation of an alternate solution for initiation of immediate shutdown upon an MBS alarm coupled with an abnormal increase in flow rate, as opposed to this scenario being subject to a 10-minute evaluation period. This item is included in **Table IX-1** in P. 144 Problems Anticipated in Appendix 1.

The project plan outlining this initiative was submitted on May 15, 2019 and subsequently agreed to by the ITP and EPA as an appropriate path forward. Enbridge believes that the solution being implemented constitutes a reasonable path forward in addressing concerns with this Paragraph and the ITP has not voiced disagreement. Enbridge has executed the plan in collaboration with the ITP through defined touchpoints this year, including June 19, July 24, August 28, September 26. Enbridge anticipates completion of implementation of the solution in December 2019 and will continue to respond to any further inquiries from the ITP on this solution. Enbridge will further report on the status of this activity in the sixth SAR.

103 ["24-hour" Alarm]

103(a)-(b). The intent of the 24-hour alarm is to detect small releases. Enbridge implemented the 24-hour volume balance alarm, also known as the Automated Volume Balance or "AVB" alarm on the Lakehead system. The AVB was integrated with Enbridge's SCADA system in advance of the 270-day deadline specified in Paragraph 103. Enbridge continuously monitors, tracks, and models the volume of oil for each MBS Segment over any rolling 24-hour period through AVB. Enbridge has a Leak Detection System assurance process, controls, and Control Room ("CCO") procedures in place to ensure that the Automated Volume Balance ("AVB")[10] System alarms, if it cannot detect, or otherwise account for, 3 percent (or more) of oil pumped or injected into the MBS Segment over any rolling 24-hour period. Should this alarm occur, the Alarm Response Team executes the appropriate procedures in accordance with Paragraphs 108 and 109.

103.c ["24-hour" Alarm Optimization Study within one year of establishing the new 24-Hour alarm]

Enbridge conducted and completed a 24-hour Alarm optimization study on February 13, 2019, to optimize the alarm thresholds for each pipeline that is part of the Lakehead system. Enbridge submitted the results of the study to the EPA on April 12, 2019 for review and approval. The report set forth the results of the study and proposed alarm thresholds, which are within the 3% sensitivity requirement. Enbridge has implemented and continuously maintains the new thresholds for each Lakehead pipeline upon submission of the report and will continue to do so until EPA approval is obtained. As of the date this SAR is written, the ITP and the EPA are still reviewing the report; hence, no EPA approval or disapproval has yet been obtained.

[10] AVB system is Enbridge implementation of 24-hour alarm that is integrated with MBS

During testing of two separate MBS segments as required by Paragraph 103.e, Enbridge observed two types of discrepancies in the simulated leak test results against the results reported in the detailed report provided to the ITP. Enbridge communicated the observation to the ITP on August 28, 2019 and took the necessary steps to investigate and correct the issue. Enbridge's investigation, analysis, and verification revealed that the discrepancies did not negatively impact the performance of 24-Hour Alarm, meaning, AVB successfully detected simulated leak sizes performed in the optimization study. Additional information about this issue is described in Paragraph 144 section "[Section G] Discrepancy in 24-Hour Alarm Threshold but not Impacting MBS Sensitivity – P103".

103.d ["24-hour" Alarm Optimization Study within one year of Initial Linefill of New US Line 3 or any other New Lakehead Pipeline or Replacement Segment]

This requirement does not apply at this time as the New US Line 3 has not yet completed construction and linefill.

103.e [Simulated testing of the 24-hour alarm optimized threshold on two separate MBS segments]

Enbridge completed simulated leak testing of AVB in two separate MBS segments with the optimized thresholds on July 5, 2019, which is within 90 days following submission of its proposal and implementation of the optimized thresholds per Paragraph 103(c). A report outlining the results of the test was submitted to the EPA on September 3, 2019, which was within 60 days of completing the test.

103.f [Submission of proposed plan and schedule for unsuccessful testing]

The testing as required by Paragraph 103.e was successful; therefore, the corrective action plan and schedule required by this Subparagraph is not required.

103.g [Compliance and exceptions of compliance to 24-hour alarm optimized threshold and reporting]

103.g(1)-(4). Enbridge continuously complies with the optimized thresholds in accordance with the study completed per Subparagraph c and maintains high reliability in its AVB system since the new optimized alarm thresholds were implemented in production. Enbridge has not seen a significant increase of false alarms that could trigger relaxing of the optimized alarm thresholds nor conducting a new optimization study that could result in new or temporary alarm thresholds.

103.g(5). Enbridge maintains high reliability of its AVB system since the new optimized alarm thresholds were implemented in production. Thus, Enbridge has not seen any increase of false alarms that would trigger this Subparagraph.

(V) Leak Detection Requirements for Control Room

104 [Applicability]

In order to ensure compliance with Section VII.G.V of the CD, Enbridge applies the term "alarm" or "alarms" to mean any and all alarms that are generated by the MBS leak detection system and by the RDS.

105 [Alarm Response Team]

Enbridge established and implemented an Alarm Response Team ("ART") within 180 days of the Effective Date of the Consent Decree. The ART responds to all leak alarms, and the team is composed of the Control Room Operator ("CRO"), the Leak Detection Analyst ("LDA"), and the Senior Technical Advisor ("STA").

106 [Remote Notification of Alarm Response Team]

Enbridge implemented the remote notification system that is specified under Paragraph 106 within 180 days after the Effective Date of the Consent Decree. In the event that any ART members have not electronically-acknowledged the alarm within two minutes after its onset, the remote notification system will notify those ART members with an automated remote telephone call that includes the alarms details (including the type of alarm, the time of its occurrence and the MBS segment that precipitated the alarm).

107 [Audible and Visual Alarms]

Enbridge implemented the audible and visual alarms required under Paragraph 107 within 180 days after the Effective Date of the Consent Decree. MBS and RDS alarms are automatically annunciated in an alarm window for all members of the ART. Alarms have a visual pulse accompanied by a strong beeping sound, indicating that an alarm requires attention. The pulse continues and beeping repeats every five seconds until the alarm is acknowledged by the ART member. ART members are trained to ensure that the alarm window remains open on their screens at all times. Unassessed alarms remain visible on their screens until assessments from ART members are complete upon execution of the alarm clearance procedures. If the assessment is not complete within the 10-minute timeframe, an audible and visual alert is generated to notify Alarm Recipients that the 10-minute period for evaluating the alarm has lapsed and a pipeline shutdown is required.

108 [Alarm Clearance Procedures]

Enbridge implemented the Alarm Clearance procedures required under Paragraph 108 within 180 days of the Effective Date of the Consent Decree. Alarm Clearance procedures have been employed and adhered to as described in Enbridge's response to Subparagraphs 108.a-f below.

108.a [Alarm Clearance Requirements]

The requirements of Subparagraph 108.a are incorporated into Enbridge's procedures to ensure that all alarms remain active unless and until: (1) the appropriate ART member(s) accounts for any cumulative imbalances (in which case the team member may invalidate the alarm); (2) all of the ART members independently rule out the possibility of a leak; or (3) the pipeline is shutdown.

108.b [Alarm Clearing Restrictions]

Enbridge procedures prohibit the ART from resolving or clearing an alarm through a manual, one-time adjustment to any alarm system or the inputs into any alarm systems. As per Subparagraph 108.b, Enbridge procedures require that all leak alarms be analyzed until an investigation has been completed and an alarm is terminated in accordance with the requirements of Subparagraph 108.a.

108.c [Confirmation of Leak Detection System Functioning]

Enbridge implemented procedures to require the LDA to analyze and determine whether the leak detection system that generated the alarm is functioning properly. This process consists of determining whether any

leak alarms have been caused by data errors input into the leak detection systems, system malfunctions, or other factors that could lead to an invalid leak alarm.

108.d [Independent Alarm Investigation]

Enbridge requires the CRO, in conjunction with the STA, to complete an investigation of the alarm, which is an investigation that is completed independently from the investigation that was conducted by the LDA. This analysis is conducted in conjunction with the Ten-Minute Rule to ensure that a final decision to invalidate the alarm is made within ten minutes after the alarm is generated. If a final decision to invalidate the alarm is not made within the ten-minute period following the alarm, the pipeline is shutdown. The final decision is made by the CRO, with the concurrence of the STA.

108.e [ART Procedures for Column Separation]

ART members are required to employ Enbridge column separation procedures when determining the cause of an alarm. Enbridge procedures accordingly mandate that a determination that an alarm was caused by Column Separation is not a permissible basis for clearing an Alarm unless the ART follows the procedures specified in Subparagraphs 109.b and 109.c.

108.f [Electronic Records of Alarm Response]

Enbridge implemented an electronic record keeping system for managing ART response information. All ART member responses are recorded and are documented as required by this Paragraph (see Appendix 2: Lakehead Leak Alarm Report). Each record – which is created at the end of each shift by each ART member choosing from specified alarm categories that are identified on an electronic menu – includes details of the alarm event including the type of alarm, reasons for clearing the alarm, and the procedures executed by members of the ART. Review of leak alarms are required by all incoming ART members during a shift change (i.e. subsequent shift). All records of alarms are retained for a minimum of five years.

109 [Unscheduled Shutdown in Response to an Alarm]

Within 50 days after the Effective Date of the Consent Decree, Enbridge implemented all the procedures specified in Subparagraphs 109.a-d, as explained in more detail in the sections that follow.

109.a [Ten-Minute Rule]

Enbridge implemented operating procedures that require the CRO to shut down and sectionalize the pipeline immediately without further consultation or notification if the ART is unable to rule out the possibility of a leak or rupture within ten minutes of the start of an alarm.

109.b [Column Separation – Running Pipeline]

Enbridge implemented column separation procedures that require the CRO to shut down and sectionalize a running pipeline if within ten minutes from the start of the alarm the column separation continues or the appropriate ART members have not: (1) determined the cause of the column separation, (2) accounted for any cumulative imbalances that triggered the alarm, and (3) ruled out a possibility of a leak or rupture. The procedures are not applicable where the alarm is caused by column separation that occurs during or after the shutdown of the pipeline, consistent with Paragraph 109.b.

109.c [Column Separation – Pipeline Shutdown]

Enbridge has implemented column separation procedures in accordance with Paragraph 109.c and appropriate alarm clearance procedures caused by column separation. Specifically, the calculation of the amount of time needed to fill the column separation and obtaining manager review and approval prior to restart in accordance with the table provided in this Subparagraph. Upon restart of any pipeline where the column fill time is exceeded, the CRO is immediately required to shut down and sectionalize the line. Upon shutdown, steps to investigate and verify the condition of the pipeline will be taken as required by this Paragraph.

109.d [Confirmed Leak Rule]

Enbridge implemented confirmed leak procedures, which require the CRO to immediately shut down and sectionalize the pipeline in the event that the ART determines that an Alarm is a confirmed leak or rupture, as defined under Subparagraphs 109.d.1-4. Unless a leak is ruled out, the CRO will shut down within ten minutes if leak conditions are observed upstream or downstream at a given location from SCADA data.

109.e [Shutdown and Restart Record]

Following the shutdown of a pipeline, Enbridge executes a procedural control and electronic recording measure process that: identifies the root cause of a leak alarm, verifies that applicable emergency procedures have been completed and electronically validated by the appropriate accountable parties, and generates a record of how the cause of the Alarm was determined and/or how the integrity of the line was verified, including the critical information that was considered in this decision-making process. In accordance with Subparagraph 109.e, Enbridge will not resume or restart pipeline operations until the procedural controls are executed, and the recording of electronic information is validated by appropriate accountable parties. Electronic records of compliance with this Subparagraph are available as of December 31, 2016. Enbridge is compliant with this Paragraph and has not observed any instances where pipeline operations were resumed without meeting the requirements of this Subparagraph.

110 [Certification of Compliance with 10-Minute Rule and other Requirements of this Subsection]

110.a [Weekly List of Alarms]

In accordance with Subparagraph 110.a, Enbridge prepares an electronic weekly list of alarms (“WLOA”) as part of the Lakehead Leak Alarm Report. That WLOA is provided in Appendix 2. The WLOA includes the pipeline, the type of alarm, date of the alarm, the time at which the alarm began, and the time when the alarm was cleared.

110.b [Record of Alarms]

Enbridge complies with this requirement by preparing an electronic Record of Alarms (“ROA”) when an unscheduled shutdown occurs. The ROA includes critical facts relating to the Alarm, such as the positions of the Alarm Recipients (i.e., CRO, STA, LDA), the time that the alarm was received, the actions of the ART, when the shutdown commenced, when the shutdown was completed, the root cause, the type of alarm, the procedures executed to determine the cause of the alarm, the justification for resumption of pumping operations, and the time that pumping operations resumed.

110.c [Alarm Submittal to EPA]

Enbridge complies with this requirement by including the WLOAs and ROAs occurring during the reporting period for all Lakehead System Pipelines as part of the Lakehead Alarm Report, enclosed hereto as Appendix 2. The Lakehead Leak Alarm Report also includes the Summary of Alarms ("SOA") noting the pipeline, the total number of alarms and the alarms that did not comply with Enbridge's Ten-Minute Rule. During this reporting period, Enbridge has complied with the Ten-Minute Rule and other requirements in Subsection VII.G. (V) when responding to leak detection system alarms. Therefore, no corrective actions needed to be taken.

110.d [Certification of Reporting Period]

To certify compliance for the reporting period of 180 days after the first SAR, the Vice-President, Pipeline Control has signed the Lakehead Leak Alarm Reports. This includes the information contained in the SOA, WLOA and ROA, which warrants that the information contained therein is true and accurate and that Enbridge has complied with the Ten-Minute Rule and other requirements of this subsection VII.G.(V), except for any non-compliances specifically listed in the SOA, which is none for this reporting period.

111 [Unscheduled Shutdown Procedures in Response to Other Events]

Enbridge has implemented procedural controls that ensure that all emergency phone calls received by the Control Center concerning a potential leak or rupture from a source other than an alarm are investigated within ten minutes of receipt of the call. In the event that the investigation uncovers evidence consistent with a leak or rupture by a Lakehead System pipeline, the CRO for the pipeline is required to immediately and without further consultation or notification to shut down and sectionalize the pipeline. Further, in addition to the requirements of the Consent Decree, Enbridge procedures independently require that while the investigation is required to be conducted as expeditiously as possible, if the investigation is not completed in ten minutes or if a potential leak is identified, the CRO will commence an emergency shutdown and sectionalize the affected pipeline or pipelines. Enbridge is compliant with this Paragraph and has not observed any instances where pipeline operations deviated from the requirements of this Paragraph.

112 [Reporting of Events from Paragraph 111]

Information related to all incidents during the reporting period where Enbridge received information concerning a potential leak or rupture, including the information provided with each such notice, the start and end times of each respective investigation, and the conclusion and findings of each investigation, is provided in Appendix 3 to this SAR: Lakehead System Pipeline Incident Reporting.

Section H – Spill Response and Preparedness

113 [Immediate Action to Confirmed Pipeline Leak or Rupture]

Enbridge had one confirmed pipeline leak or rupture on the Lakehead System within the reporting period of more than one barrel. Enbridge had no confirmed pipeline leaks or ruptures of any harmful quantity that reached the waters of the United States or adjoining shorelines.

During the reporting period, two releases occurred on the Lakehead System that triggered PHMSA reporting requirements. The releases were reported to PHMSA in accordance with either 49 C.F.R. § 195.50(b), which requires the reporting of any release of 5 gallons or more of hazardous liquid, or 49 C.F.R. § 195.50(e), which requires reporting if the initial estimated property damage, including the cost of clean-up and recovery, value of lost product, and/or damage to the property of the operator and/or others would

exceed $50,000. With respect to each release, Enbridge proceeded without delay to dispatch trained personnel to the location of the rupture or leak and took action to prevent any migration of oil into waters of the United States, including shutting down the affected line.

Additional details regarding the reportable releases from Lakehead System Pipelines that occurred during this reporting period are provided in response to Paragraph 146.

114 [Required Actions]

Enbridge's compliance with Paragraph 114 is demonstrated by its compliance with Paragraphs 115 to 119, as explained below.

115 [Agreed Exercises]

In accordance with Paragraph 115, Enbridge conducted a full-scale exercise on September 18-19, 2019, in and around Wisconsin Rapids. Planning is currently underway for the Stockbridge Agreed Exercise, which is scheduled to occur on September 22-23, 2020. For each agreed exercise, Enbridge conducts three planning meetings in accordance with Subparagraph 115.e(1). As part of its Exercise Program, Enbridge conducts additional exercise meetings where appropriate, such as a Concept and Objectives meeting and/or Master Scenario Events List meeting. Enbridge also conducts periodic touchpoint meetings via Skype to respond to and address any questions that may arise between the times that the face-to-face meetings are held. Additional information regarding each of these Agreed Exercises is provided below.

Cass Lake Agreed Exercise

Details about the Cass Lake Agreed Exercise were reported in SAR1, SAR2, SAR3, and SAR4.

Des Plaines Agreed Exercise

Details about the Des Plaines Agreed Exercise are found in SAR2, SAR3 and SAR4.

Wisconsin River Agreed Exercise

In accordance with Subparagraph 115.b(3), Enbridge scheduled the Wisconsin River Agreed Exercise to occur on September 19, 2019. Planning for the Wisconsin River Agreed Exercise was initiated in July 2018. In accordance with Subparagraph 115.e(1), the first of the planning meetings was conducted on November 14, 2018, more than 10 months before the Wisconsin River Agreed Exercise. In accordance with Subparagraph 115.e(3), Enbridge coordinated with the planning participants during the initial meeting to develop the objectives, scenario, and participant list for the Wisconsin River Agreed Exercise. The specific dates of the planning meetings are as follows:

- Concept and Objectives on September 24, 2018;
- Initial Planning Meeting on November 14, 2018;
- Midterm Planning Meeting on February 12, 2019;
- Master Scenario Events List meeting on May 22, 2019; and
- Final Planning Meeting scheduled on August 21, 2019.

Based on input provided by the initial planning meeting attendees, Enbridge prepared a draft exercise plan for the Wisconsin River Agreed Exercise, which included the scope, objectives, scenario, and participant list for the exercise. In accordance with Subparagraph 115.e(4), Enbridge submitted the Draft Wisconsin River Exercise Plan to EPA on November 28, 2018. In a letter dated February 11, EPA requested revisions

to the Wisconsin River Exercise Plan by March 14. Enbridge submitted the revised Wisconsin River Exercise Plan to EPA on March 21.

The Wisconsin River Agreed Exercise was conducted as described in the Exercise Plan. In accordance with Subparagraph 115.h, Enbridge organized and conducted an After Action Meeting on September 20, 2019, to review the Wisconsin River Agreed Exercise for the purpose of identifying "lessons learned," and to make recommendations to improve future Agreed Exercises and response actions. As required under Subparagraph 115.h, Enbridge invited each planning participant to participate in that After Action Meeting. Controllers and evaluators also attended this meeting. As required under Subparagraph 115.i, on November 19th Enbridge submitted the After Action Report for the Wisconsin River Agreed Exercise to the EPA for review.

116 [Field Exercises, Table Top Exercises, and Community Outreach]

116.a [Annual Field Exercise and Table Top Exercise Requirements]

In accordance with Subparagraph 116.a, Enbridge conducted the following Field Exercises ("FDEs") during this reporting period:

- Fort Atkinson, WI on June 19th;
- Grand Rapids, MN on July 24th;
- Bay City, MI on July 31st;
- Algonquin, IL on September 11th;

In accordance with Subparagraph 116.a, Enbridge conducted the following Table Top Exercises ("TTXs") during this reporting period:

- Bay City, MI on July 30th
- Algonquin, IL on September 10th
- Ladysmith, WI on October 30th
- Hurley, WI on November 6th

116.b [Field Exercise Requirements]

In accordance with Subparagraph 116.b, each of the Field Exercises identified above consisted of training exercises conducted in the field to test and practice specific oil spill emergency response tactics used in the initial hours of an oil spill of at least 1,000 gallons into water.

Field deployment exercises test and practice the emergency response actions and tactics of both Enbridge & Government (Federal, Tribal, State, County, and Local) response personnel and equipment, in relation to a release of crude oil from an Enbridge pipeline. A scenario is required to initiate the appropriate level of emergency response within the organizations participating in the exercise. An after-action review (hot wash) is conducted at the conclusion of the exercise to identify areas that went well and areas that need improvement.

The standard schedule for a field exercise is as follows:

- Welcome and Safety Moment
- Operations and Safety Briefing
- Field Deployment
- Equipment Retrieval/Decontamination

- Hot Wash
- Closing Comments

Each Field Exercise included the following:

- A deployment of select equipment and personnel to water;
- A review of locations downstream of a spill where containment and recovery operations can occur; and
- Implementation of one or more containment and collection measures from the Enbridge's "Inland Spill Response Guide" at locations downstream of the potential spill entry point.

Further, in accordance with Subparagraph 115.b, an after action review and discussion was held after each of the Field Exercises, as explained in response to Subparagraph 116.a above.

Specific details for each exercise include:

Fort Atkinson, WI on June 19th. This exercise was attended by 10 Enbridge employees and 9 external participants. The exercise took place on the Rock River.

The objectives of this field exercise were as follows:

Objective 1: Demonstrate the ability to deploy on-water containment and mitigation (recovery) tactics.

Objective 2: Test Control Point SURCP0455 containment and recovery tactics and verify site information.

Objective 3: Assess ability to utilize the Incident Command System to manage an equipment deployment.

Objective 4: Educate and inform stakeholders about Enbridge's Response Capabilities.

Equipment used during the exercise included spill response trailers, boom, work boats, and skimmers supplied by the Fort Atkinson PLM Crew.

During the after action review and discussion at the end of the exercise both positive observations and areas for improvement were discussed and documented.

Positive observations: The workshop conducted prior to the field deployment was beneficial for Enbridge employees. The crews conducted a fast, efficient deployment while being safe. All members of the crew pitched in to ensure a successful deployment. Equipment was in good condition and well organized.

Areas of improvement: Powered winches could not help pulling the boom in the strong current. Additionally, the noise from the overpass made communications difficult. Finally, the field Deployment site was scheduled to be painted two days prior to the exercise. Paint crews were delayed due to weather and still came to paint lines while the exercise was taking place.

The items identified under the "Areas of Improvement" category will be reviewed and addressed prior to the next Field Deployment Exercise. These items drive improvement of the response capabilities of the Midwest Region Field Response team in both field exercises and the unlikely event of a release.

Grand Rapids, MN on July 24th. This exercise was attended by 18 Enbridge employees. The exercise took place on the Mississippi River.

The objectives of this field exercise were as follows:

Objective 1: Demonstrate the ability to deploy on-water containment and mitigation (recovery) tactics.

Objective 2: Test Control Point SURCP0188 containment and recovery tactics and verify site information.

Objective 3: Assess ability to utilize the Incident Command System to manage an equipment deployment.

Objective 4: Educate and inform stakeholders about Enbridge's response capabilities.

Equipment used during the exercise included spill response trailers, boom, work boats, and skimmers supplied by the Bemidji and Superior PLM Crews.

During the after action review and discussion at the end of the exercise both positive observations and areas for improvement were discussed and documented.

Positive observations: A Field Level Hazard Assessment was completed to help ensure tactics were deployed safely with no injuries. The crews conducted a fast, efficient deployment while being safe.

Areas of improvement: Radios are not permanently mounted on all workboats. Portable radios are kept at PLM shops and must be brought separately. Not all spill response boom has rings mounted to the top for gripping ability. The PLM would like additional training opportunities for this particular area.

The items identified under the "Areas of Improvement" category will be reviewed and addressed prior to the next Field Deployment Exercise. These items drive improvement of the response capabilities of the Midwest Region Field Response team in both field exercises and the unlikely event of a release.

Bay City, MI on July 31st. This exercise was attended by 14 Enbridge employees and 6 external participants. The exercise took place on the Kawkawlin River.

The objectives of this field exercise were as follows:

Objective 1: Demonstrate the ability to deploy on-water containment and mitigation (recovery) tactics.

Objective 2: Test Control Point GLRCP0629 and GLRCP0630 containment and recovery tactics and verify site information.

Objective 3: Assess ability to utilize the Incident Command System to manage an equipment deployment.

Objective 4: Educate and inform stakeholders about Enbridge's Response Capabilities.

Equipment used during the exercise included spill response trailers, boom, small workboats, and skimmers supplied by both the Bay City PLM Crew and Marine Pollution Control, a regional OSRO for Enbridge's Great Lakes Region.

During the after action review and discussion at the end of the exercise both positive observations and areas for improvement were discussed and documented.

Positive observations: Crews at both sites were able to establish their control point quickly. Both sites could be utilized in the event of a real release. Safety and communications remained top priorities throughout the exercise. This exercise included OSRO Marine Pollution Control. The cooperation between Enbridge employees and Marine Pollution control was positive and did not disrupt the flow of the exercise.

Areas of improvement: Additional shallow water equipment would be beneficial for a response on the Kawkawlin River. Boats with Mud Motors would be ideal for this river. A key lesson learned from this exercise is that the Kawkawlin River is bi-directional depending on the season and water levels. As such, in a real response, the direction of flow must be verified before control point locations are selected. Additional access points may be needed depending on the direction of flow on the

Kawkawlin River. Heavy debris may make certain control points challenging. Field assessments would be beneficial when selecting control points for a real response.

The items identified under the "Areas of Improvement" category will be reviewed and addressed prior to the next Field Deployment Exercise. These items drive improvement of the response capabilities of the Great Lakes Region Field Response team in both field exercises and the unlikely event of a release.

Algonquin, IL on September 11th. This exercise was attended by 12 Enbridge employees and 2 external participants. The exercise took place on the Fox River.

The objectives of this field exercise were as follows:

Objective 1: Demonstrate the ability to deploy on-water containment and mitigation (recovery) tactics.

Objective 2: Test Control Point GLRCP0139 containment and recovery tactics and verify site information.

Objective 3: Assess ability to utilize the Incident Command System to manage an equipment deployment.

Objective 4: Educate and inform stakeholders about Enbridge's Response Capabilities.

Equipment used during the exercise included Enbridge response boats, skimmers and boom supplied by the Griffith PLM Crew.

During the after action review and discussion at the end of the exercise both positive observations and areas for improvement were discussed and documented.

Positive observations: During the deployment, key adjustments were made related to tie-down points. This led to the boom angle being set correctly. A comprehensive list of necessary equipment was brought to the deployment. This was a lesson learned from previous exercises. The roles and responsibilities of all participants were clearly understood. Proper PPE and general safety considerations were maintained throughout the deployment.

Areas of improvement: Mobile radios failed during the deployment. Additional batteries or spare radios will be brought to the next deployment. Additional pre-planning on tie off points and Control Point information will be helpful for future exercises. The use of a mechanical advantage (i.e. Capstan Winch) or refresher training on how to create a mechanical advantage will help speed up the rate of boom deployment as well as decrease the potential for an injury from manually pulling rope.

The items identified under the "Areas of Improvement" category will be reviewed and addressed prior to the next Field Deployment Exercise. These items drive improvement of the response capabilities of the Great Lakes Region Field Response team in both field exercises and the unlikely event of a release.

116.c [Table-Top Exercise Requirements]

In accordance with Subparagraph 116.c, the Table Top Exercises identified under Subparagraph 116.a above were conducted to test and practice non-field oil spill emergency response processes and procedures.

The scope of each Table Top Exercise is to review the response capabilities of Enbridge, Local First Response agencies and community stakeholders in relation to a release of crude oil in a pipeline. It utilizes multiple Emergency Response Plans to map out the combined response to the incident using ICS and is based on a simulation of a realistic emergency situation that included a description of the situation (scenario) with communications between players and facilitator. It identifies all responding agencies, resources, the establishment of a Unified Command, and situational assessment, and how the incident would be documented during the initial response.

The Table Top Exercise structure consists of two modules; Module 1: Initial Notifications and Response (Reactive Phase) and Module 2: Mobilization and Sustained Response (Proactive Phase). Each module begins with a multimedia update that summarizes key events occurring within that time period. After the updates, participants review the situation and engage in group discussions of appropriate response issues. A formal hot wash and or after action reports are not required for Table Tops, however discussions are held during the exercise and discussion points are captured during or after the exercise.

The exercises included the following:

- A minimum spill scenario of at least 1,000 gallons from a Lakehead System Pipeline located in close proximity to water;
- Notifications of the spill to all the government entities, including tribal authorities, that are identified in the Enbridge Integrated Contingency Plan ("ICP");
- Both near and long-term response actions to address the spill;
- Anticipated response times for Enbridge equipment and personnel;
- The risks that the spill scenario could pose to public health and the environment;
- Potential resources at risk; and
- Protective measures for the local community, including evacuation procedures, as identified in the Enbridge ICPs.

Specific details for each exercise include:

- **Bay City, MI on July 30th** – The exercise was attended by 9 members of Enbridge and 3 external participants.

  Discussion Points:
  - The Coast Guard indicated that they would like to be notified as soon as possible when an incident occurs. Enbridge utilizes the NRC to make external notifications but additional calls directly to applicable agencies may be beneficial.
  - The Bay City office could serve as a suitable command post. If incident expands and a larger command post is needed, the Bay Valley Resort and Conference Center is a larger facility that could be used. The Bay City area has a high number of potential ICS facilities in addition to those already mentioned.

- **Algonquin, IL on September 10th** – The exercise was attended by 8 members of Enbridge and 7 external participants.

  Discussion Points:
  - For the Fox River, the Army Corps of Engineers may be able to slow the flow of the river. This is not guaranteed.
  - There is a Holiday Inn on Three Oaks Road and Route 31 in Algonquin, IL that could serve as an Incident Command Post. The concrete company Ozinga also has a large yard in the area that could serve as a staging area.
  - A discussion on the Unified Command revealed that many parties in the area would want to join Unified Command. Only authorities having jurisdiction should be a part of Unified Command.
  - There are airboats in the Algonquin area. These may be helpful for gaining access to shallow water areas on the Fox River.

- **Ladysmith, WI on October 30th** – The exercise was attended by 4 members of Enbridge and 8 external participants.

Discussion Points:

- Tabletop Exercises should be held in the evening to get further participation from volunteer fire departments.
- Create a list of local logistical (catering, lodging, etc.) facilities that would be available for a response.
- Develop material for Worst Case Discharge vs Most Likely Discharge indicating what goes into those calculations and bring that information to the exercise participants.

- **Hurley, WI on November 6th** – The exercise was attended by 6 members of Enbridge and 4 external participants.

  Discussion Points:

  - Future exercises in this location should include interstate response due to the proximity of the Wisconsin/Michigan border. This would further exercise the challenges of this coordination.
  - Tabletop Exercises should be held in the evening to get further participation from volunteer fire departments.
  - The lack of OSRO's in the area creates a void in response other than internal Enbridge resources. Further information should be attained on the realistic response times of these OSRO's based on the greater distance from the location.

116.d [Field and Table-Top Invitees]

In accordance with Subparagraph 116.d, prior to conducting the Field and Table Top Exercises identified under Subparagraph 116.a above, Enbridge sent out invitations for the scheduled 2019 Table-Top and Field Exercises on December 18, 2018, to community, state and local first responders listed in CD Appendix C, as well as first responders located within 5 miles of the exercise scenario, resulting in a total of 852 invitations mailed. While not related to the data required for this reporting period, annual invitation information is provided for reference.

The invitations provided recipients with more than four weeks prior notice of the exercise date when the exercise was to be conducted. The invitation also indicated that Enbridge would provide meals to persons who attended each exercise, and that the training would be provided at no cost to the invitees, excluding travel costs. Interested respondents were directed in the letter to an external-facing website wherein they could register for their interested exercises, in addition to being provided a contact telephone number and e-mail address. During the reporting period 16 registrations were submitted to the online system with no telephone and two e-mail requests for additional information received and responded to.

As part of the 2020 mailing program, two improvements will be made at the request of US EPA. First, three EPA Region 5 planners have been added to the annual invitation mailing list. Second, county and regional state-level emergency management offices will be added to the annual invitation mailing list.

While not a requirement of the Consent Decree, Enbridge also mails exercise reminder postcards approximately two months prior to each TTX/FDE. EPA suggested amending the postcard format, while still recognizing specific venue information may not be available due to securing of appropriate permits or other logistical issues. Taking this request into account, Enbridge has amended the postcard design to include the city of the exercise and type of exercise being conducted.

116.e [Community Outreach Sessions]

During this reporting period, Enbridge continued to comply with Subparagraph 116.e of the Consent Decree regarding the required Community Outreach Session which reads:

e. In addition to the above exercises, Enbridge shall conduct or hire a contractor to conduct Community Outreach sessions regarding the hazards of the different oils in the Lakehead System and the location of Enbridge pipelines in the community and how such pipelines are marked. Specifically, within one year of the Effective Date, and for each year thereafter until the Decree is terminated, Enbridge shall hold at least 15 Community Outreach Sessions in 15 different communities where the Lakehead System is located. Enbridge shall also provide information at the Community Outreach sessions regarding: (i) how the community should respond in the event of a spill, (ii) how the community can obtain information in the event of a spill from Enbridge and government agencies, and (iii) how the community can report spills to Enbridge, EPA and the National Response Center.

Enbridge conducted the following Community Outreach Sessions during this reporting period:

- Adams, WI on July 9
- Waterloo, WI on July 10
- Delavan, WI on July 11
- Mackinaw City, MI on August 6
- Petoskey, MI on August 7
- Gaylord, MI on August 8
- Schererville, IN on November 12
- Mokena, IL on November 13
- Pontiac, IL on November 14

For the Community Outreach Sessions identified above, a total of 47,278 invitations were sent to landowners, elected officials, media, the general public, and community leaders. The general public was invited to attend through a series of advertisements placed for two weeks leading up to each event in local newspapers. There was a total of 729 documented attendees at these nine sessions.

Each Community Outreach session was conducted in an open-house format with manned booths that provided attendees with valuable information on pipeline operations, product information, safety, preventative maintenance, integrity, emergency response, public awareness, damage prevention/right-of-way, and Enbridge's involvement in local communities. The sessions are held in a come-and-go style to allow participants the flexibility to attend when they are able and so they can spend as much or as little time as they would like on specific topics. Upon arrival, each attendee receives a package of information that is reviewed with them to convey the following information:

- Potential hazards of different oils transported by the Lakehead System;
- The location of Enbridge pipelines in proximity to the communities where the sessions were conducted;
- How Enbridge's pipelines are marked;
- How the community should respond in the event of a spill;
- How the community can obtain information in the event of a spill from Enbridge and government agencies; and
- How the community can report spills to Enbridge, EPA, and the National Response Center.

The Section H Appendix includes copies of the recently updated primary, state-specific handouts reviewed with attendees upon registration at the Illinois and Indiana meetings. The handouts were updated to reflect

the appropriate contact information for EPA Region 5. (The full list of available handouts provided during the community sessions was included in Appendix 4 of SAR4).

Finally, at each Community Outreach Session Enbridge solicits feedback from attendees through both printed evaluation cards and during one-on-one conversations. After each session, there is a post session debrief with the Enbridge teams to review the feedback cards, gather feedback they've received, and discuss the conversations held at the various booths. An overwhelming majority of the feedback received, whether through the cards or conversations, were positive as attendees appreciated having access to Enbridge and to the information being provided. In Wisconsin, we were generally met with local support from officials and landowners. Questions related to products carried, eminent domain, and the possibility of a new project in Wisconsin were most common. In Michigan, conversations and questions were again primarily around the products Line 5 carries, Enbridge's emergency response plans/capabilities, what Enbridge is doing to protect the Straits of Mackinac now, and the proposed tunnel project to relocate Line 5. And in Illinois and Indiana, conversations and questions focused on the products carried by Enbridge's pipelines, Enbridge's safety protocols, and general information seeking.

117 [Control Point Plans]

In accordance with Subparagraph 117.a, Enbridge is preparing to have updated and maintained within three years after the Effective Date of the Consent Decree information for the Control Point locations set forth in Appendix D that identify containment and recovery points, as well as staging locations and other response-related locations, along the waters that could be impacted by a spill from a Lakehead System Pipeline. The Control Point information will include the specifics from Subparagraph 117.b and will be organized in a format that is consistent with the example Control Point information that is provided as Appendix E to the Consent Decree.

The Control Point information submitted to date by Enbridge to EPA was provided in the electronic formats specified in Subparagraph 117.e.

118 [Response Time]

In accordance with Paragraph 118, Enbridge has hired a contractor to, within three years of the Effective Date, complete a review of Enbridge and Oil Spill Response Organization ("OSRO") personnel and equipment available to respond to an oil spill from the Lakehead System. The scope of that review will assess whether Enbridge and its OSROs can respond and meet all personnel and equipment needs within the timeframes allotted in the maps contained in the Lakehead ICPs, and assess methodologies for estimating driving times. In accordance with Paragraph 118.c, Enbridge will submit a draft report to EPA within 180 days after the contractor completes its review of the response times contained in the ICP maps.

119 [Coordination with Governmental Planners]

Enbridge's coordination with governmental planners is described in its response to Subparagraphs 119.a to 119.k below.

119.a [Planning Meeting Participation]

In accordance with Subparagraph 119.a, Enbridge attended the following Area and Sub-Area Committee planning meetings that were held during this reporting period:

- Detroit Sub-Area Committee Meeting on July 10th;
    - Enbridge attended this planning meeting which was held as the final planning meeting in preparation for the Northwest Ohio Southeast Michigan Area Committee (NOSMAC)

"Preparedness for Response Exercise Program (PREP) Workshop (WS)" in the upper St. Clair River.

- Northern Michigan Area Committee Meeting July 16th;
    - Enbridge attended this meeting and presented information on Line 5 in-situ burning lab test results. Another topic covered during this meeting included EPA Region 5, Inland Zone Plan, Northern MI sub-Area, worst case discharge. Additionally, other topics covered included: risk perceptions and detection of oil spill on ice covered lakes, importance of ice cover in the Great Lakes, and US Coast Guard (USCG) changes.
- Duluth/Houghton Sub-Area Committee Meeting July 17th;
    - Enbridge was in attendance and a variety of topics were discussed.
- Duluth/Houghton Sub-Area Committee Meeting October 16th;
    - Enbridge attended this planning meeting. At this meeting marine safety information bulletin 09-10 Ebola Virus precautions, contact procedure for reporting and requesting assistance from US Coast Guard (USCG) command center as well as the development for a Port Security Committee for a Marine Transportation System Recovery Unit (MTSRU) and various exercises were discussed. Enbridge Midwest Region briefed the committee on upcoming training/exercises that would be taking place in the area in 2020.
- Saginaw River All Hazards Committee Meeting October 16th;
    - Enbridge attending this meeting and the topics covered match the topics covered at Detroit Sub Area committee meeting on October 24th.
- Detroit Sub-Area Committee Meeting October 24th
    - Enbridge attended this planning meeting. A variety of updates from agencies and subcommittees were provided including reference to a booming exercise held by Enbridge Energy on the Kawkawlin River as part of the Saginaw River All Hazards Committee (SRAHC) update.
- Duluth/Houghton Sub-Area Committee Meeting November 1st
    - Enbridge attended this meeting and a variety of topics were discussed which included discussion about the 2020-2021 full scale ER exercise. As well it was discussed that the table top is to occur on March 2020 and a full scale to occur in 2021 with accident scenario being a tanker refueling vessel off the coast of Isle Royale running aground leaking #6 fuel on the rocky shores of Isle Royale.

Enbridge also attended the Fall RRT Meeting that was held on October 29, 2019. This meeting fell outside of the sub-area planning meetings.

119.b [Sub-Area Activities Participation]

Enbridge's participation in Sub-Area activities is discussed in its response to Subparagraphs 119.b(1) and 119.b(2) below.

119.b(1) [Field Exercise Participation]

In accordance with Subparagraph 119.b(1), Enbridge attended the following Sub-Area Committee field exercise during this reporting period:

- Enbridge did not receive any invitations to participate in any Field Exercises for this reporting period.

119.b(2) [Other Training Events Participation]

In accordance with Subparagraph 119.b(2), Enbridge attended the following Sub-Area Committee training event during this reporting period:

- Detroit Sub-Area Committee Training Event – NOSMAC Prep Workshop, on August 29th;
    - Enbridge attended the Northwest Ohio Southeast Michigan Area Committee (NOSMAC) Preparedness for Response Exercise Program (PREP) Workshop (WS). This workshop looked to deliver on new geographic response strategies (GRS) for the St. Clair river, emergency operations plans, continuity of operations plans, or mutual aid agreements.

- Duluth/Houghton Sub-Area Committee Training event – Incident Management Training October 28th.
    - Enbridge participated and successfully completed the requirements of the US Coast Guard (USCG) Incident Management Assist Team (IMAT) Incident Management Training class.

119.c [Response Requirements to Sub-Area or Area Committee Recommendations]

No Sub-Area Committee or Area Committee for the Lakehead System has made written recommendations to Enbridge regarding its emergency preparedness plans and implementation. Thus, Enbridge had no obligation under Subparagraph 119.c to respond and/or revise its emergency preparedness plans or implementation during this reporting period.

119.d [Response Planning Meetings Requirements]

On September 11th Enbridge met with EPA Region 5 Federal On Scene Coordinator to discuss the Northern Michigan Sub Area Contingency Plan update and Pipeline Response. Enbridge discussed its response capabilities in the area and its methodology in calculating potential discharge volumes for the purposes of EPA understanding and applicability to the Sub Area Plan.

119.e-g [Plans and Prepositioned Emergency Response Locations and Equipment]

Requirements for Subparagraphs 119.e-g were fully satisfied during the first SAR reporting period, as explained in the first SAR.

119.h [Emergency Response Equipment]

Enbridge continues to maintain, in good working order, its prepositioned emergency response equipment and materials. During this reporting period, no equipment was used or expired and thus replacement of the materials was not warranted or required. Enbridge has purchased additional prepositioned equipment for the Straits of Mackinac and provided electronic written notice of these additions to EPA and the listed Area and Sub-Area Committees on December 14, 2018.

119.i [Inland Spill Response Guide on Website]

In accordance with Subparagraph 119.i, the "Inland Spill Response Guide" has been available on Enbridge's website since May 23, 2017, at https://www.emergencyresponderinfo.com/.

119.j [Inland Spill Response Guide to EPA]

EPA requested a copy of the "Inland Spill Response Guide" on November 1, 2018, and Enbridge fulfilled this request on November 2, 2018.

119.k [Electronic Submittal of Documents]

Enbridge has provided electronic copies of all documents that are required to be submitted under Paragraph 119 in accordance with the electronic submittal requirements specified under Subparagraph 119.k.

120 [Incident Command System Training]

Enbridge's compliance with ICS training requirements is described in Enbridge's response to Subparagraphs 120.a to 120.c below.

120.a [Incident Command System Training Requirements]

Enbridge has ensured that, upon assigning a person to take on the following roles, each person has completed the training identified below prior to beginning such duties or within the timeframe specified under Subparagraph 120.a:

- Incident Commanders, Deputy Incident Commanders or Alternative Incident Commanders of any Regional Incident Management Team in any Lakehead ICP: ICS 100B - 400 and position- specific training;
- All other personnel listed as members of any Regional Incident Management Team in any Lakehead ICP: ICS 100B - 300 and position-specific training;
- Regional Emergency Response Coordinators: ICS 100B - 400 training;
    - During this reporting period one new Regional Emergency Response Coordinator was hired for the Southwest Region in the US. The employee completed all require ICS training including role specific prior to starting in October 2019.
- All emergency management department personnel: ICS 100B – 300 training within 90 days of being assigned;
    - During this reporting period two employees were added to the Emergency Management Department in July 2019. Both employees completed up to ICS 300.
- Any person designated as Vice President of U.S. Operations, or in an equivalent capacity: ICS 402 training. Since the last report Enbridge conducted two series of ICS 402 (for executives); and
- Any other manager or executive who give direction to field personnel, or is responsible for making funding, personnel, or resource decisions during a spill response (if ICS 100B – 400 has not been taken): ICS 402 training.

Changes to the Incident Management Team lists due to retirements, change of employment, etc. will result in additional training being conducted for any replacement personnel. Additionally, Enbridge will track training dates for IMT positions that change.

Since the last reporting period, no changes have been made to any IMT list, therefore nothing to report.

120.b [ICS Training and Incident Management Team Personnel]

In accordance with Subparagraph 120.b, Enbridge has trained at least one employee for each Incident Management Team position as indicated in its ICP.

120.c [Training Requirements and Electronic Certification Documents]

In accordance with Subparagraph 120.c, Enbridge maintains electronic certification documents that confirm personnel training as described in Subparagraph 120.a.

Section I – New Remotely Controlled Valves

121-122. [Installation of 14 Remotely Controlled Valves]

The Consent Decree requires that Enbridge install 14 remotely-controlled valves over the term of the Decree. During the reporting period, all four planned 2019 remotely-controlled valves were installed and commissioned: two on Line 6A and two on Line 14, per Table I-1. Enbridge obtained all permits necessary from the appropriate agencies to install the remotely-controlled valves on schedule.

The valve installations completed in 2019 were installed within the milepost ("MP") ranges specified under Paragraph 122. During this reporting period, all four 2019 valves were successfully commissioned: those on Line 6A on September 12, 2019, and those on Line 14 on November 21, 2019.

123. [Enbridge Computer Modeling for Valve Locations]

The locations for the installation of all remotely-controlled valves, including those identified in Table I-1, were identified by conducting an analysis using Enbridge's Intelligent Valve Placement ("IVP") methodology. The objective and guiding principle of the IVP methodology is to reduce the maximum potential release volume as much as reasonably practicable in the unlikely event of a pipeline release. To achieve this, the entire pipeline route is modeled, taking into account: the topography of the right-of-way; the elevation profile of the pipeline; the throughput and operating pressure of the pipeline; and the location of watercourses. The IVP methodology also considers potential impacts of a pipeline release on sensitive features, or high consequence areas ("HCAs"), including highly populated areas, other populated areas, reservoirs holding water intended for human consumption, commercially navigable waterways, and environmentally sensitive areas. HCAs include those that are directly affected by the pipeline and those that are affected by a transport mechanism such as overland or terrain transport, spray, and water transport.

The IVP methodology uses a risk-based approach for optimizing valve placement to reduce potential damage from accidental discharge to populated areas, water crossings, HCAs, and areas of high volume out. The process examines the pipeline segment by segment on an iterative basis until the lowest, reasonably practicable release volume between valves is achieved along the pipeline. The goal of the IVP methodology is to protect the public and the environment in the entire area, rather than focusing only on specific watercourse crossings.

The IVP also considers the impact to environmental resources caused by construction activities in relation to valve installation. Once potential valve locations are selected using the IVP risk-based approach, Enbridge will conduct a field verification of those locations. Field verification will evaluate the impact of construction to the environment, including the following factors: valve site access, constructability, and power and land availability. Final valve locations may be altered due to constructability issues and environmental impacts identified during field verification.

The information above was summarized in a report titled "DOJ Commitment Valves, Valve Analysis", V3.0, dated January 18, 2017. The ITP was provided the report in response to information requests received from the ITP (under number I011). On July 25, 2017, an in-person meeting select ITP and Enbridge representatives were present to discuss the IVP methodology and answer the ITP's questions pertaining to method, risk, and rationale.

124. [Valve Design and Closure]

Prior to requisition of the valves for installation in 2017, Enbridge subject matter experts examined each step of the valve closure process including initiating of command, communication of command to the remote facility, energizing of the actuator, and mechanical process to fully close and seal the valve. Considerations were made for each of these steps leading up to the start of mechanical closure and subtracted from the total allowable command-to-sealed requirement, and the valves were specified on the Purchase Order to the manufacturer to close within that remaining time. Enbridge also specified on the Inspection and Test Plan that a valve closure timing test will be completed on at least one valve of each size to verify actuator open and close time. Enbridge inspectors were present to witness the shop closure timing test and confirmed that the valves closed within the specified time, prior to shipment and delivery. The valves installed on Line 6A are 34" valves and those on Line 14 are 24" valves. During dry commissioning of the valves, timing tests were conducted, and the valves all fully closed and sealed within three minutes of the operator engaging the valve-closure mechanism, complying with the Consent Decree requirement.

During this SAR reporting period, Enbridge has completed the following milestones:

- Installation of two valves on Line 6A at MP 427 and 458
- Installation of two valves on Line 14 at MP 412 and 430
- Successful commissioning of all four valves identified in the bullet points above
- Commencement of 2020 material procurement activities for two valves on Line 6A.
- Completion of 90% IFR drawings for civil, structural, mechanical, and electrical for scopes of work for 2020 execution plan of two valves on Line 6A
- Close out of all conditions, including mitigation, specified in 2018 environmental permits required for the installation of valves on Line 5 at MPs 1416, 1518, 1429, and 1621.
- Close out of all conditions, including mitigation, specified in the environmental permit required for the 2019 installation of the valve on Line 6A at MP 427; monitoring of the remaining conditions in the environmental permits applicable to the other three valves installed in 2019.

Section J – Independent Third Party Consent Decree Compliance Verification

As reported in the first SAR dated January 2018 and the second SAR dated July 2018 Enbridge retained O.B. Harris, LLC as the ITP on January 11, 2017 to conduct a comprehensive verification of Enbridge's compliance with the requirements set forth in Section VII (Injunctive Measures), except for subsection VII.H (Spill Response & Preparedness) which Paragraph 125 excludes from the verification activities that are required to be performed by the ITP. Therefore, Enbridge's obligations under Paragraphs 125, 127-132.a and 134 have been satisfied. Enbridge will continue to report on required updates and/or changes to this injunctive measure in future SARs.

126. [ITP Access to Enbridge Lakehead System]

Enbridge continues to provide the ITP with full access to all facilities that are part of Enbridge's Lakehead System including any personnel, documents and databases to allow them to fully perform all activities and services required by the requirements of the Consent Decree.

132. [Enbridge – ITP Agreement Tasks 2, 3, 4, and 5]

In accordance with Paragraph 132, Enbridge continues to support the ITP in providing them additional information and responding to their requests to assist the ITP in completing the tasks required by Subparagraphs 132.b, c, d and e.

133.b [Enbridge Response to ITP Verification Report]

The agreement between Enbridge and the ITP requires, as per Subparagraph 133.a, that the ITP prepare a written verification report that sets forth the findings, conclusions and recommendations, if any, as to each of the requirements of Section VII of the Consent Decree, excluding Subsection VII.H (Spill Response and Preparedness). There is nothing additional to report in this covered period. If there are further developments related to this Paragraph, Enbridge will provide an update in future SARs.

134.l [General Requirements – ITP Annual Certification]

On January 3, 2019, the ITP provided its annual certification to the United States, verifying that it complies with the General Requirements of Subparagraph 132.l.

135. [Enbridge Enforcement of the Agreement]

As reported in the first, second, third, and fourth SARs, Enbridge continues to enforce the terms of its written agreement with the ITP to ensure compliance with Section VII.J of the Consent Decree.

136. [ITP Replacement]

This Paragraph of the Consent Decree addresses replacement of the ITP, which is an issue that has not arisen since the Effective Date.

IX. – Reporting Requirements

144. [SAR Requirements]

This section summarizes information required by Paragraph 144 to the extent that the information is relevant to Enbridge's compliance with a requirement of the Decree and has not been reported separately above. Enbridge also recognizes that all of the matters listed in Paragraph 144 will not always be applicable relative to each of the Decree's requirements. Among matters listed in Paragraph 144 are the following:

i. Completion of milestones
ii. Problems encountered or anticipated in implementing the requirement (together with implemented or proposed solutions)
iii. Status of permit applications
iv. Operation and maintenance issues
v. Reports to State Agencies
vi. Number by types, of features repaired or mitigated during the reporting period and the number, by type, planned for future repair or mitigation
vii. Any significant changes or issues since the previous SAR

In many cases, the matters listed above have been reported in previous sections of the Report that relate to specific Decree requirements. However, Enbridge has selected the activities reported below to draw specific attention to challenges encountered during Reporting Period 5, pursuant to Paragraph 144.

Consent Decree Interpretation Issues

There are a number of Consent Decree interpretation issues that Enbridge has resolved or is working to resolve with the ITP and EPA. Enbridge is proceeding using the Enbridge interpretation in areas where the interpretation has not been agreed on by all parties. Refer to **Table IX-1** for a list of interpretation issues.

Problems Encountered or Anticipated in Implementing Consent Decree Requirements

Refer to **Table IX-2** for a list of problems encountered.

[Section B] September 26, 2019 Identified Line 3 MOP Reporting Discrepancies – P. 22

On September 26, 2019, an error was identified in the spreadsheet utilized to generate the 'MOP Exceedances on Original Line 3' data provided during the monthly technical meetings with the ITP and EPA. The error resulted in incorrect 'Maximum Pressure Achieved' values and percentages being reported to the ITP in monthly meetings February 2019 through September 2019. Enbridge notified the ITP of the issue during the technical meeting on October 22, 2019. At this meeting, Enbridge also provided updated 'MOP Exceedances on Original Line 3' tables for these months. Enbridge also notified the ITP of an additional reporting issue discovered during in-depth review of the reporting approach. The second issue is related to utilizing the lowest max value of multiple transmitters ("low select") since May 2017. Enbridge analyzed both issues and has determined that although there were multiple instances of lower pressures being reported, operating conditions were not impacted in any way, and there were no non-compliance events or unreported MOP exceedances as a result. Enbridge has implemented additional controls to prevent re-occurrence of these reporting issues and has proposed an enhanced reporting template for monthly technical meetings.

These issues did not impact the operational controls in place to manage overpressure situations and was limited to the reporting of the pressure data utilizing the historical reporting system. Enbridge is working with the ITP to provide additional data to verify the impact of the low select issue and will provide an update in SAR6.

[Section D] Alternative Wall Thickness Used for Burst Pressure Calculations – P. 34.c

Upon review of the L4 DN-VG 2018 NDT UCM UTWM corrosion program, Enbridge identified that one of the methods that the ILI vendor was using to calculate burst pressure was not clear. This prompted a retroactive review of all corrosion ILI reports. Based on this review, it was identified that one wall thickness input into RSTRENG Effective Area and Modified B31G calculations used the alternative nominal or local feature wall thickness instead of the average pipe joint wall thickness that is required by the Consent Decree. Although this results in a very minor change to the burst pressure calculation to a small number of features, Enbridge requested that 14 corrosion ILI reports from one ILI vendor be re-issued. This change required the ILI vendor to modify software in order to meet the specific requirements of the Consent Decree. A detailed list of affected reports is provided in the **Table IX-3**.

Two features from the re-issued Line 3 GF-CR 2017 UCMp inspection had changes in HCA boundaries between the first issue and final issue of the ILI report. This resulted in a change of status for both features from a non-FRE to an FRE. As a result, GW 148980 and 183120 were added to the dig list on 08/29/2019 as Dig ID 26464 and 26465 respectively with an excavation due date of 02/25/2020 (180 Days, in an HCA).

Four FREs were identified from the re-issued L6A AM-GT 2017 UMP inspection. Three of these FREs on GW 166750, 205920 and 280780 were added to the dig list on 10/24/2019 as Dig ID 26676, 26677 and 26678 respectively and have an excavation due date of 4/21/2020 (180 Days, in an HCA). One of these

FREs on GW 72080 was added to the dig list on 10/24/2019 as Dig ID 26675 and has an excavation due date of 10/23/2020 (365 Days, not in an HCA).

There were no features meeting FRE criteria identified in the other 12 corrosion ILI reports.

Enbridge worked with the ILI vendor to make software changes to ensure this problem is not encountered in the future.

[Section D] Crack and Corrosion Field Burst Pressure Calculations per Appendix B in the Consent Decree – P43

At the June 11, 2019 Face to Face meeting, Enbridge presented on the wall thickness used for burst pressure calculations on crack and corrosion features. The presentation focused on the wall thicknesses that are specified in Appendix B Section A.4 and how these wall thicknesses compare with those used by Enbridge when performing burst pressure calculations on NDE features. Field NDE technicians measure the local wall thickness at a crack or corrosion feature and use these values to calculate crack and corrosion field burst pressures. The wall thickness of the joint as measured by a USWM tool and specified nominal wall thickness of the joint (as specified in Consent Decree Appendix B.4.a-b) are not used as they are less accurate, and potentially non-conservative, compared to the wall thickness measured at the location of the indication. Using a nominal wall thickness instead of an actual measured wall thickness does not provide an actual assessment of line condition. This is consistent with guidance given in ASME B31G. The local wall thickness is used in all cases, including when it is found to be lower than nominal wall thickness or wall thickness as measured by a USWM tool.

[Section F] Line 5 PE-IR 2017 USCD+ NDE Report OneSource Load Data Re-Upload – P. 77.d

As reported in SAR4 Paragraph 144, an NDE report OneSource upload date for dig ID 23020 GW 154730 from the Line 5 PE-IR 2017 USCD+ program was incorrectly recorded in OneSource as 6/5/2019. After an investigation it was determined that the correct NDE report OneSource upload date for this dig is 03/14/2018. The OneSource record has been corrected.

[Section G] October 26, 2019 ILI bypass event at L1 Viking station, exceeded 4-hour outage – P. 96

On October 26, 2019 a bypass of the Line 1 Viking ("VG") station was initiated at 00:10 AM MST to accommodate an in-line inspection ("ILI") tool passing the station immediately following a cleaning tool run. While the station was bypassed, the VG flow meter was no longer being used by the MBS leak detection system. During the bypass, overlapping MBS segments were in place to provide leak detection capability.

Enbridge experienced delays in the initial process of loading the ILI tool into the pipeline that lead to approximately 3,400 m^3 of product between ILI and cleaning tool, which is approximately 2 hours and 48 minutes spacing at Line 1 rates during bypass.

Due to the delays, the bypass at VG station was ended at 04:20 AM MST on the same day resulting in a total bypass time of 4 hours and 10 minutes. Paragraph 97 of the CD allows 4 hours to restore MBS for Bypass of ILI Tools. The total time the flow meter was out of service exceeded the 4-hour allowance by 10 minutes, thereby triggering the reporting requirement.

This event was highlighted in the December 5, 2019 Monthly Technical Meeting with the ITP and EPA. To avoid future events specific to this scenario, Enbridge is modifying the procedures to manage ILI bypass events such that the flow meter is returned to service when spacing between multiple tools is greater than one-hour.

[Section G] Discrepancy in 24-Hour Alarm Threshold but not Impacting MBS Sensitivity – P. 103

On September 3, 2019, Enbridge submitted the 24-hour Alarm Testing Report ("AVB Testing Report") to the EPA as required by Consent Decree P. 103.e. Prior to the submission of the AVB Testing Report, on June 5, 2019, Enbridge submitted a detailed report to the ITP of the 24-Hour Alarm threshold optimization study ("detailed report"). During testing, Enbridge observed discrepancies in the simulated leak test results against the results reported in the detailed report. Enbridge informed the ITP of the discrepancy on August 28, 2019, during the monthly technical meeting, and supplemented the notification with a detailed explanation on October 15, 2019, approximately a month after AVB Testing Report submission to EPA.

The discrepancies include two types of errors:

1) Typographical errors: Line 10 meter-to-meter and overlapping section volume thresholds, and Line 5 overlapping section volume thresholds; and,
2) Inconsistent volume thresholds in production: Line 10 meter-to-meter and overlapping section volume thresholds were tested at -230 m^3 versus -218 m^3 documented in detailed report, and Line 78 meter-to-meter section volume thresholds were tested at -1100 m^3 versus -1200 m^3 documented in detailed report.

Enbridge has taken steps to investigate and correct the issue. In addition to correction of the typographical errors, Enbridge performed an impact analysis and additional testing to verify that sensitivity performance of 24-Hour Alarm per Consent Decree Paragraph 103.b is still met.

The impact analysis and additional tests performed have demonstrated that these discrepancies did not negatively impact the performance of 24-Hour Alarm, therefore did not impact the consent decree requirements defined in paragraph 103. Enbridge corrected the issue by updating the appropriate production environments with the 24-hour Alarm thresholds as defined in the detailed report.

Finally, the AVB Testing Report submitted to the EPA remains accurate, as testing demonstrated successful detection of simulated leak sizes in the optimization study.

Any significant changes or issues since the previous SAR

Any significant changes or issues since the previous SAR are addressed in the Injunctive Paragraphs as applicable.

145. [Non-Compliance]

A list of the potential non-compliances identified during the SAR5 reporting period is shown in **Table IX-4**.

[Section D] Line 01, CR-PW, UC GW93520 Remaining Life Deadline – P44.b(1)

As detailed in CD Section D P44.b(1), Enbridge shall complete initial Predicted Burst Pressure calculations and initial Remaining Life calculations for all Crack or Corrosion features within 8 weeks after completing the data quality review. Although the burst pressure was calculated in accordance with CD timelines, the remaining life of the stacked feature found at GW 93520 was not completed per the timelines in P.44. This was an oversight given the feature required a unique and separate remaining life analysis/calculation. The preliminary data review was completed of February 14, 2019 and the remaining life calculation was completed on July 18, 2019. No further action was required based on this analysis and Enbridge can confirm that there are no other unique stacked feature flaws requiring this analysis. Enbridge SMLs have been reminded of the timing requirement for these stacked features.

146. [Discharges from a Lakehead System Pipeline]

Table IX-5 in Appendix 1 identifies one discharge from a Lakehead System Pipeline of one or more barrels of oil that occurred during the reporting period for this SAR. Enbridge can confirm that this discharge did not reach any waterbody or waters of the United States or adjoining shoreline. There were no other instances of discharge of oil during the reporting period that reached any waterbody or waters of the United States or adjoining shoreline in a quantity as may be harmful. Enbridge has committed to report all Post Incident Reports that were not previously requested and provided during the current SAR reporting period. The reports at issue are provided in Appendix 4.

147. [Update on Discharges from a Lakehead System Pipeline reported in SAR4, July 2019]

There were two discharges from a Lakehead System Pipeline reported in SAR4. **Table IX-6** in Appendix 1 provide updates on the information reported in SAR4 for these two discharges.

As reported in SAR1 and SAR2, Enbridge investigated a release at the Superior Terminal on 11/14/17. As a result of the investigation, Enbridge considered monitoring tank mixers to avoid a similar release. However, Enbridge subsequently found that monitoring the mixers would not result in predictive data related to potential releases. As of the date of this report, all similar mixers are locked out long term with no planned date to utilize these appurtenances. If the mixers' statuses change, Enbridge will update this Paragraph in a future SAR.

148. [Copies of all Post Incident Reports in SAR5]

See Appendix 4.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on any personal knowledge I may have and my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

FOR DEFENDANTS:

ENBRIDGE ENERGY, LIMITED PARTNERSHIP,
ENBRIDGE PIPELINES (LAKEHEAD) L.L.C.,
ENBRIDGE ENERGY PARTNERS, L.P.,
ENBRIDGE ENERGY MANAGEMENT, L.L.C.,
ENBRIDGE ENERGY COMPANY, INC., and
ENBRIDGE EMPLOYEE SERVICES, INC.,

[redacted] Vice President

FOR DEFENDANTS:

ENBRIDGE OPERATIONAL SERVICES, INC.,
ENBRIDGE PIPELINES INC., and
ENBRIDGE EMPLOYEE SERVICES CANADA INC.

[redacted] President

Appendix 1 – Sections A-J and Section IX Tables

Reporting Period: May 23, 2019 to November 22, 2019

Table Index

Introduction

Table Intro-1: Implemented Requirements per P. 203(i)			
CD Section and Paragraph	**Short description**	**Reported in**	**ITP's recommended status**
Section B P. 21	No operation of original US Line 6B	SAR1	ITP ISR1 dated May 31, 2018, "compliant with additional information."
Section B P. 23	Line 10 evaluation	SAR1-SAR4	From the ITP's Evaluation of Enbridge US Line 10 Submittals Report dated November 6, 2018, "the collective information, taken as a whole, complies with the requirements of P23."
Section E P. 69.a; 69.b; 69.c	Biota Investigation Work Plan, report, and implementation	SAR1-SAR4	March 12, 2019, ITP recommended that EPA approve Enbridge's submitted revisions.
Section E P. 70.a; 70.b	Line 5 ILI corrosion, circumferential crack, and geometric features	SAR1	ITP ISR1 dated May 31, 2018, "compliant."
Section E P. 71.a; 71.b	Line 5 ILI axially-aligned crack features or hydrotest	SAR1	ITP ISR1 dated May 31, 2018, "compliant."
Section E P. 72.a; 72.b	Pipeline Movement Investigation (crack feature investigation and remediation)	SAR1-SAR4	ITP ISR1 dated September 24, 2018, "N/A"
Section F P. 77.a	Updated OneSource within 365 days of CD Effective Date	SAR1	ITP ISR1 dated May 31, 2018, "compliant."
Section G P. 79.a-d; 80.a-d	Assessment of Alternative Leak Detection Technologies and report	SAR1	On November 30, 2017, the ITP provided its compliance verification report concluding that Enbridge complied with Consent Decree requirements.

Table Intro-1: Implemented Requirements per P. 203(i)			
CD Section and Paragraph	**Short description**	**Reported in**	**ITP's recommended status**
Section G P. 81-83	Report on Feasibility of Installing External Leak Detection System at the Straits of Mackinac	SAR1-SAR2	ITP ISR2 dated November 5, 2018, "compliant."
Section G P. 101	Transient-State Sensitivity Analysis	SAR1	ITP ISR1 dated May 31, 2018, "compliant."
Section G P. 103	"24-hour" Alarm for Lakehead System	SAR1	ITP ISR1 dated May 31, 2018, "compliant."
Section G P. 105	Alarm Response Team (ART) addresses all Alarms	SAR1	ITP ISR1 dated May 31, 2018, "compliant."
Section G P. 106	Alarms triggers remote notification of each ART member	SAR1	ITP ISR1 dated May 31, 2018, "compliant."
Section G P. 107	Each Alarm results in an audible Alarm and Alarm window	SAR1	ITP ISR1 dated May 31, 2018, "compliant."
Section G P. 108	Alarm Clearance Procedures	SAR1	ITP ISR1 dated May 31, 2018, "compliant."
Section G P. 109.a-c	Unscheduled Shutdown Procedures in Response to an Alarm	SAR1	ITP ISR1 dated May 31, 2018, "compliant" and "compliant with additional information."
Section H P. 115.b(1) and 115.b(2)	Cass Lake and Des Plaines Agreed Exercises	SAR1-SAR3	Not applicable.
Section H P. 117.c	Straits of Mackinac Control Points (CPs)	SAR3	Not applicable.
Section H P. 119.e	Redacted Lakehead System Integrated Contingency Plans (ICPs) and Straits of Mackinac Tactical Response Plan to Area and Sub-Area Committees	SAR1	Not applicable

Table Intro-1: Implemented Requirements per P. 203(i)			
CD Section and Paragraph	**Short description**	**Reported in**	**ITP's recommended status**
Section H P. 119.g	Lakehead System map of prepositioned emergency response equipment and complete inventory to EPA, Area Committees, and Sub-Area Committees	SAR1	Not applicable
Section J P. 125	Retain ITP	SAR1	Not applicable
Section J P. 127.a-e	ITP candidates and eligibility terms	SAR1	Not applicable
Section J P. 129	EPA approves ITP	SAR1	Not applicable
Section J P. 131	Enbridge provides agreement to the ITP	SAR1	Not applicable
Section J P. 133.b	Enbridge provides response to ITP's Verification Report	SAR4	The ITP responded to the Enbridge submittal on January 22, 2019, and stated that the results of the ITP's Verification Report would not be revised.

Section A

There are no tables associated with Section A.

Section B

Table B-1: Permits/Approvals Required for Line 3 Replacement Project (U.S.)			
Unit of Government	**Type of Application**	**Reason Required**	**Permit Status**
U.S. Army Corps of Engineers ("USACE") – St. Paul District	Section 404/10 Individual Permit	Authorizes discharge of dredged and fill material into waters of the United States, including wetlands, and crossing of navigable waters of the United States; USACE has engaged Tribes through its regulatory process	MN: Application Submitted WI: Received
USACE – Omaha District	Section 404/10 Nationwide Permit	Authorizes discharge of dredged and fill material into waters of the United States, including wetlands, and crossing of navigable waters of the United States	Application Submitted
USACE – St. Paul District	Section 408 Authorization	Authorizes crossing of USACE civil works projects	Authorization Request Submitted
State Historic Preservation Office ("SHPO")	National Historic Preservation Act ("NHPA") Section 106 Clearance	Ensures adequate consideration of impacts to significant cultural resources but especially National Register of Historic Places ("NRHP")-eligible within the lead federal agency Area of Potential Effect ("APE"). SHPOs and Tribal Historic Preservation Offices are engaged through the USACE Section 404/10 process	MN: Consultation Ongoing ND: Consultation Complete WI: Consultation Complete
U.S. Fish & Wildlife Service ("USFWS")	Section 7 Endangered Species Act ("ESA") Consultation (federal threatened or endangered species)	Establishes conservation measures and authorizes, as needed, take of ESA-listed species; the USFWS is engaged through the USACE Section 10/404 process	MN: Consultations Complete ND: Consultation Complete WI: Consultation Complete
	Bald Eagle Nest Disturbance Permit	Allows for disturbance of a known bald eagle nest in proximity to construction activities	ND: Application Submitted MN: Permits Received

Table B-1: Permits/Approvals Required for Line 3 Replacement Project (U.S.)			
Unit of Government	**Type of Application**	**Reason Required**	**Permit Status**
Bureau of Indian Affairs ("BIA")	Grant of Right-of-Way	Enbridge applied for easement approval to cross the Fond du Lac Reservation	Application Submitted[1]
Fond du Lac Band of Lake Superior Chippewa ("FdL")	Section 401 Water Quality Certification ("WQC")	Section 401 WQC required to issue the USACE Section 404/10 Permit	Received
	Standard Wetland Activity Permit	Authorizes impacts to wetlands and waterbodies within the external boundaries of the Reservation	Received
	Land Use Permit	Authorizes permitted uses in zoning districts within the Reservation	Application being prepared for submittal
Minnesota Public Utilities Commission ("MPUC")	Certificate of Need	Determines need for the pipeline, including questions of size, type and timing	Previously issued, but ineffective pending completion of remand process to update EIS to include spill analysis required by Minnesota Court of Appeals' June 3, 2019 decision. Certificate of Need may be reinstated following revised EIS adequacy determination.
	Route Permit	Authorizes construction of the pipeline along a specific route, subject to certain conditions	Previously issued, but ineffective pending completion of remand process to update EIS to include spill analysis required by Minnesota Court of Appeals' June 3, 2019 decision. Route Permit may be reinstated following revised EIS adequacy determination and reinstatement of Certificate of Need.
Minnesota Department of Natural Resources ("MDNR")	License to Cross Public Waters	50-year license that allows for crossing of public waters with proposed utility	Application Submitted
	Work in Public Waters Permit	Authorizes in-water activities in public waters located on private lands	Applications Submitted

Table B-1: Permits/Approvals Required for Line 3 Replacement Project (U.S.)			
Unit of Government	**Type of Application**	**Reason Required**	**Permit Status**
	License to Cross Public Lands	50-year license that allows for crossing of public lands with proposed utility	Application Submitted
	Access Roads Leases	Authorizes use of MDNR-managed access roads during construction and/or operation	Applications Submitted
	Endangered Species Permit	Outlines plans for avoidance, minimization, and mitigation of take of state-listed flora species and authorizes take of individuals	Application Submitted
	Gully 30 Calcareous Fen Management Plan (“FMP”) Authorization	Outlines the site-specific construction, restoration, and monitoring requirements for this wetland crossing	Plan Submitted
	Individual Water Appropriation Permit for Construction Dewatering	Authorizes withdrawal of groundwater associated with dewatering of trench and excavations	Application Submitted
	Individual Water Appropriation Permit for HDD/Hydrostatic Testing	Authorizes withdrawal and use of water from surface sources to support horizontal directional drills (“HDDs”), hydrostatic testing, and dust suppression	Application Submitted
	Individual Water Appropriation Permit for Dust Suppression	Authorizes withdrawal and use of water from sources to support fugitive dust control	Application Submitted
	Individual Water Appropriation Permit for Construction Dewatering at Gully 30 Calcareous Fen	Authorizes withdrawal of groundwater associated with dewatering of excavations at the Gully 30 Calcareous Fen in accordance with the FMP	Application Submitted
Minnesota Pollution Control Agency (“MPCA”)	Section 401 WQC and Antidegradation Assessment	Section 401 WQC required to issue the USACE Section 404/10 Permit	Application Submitted

Table B-1: Permits/Approvals Required for Line 3 Replacement Project (U.S.)			
Unit of Government	**Type of Application**	**Reason Required**	**Permit Status**
	Clearbrook Terminal Air Quality Permit – Capped Emissions Permit	Authorizes construction and operation at the modified Clearbrook Terminal	Application Submitted
	National Pollutant Discharge Elimination System ("NPDES") Industrial Hydrostatic Discharge Permit and Antidegradation Analysis	Authorizes discharge of water from hydrostatic testing activities	Application Submitted
	NPDES Construction Stormwater General Permit	Authorizes ground disturbance with approved protection measures to manage soil erosion and stormwater discharge on construction site; and removal of water that may accumulate in pipeline trench	To Be Filed 30 days prior to construction start
Minnesota Department of Agriculture ("MDA")	Agricultural Protection Plan ("APP")	Establishes measures for agricultural protection	Approved by MDA
Minnesota Department of Transportation ("MnDOT")	Road Crossing Permits	Authorizes crossings of state jurisdictional roadways	Received
	Temporary access/entrance	Authorizes access to private lands during construction from state land	Received
Red Lake, Two Rivers, and Middle-Snake Watershed Districts	Watershed District Permits	Authorizes crossing of legal drains and ditches within watershed	Received
Mississippi Headwaters Board	Compatibility Evaluation	Submittal ensures project crossings align with Minnesota Statutes 116C.57 subd.2c	Consultation Ongoing

Table B-1: Permits/Approvals Required for Line 3 Replacement Project (U.S.)			
Unit of Government	**Type of Application**	**Reason Required**	**Permit Status**
Minnesota Department of Drinking Water Supply Management Areas ("DWSMAs")	Notification of crossing of DWSMAs	To ensure appropriate protective measures are implemented	Consultation Ongoing
North Dakota State Water Commission ("NDSWC")	Sovereign Lands Permit	Authorizes crossing of state Sovereign Lands and navigable waters	Received
	Temporary Water Permit / Water Withdrawal Permit	Coverage under a temporary water permit authorizes water use for HDDs, hydrostatic testing, and dust suppression	Received
North Dakota Department of Health ("NDDH")	Section 401 WQC	Section 401 WQC required to issue the USACE Section 404/10 Permit	Received
	Construction Stormwater General Permit	Coverage under General Permit NDR10-0000 authorizes ground disturbance with approved protection measures to manage soil erosion and stormwater discharge on construction site	Received
	Temporary Dewatering / Hydrostatic Discharge Permit	Coverage under General Permit NDG-0700000 authorizes for temporary dewatering and hydrostatic test discharge activities	Received
Pembina County	Pembina County Floodplain Permit	Authorizes crossing of Pembina County floodplains	Received
North Dakota Game and Fish ("NDGF")	Duncklee Wildlife Management Area ("WMA") Consultation	Consult with NDGF to identify special seeding or restoration measures on WMA	Consultations Ongoing
Wisconsin Department of Natural Resources ("WDNR")	Chapter 30 Wetland Individual Permit / NR 103 Wetland Permit / WQC	Authorizes impacts to wetlands and waterbodies; Section 401 WQC required to issue the USACE Section 404/10 Permit	Received

Table B-1: Permits/Approvals Required for Line 3 Replacement Project (U.S.)			
Unit of Government	**Type of Application**	**Reason Required**	**Permit Status**
	Protected Species Consultation and Incidental Take Permit	Outlines plans for avoidance, minimization, and mitigation of take of state-listed flora and fauna species and authorizes take of individual flora species	Received
	Superior Terminal Air Permit	Authorizes construction and operation at the modified Superior Terminal	Received
Wisconsin Coastal Management Program ("WCMP")	Consistency Review	Authorizes activities within the Coastal Management Zone	Received
City of Superior	Land Disturbing Permit – Pipeline and Superior Terminal	Authorizes ground disturbance with approved protection measures to manage soil erosion and stormwater discharge on construction site	Received
	Post-Construction Stormwater Management – Pipeline	To establish long-term, post construction runoff management requirements	Received

TABLE NOTE:

[1] This Grant of a Right-of-Way certificate would extend and modify an existing easement for Enbridge Energy pipeline numbers 1, 2, 3, 4, and 67, and Southern Lights Line 13, as well as the repair of Line 4 within the exterior boundaries of the Fond du Lac Reservation in Carlton and St. Louis Counties, Minnesota. Enbridge will submit cultural resources survey data, valuation appraisals, and allotment easement consents to BIA in support of the application.

Table B-2: Line 3 Construction Milestone Schedule		
Line 3 Milestone	**Status**	**Notes**
Mainline Design Reports	Completed before Q3, 2015	
Facilities Design	Completed Q1 2017	Design was updated to account for route modifications, changes to external codes and regulations, etc.
Procurement for major items – pipe, valves, transformers, etc.	Completed Q1 2018	Some items are still being manufactured, but all purchase orders have been issued.
Line 3 Construction – Segment 18 Wisconsin	Completed Q1 2018	
Segment 18 Tie-in	May 25, 2018	Commissioning of pipe segment completed May 25, 2018.
Superior Terminal Construction Start	Q3 2018	
Execution of Mainline and Facilities Construction Contracts	Q3-Q4 2019	
Line 3 Construction Start – North Dakota + Minnesota	Projected 2020	Pending permits. Note that a segment of Line 3 near the U.S.-Canada border in North Dakota has already been replaced.
Line 3 Construction Complete	TBD	Completion date dependent on timing of issuance of permits.

Table B-3: P. 22.d(3) Original US Line 3 Biocide Treatments		
Segment	**Type of Tool Run**	**Completion Date (MM/DD/YYYY)**
Gretna to Clearbrook	Biocide treatment	5/27/2019
Clearbrook to Superior	Biocide treatment	5/31/2019
Gretna to Clearbrook	Biocide treatment	8/12/2019
Clearbrook to Superior	Biocide treatment	8/19/2019
Gretna to Clearbrook	Biocide treatment	10/16/2019
Clearbrook to Superior	Biocide treatment	10/29/2019

TABLE NOTE:

All Original US Line 3 2019 Biocide Treatments meet the requirements set forth in Subparagraph 22.d.(3) of the Consent Decree

Section C

There are no tables associated with Section C.

Section D

Notes for Section D tables:

1. Dates below are in month/day/year format.
2. The tool Kaliper K360 is referred to also as DEF XYZ in the ILI reports.

Table D-1: P. 28.a-b ILI Runs Completed During this Reporting Period						
Tool Run ID	**Line**	**Segment**	**Tool**	**Pull Date**	**Threat Monitored**	**Required Completion Date**
4503	1	[redacted]	CD+	10/27/2019	Crack	2/4/2020
6396	3		MFL4	6/3/2019	Corrosion	8/12/2019
6395	3		DUO CD	7/1/2019[1]	Crack	4/8/2019
6396	3		MFL4	6/3/2019	Geometry	8/12/2019
6394	3		MFL4	7/12/2019	Corrosion	8/27/2019
6393	3		DUO CD	7/19/2019	Crack	7/30/2019
6394	3		MFL4	7/12/2019	Geometry	8/27/2019
4519	4		Kaliper K360	9/13/2019	Geometry	2/10/2020
4537	5		UCx	7/25/2019	Crack	9/25/2019
4674	6A		USWM+	9/26/2019	Corrosion	6/1/2020
5369	6A		Vectra	6/7/2019	Corrosion	7/8/2020
4544	6A		Vectra	8/16/2019	Corrosion	3/30/2020
4676	6A		DUO CD	8/23/2019	Crack	4/6/2020
6546	61		MFL-A	6/7/2019	Corrosion	6/26/2019
4612	61		UC	8/20/2019	Crack	11/14/2019
4613	64		UC	9/17/2019	Crack	12/9/2019

TABLE NOTE:

[1] Reported in SAR4, paragraph 144. The run was completed during this reporting period.

Table D-2: P. 28.c Incomplete or Invalid ILIs and Rerun Dates								
Tool Run ID	**Line**	**Segment**	**Tool**	**Inspection Deadline**	**Pull Date**	**Date of DQA Notification**	**Rerun Tool Run ID**	**Rerun Date**
NA[1]								

TABLE NOTE:

[1]There were no Incomplete or Invalid ILIs that occurred during the reporting period for this SAR.

Table D-3: P. 29 12-Month Lakehead ILI Schedule (November 23, 2019 – November 22, 2020)[1]					
Run ID	**Line**	**Segment**	**Tool**	**Threat Monitored**	**Required Completion Date[2]**
4506	02[3]	[redacted]	NGCD	Crack	9/22/2020
4507	02[3]		NGCD	Crack	9/21/2020
6367	02[3]		NGCD	Crack	9/14/2020
6368	02[3]		NGCD	Crack	9/14/2020
6581	03		UCMp	Corrosion	6/2/2020
6581	03		UCMp	Crack	6/30/2020
6606	03		MFL4	Geometry	6/2/2020
6606	03		MFL4	Corrosion	6/2/2020
6605	03		MFL4	Geometry	7/11/2020
6605	03		MFL4	Corrosion	7/11/2020
6604	03		DUO CD	Crack	7/18/2020
6582	04		MFL DuDi	Corrosion	5/9/2022
6610	04		Kaliper K360	Geometry	4/24/2021
6453	04		MFL DuDi	Corrosion	3/15/2021
6452	04		Kaliper K360	Geometry	4/27/2022
6489	04		MFL DuDi	Corrosion	2/6/2023
6052	04		Kaliper K360	Geometry	2/3/2020
6487	04		MFL DuDi	Corrosion	4/9/2020
6486	04		DuDi UCM	Corrosion	2/27/2023
6486	04		DuDi UCM	Crack	8/27/2020
6485	04		Kaliper K360	Geometry	2/10/2020
6488	04		MFL DuDi	Corrosion	7/18/2022
6607	04		MFL DuDi	Corrosion	5/3/2021
6549	04		Kaliper K360	Geometry	3/22/2021
6551	04		MFL DuDi	Corrosion	3/29/2021
6550	04		Kaliper K360	Geometry	4/6/2021
6501	04		MFL DuDi	Corrosion	5/5/2021
6554	04		Kaliper K360	Geometry	4/5/2021
6539	04		Vectra	Corrosion	5/4/2020
6565	05		MFL4	Geometry	3/12/2020
6565	05		MFL4	Corrosion	3/12/2020
6563	05		UCc	Crack	3/5/2020
6577	05		GEMINI	Geometry	4/11/2022

Table D-3: P. 29 12-Month Lakehead ILI Schedule (November 23, 2019 – November 22, 2020)[1]					
Run ID	**Line**	**Segment**	**Tool**	**Threat Monitored**	**Required Completion Date[2]**
6577	05	[redacted]	GEMINI	Corrosion	4/11/2022
6593	05		CD+	Crack	4/20/2022
6579	05		GEMINI	Geometry	1/24/2022
6579	05		GEMINI	Corrosion	1/24/2022
6609	05		GEMINI	Geometry	1/24/2022
6609	05		GEMINI	Corrosion	3/13/2022
6562	05		MFL4	Geometry	3/13/2020
6562	05		MFL4	Corrosion	3/13/2020
6560	05		UCc	Crack	3/6/2020
6578	06A		GeoPig	Geometry	3/9/2022
6449	10		Eclipse	Crack	9/19/2020
6491	10		Eclipse	Crack	7/27/2020
6557	10		USWM	Corrosion	5/14/2021
6443	14		MFL4	Geometry	1/6/2021
6443	14		MFL4	Corrosion	1/27/2021
6547	14		UCx	Crack	7/26/2021
6498	14		MFL4	Geometry	1/15/2021
6498	14		MFL4	Corrosion	1/15/2021
6553	14		UCx	Crack	1/19/2021
6556	65		GEMINI	Geometry	5/3/2021
6556	65		GEMINI	Corrosion	5/3/2021
6555	65		CD+	Crack	4/6/2021
6504	67		GEMINI	Geometry	6/3/2020
6504	67		GEMINI	Corrosion	6/3/2020
6503	67		UC	Crack	7/24/2020
6416	78		UC	Crack	6/24/2020
6418	78		CD+	Crack	3/13/2020

TABLE NOTE:

[1] Line 62 is idle therefore ILIs do not need to be run on that line while it remains out of operation; there is no ILI scheduled for Line 62 for this 12-month period. (More detail is available in SAR2, which was submitted on July 18, 2018.)

[2] ILI tools will be scheduled/run prior to the Required Completion Date. The Required Completion Dates comply with all applicable laws and regulations in addition to the Consent Decree requirements and requirements found in the "Stipulation and Agreement Regarding Assessment and Payment of Stipulated Penalties Relating to Timeliness of Certain In-Line Inspection" filed with the Court on May 2, 2018.

[3] Line 2 crack ILI deadline is calculated based on the completion of the 2015 Hydrostatic Testing, as stipulated in the "Stipulation and Agreement Regarding Assessment and Payment of Stipulated Penalties Relating to Timeliness of Certain In-Line Inspection". NGCD Refers to the Next Generation Crack Tool.

Table D-4: P. 30 Changes to Previous 12-Month ILI Schedule (May 23, 2019 to May 22, 2020)							
Original Run ID	**Revised Run ID**	**Line**	**Segment Name**	**Tool**	**Threat Monitored**	**Required Completion Date**	**Schedule Revision Comments**
N/A	6581	03	[redacted]	UCMp	Corrosion	6/2/2020	Inspection added.
N/A	6581	03		UCMp	Crack	6/30/2020	Inspection added.
N/A	6606	03		MFL4	Geometry	6/2/2020	Inspection added.
N/A	6606	03		MFL4	Corrosion	6/2/2020	Inspection added.
N/A	6605	03		MFL4	Geometry	7/11/2020	Inspection added.
N/A	6605	03		MFL4	Corrosion	7/11/2020	Inspection added.
N/A	6604	03		DUO CD	Crack	7/18/2020	Inspection added.
N/A	6582	04		MFL DuDi	Corrosion	5/9/2022	Inspection added.
N/A	6610	04		Kaliper K360	Geometry	4/24/2021	Inspection added.
N/A	6607	04		MFL DuDi	Corrosion	5/3/2021	Inspection added.
6564	6565	05		MFL4	Geometry	3/12/2020	Was a single tool run, now combined with 6565 as a combo tool run
6565	6565	05		MFL4	Corrosion	3/12/2020	Tool Type was Vectra, change to MFL4 as combo run
N/A	6577	05		GEMINI	Geometry	4/11/2022	Inspection added.
N/A	6577	05		GEMINI	Corrosion	4/11/2022	Inspection added.
N/A	6593	05		CD+	Crack	4/20/2022	Inspection added.
N/A	6579	05		GEMINI	Geometry	1/24/2022	Inspection added.
N/A	6579	05		GEMINI	Corrosion	1/24/2022	Inspection added.
6558	6609	05		GEMINI	Geometry	1/24/2022	Tool type was Caliper, now combined with 6609 as combo run
N/A	6609	05		GEMINI	Corrosion	3/13/2022	Inspection added.
6561	6562	05		MFL4	Geometry	3/13/2020	Tool type was GeoPig, now combined with 6562 as combo run
6562	6562	05		MFL4	Corrosion	3/13/2020	Tool type was Vectra, changed to MFL4 as combo run
N/A	6578	06A		GeoPig	Geometry	3/9/2022	Inspection added.
6548	N/A	10		GEMINI	Geometry	6/4/2021	Run moved out to beyond May 22, 2020 for schedule accommodations

Table D-4: P. 30 Changes to Previous 12-Month ILI Schedule (May 23, 2019 to May 22, 2020)							
Original Run ID	**Revised Run ID**	**Line**	**Segment Name**	**Tool**	**Threat Monitored**	**Required Completion Date**	**Schedule Revision Comments**
6548	N/A	10	[redacted]	GEMINI	Corrosion	6/4/2021	Run moved out to beyond May 22, 2020 for schedule accommodations
N/A	6449	10		Eclipse	Crack	9/19/2020	Inspection added.
6552	N/A	10		MFL4	Geometry	5/17/2021	Run moved out to beyond May 22, 2020 for schedule accommodations
6552	N/A	10		MFL4	Corrosion	7/12/2021	Run moved out to beyond May 22, 2020 for schedule accommodations
N/A	6491	10		Eclipse	Crack	7/27/2020	Inspection added.
N/A	6503	67		UC	Crack	7/24/2020	Inspection added.

Table D-5: P. 31 Incomplete or Invalid ILIs and Rerun Dates								
Tool Run ID	**Line**	**Segment**	**Tool**	**Inspection Deadline**	**Pull Date**	**Date of DQA Notification**	**Rerun Tool Run ID**	**Rerun Date**
NA[1]								

TABLE NOTE:

[1] There were no Incomplete or Invalid ILIs that occurred during the reporting period for this SAR.

Table D-6: P. 31 ILIs with Minor Tool Performance Deficiencies[1]							
Tool Run ID	**Line**	**Segment**	**Tool**	**Inspection Deadline**	**Pull Date**	**ILI Tool Run Accepted?**	**Further Action Required?**
6394	3	[redacted]	MFL4 CAL	08/27/2019	07/12/2019	Yes	No
4804	06A		Duo CD	05/18/2019	03/23/2019	Yes	No
6546	61		MFL-A	06/26/2019	06/07/2019	Yes	No

TABLE NOTE:

[1] Table includes ILIs that occurred in SAR4, Enbridge accepted the tool runs and their ILI Initial Report receipts and subsequent Data Quality Review and ILI assessment occurred in SAR5.

Table D-7: P. 32.a-c Valid In-line Inspection Runs with Initial ILI Report Received							
Tool Run ID	**Line**	**Segment**	**Tool**	**Report Type**	**Report Due Date**	**Report Received Date**	**Report Received On Time?**
4502	01	[redacted]	GEMINI	Corrosion	8/16/2019	8/15/2019	True
4502	01		GEMINI	Geometry	7/17/2019	7/17/2019	True
6396	03		MFL4	Corrosion	9/2/2019	8/29/2019	True
6395	03		DUO CD	Crack	10/29/2019	10/29/2019	True
6396[1]	03		MFL4	Geometry	9/2/2019	8/29/2019	True
6394	03		MFL4	Corrosion	10/10/2019	10/10/2019	True
6393	03		DUO CD	Crack	11/15/2019	11/15/2019	True
6394[1]	03		MFL4	Geometry	10/10/2019	10/10/2019	True
4519	04		Kaliper K360	Geometry	11/12/2019	11/12/2019	True
6387	05		MFL3	Corrosion	6/11/2019	6/11/2019	True
4536	05		UCc	Crack	7/5/2019	7/4/2019	True
4537	05		UCx	Crack	11/22/2019	11/22/2019	True
6386	05		MFL3	Corrosion	6/12/2019	6/12/2019	True
4543	05		UCc	Crack	7/5/2019	7/4/2019	True
5369	06A		Vectra	Corrosion	9/5/2019	9/4/2019	True
4804	06A		DUO CD	Crack	7/22/2019	7/19/2019	True
4544	06A		Vectra	Corrosion	11/14/2019	11/13/2019	True
4805	06A		UMP	Corrosion	5/30/2019	5/29/2019	True
4555	10		USWM+	Corrosion	6/4/2019	6/3/2019	True
6546	61		MFL-A	Corrosion	9/5/2019	9/5/2019	True
4614	67		UC	Crack	9/6/2019	8/22/2019	True

TABLE NOTE:

[1] These geometry runs were part of a catch-up program for geometry features <2%OD. A modification is in progress which allows for these reports to be received 90 days after the ILI run due to the complexity and size of these reports.

Table D-8: P. 33.b ILIMRR Version 8.2 Table 3 Inside Diameter Priority Notification Criteria for Ovalities and Other Deformation Features				
NPS (inch)	**Actual OD (inch)**	**Actual OD (mm)**	**Min ID (inch)**	**Min ID (mm)**
6	6.625	168.28	5.2	131.2
8	8.625	219.08	7.1	179.3
10	10.75	273.05	9.1	230.3
12	12.75	323.85	11.0	279.4
16	16	406.4	14.3	362.0
18	18	457.2	15.8	400.1
20	20	508	17.9	454.7
22	22	558.8	19.7	500.6
24	24	609.6	21.5	546.1
26	26	660.4	23.5	596.9
30	30	762	27.1	687.8
34	34	863.6	31.1	789.9
36	36	914.4	33.0	837.0
42	42	1066.8	38.6	981.2
48	48	1219.2	44.4	1127.8

Table D-9: P. 33.c-d Priority Features											
Run ID	**Line**	**Segment**	**Technology**	**Girth Weld (GW)**	**Date Priority Notification Received**	**Date Priority Notification Reviewed**	**Date of Discovery/ Date Features Added to Dig List[2]**	**Pressure Restriction Required?**	**Date Pressure Restriction Imposed[2]**	**Repair/ Mitigation Deadline**	**Date of Repair/ Mitigation**
3827	3	[redacted]	DuoCD	146510	11/13/2018 [1]	11/16/2018	11/16/2018	No	NA	11/18/2019	7/15/2019
6393	3		DuoCD	163930	10/24/2019	10/28/2019	10/30/2019	Yes	11/1/2019	11/29/2019	11/1/2019
4519	4		Kaliper K360	21320	9/20/2019	9/20/2019	NA	No	NA	NA	NA

TABLE NOTE:

[1] The Priority Notifications were received in SAR3; the Priority Features were placed on Dig List in SAR3. The repair/mitigations were completed in the current reporting period of SAR5. This Priority Feature was reported in Paragraph 144 Line 3 GF-CR DuoCD GW 80670, GW 141580, GW 146510 and GW 149430 Priority Feature Review of SAR3.

[2] "NA" in this table indicates that the features were not applicable to be added to the dig list (i.e. previously repaired or mitigated, or not did not meet repair or mitigation criteria) or that a pressure restriction was not required

Table D-10: P. 34.a Preliminary Review of Initial ILI Reports[1]									
Tool Run ID	**Line**	**Segment**	**Tool**	**Report Received Date**	**Report Type**	**Date Preliminary Review Required**	**Date Preliminary Review Completed**	**Review Completed on Time?**	**Data Quality Concerns?**
4502	01	[redacted]	GEMINI	8/15/2019	Corrosion	9/16/2019	9/12/2019	Yes	No
4502	01		GEMINI	7/17/2019	Geometry	8/16/2019	8/6/2019	Yes	No
6396	03		MFL4	8/29/2019	Corrosion	9/30/2019	09/26/2019	Yes	Yes
6395	03		DUO CD	10/29/2019	Crack	11/29/2019	11/26/2019	Yes	No
6396	03		MFL4	8/29/2019	Geometry	9/30/2019	9/30/2019	Yes	Yes
6394	03		MFL4	10/10/2019	Corrosion	11/12/2019	11/12/2019	Yes	Yes
6393	03		DUO CD	11/15/2019	Crack	12/16/2019	FR	FR	FR
6394	03		MFL4	10/10/2019	Geometry	11/12/2019	11/12/2019	Yes	Yes
4519	04		Deformation	11/12/2019	Geometry	12/12/2019	FR	FR	FR
6387	05		MFL3	6/11/2019	Corrosion	7/11/2019	7/11/2019	Yes	No
4536	05		UCc	7/4/2019	Crack	8/5/2019	8/2/2019	Yes	No
4537	05		UCx	11/22/2019	Crack	12/23/2019	FR	FR	FR
6386	05		MFL3	6/12/2019	Corrosion	7/12/2019	7/11/2019	Yes	Yes
4543	05		UCc	7/4/2019	Crack	8/5/2019	8/2/2019	Yes	No
5369	06A		Vectra	9/4/2019	Corrosion	10/4/2019	10/4/2019	Yes	Yes
4804	06A		DUO CD	7/19/2019	Crack	8/19/2019	8/19/2019	Yes	Yes
4805	06A		UMP	5/29/2019	Corrosion	6/28/2019	6/28/2019	Yes	Yes
4544	06A		Vectra	11/13/2019	Corrosion	12/13/2019	FR	FR	FR
4555	10		USWM+	6/3/2019	Corrosion	7/3/2019	6/25/2019	Yes	No
6546	61		MFL-A	9/5/2019	Corrosion	10/7/2019	10/7/2019	Yes	Yes
4610	61		GEMINI	4/26/2019	Geometry	5/28/2019[2]	5/28/2019	Yes	Yes
4614	67		UC	8/22/2019	Crack	9/23/2019	9/6/2019	Yes	No

TABLE NOTE:

[1] "FR" indicates that this information is outside the reporting window of this SAR and will be included in a future SAR.

[2] Line 61 PE-FN GEMINI Date Preliminary Review Required was 5/26/2019, which was a Sunday. 5/27/2019 was a US federal holiday. Therefore, the due date was adjusted to 5/28/2019.

Table D-11: P. 34.c ILI Reports with Reporting and/or Data Quality Issues								
Tool Run ID	**Line**	**Segment**	**Tool**	**Report Type**	**Initial Report Received Date**	**Date Preliminary Review of Initial ILI Report Required**	**Date Preliminary Review of Initial ILI Report Completed**	**Data Quality Concerns Identified and Resolved**
6394	3	[redacted]	MFL4	Geometry	10/10/2019	11/12/2019	11/12/2019	Yes
6396	3		MFL4	Corrosion	8/29/2019	9/30/2019	10/7/2019	Yes
6396	3		MFL4	Geometry	8/29/2019	9/30/2019	9/30/2019	Yes
6386	5		MFL3	Corrosion	6/12/2019	7/12/2019	7/11/2019	Yes
6387	5		MFL3	Corrosion	6/11/2019	7/11/2019	7/11/2019	Yes
4804	6A		DuoCD	Crack	7/19/2019	8/19/2019	8/19/2019	Yes
4805	6A		UMP	Corrosion	5/29/2019	6/28/2019	6/28/2019	Yes
4610	61		GEMINI	Geometry	4/26/2019	5/28/2019	5/28/2019	Yes
6546	61		MFL-A	Corrosion	9/5/2019	10/7/2019	10/7/2019	Yes
4614	67		UC	Crack	8/22/2019	9/23/2019	9/6/2019	Yes

Table D-12: P. 34.d Data Quality Evaluation Timelines							
Tool Run ID	**Line**	**Segment**	**Tool**	**Pull Date**	**Report Type**	**Deadline to Complete All ILI Data Quality Evaluations**	**Quality Evaluations Completed Within 180 Days?**
4502	01	[redacted]	GEMINI	5/18/2019	Corrosion	11/14/2019	Yes
4502	01		GEMINI	5/18/2019	Geometry	11/14/2019	Yes
4503	01		CD+	10/27/2019	Crack	4/24/2020	FR
6395	03		DUO CD	7/1/2019	Crack	12/28/2019	FR
6396	03		MFL4	6/3/2019	Corrosion	11/30/2019	FR
6396	03		MFL4	6/3/2019	Corrosion (Issue 2)	11/30/2019	FR
6396	03		MFL4	6/3/2019	Geometry	11/30/2019	FR
6393	03		DUO CD	7/19/2019	Crack	1/15/2020	FR
6394	03		MFL4	7/12/2019	Corrosion	1/8/2020	FR
6394	03		MFL4	7/12/2019	Geometry	1/8/2020	FR
4519	04		Kaliper K360	9/13/2019	Geometry	3/11/2020	FR
4536	05		UCc	3/6/2019	Crack	9/2/2019	Yes
6387	05		MFL3	3/13/2019	Corrosion	9/9/2019	Yes
4537	05		UCx	7/25/2019	Crack	1/21/2020	FR
4543	05		UCc	3/7/2019	Crack	9/3/2019	Yes
6386	05		MFL3	3/14/2019	Corrosion	9/10/2019	Yes
4674	06A		USWM+	9/26/2019	Corrosion	3/24/2020	FR
4804	06A		DUO CD	3/23/2019	Crack	9/19/2019	Yes
5369	06A		Vectra	6/7/2019	Corrosion	12/4/2019	FR
4544	06A		Vectra	8/16/2019	Corrosion	2/12/2020	FR
4676	06A		DUO CD	8/23/2019	Crack	2/19/2020	FR
4805	06A		UMP	3/1/2019	Corrosion	8/28/2019	Yes
4555	10		USWM+	3/6/2019	Corrosion	9/2/2019	Yes
4610	61		GEMINI	2/25/2019	Geometry (issue 2)	8/24/2019	Yes
4610	61		GEMINI	2/25/2019	Geometry	8/24/2019	Yes
4612	61		UCM	8/20/2019	Crack	2/16/2020	FR

Table D-12: P. 34.d Data Quality Evaluation Timelines							
Tool Run ID	**Line**	**Segment**	**Tool**	**Pull Date**	**Report Type**	**Deadline to Complete All ILI Data Quality Evaluations**	**Quality Evaluations Completed Within 180 Days?**
6546	61	[redacted]	MFL-A	6/7/2019	Corrosion	12/4/2019	FR
4613	64		UC	9/17/2019	Crack	3/15/2020	FR
4614	67		UC	5/9/2019	Crack	11/5/2019	Yes

TABLE NOTE:

"FR" indicates that this information is outside the reporting window of this SAR and will be included in a future SAR.

Table D-13: P. 34.e Discrepancies between Two Successive ILI Runs							
Tool Run ID	**Line**	**Segment**	**Tool**	**Report Type**	**Severity Discrepancy?**	**Density Discrepancy ?**	**Feature Type Discrepancy?**
4502	1	[redacted]	GEMINI	Geometry	No	Yes	No
6396	3		MFL4	Corrosion	No	No	No
6395	3		DUO CD	Crack	No	Yes	No
6394	3		MFL4	Corrosion	No	No	No
6393	3		DUO CD	Crack	FR	FR	FR
6394	3		MFL4	Geometry	No	Yes	No
4519	4		Kaliper K360	Geometry	No	No	No
6387	5		MFL3	Corrosion	No	No	No
4536	5		UCc	Crack	No	No	No
4537	5		UCx	Crack	FR	FR	FR
6386	5		MFL3	Corrosion	No	No	No
4543	5		UCc	Crack	No	No	No
4555	10		USWM+	Corrosion	No	Yes	No
4804	6A		DUO CD	Crack	No	No	No
5369	6A		Vectra	Corrosion	No	No	No
4805	6A		UMP	Corrosion	No	No	No
4544	6A		Vectra	Corrosion	FR	FR	FR
6546	61		MFL-A	Corrosion	No	Yes	No
4614	67		UC	Crack	No	Yes	No

Table D-14: P. 37 Deadlines for Placing Features Requiring Excavation on the Dig List												
Tool Run ID	**Line**	**Seg-ment**	**Tool**	**Threat Type**	**Pull Date**	**Burst Pressure Calculation Date**	**Remaining Life Calculation Date**	**Other Features Identified Date**	**Number of Features Identified**	**Date All Features Added to Dig List**	**Within 180 Days of Tool Pull Date?**	**Within 5 Days of Calculations?**
6396	L0003	[redacted]	MFL4MFL	Corrosion	6/3/2019	10/7/2019	10/7/2019	10/7/2019	10	10/9/2019	Yes	Yes
6396	L0003		MFL4CAL	Interacting	6/3/2019	N/A	N/A	9/30/2019	1	9/30/2019	Yes	Yes
3711	L0003		UCMPUTWM	Corrosion	11/14/2017	8/29/2019	8/28/2019	8/28/2019	2	8/29/2019	No[1]	Yes
6394	L0003		MFL4MFL	Corrosion	7/12/2019	11/12/2019	11/12/2019	11/12/2019	4	11/12/2019	Yes	Yes
4443	L0006 A		UMP	Corrosion	12/2/2017	10/23/2019	10/23/2019	10/23/2019	4	10/24/2019	No[1]	Yes
4804	L0006 A		DUOCD	Crack	3/23/2019	8/19/2019	8/19/2019	8/19/2019	8	8/20/2019	Yes	Yes
5369	L0006 A		VECTRA	Corrosion	6/7/2019	10/4/2019	10/4/2019	10/4/2019	3	10/8/2019	Yes	Yes
4805	L0006 A		UMP	Corrosion	3/1/2019	6/28/2019	6/28/2019	6/28/2019	8	7/3/2019	Yes	Yes
4610	L0061		GEMINICAL	Geometry	2/25/2019	N/A	N/A	8/13/2019	10	8/13/2019	Yes	Yes
6546	L0061		MFL-A	Corrosion	6/7/2019	10/7/2019	10/7/2019	10/7/2019	3	10/7/2019	Yes	Yes

TABLE NOTE:

[1]The details of these FREs are reported in Paragraph 144 [Section D] Alternative Wall Thickness Used for RPR Calculations of this SAR Report

Table D-15: P. 39.a-b FREs Repaired and Planned for Repair										
Dig ID	**Line**	**Segment**	**Girth Weld**	**Tool Run ID**	**Date of Repair / Mitigation**	**Crack Features**	**Corrosion Features**	**Axial Grooving Features**	**Interacting Features**	**Geometry Features**
24862	L0001	[redacted]	121630	4045	FR		1			
25340	L0001		12010	4405	FR	1				
25341	L0001		32060	4405	6/20/2019	1				
25342	L0001		41650	4405	7/8/2019	1				
25343	L0001		98280	4405	FR	1				
25344	L0001		115710	4405	6/20/2019	1				
25345	L0001		119180	4405	9/9/2019	1				
25346	L0001		122610	4405	FR	1				
25347	L0001		126590	4405	FR	1				
25348	L0001		128650	4405	FR	1				
25349	L0001		131300	4405	FR	1				
25350	L0001		134870	4405	7/11/2019	1				
25351	L0001		151600	4405	8/2/2019	1				
25352	L0001		172170	4405	FR	1				
25353	L0001		176630	4405	FR	1				
25354	L0001		187180	4405	9/4/2019	1				
25355	L0001		194840	4405	FR	1				
25359	L0001		249230	4405	7/28/2019	1				
25360	L0001		251130	4405	8/8/2019	1				
25361	L0001		253170	4405	8/12/2019	1				
25362	L0001		256500	4405	6/22/2019	1				
24805[1]	L0003		58670[1]	3829	FR		1			
24816	L0003		225550	3829	5/31/2019		1			
24829	L0003		4050	3830	7/16/2019			1		
24830	L0003		14280	3830	8/16/2019			1		
24841	L0003		160440	3830	9/18/2019			2		
24849	L0003		239490	3830	7/20/2019		1			

Table D-15: P. 39.a-b FREs Repaired and Planned for Repair										
Dig ID	**Line**	**Segment**	**Girth Weld**	**Tool Run ID**	**Date of Repair / Mitigation**	**Crack Features**	**Corrosion Features**	**Axial Grooving Features**	**Interacting Features**	**Geometry Features**
26586	L0003	[redacted]	125700	6396	10/2/2019				1	
26636	L0003		56530	6396	FR		1			
26637	L0003		56850	6396	FR		1			
26638	L0003		57690	6396	FR		2			
26639	L0003		58620	6396	FR		1			
26640	L0003		59010	6396	FR		1			
26641	L0003		59670	6396	FR		1			
26642	L0003		60300	6396	FR		1			
26643	L0003		136940	6396	11/19/2019		1			
26644	L0003		154460	6396	FR		1			
25084	L0003		150130	3827	7/17/2019	1				
25085	L0003		150860	3827	7/23/2019	1				
25086	L0003		152890	3827	9/25/2019	1				
25087	L0003		153720	3827	9/11/2019	1				
25088	L0003		153730	3827	9/17/2019	1				
25089	L0003		154120	3827	9/11/2019	1				
26721	L0003		75050	6394	FR		1			
26722	L0003		129340	6394	FR		1			
26723	L0003		129880	6394	FR		1			
26724	L0003		133000	6394	FR		1			
26740	L0003		86580	6394	11/19/2019				1	
26464	L0003		148980	3711	10/10/2019		1			
26465	L0003		183120	3711	FR		1			
26696	L0005		97480	2183	11/5/2019				1	
23941	L0006A		256490[2]	4334	FR		1			
24098	L0006A		226360[3]	4334	FR		1			
26429	L0006A		40730	4804	9/14/2019	1				

Table D-15: P. 39.a-b FREs Repaired and Planned for Repair										
Dig ID	**Line**	**Segment**	**Girth Weld**	**Tool Run ID**	**Date of Repair / Mitigation**	**Crack Features**	**Corrosion Features**	**Axial Grooving Features**	**Interacting Features**	**Geometry Features**
26433	L0006A	[redacted]	122260	4804	FR	1				
26434	L0006A		203270	4804	FR	1				
26435	L0006A		210840	4804	FR	1				
26436	L0006A		275420	4804	11/18/2019	1				
26438	L0006A		300610	4804	FR	1				
26439	L0006A		305690	4804	FR	1				
26441	L0006A		307340	4804	FR	1				
26632	L0006A		109850	5369	FR		1			
26633	L0006A		300190	5369	FR		1			
26634	L0006A		329710	5369	FR		1			
26675	L0006A		72080	4443	11/20/2019		1			
26676	L0006A		166750	4443	FR		1			
26677	L0006A		205920	4443	FR		1			
26678	L0006A		280780	4443	FR		1			
26238	L0006A		20550	4805	7/27/2019		1			
26239	L0006A		46330	4805	8/22/2019		1			
26240	L0006A		117220	4805	8/28/2019		1			
26241	L0006A		161650	4805	9/19/2019		1			
26242	L0006A		174680	4805	9/17/2019		1			
26243	L0006A		216270	4805	FR		1			
26244	L0006A		228030	4805	10/15/2019		1			
26245	L0006A		241240	4805	9/28/2019		1			
26410	L0061		77300	4610	10/4/2019					1
26411	L0061		114890	4610	9/26/2019					1
26412	L0061		169340	4610	10/9/2019					1
26413	L0061		169530	4610	10/12/2019					1
26414	L0061		178680	4610	10/31/2019					1

Table D-15: P. 39.a-b FREs Repaired and Planned for Repair										
Dig ID	**Line**	**Segment**	**Girth Weld**	**Tool Run ID**	**Date of Repair / Mitigation**	**Crack Features**	**Corrosion Features**	**Axial Grooving Features**	**Interacting Features**	**Geometry Features**
26415	L0061	[redacted]	179140	4610	10/25/2019					1
26416	L0061		181760	4610	10/23/2019					1
26417	L0061		270280	4610	10/16/2019					1
26418	L0061		281890	4610	10/16/2019					1
26419	L0061		333520	4610	10/10/2019					1
26627	L0061		73610	6546	FR		1			
26628	L0061		90360	6546	FR		1			
26629	L0061		250590	6546	FR		1			
Total: 91						**34**	**40**	**4**	**3**	**10**

TABLE NOTE:

[1]This dig is related to Alternate Plan 5.

[2]This dig is related to Alternate Plan 3

[3]This dig is related to Alternate Plan 4

Table D-16: P. 40 ILI Programs with all Features Requiring Excavation Repaired/Mitigated during the reporting period						
Tool Run ID	**Line**	**Segment**	**Tool**	**Report Type**	**Last NDE Report Approved Date**	**Analysis of Field Data/Statistical Analysis Date**
4045	L0001	[redacted]	UMP	UTWM	7/5/2019	7/9/2019
3830	L0003		AFD	CMFL	10/11/2019	10/16/2019
3826	L0003		AFD	CMFL	7/19/2019	7/25/2019
3827	L0003		DUOCD	PHASEDARRAY	10/17/2019	10/25/2019
4538	L0005		GeoPig	CALIPER	6/11/2019	7/3/2019
4334	L0006A		GEMINI	CALIPER	5/3/2019	5/8/2019[1]
3809	L0006A		DUOCD	PHASEDARRAY	4/23/2019	5/2/2019[1]

Table Note:

[1] Updated dates from SAR4

Table D-17: P. 40 Cancelled Digs						
Dig ID	**Line**	**Segment**	**Girth Weld**	**Tool Run ID**	**Technology**	**Reason for Dig Cancellation**
25398	L0003	[redacted]	17920	3712	UTWM	Dig 25398 has been cancelled because it was incorrectly identified as requiring additional excavations as the result of an applied depth bias to the original program. The depth bias applied was less than the one tool tolerance threshold required by the Consent Decree.
25399	L0003		261670	3712	UTWM	Dig 25399 has been cancelled because it was incorrectly identified as requiring additional excavations as the result of an applied depth bias to the original program. The depth bias applied was less than the one tool tolerance threshold required by the Consent Decree.
25403	L0003		82310	3826	CMFL	Dig 25403 has been cancelled because it was incorrectly identified as requiring additional excavations as the result of an applied depth bias to the original program. The depth bias applied was less than the one tool tolerance threshold required by the Consent Decree.
25404	L0003		117850	3826	CMFL	Dig 25404 has been cancelled because it was incorrectly identified as requiring additional excavations as the result of an applied depth bias to the original program. The depth bias applied was less than the one tool tolerance threshold required by the Consent Decree.
25407	L0003		147370	3826	CMFL	Dig 25407 has been cancelled because it was incorrectly identified as requiring additional excavations as the result of an applied depth bias to the original program. The depth bias applied was less than the one tool tolerance threshold required by the Consent Decree.
25408	L0003		148990	3826	CMFL	Dig 25408 has been cancelled because it was incorrectly identified as requiring additional excavations as the result of an applied depth bias to the original program. The depth bias applied was less than the one tool tolerance threshold required by the Consent Decree.
25409	L0003		152960	3826	CMFL	Dig 25409 has been cancelled because it was incorrectly identified as requiring additional excavations as the result of an applied depth bias to the original program.

Table D-17: P. 40 Cancelled Digs						
Dig ID	**Line**	**Segment**	**Girth Weld**	**Tool Run ID**	**Technology**	**Reason for Dig Cancellation**
		[redacted]				The depth bias applied was less than the one tool tolerance threshold required by the Consent Decree.
25410	L0003		168700	3826	CMFL	Dig 25410 has been cancelled because it was incorrectly identified as requiring additional excavations as the result of an applied depth bias to the original program. The depth bias applied was less than the one tool tolerance threshold required by the Consent Decree.
25411	L0003		183130	3826	CMFL	Dig 25411 has been cancelled because it was incorrectly identified as requiring additional excavations as the result of an applied depth bias to the original program. The depth bias applied was less than the one tool tolerance threshold required by the Consent Decree.
25412	L0003		184410	3826	CMFL	Dig 25412 has been cancelled because it was incorrectly identified as requiring additional excavations as the result of an applied depth bias to the original program. The depth bias applied was less than the one tool tolerance threshold required by the Consent Decree.
25413	L0003		185730	3826	CMFL	Dig 25413 has been cancelled because it was incorrectly identified as requiring additional excavations as the result of an applied depth bias to the original program. The depth bias applied was less than the one tool tolerance threshold required by the Consent Decree.
25684	L0003		135170	3826	CMFL	Dig 25684 has been cancelled because it was incorrectly identified as requiring additional excavations as the result of an applied depth bias to the original program. The depth bias applied was less than the one tool tolerance threshold required by the Consent Decree.
25685	L0003		191960	3826	CMFL	Dig 25685 has been cancelled because it was incorrectly identified as requiring additional excavations as the result of an applied depth bias to the original program. The depth bias applied was less than the one tool tolerance threshold required by the Consent Decree.

Table D-17: P. 40 Cancelled Digs						
Dig ID	**Line**	**Segment**	**Girth Weld**	**Tool Run ID**	**Technology**	**Reason for Dig Cancellation**
25681	L0004	[redacted]	34670	2351	UTWM	Dig 25681 has been cancelled because it was incorrectly identified as requiring additional excavations as the result of an applied depth bias to the original program. The depth bias applied was less than the one tool tolerance threshold required by the Consent Decree.
25682	L0004		38210	2351	UTWM	Dig 25682 has been cancelled because it was incorrectly identified as requiring additional excavations as the result of an applied depth bias to the original program. The depth bias applied was less than the one tool tolerance threshold required by the Consent Decree.
25683	L0004		38270	2351	UTWM	Dig 25683 has been cancelled because it was incorrectly identified as requiring additional excavations as the result of an applied depth bias to the original program. The depth bias applied was less than the one tool tolerance threshold required by the Consent Decree.
26439	L0006A		305690	4804	PHASEDARRAY	Dig 26439 has been cancelled because it was identified that the feature was previously repaired with a sleeve.

Table D-18: P. 44.a-b Initial Predicted Burst Pressure and Initial Remaining Life Calculations											
Tool Run ID	**Line**	**Segment**	**Tool**	**Report Type**	**Pull Date**	**Date Preliminary Review Completed**	**Data Quality Concerns ?**	**Calculation Deadline (1)**	**Calculation Deadline (2)**	**Burst Pressure Calculation Date**	**Remaining Life Calculation Date**
4502	01	[redacted]	GEMINI	Corrosion	5/18/2019	9/12/2019	No	11/7/2019	11/9/2019	9/12/2019	9/12/2019
4405	01		UC	Crack	9/18/2018	2/14/2019	No	4/11/2019	3/12/2019	2/14/2019	7/18/2019[1]
6396	03		MFL4	Corrosion	6/3/2019	10/7/2019	Yes	11/23/2019	11/25/2019	10/7/2019	10/7/2019
6394	03		MFL4	Corrosion	7/12/2019	11/12/2019	No	1/4/2020	1/3/2020	11/12/2019	11/12/2019
4536	05		UCc	Crack	3/6/2019	8/2/2019	No	9/27/2019	8/28/2019	8/2/2019	8/2/2019
6387	05		MFL3	Corrosion	3/13/2019	7/10/2019	No	9/4/2019	9/4/2019	7/10/2019	7/10/2019
4543	05		UCc	Crack	3/7/2019	8/2/2019	No	9/27/2019	8/29/2019	8/2/2019	8/2/2019
6386	05		MFL3	Corrosion	3/14/2019	7/10/2019	No	9/4/2019	9/5/2019	7/10/2019	7/10/2019
4804	06A		DUO CD	Crack	3/23/2019	8/6/2019	Yes	10/1/2019	9/14/2019	8/14/2019	8/14/2019
5369	06A		Vectra	Corrosion	6/7/2019	10/4/2019	Yes	11/29/2019	11/29/2019	10/4/2019	10/4/2019
4805	06A		UMP	Corrosion	3/1/2019	6/6/2019	Yes	8/1/2019	8/23/2019	6/28/2019	6/28/2019
4555	10		USWM+	Corrosion	3/6/2019	6/25/2019	No	8/20/2019	8/28/2019	6/25/2019	6/25/2019
6546	61		MFL-A	Corrosion	6/7/2019	10/7/2019	Yes	11/30/2019	11/29/2019	10/7/2019	10/7/2019
4614	67		UC	Crack	5/9/2019	9/6/2019	No	11/1/2019	10/31/2019	9/9/2019	9/9/2019

TABLE NOTE:

[1]The details of the remaining life calculations for this program are reported in Paragraph 145 [Section D] Line 01 CR-PW UC GW 93520 Remaining Life Deadline – P. 44.b(1)

Table D-19: P. 46.a, c Identified Digs								
Dig ID	**Line**	**Segment**	**Girth Weld**	**Tool Run ID**	**Technology**	**Date of Discovery / Feature Added to Dig List**	**Repair / Mitigation Deadline**	**Date of Repair / Mitigation[1]**
24862	L0001	[redacted]	121630	4045	UTWM	12/17/2018	6/15/2019	6/7/2019
25340	L0001		12010	4405	UTCD	2/14/2019	2/14/2020	FR
25341	L0001		32060	4405	UTCD	2/14/2019	8/13/2019	6/20/2019
25342	L0001		41650	4405	UTCD	2/14/2019	2/14/2020	7/8/2019
25343	L0001		98280	4405	UTCD	2/14/2019	2/14/2020	FR
25344	L0001		115710	4405	UTCD	2/14/2019	8/13/2019	6/20/2019
25345	L0001		119180	4405	UTCD	2/14/2019	2/14/2020	9/9/2019
25346	L0001		122610	4405	UTCD	2/14/2019	2/14/2020	FR
25347	L0001		126590	4405	UTCD	2/14/2019	2/14/2020	FR
25348	L0001		128650	4405	UTCD	2/14/2019	2/14/2020	FR
25349	L0001		131300	4405	UTCD	2/14/2019	8/13/2019	6/7/2019
25350	L0001		134870	4405	UTCD	2/14/2019	8/13/2019	7/11/2019
25351	L0001		151600	4405	UTCD	2/14/2019	2/14/2020	8/2/2019
25352	L0001		172170	4405	UTCD	2/14/2019	2/14/2020	FR
25353	L0001		176630	4405	UTCD	2/14/2019	2/14/2020	FR
25354	L0001		187180	4405	UTCD	2/14/2019	2/14/2020	9/4/2019
25355	L0001		194840	4405	UTCD	2/14/2019	2/14/2020	FR
25359	L0001		249230	4405	UTCD	2/14/2019	8/13/2019	7/28/2019
25360	L0001		251130	4405	UTCD	2/14/2019	8/13/2019	8/8/2019
25361	L0001		253170	4405	UTCD	2/14/2019	8/13/2019	8/12/2019
25362	L0001		256500	4405	UTCD	2/14/2019	8/13/2019	6/22/2019
24805	L0003		58670	3829	MFL	12/10/2018	6/8/2019[2]	FR
24816	L0003		225550	3829	MFL	12/10/2018	6/8/2019	5/31/2019
24829	L0003		4050	3830	CMFL	12/17/2018	12/17/2019	7/16/2019
24830	L0003		14280	3830	CMFL	12/17/2018	12/17/2019	8/16/2019

Table D-19: P. 46.a, c Identified Digs								
Dig ID	**Line**	**Segment**	**Girth Weld**	**Tool Run ID**	**Technology**	**Date of Discovery / Feature Added to Dig List**	**Repair / Mitigation Deadline**	**Date of Repair / Mitigation[1]**
24841	L0003	[redacted]	160440	3830	CMFL	12/17/2018	12/17/2019	9/18/2019
24849	L0003		239490	3830	CMFL	12/17/2018	12/17/2019	7/20/2019
26586	L0003		125700	6396	CALIPER	9/30/2019	9/29/2020	10/2/2019
26636	L0003		56530	6396	MFL	10/9/2019	4/6/2020	FR
26637	L0003		56850	6396	MFL	10/9/2019	4/6/2020	FR
26638	L0003		57690	6396	MFL	10/9/2019	4/6/2020	FR
26639	L0003		58620	6396	MFL	10/9/2019	4/6/2020	FR
26640	L0003		59010	6396	MFL	10/9/2019	4/6/2020	FR
26641	L0003		59670	6396	MFL	10/9/2019	4/6/2020	FR
26642	L0003		60300	6396	MFL	10/9/2019	4/6/2020	FR
26643	L0003		136940	6396	MFL	10/9/2019	4/6/2020	11/19/2019
26644	L0003		154460	6396	MFL	10/9/2019	4/6/2020	FR
25084	L0003		150130	3827	PHASEDAR RAY	12/24/2018	12/24/2019	7/17/2019
25085	L0003		150860	3827	PHASEDAR RAY	12/24/2018	12/24/2019	7/23/2019
25086	L0003		152890	3827	PHASEDAR RAY	12/24/2018	12/24/2019	9/25/2019
25087	L0003		153720	3827	PHASEDAR RAY	12/24/2018	12/24/2019	9/11/2019
25088	L0003		153730	3827	PHASEDAR RAY	12/24/2018	12/24/2019	9/17/2019
25089	L0003		154120	3827	PHASEDAR RAY	12/24/2018	12/24/2019	9/11/2019
26721	L0003		75050	6394	MFL	11/12/2019	5/10/2020	FR
26722	L0003		129340	6394	MFL	11/12/2019	5/10/2020	FR
26723	L0003		129880	6394	MFL	11/12/2019	5/10/2020	FR
26724	L0003		133000	6394	MFL	11/12/2019	5/10/2020	FR

Table D-19: P. 46.a, c Identified Digs								
Dig ID	**Line**	**Segment**	**Girth Weld**	**Tool Run ID**	**Technology**	**Date of Discovery / Feature Added to Dig List**	**Repair / Mitigation Deadline**	**Date of Repair / Mitigation[1]**
26740	L0003		86580	6394	CALIPER	11/18/2019	11/11/2020	11/19/2019
26464	L0003		148980	UNKNOWN	UTWM	8/29/2019	2/25/2020	10/10/2019
26465	L0003		183120	UNKNOWN	UTWM	8/29/2019	2/25/2020	FR
26696	L0005		97480	2183	CALIPER	11/4/2019	11/3/2020	11/5/2019
23941	L0006A		256490	4334	MFL	5/11/2018	7/18/2020[3]	FR
24098	L0006A		226360	4334	MFL	7/6/2018	7/27/2020[4]	FR
26429	L0006A		40730	4804	PHASEDARRAY	8/20/2019	2/16/2020	9/14/2019
26433	L0006A		122260	4804	PHASEDARRAY	8/20/2019	2/16/2020	FR
26434	L0006A		203270	4804	PHASEDARRAY	8/20/2019	2/16/2020	FR
26435	L0006A		210840	4804	PHASEDARRAY	8/20/2019	2/16/2020	FR
26436	L0006A		275420	4804	PHASEDARRAY	8/20/2019	2/16/2020	11/18/2019
26438	L0006A		300610	4804	PHASEDARRAY	8/20/2019	2/16/2020	FR
26439	L0006A		305690	4804	PHASEDARRAY	8/20/2019	2/16/2020	N/A
26441	L0006A		307340	4804	PHASEDARRAY	8/20/2019	2/16/2020	FR
26632	L0006A		109850	5369	MFL	10/8/2019	4/5/2020	FR
26633	L0006A		300190	5369	MFL	10/8/2019	4/5/2020	FR
26634	L0006A		329710	5369	MFL	10/8/2019	4/5/2020	FR
26675	L0006A		72080	UNKNOWN	UTWM	10/24/2019	10/23/2020	11/20/2019

Table D-19: P. 46.a, c Identified Digs								
Dig ID	**Line**	**Segment**	**Girth Weld**	**Tool Run ID**	**Technology**	**Date of Discovery / Feature Added to Dig List**	**Repair / Mitigation Deadline**	**Date of Repair / Mitigation[1]**
26676	L0006A		166750	UNKNOWN	UTWM	10/24/2019	4/21/2020	FR
26677	L0006A		205920	UNKNOWN	UTWM	10/24/2019	4/21/2020	FR
26678	L0006A		280780	UNKNOWN	UTWM	10/24/2019	4/21/2020	FR
26238	L0006A		20550	4805	UTWM	7/3/2019	7/2/2020	7/27/2019
26239	L0006A		46330	4805	UTWM	7/3/2019	12/30/2019	8/22/2019
26240	L0006A		117220	4805	UTWM	7/3/2019	12/30/2019	8/28/2019
26241	L0006A		161650	4805	UTWM	7/3/2019	7/2/2020	9/19/2019
26242	L0006A		174680	4805	UTWM	7/3/2019	12/30/2019	9/17/2019
26243	L0006A		216270	4805	UTWM	7/3/2019	7/2/2020	FR
26244	L0006A		228030	4805	UTWM	7/3/2019	7/2/2020	10/15/2019
26245	L0006A		241240	4805	UTWM	7/3/2019	12/30/2019	9/28/2019
26410	L0061		77300	4610	CALIPER	8/13/2019	2/9/2020	10/4/2019
26411	L0061		114890	4610	CALIPER	8/13/2019	2/9/2020	9/26/2019
26412	L0061		169340	4610	CALIPER	8/13/2019	2/9/2020	10/9/2019
26413	L0061		169530	4610	CALIPER	8/13/2019	2/9/2020	10/12/2019
26414	L0061		178680	4610	CALIPER	8/13/2019	2/9/2020	10/31/2019
26415	L0061		179140	4610	CALIPER	8/13/2019	2/9/2020	10/25/2019
26416	L0061		181760	4610	CALIPER	8/13/2019	2/9/2020	10/23/2019
26417	L0061		270280	4610	CALIPER	8/13/2019	2/9/2020	10/16/2019
26418	L0061		281890	4610	CALIPER	8/13/2019	2/9/2020	10/16/2019
26419	L0061		333520	4610	CALIPER	8/13/2019	2/9/2020	10/10/2019
26627	L0061		73610	6546	MFL	10/7/2019	4/4/2020	FR
26628	L0061		90360	6546	MFL	10/7/2019	4/4/2020	FR

Table D-19: P. 46.a, c Identified Digs								
Dig ID	**Line**	**Segment**	**Girth Weld**	**Tool Run ID**	**Technology**	**Date of Discovery / Feature Added to Dig List**	**Repair / Mitigation Deadline**	**Date of Repair / Mitigation[1]**
26629	L0061	[redacted]	250590	6546	MFL	10/7/2019	4/4/2020	FR

TABLE NOTES:

[1] "FR" indicates that this information is outside the reporting window of this SAR and will be included in a future SAR.

[2] Repair / Mitigation Deadline will be modified from 6/8/2019 as part of AP5. The date is still to be determined.

[3] Repair / Mitigation Deadline has been modified from 11/7/2018 to 7/18/2020 as outlined in AP3

[4] Repair / Mitigation Deadline has been modified from 1/2/2019 to 7/27/2020 as outlined in AP4

Table D-20: P. 46.b. d PPRs								
PR ID	**Line**	**Segment**	**Girth Weld**	**Date of Discovery**	**Repair / Mitigation Deadline[1]**	**PPR Imposition Date**	**Repair / Mitigation Date**	**PPR Removal Date[2]**
29198	L0001	[redacted]	32060	2/14/2019	8/13/2019	2/15/2019	6/20/2019	11/13/2019
29199	L0001		98280	2/14/2019	2/14/2020	2/15/2019	FR	FR
29200	L0001		115710	2/14/2019	8/13/2019	2/15/2019	6/20/2019	11/13/2019
29201	L0001		131300	2/14/2019	8/13/2019	2/15/2019	6/7/2019	11/13/2019
29202	L0001		134870	2/14/2019	8/13/2019	2/15/2019	7/11/2019	11/13/2019
29203	L0001		207250	2/14/2019	8/13/2019	2/15/2019	3/11/2019	11/13/2019
29204	L0001		242340	2/14/2019	8/13/2019	2/15/2019	5/14/2019	11/13/2019
29205	L0001		249230	2/14/2019	8/13/2019	2/15/2019	7/28/2019	11/13/2019
29206	L0001		251130	2/14/2019	8/13/2019	2/15/2019	8/8/2019	11/13/2019
29207	L0001		253170	2/14/2019	8/13/2019	2/15/2019	8/12/2019	11/13/2019
29208	L0001		256500	2/14/2019	8/13/2019	2/15/2019	6/22/2019	11/13/2019
29209	L0001		259240	2/14/2019	8/13/2019	2/15/2019	3/13/2019	11/13/2019
29210	L0001		260360	2/14/2019	8/13/2019	2/15/2019	5/21/2019	11/13/2019
27100	L0003		239920	12/26/2017	6/24/2018	12/28/2017	1/25/2018	FR
30397	L0003		125700	9/30/2019	9/29/2020	Table Note 3	10/2/2019	10/2/2019
30436	L0003		163930	10/30/2019	11/29/2019	Table Note 3	11/1/2019	11/1/2019
30438	L0003		86580	11/18/2019	11/11/2020	Table Note 3	11/19/2019	11/20/2019
28124	L0004		39450	6/12/2018	6/12/2019	6/8/2018	9/5/2018	11/8/2019
28145	L0004		32780	7/31/2018	1/27/2019	8/2/2018	12/1/2018	11/8/2019
28144	L0004		37520	7/17/2018	1/13/2019	7/18/2018	10/29/2018	11/8/2019
27954	L0004		25700	3/22/2018	3/22/2019	3/23/2018	10/23/2018	11/8/2019
27955	L0004		48150	3/22/2018	3/22/2019	3/23/2018	6/19/2018	11/8/2019
27062	L0005		13220	12/18/2017	6/16/2018	12/19/2017	5/17/2018	FR
27064	L0005		26290	12/18/2017	12/18/2018	12/19/2017	8/22/2018	11/14/2019
27067	L0005		63420	12/18/2017	12/18/2018	12/19/2017	8/24/2018	11/14/2019
28067	L0005		12760	5/1/2018	10/28/2018	5/2/2018	8/10/2018	11/14/2019
27978	L0005		65420	4/10/2018	10/7/2018	4/11/2018	8/4/2018	11/14/2019

Table D-20: P. 46.b. d PPRs								
PR ID	**Line**	**Segment**	**Girth Weld**	**Date of Discovery**	**Repair / Mitigation Deadline[1]**	**PPR Imposition Date**	**Repair / Mitigation Date**	**PPR Removal Date[2]**
30437	L0005	[redacted]	97480	11/4/2019	11/3/2020	Table Note 3	11/5/2019	11/6/2019
27024	L0005		242570	10/27/2017	4/25/2018	10/30/2017	3/1/2018	FR
27098	L0005		116930	12/26/2017	6/24/2018	12/27/2017	6/22/2018	11/14/2019
27099	L0005		230050	12/26/2017	6/24/2018	12/27/2017	6/21/2018	11/14/2019
28133	L0006 A		226360	7/6/2018	7/27/2020	7/6/2018	FR[4]	FR
30350	L0006 A		40730	8/20/2019	2/16/2020	8/22/2019	9/14/2019	11/15/2019
30351	L0006 A		122260	8/20/2019	2/16/2020	8/22/2019	FR	FR
30352	L0006 A		203270	8/20/2019	2/16/2020	8/22/2019	FR	FR
30353	L0006 A		210840	8/20/2019	2/16/2020	8/22/2019	FR	FR
30354	L0006 A		275420	8/20/2019	2/16/2020	8/22/2019	11/18/2019	FR
30355	L0006 A		300610	8/20/2019	2/16/2020	8/22/2019	FR	FR
30356	L0006 A		305690	8/20/2019	2/16/2020	8/22/2019	N/A	N/A[5]
30358	L0006 A		307340	8/20/2019	2/16/2020	8/22/2019	FR	FR
30401	L0006 A		109850	10/8/2019	4/5/2020	10/10/2019	FR	FR
30432	L0006 A		72080	10/24/2019	10/23/2020	10/28/2019	11/20/2019	FR
30433	L0006 A		166750	10/24/2019	4/21/2020	10/28/2019	FR	FR
30434	L0006 A		205920	10/24/2019	4/21/2020	10/28/2019	FR	FR
30435	L0006 A		280780	10/24/2019	4/21/2020	10/28/2019	FR	FR
27828	L0006 A		24530	2/5/2018	2/5/2019	2/7/2018	9/29/2018	11/15/2019
27829	L0006 A		63000	2/5/2018	2/5/2019	2/7/2018	3/1/2018	11/15/2019

Table D-20: P. 46.b. d PPRs								
PR ID	**Line**	**Segment**	**Girth Weld**	**Date of Discovery**	**Repair / Mitigation Deadline[1]**	**PPR Imposition Date**	**Repair / Mitigation Date**	**PPR Removal Date[2]**
27830	L0006 A	[redacted]	117210	2/5/2018	2/5/2019	2/7/2018	1/19/2019	11/15/2019
27831	L0006 A		135390	2/5/2018	2/5/2019	2/7/2018	2/23/2018	11/15/2019
27832	L0006 A		142960	2/5/2018	8/4/2018	2/7/2018	7/23/2018	11/15/2019
27833	L0006 A		148400	2/5/2018	2/5/2019	2/7/2018	8/10/2018	11/15/2019
27834	L0006 A		216510	2/5/2018	2/5/2019	2/7/2018	8/25/2018	11/15/2019
27835	L0006 A		223520	2/5/2018	2/5/2019	2/7/2018	9/17/2018	11/15/2019
27836	L0006 A		226760	2/5/2018	2/5/2019	2/7/2018	6/29/2018	11/15/2019
27837	L0006 A		226790	2/5/2018	2/5/2019	2/7/2018	6/30/2018	11/15/2019
27838	L0006 A		230360	2/5/2018	2/5/2019	2/7/2018	8/21/2018	11/15/2019
27840	L0006 A		236100	2/5/2018	2/5/2019	2/7/2018	10/31/2018	11/15/2019
27841	L0006 A		271270	2/5/2018	2/5/2019	2/7/2018	7/30/2018	11/15/2019
27916	L0006 A		1810	3/9/2018	9/5/2018	3/12/2018	8/7/2018	11/15/2019
27917	L0006 A		7250	3/9/2018	9/5/2018	3/12/2018	6/15/2018	11/15/2019
27918	L0006 A		13370	3/9/2018	9/5/2018	3/12/2018	7/20/2018	11/15/2019
27919	L0006 A		14060	3/9/2018	9/5/2018	3/12/2018	6/12/2018	11/15/2019
27920	L0006 A		14750	3/9/2018	9/5/2018	3/12/2018	7/13/2018	11/15/2019
27921	L0006 A		32610	3/9/2018	9/5/2018	3/12/2018	6/23/2018	11/15/2019
27922	L0006 A		64390	3/9/2018	3/4/2019	3/12/2018	1/29/2019	11/15/2019
27923	L0006 A		64440	3/9/2018	3/4/2019	3/12/2018	2/4/2019	11/15/2019

Table D-20: P. 46.b. d PPRs								
PR ID	**Line**	**Segment**	**Girth Weld**	**Date of Discovery**	**Repair / Mitigation Deadline[1]**	**PPR Imposition Date**	**Repair / Mitigation Date**	**PPR Removal Date[2]**
27924	L0006 A	[redacted]	64650	3/9/2018	3/4/2019	3/12/2018	1/31/2019	11/15/2019
27925	L0006 A		65160	3/9/2018	3/4/2019	3/12/2018	1/24/2019	11/15/2019
27926	L0006 A		65300	3/9/2018	3/4/2019	3/12/2018	1/26/2019	11/15/2019
27927	L0006 A		65830	3/9/2018	3/4/2019	3/12/2018	1/22/2019	11/15/2019
27928	L0006 A		68870	3/9/2018	3/4/2019	3/12/2018	2/7/2019	11/15/2019
27929	L0006 A		91150	3/9/2018	9/5/2018	3/12/2018	6/22/2018	11/15/2019
27930	L0006 A		102240	3/9/2018	9/5/2018	3/12/2018	7/25/2018	11/15/2019
27931	L0006 A		104330	3/9/2018	9/5/2018	3/12/2018	7/18/2018	11/15/2019
27932	L0006 A		148440	3/9/2018	9/5/2018	3/12/2018	8/16/2018	11/15/2019
27933	L0006 A		154650	3/9/2018	9/5/2018	3/12/2018	8/23/2018	11/15/2019
27934	L0006 A		164110	3/9/2018	9/5/2018	3/12/2018	8/9/2018	11/15/2019
27935	L0006 A		167090	3/9/2018	9/5/2018	3/12/2018	6/19/2018	11/15/2019
27936	L0006 A		169660	3/9/2018	9/5/2018	3/12/2018	8/9/2018	11/15/2019
27937	L0006 A		170290	3/9/2018	9/5/2018	3/12/2018	8/4/2018	11/15/2019
27938	L0006 A		173380	3/9/2018	9/5/2018	3/12/2018	7/28/2018	11/15/2019
27939	L0006 A		173450	3/9/2018	9/5/2018	3/12/2018	7/30/2018	11/15/2019
27940	L0006 A		173540	3/9/2018	9/5/2018	3/12/2018	8/4/2018	11/15/2019
27941	L0006 A		173790	3/9/2018	9/5/2018	3/12/2018	8/14/2018	11/15/2019
27942	L0006 A		174300	3/9/2018	9/5/2018	3/12/2018	6/7/2018	11/15/2019

Table D-20: P. 46.b. d PPRs								
PR ID	**Line**	**Segment**	**Girth Weld**	**Date of Discovery**	**Repair / Mitigation Deadline[1]**	**PPR Imposition Date**	**Repair / Mitigation Date**	**PPR Removal Date[2]**
27943	L0006 A	[redacted]	193860	3/9/2018	9/5/2018	3/12/2018	7/19/2018	11/15/2019
27944	L0006 A		194100	3/9/2018	9/5/2018	3/12/2018	7/21/2018	11/15/2019
27945	L0006 A		216150	3/9/2018	9/5/2018	3/12/2018	8/29/2018	11/15/2019
27946	L0006 A		219110	3/9/2018	9/5/2018	3/12/2018	8/17/2018	11/15/2019
27947	L0006 A		219830	3/9/2018	9/5/2018	3/12/2018	8/16/2018	11/15/2019
27948	L0006 A		257870	3/9/2018	9/5/2018	3/12/2018	7/23/2018	11/15/2019
27949	L0006 A		262700	3/9/2018	9/5/2018	3/12/2018	8/27/2018	11/15/2019
27950	L0006 A		283440	3/9/2018	9/5/2018	3/12/2018	8/3/2018	11/15/2019
27951	L0006 A		295120	3/9/2018	9/5/2018	3/12/2018	8/4/2018	11/15/2019
27952	L0006 A		299650	3/9/2018	9/5/2018	3/12/2018	7/17/2018	11/15/2019
27953	L0006 A		322910	3/9/2018	9/5/2018	3/12/2018	8/18/2018	11/15/2019
30291	L0006 A		20550	7/3/2019	7/2/2020	7/4/2019	7/27/2019	11/15/2019
30292	L0006 A		46330	7/3/2019	12/30/2019	7/4/2019	8/22/2019	FR
30293	L0006 A		117220	7/3/2019	12/30/2019	7/4/2019	8/28/2019	FR
30294	L0006 A		161650	7/3/2019	7/2/2020	7/4/2019	9/19/2019	FR
30295	L0006 A		174680	7/3/2019	12/30/2019	7/4/2019	9/17/2019	FR
30296	L0006 A		216270	7/3/2019	7/2/2020	7/4/2019	FR	FR
30297	L0006 A		228030	7/3/2019	7/2/2020	7/4/2019	10/15/2019	FR
30298	L0006 A		241240	7/3/2019	12/30/2019	7/4/2019	9/28/2019	FR

Table D-20: P. 46.b. d PPRs								
PR ID	**Line**	**Segment**	**Girth Weld**	**Date of Discovery**	**Repair / Mitigation Deadline[1]**	**PPR Imposition Date**	**Repair / Mitigation Date**	**PPR Removal Date[2]**
30398	L0061	[redacted]	73610	10/7/2019	4/4/2020	10/9/2019	FR	FR
30399	L0061		90360	10/7/2019	4/4/2020	10/9/2019	FR	FR
30400	L0061		250590	10/7/2019	4/4/2020	10/9/2019	FR	FR

TABLE NOTES:

[1] Repair/Mitigation Deadline was specified in Tables 1 to 5 of the Consent Decree.

[2] PPR is removed after the Feature Requiring Pressure Restriction is repaired or mitigated. This PPR Removal Date can be before the Repair / Mitigation Date which is the repair and mitigation date of the entire dig package that may include other features not requiring pressure restriction. PPR is no longer required after the Feature Requiring Pressure Restriction is repaired.

[3] The PPR Removal Date is the same as the scheduled PPR Imposition Date as the feature was repaired prior to the scheduled imposition of the PPR.

[4] Repair / Mitigation Deadline has been modified from 1/2/2019 to 7/27/2020 as outlined in AP4

[5] Dig cancelled, see Table D-18-1

Table D-21: P. 46.e, 46.l Alternate Plans and Alternate Pressure Restrictions	
46.e. Alternate Plan or Alternate Interim Pressure Restrictions submitted from effective date to the end of this SAR reporting period:	5 of maximum 40
46.e. Cumulative Excavations of Joints	5 of maximum 200
46.e. Maximum number of contiguous joints for each Alternate Plans or Alternate Interim Pressure Restriction	1 of maximum 10

Table D-22: P. 46.g Alternate Plan #5 Details Line 3 CR-PW GW 58670	
Alternate Plan Line	3
Alternate Plan Tool Run	2018 GEMINI MFL
Alternate Plan Joint	58670
46.l. (iv) Date Engineering Assessment was Completed OR the original feature repair/mitigation deadline	original feature repair/mitigation deadline June 8, 2019
46.l.(vii) Alternate Plan Implementation Date	5/29/2019
46.l.(iv) Alternate Plan Reporting/Notification Date	05/29/2019
Notification was within 10 days of EA completion or 10 days before Original Feature Mitigation Deadline	Yes
Recommended Alternative(s) to Repair/Mitigate the FRE	The target corrosion FRE is located under the railway track/foundation within the [redacted], Minnesota. It was reported with depth of 57% in 2018 GEMINI MFL, but it was reported with depth of 50% in 2019 MFL4 MFL. Therefore, based on the most recent ILI data, the assessment results showed that this feature is not an FRE, and so it will be monitored in annual ILI inspections.
Number of Features Requiring Excavation covered by the Alternate Plan	1
46.c.(1) Extraordinary Scope or Complexity	Yes
46.c.(2) Replacement of Segment	Yes
46.c.(3) Alternate Plan submitted for 46.c.(1)(2)	Yes
46.d.(i) Significantly Impair Operability	No
46.d.(ii) Significant Adverse Effect on Pipeline Integrity	No

46.l(i) Alternate Plan Detailed Description:

This Alternate Plan (AP) is prepared as provided in Paragraph 46.c of the Consent Decree (CD). The Alternate Plan addresses issues relating to the excavation and mitigation of a Feature Requiring Excavation (FRE) as defined in Paragraph 36 of the Consent Decree.

The internal metal loss feature (295155-CL288374) on [redacted] Girth Weld (GW) 58670 was reported by the 2018 GEMINI MFL (Issue 1) in-line inspection (ILI) run and issued for excavation with a Date of Discovery (DoD) of December 10, 2018, and an original Excavation Deadline of June 8, 2019.

This feature is located underneath a railway track/foundation within the [redacted], Minnesota. It was reported with depth of 57% in 2018 GEMINI MFL, but it was reported with depth of 50% in 2019 MFL4 MFL. Therefore, based on the most recent ILI data, the assessment results showed that this feature is not an FRE. Engineering Assessment results shows that this feature will be safe until April 17, 2032. So, it will be monitored in annual ILI inspection. The quarterly cleaning and bio-treatment are scheduled on this line segment, which can significantly decrease the internal corrosion growth.

46.l.(iii) Basis for selection of the Alternate Plan and alternate timetables

Enbridge is proposing to eliminate this feature with the Line 3 Replacement Project (L3RP). The change of Engineering Assessment and mitigation plan has been communicated with ITP in August 2019.

46.l(iv) Detailed description of the analysis comparing the level of safety achieved by each such Alternate Plan with the level of safety that would be achieved through compliance with the requirements of Subsection VII.D.(V)

There is a low likelihood of the target Feature being a safety threat over the next 2 years. Based on the 2019 MFL results, the feature has a safety factor of 2.70 (MOP) and has no interacting or intersecting threats, such as cracks or dents. A low CGR was confirmed on this joint. This joint also has a low operating pressure with an MOP at 372 psi, the last 60-day high at 249 psi, and and the last 365-day high 253 psi. This feature does not pose a rupture threat, nor will it pose a risk of leak within the proposed timeframe for repair. It is monitored annually by running a high-resolution corrosion ILI tool. The scheduled quarterly cleaning and biocide injection can also decrease the internal corrosion growth rate. An internal corrosion monitoring coupon was installed at MP 950, about 1.5 miles upstream of this target feature, which indicates a low CGR, [redacted].

46.l.(vi) Description of activities undertaken by Enbridge during the reporting period to implement Alternate Plan

- This segment is monitored annually by running a high-resolution corrosion ILI tool and has quarterly cleaning and biocide injections. This segment of the pipeline will be replaced as part of the Line 3 Replacement Project (L3RP).

Table D-23: P. 46.l Previous Alternate Plan Status Update	
Alternate Plan #3	• The site survey was delayed due to weather and crew scheduling, and the site survey was completed on March 19, 2019. • 60% Design Package and Review was completed on April 4, 2019. • Additional soil boring was required due to engineering contractor's request, which was completed on May 24th, 2019. • Permit application submittals were completed on June 20, 2019. • 90% IFB design was completed on July 19, 2019. • HDD review with contractor was delayed aligning with 90% drawing release. HDD Review with Contractor was completed on July 23, 2019. • 34" Heavy wall pipe mill run completed on September 6, 2019 • Post RFP Evaluation completed on October 31, 2019Updated ILI of 2019 Vectra MFL and the most conservative CGR indicates that the FRE is safe until November 1, 2024, and no additional integrity actions are required prior to the planned remediation.
Alternate Plan #4	• Site Survey complete on March 15, 2019 • Permit application submittals were completed on July 30, 2019 • Bore holes were completed on August 16, 2019. • 34" Heavy wall pipe mill run completed on September 11, 2019IFB Drawings completed on October 21, 2019 • Updated ILI of 2019 Vectra MFL indicates that the FRE is safe until August 1, 2026 and no additional integrity actions are required prior to the planned remediation.

Table D-24: P. 47 Crack Features Requiring Excavation						
Dig ID	**Line**	**Segment**	**Girth Weld**	**Date Features Added to Dig List**	**Repair / Mitigation Deadline**	**Date of Repair / Mitigation**
25340	L0001	[redacted]	12010	2/14/2019	2/14/2020	FR
25341	L0001		32060	2/14/2019	8/13/2019	6/20/2019
25342	L0001		41650	2/14/2019	2/14/2020	7/8/2019
25343	L0001		98280	2/14/2019	2/14/2020	FR
25344	L0001		115710	2/14/2019	8/13/2019	6/20/2019
25345	L0001		119180	2/14/2019	2/14/2020	9/9/2019
25346	L0001		122610	2/14/2019	2/14/2020	FR
25347	L0001		126590	2/14/2019	2/14/2020	FR
25348	L0001		128650	2/14/2019	2/14/2020	FR
25349	L0001		131300	2/14/2019	8/13/2019	6/7/2019
25350	L0001		134870	2/14/2019	8/13/2019	7/11/2019
25351	L0001		151600	2/14/2019	2/14/2020	8/2/2019
25352	L0001		172170	2/14/2019	2/14/2020	FR
25353	L0001		176630	2/14/2019	2/14/2020	FR
25354	L0001		187180	2/14/2019	2/14/2020	9/4/2019
25355	L0001		194840	2/14/2019	2/14/2020	FR
25359	L0001		249230	2/14/2019	8/13/2019	7/28/2019
25360	L0001		251130	2/14/2019	8/13/2019	8/8/2019
25361	L0001		253170	2/14/2019	8/13/2019	8/12/2019
25362	L0001		256500	2/14/2019	8/13/2019	6/22/2019
25084	L0003		150130	12/24/2018	12/24/2019	7/17/2019
25085	L0003		150860	12/24/2018	12/24/2019	7/23/2019
25086	L0003		152890	12/24/2018	12/24/2019	9/25/2019
25087	L0003		153720	12/24/2018	12/24/2019	9/11/2019
25088	L0003		153730	12/24/2018	12/24/2019	9/17/2019
25089	L0003		154120	12/24/2018	12/24/2019	9/11/2019
26429	L0006A		40730	8/20/2019	2/16/2020	9/14/2019
26433	L0006A		122260	8/20/2019	2/16/2020	FR
26434	L0006A		203270	8/20/2019	2/16/2020	FR
26435	L0006A		210840	8/20/2019	2/16/2020	FR
26436	L0006A		275420	8/20/2019	2/16/2020	11/18/2019
26438	L0006A		300610	8/20/2019	2/16/2020	FR

Table D-24: P. 47 Crack Features Requiring Excavation						
Dig ID	**Line**	**Segment**	**Girth Weld**	**Date Features Added to Dig List**	**Repair / Mitigation Deadline**	**Date of Repair / Mitigation**
26439	L0006A	[redacted]	305690	8/20/2019	2/16/2020	N/A (Dig was cancelled. Refer to Table Cancelled Digs)
26441	L0006A		307340	8/20/2019	2/16/2020	FR

Table D-25: P. 47 Crack Feature Pressure Restrictions									
PR ID	**Line**	**Segment**	**Girth Weld**	**Date of Discovery**	**Repair / Mitigation Deadline (specified in Tables 1 to 5 of the Consent Decree)**	**PPR Set (psi)**	**PPR Imposition Date**	**Repair / Mitigation Date**	**PPR Removal Date[1]**
29198	L0001	[redacted]	32060	2/14/2019	8/13/2019	755	2/15/2019	6/20/2019	11/13/2019
29199	L0001		98280	2/14/2019	2/14/2020	781	2/15/2019	FR	FR
29200	L0001		115710	2/14/2019	8/13/2019	835	2/15/2019	6/20/2019	11/13/2019
29201	L0001		131300	2/14/2019	8/13/2019	806	2/15/2019	6/7/2019	11/13/2019
29202	L0001		134870	2/14/2019	8/13/2019	1181	2/15/2019	7/11/2019	11/13/2019
29203	L0001		207250	2/14/2019	8/13/2019	711	2/15/2019	3/11/2019	11/13/2019
29204	L0001		242340	2/14/2019	8/13/2019	621	2/15/2019	5/14/2019	11/13/2019
29205	L0001		249230	2/14/2019	8/13/2019	807	2/15/2019	7/28/2019	11/13/2019
29206	L0001		251130	2/14/2019	8/13/2019	777	2/15/2019	8/8/2019	11/13/2019
29207	L0001		253170	2/14/2019	8/13/2019	892	2/15/2019	8/12/2019	11/13/2019
29208	L0001		256500	2/14/2019	8/13/2019	934	2/15/2019	6/22/2019	11/13/2019
29209	L0001		259240	2/14/2019	8/13/2019	936	2/15/2019	3/13/2019	11/13/2019
29210	L0001		260360	2/14/2019	8/13/2019	958	2/15/2019	5/21/2019	11/13/2019
30436	L0003		163930	10/30/2019	11/29/2019	291	Table Note 3	11/1/2019	11/1/2019
28067	L0005		12760	5/1/2018	10/28/2018	687	5/2/2018	8/10/2018	11/14/2019
27978	L0005		65420	4/10/2018	10/7/2018	657	4/11/2018	8/4/2018	11/14/2019
30350	L0006A		40730	8/20/2019	2/16/2020	610	8/22/2019	9/14/2019	11/15/2019
30351	L0006A		122260	8/20/2019	2/16/2020	1099	8/22/2019	FR	FR
30352	L0006A		203270	8/20/2019	2/16/2020	612	8/22/2019	FR	FR
30353	L0006A		210840	8/20/2019	2/16/2020	571	8/22/2019	FR	FR
30354	L0006A		275420	8/20/2019	2/16/2020	529	8/22/2019	11/18/2019	FR
30355	L0006A		300610	8/20/2019	2/16/2020	600	8/22/2019	FR	FR
30356	L0006A		305690	8/20/2019	2/16/2020	538	8/22/2019	N/A	N/A
30358	L0006A		307340	8/20/2019	2/16/2020	596	8/22/2019	FR	FR
27916	L0006A		1810	3/9/2018	9/5/2018	823	3/12/2018	8/7/2018	11/15/2019
27917	L0006A		7250	3/9/2018	9/5/2018	805	3/12/2018	6/15/2018	11/15/2019
27918	L0006A		13370	3/9/2018	9/5/2018	671	3/12/2018	7/20/2018	11/15/2019

Table D-25: P. 47 Crack Feature Pressure Restrictions									
PR ID	**Line**	**Segment**	**Girth Weld**	**Date of Discovery**	**Repair / Mitigation Deadline (specified in Tables 1 to 5 of the Consent Decree)**	**PPR Set (psi)**	**PPR Imposition Date**	**Repair / Mitigation Date**	**PPR Removal Date[1]**
27919	L0006A	[redacted]	14060	3/9/2018	9/5/2018	654	3/12/2018	6/12/2018	11/15/2019
27920	L0006A		14750	3/9/2018	9/5/2018	663	3/12/2018	7/13/2018	11/15/2019
27921	L0006A		32610	3/9/2018	9/5/2018	618	3/12/2018	6/23/2018	11/15/2019
27922	L0006A		64390	3/9/2018	3/4/2019	601	3/12/2018	1/29/2019	11/15/2019
27923	L0006A		64440	3/9/2018	3/4/2019	614	3/12/2018	2/4/2019	11/15/2019
27924	L0006A		64650	3/9/2018	3/4/2019	597	3/12/2018	1/31/2019	11/15/2019
27925	L0006A		65160	3/9/2018	3/4/2019	612	3/12/2018	1/24/2019	11/15/2019
27926	L0006A		65300	3/9/2018	3/4/2019	611	3/12/2018	1/26/2019	11/15/2019
27927	L0006A		65830	3/9/2018	3/4/2019	615	3/12/2018	1/22/2019	11/15/2019
27928	L0006A		68870	3/9/2018	3/4/2019	586	3/12/2018	2/7/2019	11/15/2019
27929	L0006A		91150	3/9/2018	9/5/2018	581	3/12/2018	6/22/2018	11/15/2019
27930	L0006A		102240	3/9/2018	9/5/2018	557	3/12/2018	7/25/2018	11/15/2019
27931	L0006A		104330	3/9/2018	9/5/2018	576	3/12/2018	7/18/2018	11/15/2019
27932	L0006A		148440	3/9/2018	9/5/2018	595	3/12/2018	8/16/2018	11/15/2019
27933	L0006A		154650	3/9/2018	9/5/2018	598	3/12/2018	8/23/2018	11/15/2019
27934	L0006A		164110	3/9/2018	9/5/2018	613	3/12/2018	8/9/2018	11/15/2019
27935	L0006A		167090	3/9/2018	9/5/2018	616	3/12/2018	6/19/2018	11/15/2019
27936	L0006A		169660	3/9/2018	9/5/2018	618	3/12/2018	8/9/2018	11/15/2019
27937	L0006A		170290	3/9/2018	9/5/2018	568	3/12/2018	8/4/2018	11/15/2019
27938	L0006A		173380	3/9/2018	9/5/2018	609	3/12/2018	7/28/2018	11/15/2019
27939	L0006A		173450	3/9/2018	9/5/2018	582	3/12/2018	7/30/2018	11/15/2019
27940	L0006A		173540	3/9/2018	9/5/2018	588	3/12/2018	8/4/2018	11/15/2019
27941	L0006A		173790	3/9/2018	9/5/2018	602	3/12/2018	8/14/2018	11/15/2019
27942	L0006A		174300	3/9/2018	9/5/2018	605	3/12/2018	6/7/2018	11/15/2019
27943	L0006A		193860	3/9/2018	9/5/2018	578	3/12/2018	7/19/2018	11/15/2019
27944	L0006A		194100	3/9/2018	9/5/2018	597	3/12/2018	7/21/2018	11/15/2019
27945	L0006A		216150	3/9/2018	9/5/2018	605	3/12/2018	8/29/2018	11/15/2019
27946	L0006A		219110	3/9/2018	9/5/2018	614	3/12/2018	8/17/2018	11/15/2019
27947	L0006A		219830	3/9/2018	9/5/2018	618	3/12/2018	8/16/2018	11/15/2019

Table D-25: P. 47 Crack Feature Pressure Restrictions									
PR ID	**Line**	**Segment**	**Girth Weld**	**Date of Discovery**	**Repair / Mitigation Deadline (specified in Tables 1 to 5 of the Consent Decree)**	**PPR Set (psi)**	**PPR Imposition Date**	**Repair / Mitigation Date**	**PPR Removal Date[1]**
27948	L0006A	[redacted]	257870	3/9/2018	9/5/2018	600	3/12/2018	7/23/2018	11/15/2019
27949	L0006A		262700	3/9/2018	9/5/2018	609	3/12/2018	8/27/2018	11/15/2019
27950	L0006A		283440	3/9/2018	9/5/2018	600	3/12/2018	8/3/2018	11/15/2019
27951	L0006A		295120	3/9/2018	9/5/2018	614	3/12/2018	8/4/2018	11/15/2019
27952	L0006A		299650	3/9/2018	9/5/2018	607	3/12/2018	7/17/2018	11/15/2019
27953	L0006A		322910	3/9/2018	9/5/2018	616	3/12/2018	8/18/2018	11/15/2019

TABLE NOTES:

[1] PPR is removed after the Feature Requiring Pressure Restriction is repaired or mitigated. This PPR Removal Date can be before the Repair / Mitigation Date which is the repair and mitigation date of the entire dig package that may include other features not requiring pressure restriction.

[2] "FR" indicates that this information is outside the reporting window of this SAR and will be included in a future SAR.

[3] The PPR Removal Date is the same as the scheduled PPR Imposition Date as the feature was repaired prior to the scheduled imposition of the PPR.

Table D-26: P. 50 Corrosion Features Requiring Excavation						
Dig ID	**Line**	**Segment**	**Girth Weld**	**Date Features Added to Dig List**	**Repair / Mitigation Deadline**	**Date of Repair / Mitigation[1]**
24862	L0001	[redacted]	121630	12/17/2018	6/15/2019	6/7/2019
24805	L0003		58670	12/10/2018	6/8/2019[4]	FR
24816	L0003		225550	12/10/2018	6/8/2019	5/31/2019
24849	L0003		239490	12/17/2018	12/17/2019	7/20/2019
26636	L0003		56530	10/9/2019	4/6/2020	FR
26637	L0003		56850	10/9/2019	4/6/2020	FR
26638	L0003		57690	10/9/2019	4/6/2020	FR
26639	L0003		58620	10/9/2019	4/6/2020	FR
26640	L0003		59010	10/9/2019	4/6/2020	FR
26641	L0003		59670	10/9/2019	4/6/2020	FR
26642	L0003		60300	10/9/2019	4/6/2020	FR
26643	L0003		136940	10/9/2019	4/6/2020	11/19/2019
26644	L0003		154460	10/9/2019	4/6/2020	FR
26464	L0003		148980	8/29/2019	2/25/2020	10/10/2019
26465	L0003		183120	8/29/2019	2/25/2020	FR
26721	L0003		75050	11/12/2019	5/10/2020	FR
26722	L0003		129340	11/12/2019	5/10/2020	FR
26723	L0003		129880	11/12/2019	5/10/2020	FR[1]
26724	L0003		133000	11/12/2019	5/10/2020	FR
23941	L0006A		256490	5/11/2018	7/18/2020[2]	FR
24098	L0006A		226360	7/6/2018	7/27/2020[3]	FR
26632	L0006A		109850	10/8/2019	4/5/2020	FR
26633	L0006A		300190	10/8/2019	4/5/2020	FR
26634	L0006A		329710	10/8/2019	4/5/2020	FR
26675	L0006A		72080	10/24/2019	10/23/2020	11/20/2019
26676	L0006A		166750	10/24/2019	4/21/2020	FR
26677	L0006A		205920	10/24/2019	4/21/2020	FR
26678	L0006A		280780	10/24/2019	4/21/2020	FR
26238	L0006A		20550	7/3/2019	7/2/2020	7/27/2019
26239	L0006A		46330	7/3/2019	12/30/2019	8/22/2019
26240	L0006A		117220	7/3/2019	12/30/2019	8/28/2019
26241	L0006A		161650	7/3/2019	7/2/2020	9/19/2019

Table D-26: P. 50 Corrosion Features Requiring Excavation						
Dig ID	**Line**	**Segment**	**Girth Weld**	**Date Features Added to Dig List**	**Repair / Mitigation Deadline**	**Date of Repair / Mitigation[1]**
26242	L0006A	[redacted]	174680	7/3/2019	12/30/2019	9/17/2019
26243	L0006A		216270	7/3/2019	7/2/2020	FR
26244	L0006A		228030	7/3/2019	7/2/2020	10/15/2019
26245	L0006A		241240	7/3/2019	12/30/2019	9/28/2019
26627	L0061		73610	10/7/2019[5]	4/4/2020	FR
26628	L0061		90360	10/7/2019[5]	4/4/2020	FR
26629	L0061		250590	10/7/2019[5]	4/4/2020	FR

TABLE NOTE:

[1] "FR" indicates that this information is outside the reporting window of this SAR and will be included in a future SAR.

[2] Repair / Mitigation Deadline has been modified from 11/7/2018 to 7/18/2020 as outlined in AP3

[3] Repair / Mitigation Deadline has been modified from 1/2/2019 to 7/27/2020 as outlined in AP4

[4] Repair / Mitigation Deadline will be modified from 6/8/2019 as part of AP5. The date is still to be determined.

[5] Enbridge has identified that these FREs are based on inaccurate Established MOP values listed on the EPA web site.

Table D-27: P. 52 Corrosion Feature Pressure Restrictions									
PR ID	**Line**	**Segment**	**Girth Weld**	**Date of Discovery**	**Repair / Mitigation Deadline[1]**	**PPR Set (psi)**	**PPR Imposition Date**	**Repair / Mitigation Date**	**PPR Removal Date[2,3]**
28124	L0004		39450	6/12/2018	6/12/2019	615	6/8/2018	9/5/2018	11/8/2019
27954	L0004		25700	3/22/2018	3/22/2019	602	3/23/2018	10/23/2018	11/8/2019
27955	L0004		48150	3/22/2018	3/22/2019	630	3/23/2018	6/19/2018	11/8/2019
27062	L0005		13220	12/18/2017	6/16/2018	731	12/19/2017	5/17/2018	FR
27064	L0005		26290	12/18/2017	12/18/2018	680	12/19/2017	8/22/2018	11/14/2019
27067	L0005		63420	12/18/2017	12/18/2018	617	12/19/2017	8/24/2018	11/14/2019
27024	L0005		242570	10/27/2017	4/25/2018	696	10/30/2017	3/1/2018	FR
28133	L0006A		226360	7/6/2018	7/27/2020	554	7/6/2018	FR[4]	FR
27828	L0006A		24530	2/5/2018	2/5/2019	604	2/7/2018	9/29/2018	11/15/2019
27829	L0006A		63000	2/5/2018	2/5/2019	615	2/7/2018	3/1/2018	11/15/2019
27830	L0006A		117210	2/5/2018	2/5/2019	596	2/7/2018	1/19/2019	11/15/2019
27831	L0006A		135390	2/5/2018	2/5/2019	616	2/7/2018	2/23/2018	11/15/2019
27832	L0006A		142960	2/5/2018	8/4/2018	595	2/7/2018	7/23/2018	11/15/2019
27833	L0006A		148400	2/5/2018	2/5/2019	614	2/7/2018	8/10/2018	11/15/2019
27834	L0006A		216510	2/5/2018	2/5/2019	615	2/7/2018	8/25/2018	11/15/2019
27835	L0006A		223520	2/5/2018	2/5/2019	616	2/7/2018	9/17/2018	11/15/2019
27836	L0006A		226760	2/5/2018	2/5/2019	609	2/7/2018	6/29/2018	11/15/2019
27837	L0006A		226790	2/5/2018	2/5/2019	609	2/7/2018	6/30/2018	11/15/2019
27838	L0006A		230360	2/5/2018	2/5/2019	609	2/7/2018	8/21/2018	11/15/2019
27840	L0006A		236100	2/5/2018	2/5/2019	606	2/7/2018	10/31/2018	11/15/2019
27841	L0006A		271270	2/5/2018	2/5/2019	603	2/7/2018	7/30/2018	11/15/2019
30291	L0006A		20550	7/3/2019	7/2/2020	660	7/4/2019	7/27/2019	11/15/2019
30292	L0006A		46330	7/3/2019	12/30/2019	612	7/4/2019	8/22/2019	FR

Table D-27: P. 52 Corrosion Feature Pressure Restrictions									
PR ID	**Line**	**Segment**	**Girth Weld**	**Date of Discovery**	**Repair / Mitigation Deadline[1]**	**PPR Set (psi)**	**PPR Imposition Date**	**Repair / Mitigation Date**	**PPR Removal Date[2,3]**
30293	L0006A	[redacted]	117220	7/3/2019	12/30/2019	612	7/4/2019	8/28/2019	FR
30294	L0006A		161650	7/3/2019	7/2/2020	677	7/4/2019	9/19/2019	FR
30295	L0006A		174680	7/3/2019	12/30/2019	617	7/4/2019	9/17/2019	FR
30296	L0006A		216270	7/3/2019	7/2/2020	607	7/4/2019	FR	FR
30297	L0006A		228030	7/3/2019	7/2/2020	618	7/4/2019	10/15/2019	FR
30298	L0006A		241240	7/3/2019	12/30/2019	619	7/4/2019	9/28/2019	FR
30401	L0006A		109850	10/8/2019	4/5/2020	614	10/10/2019	FR	FR
30432	L0006A		72080	10/24/2019	10/23/2020	604	10/28/2019	11/20/2019	FR
30433	L0006A		166750	10/24/2019	4/21/2020	610	10/28/2019	FR	FR
30434	L0006A		205920	10/24/2019	4/21/2020	612	10/28/2019	FR	FR
30435	L0006A		280780	10/24/2019	4/21/2020	610	10/28/2019	FR	FR
30398	L0061		73610	10/7/2019	4/4/2020	1153	10/9/2019	FR	FR
30399	L0061		90360	10/7/2019	4/4/2020	1137	10/9/2019	FR	FR
30400	L0061		250590	10/7/2019	4/4/2020	1156	10/9/2019	FR	FR

TABLE NOTES:

[1] Repair/ Mitigation Deadline was specified in Tables 1 to 5 of the Consent Decree

[2] PPR is removed after the Feature Requiring Pressure Restriction is repaired or mitigated. This PPR Removal Date can be before the Repair / Mitigation Date which is the repair and mitigation date of the entire dig package that may include other features not requiring pressure restriction.

[3] "FR" indicates that this information is outside the reporting window of this SAR and will be included in a future SAR.

[4] Repair / Mitigation Deadline has been modified from 1/2/2019 to 7/27/2020 as outlined in AP4

Table D-28: P. 53 Digs for Axial Slotting, Axial Grooving, Selective Seam Corrosion and Seam Weld anomaly A/B Features						
Dig ID	**Line**	**Segment**	**Girth Weld**	**Date of Discovery / Feature Added to Dig List**	**Repair / Mitigation Deadline**	**Date of Repair / Mitigation[1]**
24829	L0003	[redacted]	4050	12/17/2018	12/17/2019	7/16/2019
24830	L0003		14280	12/17/2018	12/17/2019	8/16/2019
24841	L0003		160440	12/17/2018	12/17/2019	FR

TABLE NOTES:

[1] "FR" indicates that this information is outside the reporting window of this SAR and will be included in a future SAR.

Table D-29: P. 54 Axial Slotting, Axial Grooving, and Selective Seam Corrosion, and Weld Anomaly A/B Feature Pressure Restrictions									
PR ID	**Line**	**Segment**	**Girth Weld**	**Date of Discovery**	**Repair / Mitigation Deadline[1]**	**PPR Set (psi)**	**PPR Imposition Date**	**Repair / Mitigation Date**	**PPR Removal Date[2,3]**
27098	L0005	[redacted]	116930	12/26/2017	6/24/2018	677	12/27/2017	6/22/2018	11/14/2019
27099	L0005		230050	12/26/2017	6/24/2018	654	12/27/2017	6/21/2018	11/14/2019

TABLE NOTES:

[1] Specified in Tables 1 to 5 of the Consent Decree

[2] PPR is removed after the Feature Requiring Pressure Restriction is repaired or mitigated. This PPR Removal Date can be before the Repair / Mitigation Date which is the repair and mitigation date of the entire dig package that may include other features not requiring pressure restriction.

[3] "FR" indicates that this information is outside the reporting window of this SAR and will be included in a future SAR.

Table D-30: P. 56 Geometry features Mitigation Timelines						
Dig ID	**Line**	**Segment**	**Girth Weld**	**Date of Discovery / Feature Added to Dig List**	**Repair / Mitigation Deadline**	**Date of Repair / Mitigation[1]**
26410	L0061	[redacted]	77300	8/13/2019	2/9/2020	10/4/2019
26411	L0061		114890	8/13/2019	2/9/2020	9/26/2019
26412	L0061		169340	8/13/2019	2/9/2020	10/10/2019
26413	L0061		169530	8/13/2019	2/9/2020	10/12/2019
26414	L0061		178680	8/13/2019	2/9/2020	10/31/2019
26415	L0061		179140	8/13/2019	2/9/2020	10/25/2019
26416	L0061		181760	8/13/2019	2/9/2020	10/23/2019
26417	L0061		270280	8/13/2019	2/9/2020	10/16/2019
26418	L0061		281890	8/13/2019	2/9/2020	10/16/2019
26419	L0061		333520	8/13/2019	2/9/2020	10/10/2019

TABLE NOTE:

[1] *"FR" indicates that this information is outside the reporting window of this SAR and will be included in a future SAR.*

Table D-31: P. 58 Interacting Features Requiring Excavation										
Dig ID	**Line**	**Segment**	**Girth Weld**	**Tool**	**Report Received Date**	**One-Source Load Date**	**Date of Discovery / Feature Added to Dig List**	**Repair / Mitigation Deadline**	**Type of Inter-acting features (tool)**	**Date of Repair / Mitigation[1]**
26586	L0003	[redacted]	125700	CALIPER	8/29/2019	8/29/2019	9/30/2019	9/29/2020	Crack	10/2/2019
26740	L0003		86580	CALIPER	10/10/2019	10/10/2019	11/18/2019	11/17/2020	Crack	11/19/2019
26696	L0005		97480	CALIPER	9/12/2019	9/13/2019	11/4/2019	11/3/2020	Crack	11/5/2019

TABLE NOTE:

[1] "FR" indicates that this information is outside the reporting window of this SAR and will be included in a future SAR

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Table D-32: P. 59 Interacting Features Pressure Restrictions									
PR ID	**Line**	**Segment**	**Girth Weld**	**Date of Discovery**	**Repair / Mitigation Deadline[1]**	**PPR Set (psi)**	**PPR Imposition Date**	**Repair / Mitigation Date**	**PPR Removal Date[2,3]**
27100	L0003	[redacted]	239920	12/26/2017	6/24/2018	322	12/28/2017	1/25/2018	FR
30397	L0003		125700	9/30/2019	9/29/2020	224	Table Note 4	10/2/2019	10/2/2019
30438	L0003		86580	11/18/2019	11/11/2020	217	Table Note 4	11/19/2019	11/20/2019
28145	L0004		32780	7/31/2018	1/27/2019	622	8/2/2018	12/1/2018	11/8/2019
28144	L0004		37520	7/17/2018	1/13/2019	613	7/18/2018	10/29/2018	11/8/2019
26696	L0005		97480	11/4/2019	11/3/2020	329	Table Note 4	11/5/2019	11/6/2019

TABLE NOTES:

[1] Specified in Tables 1 to 5 of the Consent Decree

[2] PPR is removed after the Feature requiring Pressure Restriction is repaired or mitigated. The PPR Removal Date may be before the Repair / Mitigation Date because that date is the repair and mitigation date of the entire dig package that may include other features not requiring pressure restriction.

[3] "FR" indicates that this information is outside the reporting window of this SAR and will be included in a future SAR.

[4] The PPR Removal Date is the same as the scheduled PPR Imposition Date as the feature was repaired prior to the scheduled imposition of the PPR.

Table D-33: P. 60 Remaining Life Calculations					
Tool Run ID	**Line**	**Segment**	**Tool**	**Report Type**	**Remaining Life Calculation Completion Date**
4502	01	[redacted]	GEMINI	Corrosion	9/12/2019
4405[1]	01		UC	Crack	7/18/2019
6396	03		MFL4	Corrosion	10/7/2019
6394	03		MFL4	Corrosion	11/12/2019
6387	05		MFL3	Corrosion	7/11/2019
6386	05		MFL3	Corrosion	7/11/2019
4804	06A		DUO CD	Crack	8/19/2019
5369	06A		Vectra	Corrosion	10/4/2019
4805	06A		UMP	Corrosion	6/28/2019
4555	10		USWM+	Corrosion	6/25/2019
6546	61		MFL-A	Corrosion	10/7/2019
4614	67		UC	Crack	9/6/2019

TABLE NOTE:

[1]The details of the remaining life calculations for this program are reported in Paragraph 145 [Section D] Line 01 CR-PW UC GW 93520 Remaining Life Deadline – P44.b(1)

Table D-34: P. 63 Crack Feature Remaining Life Calculations					
Tool Run ID	**Line**	**Segment**	**Tool**	**Report Type**	**Remaining Life Calculation Completion Date**
4405[1]	01	[redacted]	UC	Crack	7/18/2019
4536	05		UCc	Crack	N/A (Remaining Life is not applicable for Circumferential Crack features)
4543	05		UCc	Crack	N/A (Remaining Life is not applicable for Circumferential Crack features)
4804	06A		DUO CD	Crack	7/19/2019
4614	67		UC	Crack	8/22/2019

TABLE NOTE:

[1]The details of the remaining life calculations for this program are reported in Paragraph 145 [Section D] Line 01 CR-PW UC GW 93520 Remaining Life Deadline – P44.b(1)

Section E

Table E-1: P. 68 Consent Decree Screw Anchor Installation Summary				
Location	**Installed**	**Installation Year**	**Long.**	**Lat.**
EP-17-1	Y	2018	[redacted]	
EP-17-2	Y	2018		
EP-17-3	Y	2018		
EP-17-4	Y	2018		
EP-17-5	Y	2018		
WP-17-1	Y	2018		
WP-17-2	Y	2018		
WP-17-3	Y	2018		
WP-17-4	Y	2018		
WP-17-5	Y	2018		
WP-17-6	Y	2018		
WP-17-7	Y	2018		
WP-17-8	Y	2018		
WP-17-9	Y	2018		
WP-17-10	Y	2018		
WP-17-11	Y	2018		
WP-17-12	Y	2018		
WP-17-13	N	-		
WP-17-14	N	-		
WP-17-15	Y	2018		
WP-17-16	Y	2018		
WP-17-17	Y	2019		
EAP-1	Y	2019		
EAP-2	N	-		
EAP-3	N	-		
EAP-4	N	-		
EAP-5	Y	2019		
EAP-6	N	-		
EAP-7	N	-		
EAP-8	N	-		
EAP-9	N	-		
EAP-10	N	-		
EAP-11	N	-		
EAP-12	N	-		
EAP-13	Y	2019		
EAP-14	Y	2019		
EAP-15	Y	2019		
EAP-16	Y	2019		
EAP-17	Y	2019		
EAP-18	Y	2019		

Table E-1: P. 68 Consent Decree Screw Anchor Installation Summary				
Location	**Installed**	**Installation Year**	**Long.**	**Lat.**
EAP-19	Y	2019		
EAP-20	Y	2019		
EAP-21	Y	2019		
EAP-22	Y	2019		
EAP-23	Y	2019		
EAP-24	Y	2019		
EAP-25	N	-		
EAP-26	Y	2019		
EAP-27	Y	2019		
EAP-28	N	-		
EAP-29	N	-		
EAP-30	Y	2019		
WAP-1	Y	2019		
WAP-2	Y	2019		
WAP-3	N	-		
WAP-4	N	-		
WAP-5	Y	2019		
WAP-6	N	-		
WAP-7	Y	2019		
WAP-8	Y	2019		
WAP-9	Y	2019		
WAP-10	Y	2019		
WAP-11	Y	2019		
WAP-12	N	-		
WAP-13	Y	2019		
WAP-14	Y	2019		
WAP-15	Y	2019		
WAP-16	Y	2019		
WAP-17	Y	2019		
WAP-18	Y	2019		
WAP-19	Y	2019		
WAP-20	Y	2019		
WAP-21	N	-		

Table E-2: P. 68.a Line 5 Straits – Dual Pipelines Anchor Strike Mitigation Initiatives		
Initiative Area	**Activity Description**	**Activity Status**
Operations	Markup of pipeline on National Oceanic and Atmospheric Administration's marine navigation maps	Complete. Available for reference.
	Enbridge's engagement with the Great Lakes' mariner associations and other maritime agencies	Ongoing
	Recurring Pipeline Patrol via bi-weekly flights over the Straits	Ongoing
Technology	Implementation of GE ThreatScan strike detection system for indication of pipeline impacts requiring operational response	Installed: Q4 2018 Target Testing: 2019-2020
	Implementation of Vesper Marine *Guardian:protect* Automatic Identification System ("AIS") for potential communication with vessels in the Straits regarding pipeline safety (e.g. no anchoring instructions)	Installed in December 2017. Vessel detection functionality is operational; however, Enbridge is gathering information required to demonstrate communication capabilities of the system's "Mark" and "Prevent" functions Enbridge submitted USCG PAtoNs application on August 30, 2019 (revised September 3, 2019) pursuant to initiating vessel communication functions
	Investigation of Distributed Acoustic Sensing ("DAS") system – use of fiber optic cables to detect line strikes	Following review of received Request for Information responses, Enbridge determined that DAS technology is not sufficiently developed for use in a submerged environment such as the Straits. Enbridge will no longer pursue DAS until such time the technology is proven for the proposed application.
Regulatory	State of Michigan ("SoM") Governor's approval of Department of Natural Resources Emergency Rule establishing a restricted anchor and vessel equipment zone in the Straits May 24, 2018 –(No direct action by Enbridge)	Complete: May 24, 2018
	Enbridge provided support and feedback (via public commentary process) on United States Coast Guard (USCG)/Department of Homeland Security ("DHS") Final Rule "Regulated Navigation Area; Straits of Mackinac, Mackinaw City, MI" (Docket Number USCG–2018–0563) issued Oct. 1, 2018 and effective Oct. 31, 2018 impacting 33 CFR Part 165. The Final Rule restricts the deployment of anchors by vessels in the regulated navigation area.	Enbridge commentary submitted August 31, 2018 Complete: Final Rule Effective October 31, 2018.

Table E-2: P. 68.a Line 5 Straits – Dual Pipelines Anchor Strike Mitigation Initiatives		
Initiative Area	**Activity Description**	**Activity Status**
Agreements with the State of Michigan	Line 5 Agreements with the State of Michigan aimed at increasing "coordination between the State and Enbridge concerning the operation and maintenance of Enbridge's Line 5 pipeline located in the State of Michigan, including enhancing its operation in the interest of the citizens of Michigan". 1st Line 5 Agreement executed November 27, 2017 2nd Line 5 Agreement executed October 3, 2018. As part of the Second Agreement, Enbridge has provided $200,000 to the USCG for video cameras to monitor compliance with the USCG Restricted Navigation Area rules restricting the deployment of vessel anchors in the Straits. A 3rd Agreement and Tunnel Agreement were executed December 19, 2018, providing in part for replacement of the Dual Pipelines with a new pipeline inside of a shared utility tunnel below the Straits. Enbridge engagement with the State regarding 3rd Agreement and Tunnel Agreement work continues. On June 6, 2019 Enbridge filed a legal action in the Michigan Court of Claims seeking a ruling that the tunnel legislation is constitutional. The Michigan Attorney General opposed Enbridge's action, seeking a summary determination of unconstitutionality. On October 31, 2019, the Michigan Court of Claims upheld the constitutionality of the tunnel statute. The case is now pending on appeal to the Michigan Court of Appeals. On July 1, 2019, the State of Michigan initiated a legal action in the Michigan Circuit Court in Ingham County seeking a ruling that the 1953 Easement on which the Dual Pipelines rely should be voided as contrary to the public trust, that the continued operation of the Dual Pipelines violates the public trust, that the Dual Pipelines are a public nuisance and that their operation is contrary to the Michigan Environmental Protection Act. The case is pending on cross-motions for summary disposition.	Ongoing

Table E-2: P. 68.a Line 5 Straits – Dual Pipelines Anchor Strike Mitigation Initiatives		
Initiative Area	**Activity Description**	**Activity Status**
	Despite the litigation, Enbridge has continued to adhere to obligations it undertook in the Third Agreement and Tunnel Agreement, including: • April 4, 2019 submission of a work plan to, in conjunction with the Close Interval Surveys required under Section I.D of the Second Agreement, visually inspect pipeline coatings at sites to be specified in the work plan along the Dual Pipelines and to repair the coating at any and all sites where Bare Metal is identified. Continuation of Close Interval Surveys. • April 29, 2019 submission of the Draft Procurement and Contracting Execution Plan submitted to MSCA on April 29, 2019 as part of the April Progress Report • Geotechnical investigations of the lakebed within the proposed tunnel easement	

Table E-3: P. 73 Acoustic Leak Detection		
Segment	**Quarter**	**Leak Detection Tool Run Date**
Dual Pipelines (West and East)	Q3 2019	7/22/2019
Dual Pipelines (West and East)	Q4 2019	11/5/2019

Section F

Table F-1: P. 77 OneSource NDE Updates						
Tool Run ID	**Line**	**Segment**	**Tool**	**Report Type**	**Last NDE Report Approved Date**	**OneSource Load Date**
4045	L0001	[redacted]	UMP	Corrosion	7/5/2019	7/10/2019
3830	L0003		AFD	Corrosion	10/11/2019	10/15/2019
4447	L0003		MFL4MFL	Corrosion	4/23/2019	5/30/2019
3826	L0003		AFD	Corrosion	7/19/2019	7/23/2019
3827	L0003		DUOCD	Crack	10/17/2019	10/21/2019
4465	L0004		UCMUTCD	Crack	5/17/2019	6/6/2019
6087[1]	L0005		GEOPIG	Geometry	9/20/2018	6/5/2019
4538	L0005		GEOPIG	Geometry	6/11/2019	6/18/2019
2150[2]	L0005		CD+	Crack	9/27/2018	6/5/2019
6088[1]	L0005		GEOPIG	Geometry	9/19/2018	6/5/2019
4334	L0006A		GEMINICAL	Geometry	5/3/2019	5/30/2019
3809	L0006A		DUOCD	Crack	4/23/2019	5/30/2019
4473	L0010		UMP	Corrosion	4/25/2019	5/30/2019
6095	L0010		MFL4MFL	Corrosion	5/9/2019	5/30/2019

TABLE NOTE:

[1] Last NDE report upload to OneSource for all FRE's for this program occurred later than 60 days after approval. Refer to SAR4 Paragraph 145 '[Section F] Line 5 ENO-EMA and WNO-WMA GEOPIG NDE Report OneSource Upload Deadline – P77.d'.

[2] Last NDE report upload to OneSource for all FRE's for this program originally occurred on 10/10/2018, it was inadvertently re-uploaded to OneSource on 6/5/2019 which is the date that is listed in the table above. Please refer to Paragraph 144 '[Section F] Line 5 PE-IR USCD+ NDE Report OneSource Upload Deadline – P77.d' of this report.

Table F-2: P. 78.a OneSource ILI Updates						
Tool Run ID	**Line**	**Segment**	**Tool**	**Report Type**	**Report Received Date**	**OneSource Load Date**
4502	01	[redacted]	GEMINI	Corrosion	8/15/2019	8/16/2019
4502	01		GEMINI	Geometry	7/17/2019	7/18/2019
6395	03		DUO CD	Crack	10/29/2019	10/29/2019
6396	03		MFL4	Corrosion	8/29/2019	8/30/2019
6396	03		MFL4	Geometry	8/29/2019	8/29/2019
6393	03		DUO CD	Crack	11/15/2019	11/18/2019
6394	03		MFL4	Corrosion	10/10/2019	10/11/2019
6394	03		MFL4	Geometry	10/10/2019	10/10/2019
4519	04		Deformation	Geometry	11/12/2019	11/19/2019
4536	05		UCc	Crack	7/4/2019	7/8/2019
6387	05		MFL3	Corrosion	6/11/2019	6/17/2019
4537	05		UCx	Crack	11/22/2019	11/25/2019
4543	05		UCc	Crack	7/4/2019	7/8/2019
6386	05		MFL3	Corrosion	6/12/2019	6/18/2019
4804	06A		DUO CD	Crack	7/19/2019	7/19/2019
5369	06A		Vectra	Corrosion	9/4/2019	9/4/2019
4544	06A		Vectra	Corrosion	11/13/2019	11/15/2019
4805	06A		UMP	Corrosion	5/29/2019	5/30/2019
4555	10		USWM+	Corrosion	6/3/2019	6/5/2019
4556	10		UCc	Crack	10/2/2019	10/3/2019
6546	61		MFL-A	Corrosion	9/5/2019	9/5/2019
4614	67		UC	Crack	8/22/2019	8/23/2019

Table F-3: P. 78.b Interacting Feature Reviews								
Tool Run ID	**Line**	**Segment**	**Tool**	**Report Type**	**Pull Date**	**Report Received Date**	**Interacting Feature Review**	**Issue #**
4045	01	[redacted]	UMP	Corrosion	08/18/2018	07/08/2019	08/07/2019	2
4502	01		GEMINI	Corrosion	05/18/2019	08/15/2019	09/12/2019	1
4502	01		GEMINI	Geometry	05/18/2019	07/17/2019	08/06/2019	1
6396	03		MFL4	Corrosion	06/03/2019	10/07/2019	10/09/2019	1
6396	03		MFL4	Corrosion	06/03/2019	09/26/2019	10/11/2019	2
6395	03		DUO CD	Crack	07/01/2019	10/29/2019	11/26/2019	1
6396	03		MFL4	Geometry	06/03/2019	08/29/2019	09/30/2019	1
3711	03		UCMp	Corrosion	11/14/2017	07/29/2019	08/28/2019	3
6394	03		MFL4	Corrosion	07/12/2019	10/10/2019	11/12/2019	1
6394	03		MFL4	Geometry	07/12/2019	10/10/2019	11/12/2019	1
2254	04		DuDi UCM	Corrosion	10/18/2017	07/22/2019	08/09/2019	3
4465	04		DuDi UCM	Corrosion	10/20/2017	07/29/2019	08/28/2019	4
2351	04		DuDi UCM	Corrosion	02/07/2018	05/22/2019	06/19/2019	2
2346	04		DuDi UCM	Corrosion	02/27/2018	05/22/2019	06/19/2019	2
4466	04		DuDi UCM	Corrosion	12/12/2017	07/22/2019	08/13/2019	2
6013	04		DuDi UCM	Corrosion	12/08/2017	07/29/2019	08/26/2019	2
2358	04		DuDi UCM	Corrosion	02/20/2018	05/22/2019	06/18/2019	2
2323	04		DuDi UCM	Corrosion	02/14/2018	06/07/2019	07/08/2019	2
2381	04		DuDi UCM	Corrosion	03/14/2018	05/22/2018	06/19/2019	2
6387	05		MFL3	Corrosion	03/13/2019	06/11/2019	07/11/2019	1

Table F-3: P. 78.b Interacting Feature Reviews								
Tool Run ID	**Line**	**Segment**	**Tool**	**Report Type**	**Pull Date**	**Report Received Date**	**Interacting Feature Review**	**Issue #**
4536	05	[redacted]	UCc	Crack	03/06/2019	07/04/2019	08/02/2019	1
6386	05		MFL3	Corrosion	03/14/2019	06/12/2019	07/11/2019	1
4543	05		UCc	Crack	03/07/2019	07/04/2019	08/02/2019	1
4443	06A		UMP	Corrosion	12/02/2017	09/23/2019	10/23/2019	3
5369	06A		Vectra	Corrosion	06/07/2019	09/04/2019	10/04/2019	1
4804	06A		DUO CD	Crack	03/23/2019	07/19/2019	08/19/2019	1
4805	06A		UMP	Corrosion	03/01/2019	05/29/2019	06/28/2019	1
4555	10		USWM+	Corrosion	03/06/2019	06/03/2019	06/25/2019	1
6546	61		MFL-A	Corrosion	06/07/2019	09/05/2019	10/07/2019	1
4610	61		GEMINI	Geometry	02/25/2019	07/16/2019	08/13/2019	2
4614	67		UC	Crack	05/09/2019	08/22/2019	09/06/2019	1
4489	78		UMP	Corrosion	01/12/2018	05/22/2019	06/19/2019	2

Section G

Table G-1: P. 93-94, 96-97 Temporary MBS Suspension			
Reason for Instrumentation Outage	**Time Period to Restore MBS Segment to Operation (Requirement)**	**Number of Occurrences**	**Number of Occurrences Exceeding Time Period**
Instrumentation failure	10 days	9	0
Bypass of ILI Tool	4 hours	13	1
Scheduled maintenance or repairs	4 days	47	0

Table G-2: P. 99 Projects				
Line	**Milepost**	**Valve Tag No.**	**Installation Date**	**Triggers Paragraph 99?**
5	[redacted]		Sep 2019	Yes. Valve was partially excavated, as were pressure transmitter/temperature transmitter (PT/TT) locations on the upstream and downstream sides of the valve. PTs installed on upstream and downstream sides of valve; TT installed on upstream side.
1			Oct 2019	Yes, Valve was partially excavated, as were PT/TT locations on the upstream side of the valve only. PT, TT installed on upstream side of valve.
5			Nov 2019	Yes. Valve was partially excavated, as were PT/TT locations on the upstream and downstream sides of the valve. PTs installed on upstream and downstream sides of valve.TT installed on downstream side.

Table G-3: P. 112 Lakehead System Pipeline Incident Reporting						
Incident Description	**Date and Time Notice Received**	**Date and Time Investigation Began**	**Date and time when preliminary Investigation complete**	**Information Provided with Notice**	**Conclusion and Findings of the Investigation**	**Lakehead Lines Affected**
[redacted]	05/24/2019 05:27 MST	05/24/2019 05:33 MST	05/24/2019 05:34 MST	[redacted]	[redacted]	Line 78
	05/25/2019 09:30 MST	05/25/2019 09:38 MST	05/25/2019 09:41 MST			Line 78 Line 06A Line 64
	05/26/2019 08:47 MST	05/26/2019 08:56 MST	05/26/2019 09:01 MST			Line 06A Line 14 Line 61

Table G-3: P. 112 Lakehead System Pipeline Incident Reporting						
Incident Description	**Date and Time Notice Received**	**Date and Time Investigation Began**	**Date and time when preliminary Investigation complete**	**Information Provided with Notice**	**Conclusion and Findings of the Investigation**	**Lakehead Lines Affected**
[redacted]	06/03/2019 09:20 MST	06/03/2019 09:22 MST	06/03/2019 09:26 MST	[redacted]	[redacted]	Line 78
	06/09/2019 18:14 MST	06/09/2019 18:18 MST	06/09/2019 18:20 MST			Line 78
	06/11/2019 10:51 MST	06/11/2019 10:54 MST	06/11/2019 10:53 MST			Line 05

Table G-3: P. 112 Lakehead System Pipeline Incident Reporting						
Incident Description	**Date and Time Notice Received**	**Date and Time Investigation Began**	**Date and time when preliminary Investigation complete**	**Information Provided with Notice**	**Conclusion and Findings of the Investigation**	**Lakehead Lines Affected**
[redacted]	06/15/2019 14:30 MST	06/15/2019 14:37 MST	06/15/2019 14:39 MST	[redacted]	[redacted]	Line 14 Line 64 Line 62 Line 78 Line 06A
[redacted]	06/30/2019 14:58 MST	06/30/2019 15:02 MST	06/30/2019 15:04 MST	[redacted]	[redacted]	Line 78

Table G-3: P. 112 Lakehead System Pipeline Incident Reporting						
Incident Description	**Date and Time Notice Received**	**Date and Time Investigation Began**	**Date and time when preliminary Investigation complete**	**Information Provided with Notice**	**Conclusion and Findings of the Investigation**	**Lakehead Lines Affected**
[redacted]	07/10/2019 10:15 MST	07/10/2019 10:17 MST	07/10/2019 10:18 MST	[redacted]	[redacted]	Line 01 Line 02B Line 03 Line 04 Line 67
	08/14/2019 18:33 MST	08/14/2019 18:36 MST	08/14/2019 18:39 MST			Line 01 Line 02B Line 03 Line 04 Line 65 Line 67
	08/30/2019 21:04 MST	08/30/2019 21:09 MST	08/30/2019 21:13 MST			Line 05

Table G-3: P. 112 Lakehead System Pipeline Incident Reporting						
Incident Description	**Date and Time Notice Received**	**Date and Time Investigation Began**	**Date and time when preliminary Investigation complete**	**Information Provided with Notice**	**Conclusion and Findings of the Investigation**	**Lakehead Lines Affected**
[redacted]	09/04/2019 10:30 MST	09/04/2019 10:36 MST	09/04/2019 10:38 MST	[redacted]	[redacted]	Line 78
	09/04/2019 19:36 MST	09/04/2019 19:44 MST	09/04/2019 19:48 MST			Line 06A Line 62 Line 64 Line 78
	09/12/2019 07:49 MST	09/12/2019 07:57 MST	*Pipeline already shutdown.*			Line 14 Line 06A

Table G-3: P. 112 Lakehead System Pipeline Incident Reporting						
Incident Description	**Date and Time Notice Received**	**Date and Time Investigation Began**	**Date and time when preliminary Investigation complete**	**Information Provided with Notice**	**Conclusion and Findings of the Investigation**	**Lakehead Lines Affected**
[redacted]	09/13/2019 09:07 MST	09/13/2019 09:12 MST	09/13/2019 09:15 MST	[redacted]	[redacted]	Line 05
	09/14/2019 17:45 MST	09/14/2019 17:52 MST	09/14/2019 17:56 MST			Line 6A Line 78 Line 14
	09/17/2019 09:29 MST	09/17/2019 09:35 MST	09/17/2019 09:41 MST			Line 01 Line 02B Line 03 Line 04 Line 67

Table G-3: P. 112 Lakehead System Pipeline Incident Reporting						
Incident Description	**Date and Time Notice Received**	**Date and Time Investigation Began**	**Date and time when preliminary Investigation complete**	**Information Provided with Notice**	**Conclusion and Findings of the Investigation**	**Lakehead Lines Affected**
[redacted]	09/17/2019 09:49 MST	09/17/2019 09:59 MST	09/17/2019 10:00 MST	[redacted]	[redacted]	Line 05
	10/01/2019 11:43 MST	10/01/2019 11:47 MST	10/01/2019 11:48 MST			Line 06A Line 14 Line 61
	10/15/2019 12:20 MST	10/15/2019 12:26 MST	10/15/2019 12:31 MST			Line 06A Line 14

Table G-3: P. 112 Lakehead System Pipeline Incident Reporting						
Incident Description	**Date and Time Notice Received**	**Date and Time Investigation Began**	**Date and time when preliminary Investigation complete**	**Information Provided with Notice**	**Conclusion and Findings of the Investigation**	**Lakehead Lines Affected**
[redacted]	10/26/2019 09:29 MST	10/26/2019 09:35 MST	10/26/2019 09:35 MST	[redacted]	[redacted]	Line 78
	10/28/2019 11:37 MST	10/28/2019 11:43 MST	10/28/2019 11:52 MST			Line 01 Line 02B Line 03 Line 04 Line 65 Line 67
	10/30/2019 07:55 MST	10/30/2019 08:01 MST	10/30/2019 08:03 MST			Line 01 Line 02B Line 03 Line 04 Line 67

Table G-3: P. 112 Lakehead System Pipeline Incident Reporting						
Incident Description	**Date and Time Notice Received**	**Date and Time Investigation Began**	**Date and time when preliminary Investigation complete**	**Information Provided with Notice**	**Conclusion and Findings of the Investigation**	**Lakehead Lines Affected**
[redacted]	10/31/2019 07:08 MST	10/31/2019 07:12 MST	10/31/2019 07:14 MST	[redacted]	[redacted]	Line 62 Line 78
	11/10/2019 08:54 MST	11/10/2019 08:59 MST	11/10/2019 08:59 MST			Line 05

Section H

There are no tables associated with Section H.

Section I

Table I-1: P. 121-122 Planned Valve Installation Program Overview		
Year	**Quantity and Line Number**	**Milepost Number**
2017 (Complete)	4 sites, Line 5	1473, 1487, 1601, 1715
2018 (Complete)	4 sites, Line 5	1416, 1518, 1429, 1621
2019 (Complete)	2 sites, Line 6A 2 sites, Line 14	427, 458 412, 430
2020 (Planned)	2 sites, Line 6A	80, 197

Section J

There are no tables associated with Section J.

Section IX

Table IX-1: P. 144 Problems Anticipated, Consent Decree Interpretation Issues		
Section and Title	**Relevant Paragraph or Reference**	**Enbridge Position**
[Section B] Replacement of Line 3	Paragraph 22.d(1); interpretation of "on an annual basis" from "On an annual basis with the exception of the final year of service for the Original US Line 3, Enbridge shall complete valid ILIs of all portions of Original US Line 3…"	The parties did not initially agree on whether an "annual basis" referred to a calendar year or any 12-month period. Enbridge interpreted "on an annual basis" to refer to a calendar year. EPA disagreed with this position. Enbridge, without agreeing that its initial interpretation was incorrect, has agreed to schedule all L3 runs in line with the EPA interpretation going forward, with the exception of the final year of service.
[Section D] Periodic In-Line Inspections, ILI Completion	Paragraph 28	ILI Completion is when the ILI tool is removed from the trap, the field data quality assessment is complete and demonstrates that the ILI data collection is acceptable for further analysis.
[Section D] Periodic In-Line Inspections, Circumferential Cracking	Paragraph 27, 28: "ILI tools that are most appropriate for accurately detecting, characterizing and sizing all Crack features."	As the parties have discussed at length, Enbridge believes that the consent decree was not drafted to address circumferential cracking, which historically has not occurred within the Lakehead system.
[Section D] and [Appendix A] Ovality Features	Paragraph 33.a and Paragraph 33.b	Ovality feature Priority Notifications are governed by the requirements in the project work order per Appendix A Line Proving & Geometry 2. The parties appear likely to reach agreement on how to address this issue going forward.
[Section D] FRE completed	Paragraph 40, 77.d	FRE Completion is the NDE approval date. This is chosen because the NDE QA/QC process can result in revisions to the NDE data, additional NDE data being provided and ultimately, rarely, re-excavation of the site. It appears likely that the parties will agree on a mutually accepted interpretation going forward and thus resolve this issue.

Table IX-1: P. 144 Problems Anticipated, Consent Decree Interpretation Issues		
Section and Title	**Relevant Paragraph or Reference**	**Enbridge Position**
[Section D] Interacting Features	Table 5 and Paragraph 58	The parties have disagreed over the proper characterization and handling of interacting features that include a geometric feature that is less than 2%. Following extensive discussions, the parties are close to resolving this issue by adoption of a standard that would involve use of processes known as SQuAD and QuAD.
[Section F] Update of OneSource Database, “all field investigations”	Paragraph 77.d	All field investigations applies to excavations that are triggered by consent decree requirements. Digs that Enbridge selects outside of the consent decree such as validation digs would be excluded. It appears likely that the parties will agree on a mutually accepted interpretation going forward and thus resolve this issue.
[Section G] Rupture Detection System Alarm	Paragraph 102.a	Enbridge maintains that it has met the requirements in Paragraph 102.a and that flow rate is not a mandatory input. It currently appears that this issue may be resolved based on information already provided to EPA and the ITP.

Table IX-2: P. 144 Problems Encountered	
Problem Encountered	**Relevant Paragraph**
[Section B] September 26, 2019 Identified Line 3 MOP Reporting Discrepancies	Paragraph 22
[Section D] Alternative Wall Thickness Used for RPR Calculations	Paragraph 34.c
[Section D] Crack and Corrosion Field Burst Pressure Calculations per Appendix B in the Consent Decree	Paragraph 43
[Section F] Line 5 PE-IR 2017 USCD+ NDE Report OneSource Load Data Re-Upload	Paragraph 77.d
[Section G] October 26, 2019 ILI bypass event at L1 Viking station, exceeded 4-hour outage	Paragraph 96
[Section G] Discrepancy in 24-Hour Alarm Threshold but not Impacting MBS Sensitivity	Paragraph 103

Table IX-3: P. 144 Problems Encountered [Section D] Alternative Wall Thickness Used for RPR Calculations – P. 34.c						
Tool Run ID	**Line**	**Segment**	**Tool**	**Report Type**	**Issue #**	**Re-issue receive Date**
4045	1	[redacted]	UMp	Corrosion	2	7/8/2019
3711	3		UCMp	Corrosion	3	7/29/2019
2254	4		DuDi UCM	Corrosion	3	7/22/2019
4465	4		DuDi UCM	Corrosion	4	7/29/2019
2351	4		DuDi UCM	Corrosion	2	5/22/2019[1]
2346	4		DuDi UCM	Corrosion	2	5/22/2019[1]
4466	4		DuDi UCM	Corrosion	2	7/22/2019
6013	4		DuDi UCM	Corrosion	2	7/29/2019
2358	4		DuDi UCM	Corrosion	2	5/22/2019[1]
2323	4		DuDi UCM	Corrosion	2	6/7/2019
2381	4		DuDi UCM	Corrosion	2	5/22/2019[1]
4473	10		UMp	Corrosion	3	5/22/2019[1]
4489	78		UMp	Corrosion	2	5/22/2019[1]
4443	6A		UMp	Corrosion	3	9/23/2019

TABLE NOTES

[1] These 6 reports were received during the SAR4 reporting period and reported in SAR4.

Table IX-4: P. 145 List of Potential Non-Compliances	
Potential Non-Compliance	**Summary Location**
[Section D] Line 01, CR-PW, UC GW93520 Remaining Life Deadline	Paragraph 44.b(1)

Table IX-5: P. 146 Discharges from a Lakehead System Pipeline	
Spill Date (MM/DD/YYYY)	7/4/2019
National Response Center #	1251072
Spill Location	Floodwood, St. Louis County, MN
MP#/Facility Name	Floodwood Station
Equipment or Line Number	Line 4 Unit 2 Pump
Cause of spill	Under Investigation
Spill Material	Crude Oil
Quantity of Spill	6.7 Barrels
Distance Spill Travelled	Contained within the pump room building, with a small amount of product migrating outside the building wall.
Sheen, Sludge or Emulsion Observed	Not Applicable
Name of Water that Spill Entered (if applicable)	Not Applicable
Water Quality Standard Exceeded/Violated	Not Applicable
Actions Taken or Planned to Address Spill	Pump is currently out of service for scheduled maintenance. The failed tubing will be replaced prior to the pump going back into service.
Actions Taken or Planned to Prevent Future Spills and Schedule for Future Actions	Once the final metallurgical analysis is received, it will be determined if similar configurations require remediation.
Environmental Impacts from Spill	Soil (Solely on Enbridge Property)
Root Cause	Under Investigation

Table IX-6: P. 147 Update on Discharges from a Lakehead System Pipeline		
Spill Date (MM/DD/YYYY)	3/16/2019	4/4/2019
National Response Center #	Not Required	1242662
Spill Location	Superior, Douglas County, WI	Superior, Douglas County, WI
MP#/Facility Name	Superior Terminal	Superior Terminal
Equipment or Line Number	Tank 21 Piping Flange	Tank 24 Header Line
Cause of spill	Material Failure of Pipe or Weld	Corrosion
Spill Material	Crude Oil	Crude Oil
Quantity of Spill	1.71 Barrels	2.00 Barrels
Distance Spill Travelled	80 feet	112 feet
Sheen, Sludge or Emulsion Observed	None	None
Name of Water that Spill Entered (if applicable)	Not Applicable	Not Applicable
Water Quality Standard Exceeded/Violated	Not Applicable	Not Applicable
Actions Taken or Planned to Address Spill	A pressure containing sleeve was welded over the crack and the line was placed back into service	A leak clamp was installed over the failure.
Actions Taken or Planned to Prevent Future Spills and Schedule for Future Actions	Facilities Integrity will discuss feasibility of complete removal and replacement of the failed flange and weld.	Tank 24 is currently out of service for an API 653 Inspection. The short piece of dead leg piping that failed will be removed from the system prior to Tank 24 going back into service.
Final Actions Taken or Planned to Prevent Future Spills and Schedule for Future Actions	*NDE testing concluded that the sleeve is the permanent repair[1].* *No further action warranted.*	*The dead leg piping has been removed from the tank line.* *No further action warranted.*
Environmental Impacts from Spill	Soil (Solely on Enbridge Property)	Soil (Solely on Enbridge Property)
Preliminary Root Cause	Construction, Installation, or Fabrication (Mechanical Stress)	Internal Corrosion
Final Root Cause	*No change*	*No change*

TABLE NOTE:

[1] Updates to the discharges reported in the fourth SAR are italicized

Appendix 2 – Lakehead Leak Alarm Report [108,110,111]

Reporting Period: May 23, 2019 to November 22, 2019

Lakehead Leak Alarm Reports

- Summary of Alarms (SOA)
- Record of Alarms (ROA)
- Weekly List of Alarms (WLOA)
- Instrumentation Outage Report

Prepared by Pipeline Control

On December 2, 2019

For reporting period May 23, 2019 to November 22, 2019

Purpose of the Document

The following sections present four (4) reports from section **VII.G. LEAK DETECTION AND CONTROL ROOM OPERATIONS** of the Consent Decree.

The first three reports are for subsection **VII.G.V. Leak Detection Requirements for Control Room** of the decree. They list production MBS Leak Detection System (MBS) and Rupture Detection System (RDS) alarms in the Lakehead System:

1. The summary of alarms (“SOA”) lists the total number of Alarms per pipeline and states whether or not Enbridge complied with the 10-Minute Rule in responding to Alarms. With respect to each non-compliance, it provides a reference to the post incident report which states the reason for the non-compliance and identifies the corrective action, if any, taken to prevent a recurrence of the non-compliance.
2. The record of alarms (“ROA”) documents Unscheduled Shutdowns due to Alarms. Each record indicates an instance when the pipeline was shutdown with critical facts relating to the Alarm.
3. The weekly list of alarms (“WLOA”) include Alarms broken down by pipeline, the type of Alarm, the total number of Alarms for the reporting period, the date of the Alarm, the time at which it began, and the time when the Alarm was cleared.

The fourth report is for subsection **VII.G.IV. Leak Detection Requirements for Pipelines** within the Lakehead System of the decree. The report lists instances when the outage exceeded time periods set forth in paragraph VII.G.IV.97 of the decree.

4. The instrumentation outage report documents two of the three "Reason for Instrumentation Outage" listed in paragraph VII.G.IV.97 of the decree:
    - *Instrumentation Failure*
    - *Scheduled Maintenance or repairs*
    - *Bypass ILI Tool* is documented separately.

Timestamps in the reports are in 24-hour Mountain Standard Time format.

For specific detailed requirements of the reports, please to refer to the Consent Decree.

Terms of Reference

Terms of Reference Table: Special Terms and Reference from the Consent Decree

The following section define terms copied from the Consent Decree for convenience. Please refer to the Consent Decree in case of any discrepancies.

Consent Decree Reference	Term	Definition
IV.10.dd	Lakehead System	The portion of the Mainline System within the United States that is comprised of fourteen pipelines – Lines 1, 2B, 3, 4, 5, 6A, 6B, 10, 14, 61, 62, 64, 65, and 67 – and all New Lakehead Pipelines. *Note: Line 6B has been renamed to Line 78. 6B and 78 are equivalent and the same pipeline.*
IV.10.ii	Material Balance System or MBS Leak Detection System	The computational pipeline monitoring system used by Enbridge to detect leaks or ruptures in the Lakehead System.
IV.10.ggg	Shutdown	The operational period between (1) the initial cessation of pumping operations in a pipeline, or section of pipeline, through which oil has been actively flowing and (2) the point where the flow rate within the pipeline, or section of pipeline, is zero.
IV.10.iii	Startup	The operational period between (1) the commencement of pumping operations in a pipeline that had been previously shut down and (2) the point where oil in the pipeline achieves a Steady State.
VII.G.V.105	Alarm Response Team: CRO, LDA, STA	All Alarms shall be addressed by an Alarm Response Team, which shall be composed of the following individuals in the Control Room at the time that the Alarm occurs: 1. the Control Room operator (“CRO”) who is responsible for the pipeline that generates the alarm, 2. the leak detection analyst (“LD Analyst”), and 3. the senior technical advisor for that pipeline.

Terms of Reference Table: Special Terms referenced in these reports.

The following section define terms used by Enbridge for the purpose of these reports.

Consent Decree Reference	Term	Definition
VII.G.V.104	Alarm or Alarms	Alarm and Alarming Event are equivalent in these reports. An Alarming Event is an event with a single root cause but can generate one or more alarms. Enbridge documents alarms as events. In order to align with the information requested by the Consent Decree (such as root cause), Alarming Events are reported.
VII.G.V.108	Alarm Clearance	Alarm Clearance is the act of investigating whether an Alarm is truly a potential leak or a false alarm. The alarm clearance is a procedural act and not to be confused with the alarm status which is the binary state of in alarm state (ALM, often “1”) or returned to normal (RTN, often “0”).

I certify that for this reporting period, the information contained in the SOA, WLOA, and ROAs, is true and accurate, and Enbridge has complied with the 10-Minute Rule and other requirements of Subsection VII.G.(V).

Vice President, Pipeline Control

[redacted]

Name

[redacted]

Date

1. Summary of Alarms (“SOA”)

The records in this report each contain data that are referenced by the Consent Decree. The terms are explained in the following table.

Table 1a: Description of fields in this Report

Data	Description
Pipeline	Name (number) of the pipeline
Total Alarms	Total number of alarming events for reporting period
Total Non-Compliance	**(Alarming)** Number of times Enbridge did not comply with the 10-Minute Rule in responding to Alarms **(Non-Alarming)** Number of times Enbridge did not comply with the 10-Minute Rule in responding to potential leak or rupture from a source other than an Alarm
Reasons and Corrective Actions for each Non-Compliance	Reference to the Post Incident Report describing reason for the non-compliance and the corrective action, if any, taken to prevent a reoccurrence of the non-compliance. An empty reference indicates either zero non-compliance to the 10-minute rule or the Post Incident Report is not yet generated.

Table 1b: Summary of Alarms (Reporting Period: May 23, 2019 to November 22, 2019)

Pipeline	Total Alarms	Total Non-Compliance (Alarming)	Total Non-Compliance (Non-Alarming)	Reasons and Corrective Actions for each Non-Compliance
00	0	0	0	
01	7	0	0	
02	13	0	0	
03	27	0	0	
04	6	0	0	
05	11	0	0	
06A	9	0	0	
10	3	0	0	
14	29	0	0	
61	6	0	0	
62	0	0	0	

Pipeline	Total Alarms	Total Non-Compliance (Alarming)	Total Non-Compliance (Non-Alarming)	Reasons and Corrective Actions for each Non-Compliance
64	0	0	0	
65	1	0	0	
67	3	0	0	
78	26	0	0	

2. Record of Alarm (“ROA”)

The records in this report each contain data that are referenced by the Consent Decree. The terms are explained in the following table.

Table 2a: Description of fields in this Report

Data	Description
Pipeline	Name (number) of the pipeline.
Alarming Event Start Time	Start of the Alarming Event that caused the alarm(s) to trigger. It is always the receipt time of the earliest alarm in an Alarming Event.
Alarm Received Time	Time that the alarm was received for each individual alarm within the Alarming Event. Each alarm is simultaneously received by all members of the alarm response team.
Alarm Assessed Time	Time that the alarm was assessed for each individual alarm within the Alarming Event. Each alarm is assessed by each independent member of the alarm response team; an alarm is considered assessed when all members of the alarm response team has assessed.
Root Cause	Cause and classification of the Alarm. An empty field indicates the root cause has not yet been documented.
CRO and STA Actions	Procedures executed by the control room operator (OP) and the senior technical advisor (STA) which define the positions (i.e. role) of the Alarm Recipients, the actions (or inactions) of the Alarm Response Team, and each fact considered in determining the cause of the Alarm. An empty field indicates the actions or procedures have not yet been documented.

Table 2a: Description of fields in this Report

LDA Actions	Procedures executed by the leak detection analyst (LDA) which define the positions (i.e. role) of the Alarm Recipients, the actions (or inactions) of the Alarm Response Team, and each fact considered in determining the cause of the Alarm. An empty field indicates the actions or procedures have not yet been documented.
Shutdown Commenced	Time the Unscheduled Shutdown commenced. An empty time indicates the Shutdown Commenced has not yet been documented.
Shutdown Completed	Time the Unscheduled Shutdown completed. An empty time indicates the Shutdown Completed has not yet been documented.
Justification for Resumption	Justification for resumption of pumping operations. An empty field indicates the Justification for Resumption has not yet been documented.
Startup Commenced	Time that pumping operations resumed. An empty time indicates the Startup Commenced has not yet been documented.
Were Procedures Followed	Certification of compliance with 10-Minute Rule. An empty field indicates the certification of compliance has not yet been documented.
Post Incident Report	Reference of Post-Incident Report if not in compliance with the 10-Minute Rule. An empty reference indicates the Post Incident Report is not needed or has not yet been documented.

Table 2b: Record of Alarm

Pipeline	01
Alarming Event Start Time	2019-08-28 23:14:13
MBS Alarm Received Time **MBS Alarm Assessed Time**	2019-08-28 23:14:13 2019-08-28 23:23:01
Root Cause	Column Separation
CRO and STA Actions	LDAM - Leak Detection System (LDS) Alarm - Flowing Pipeline
LDA Actions	LD - MBS - Leak Alarm
Shutdown Commenced	2019-08-28 23:23:29
Shutdown Completed	2019-08-28 23:34:40
Justification for Resumption	After shutdown, alarm deemed valid following LDA investigation. Column separation investigated by CCO with no unexplained leak triggers
Startup Commenced	2019-08-29 01:23:20
Were Procedures Followed	Yes
Post Incident Report	

Pipeline	02
Alarming Event Start Time	2019-07-05 21:16:52
MBS Alarm Received Time **MBS Alarm Assessed Time** **MBS Alarm Received Time** **MBS Alarm Assessed Time**	2019-07-05 21:16:52 2019-07-05 21:25:04 2019-07-05 21:20:22 2019-07-05 21:25:08
Root Cause	Transient Condition
CRO and STA Actions	LDAM - Leak Detection System (LDS) Alarm - Flowing Pipeline LDAM - Leak Detection System (LDS) Alarm - Non-Flowing Pipeline
LDA Actions	LD - MBS - Leak Alarm
Shutdown Commenced	2019-07-05 21:07:12** **The line was in the process of shutting down when the alarm was generated. The 'Shutdown Commenced' time identifies when the shutdown was initiated.
Shutdown Completed	2019-07-05 21:33:39
Justification for Resumption	Static Pressure Monitoring of System over 60 minutes and CCO investigation identified no additional leak triggers. Regional and CCO Admin approvals granted
Startup Commenced	2019-07-06 02:55:00
Were Procedures Followed	Yes
Post Incident Report	

Pipeline	02
Alarming Event Start Time	2019-07-09 23:07:39
MBS Alarm Received Time **MBS Alarm Assessed Time** **MBS Alarm Received Time** **MBS Alarm Assessed Time**	2019-07-09 23:07:39 2019-07-10 00:47:13 2019-07-09 23:20:40 2019-07-10 00:47:15
Root Cause	Instrument Error
CRO and STA Actions	LDAM - Leak Detection System (LDS) Alarm - Flowing Pipeline
LDA Actions	LD - MBS - Leak Alarm
Shutdown Commenced	2019-07-09 23:17:18
Shutdown Completed	2019-07-09 23:32:15
Justification for Resumption	CCO investigation identified no leak triggers - Regional and CCO admin approvals granted
Startup Commenced	2019-07-10 02:00:00
Were Procedures Followed	Yes
Post Incident Report	

Pipeline	02
Alarming Event Start Time	2019-09-01 05:49:14
MBS Alarm Received Time **MBS Alarm Assessed Time** **MBS Alarm Received Time** **MBS Alarm Assessed Time**	2019-09-01 05:49:14 2019-09-01 07:01:24 2019-09-01 05:49:45 2019-09-01 07:01:27
Root Cause	Instrument Error
CRO and STA Actions	LDAM - Leak Detection System (LDS) Alarm - Flowing Pipeline
LDA Actions	LD - MBS - Leak Alarm
Shutdown Commenced	2019-09-01 05:59:00
Shutdown Completed	2019-09-01 06:15:34
Justification for Resumption	After shutdown, alarm deemed invalid following LDA investigation and CCO investigation identified no leak triggers
Startup Commenced	2019-09-01 09:35:00
Were Procedures Followed	Yes
Post Incident Report	

Pipeline	02
Alarming Event Start Time	2019-11-10 07:32:18
MBS Alarm Received Time **MBS Alarm Assessed Time** **MBS Alarm Received Time** **MBS Alarm Assessed Time**	2019-11-10 07:32:18 2019-11-10 08:58:36 2019-11-10 07:38:49 2019-11-10 08:58:38
Root Cause	Fluid Issue
CRO and STA Actions	LDAM - Leak Detection System (LDS) Alarm - Flowing Pipeline
LDA Actions	LD - MBS - Leak Alarm
Shutdown Commenced	2019-11-10 07:42:39* *Each alarm was assessed individually to rule out the possibility of a leak within 10 minutes of the alarm in the event. Shutdown was commenced immediately, not to exceed 60 seconds upon completion of the 10-minute timer. This is in accordance with the Ten-Minute Rule as explained to the ITP on Sept 2017 and Jan 2018.
Shutdown Completed	2019-11-10 08:00:51
Justification for Resumption	CCO investigation identified no leak triggers - Regional and CCO admin approvals granted
Startup Commenced	2019-11-10 09:35:16
Were Procedures Followed	Yes
Post Incident Report	

Pipeline	03
Alarming Event Start Time	2019-06-03 09:42:55
MBS Alarm Received Time **MBS Alarm Assessed Time**	2019-06-03 09:42:55 2019-06-03 09:51:35
Root Cause	Transient Condition
CRO and STA Actions	LDAM - Leak Detection System (LDS) Alarm - Flowing Pipeline
LDA Actions	LD - MBS - Leak Alarm
Shutdown Commenced	2019-06-03 09:42:36** **The line was in the process of shutting down when the alarm was generated. The 'Shutdown Commenced' time identifies when the shutdown was initiated.
Shutdown Completed	2019-06-03 10:06:29
Justification for Resumption	Static Pressure Monitoring of System over 60 minutes and CCO investigation identified no additional leak triggers. Regional and CCO Admin approvals granted
Startup Commenced	2019-06-03 12:31:02
Were Procedures Followed	Yes
Post Incident Report	

Pipeline	03
Alarming Event Start Time	2019-09-05 07:49:51
MBS Alarm Received Time **MBS Alarm Assessed Time**	2019-09-05 07:49:51 2019-09-05 07:55:31
Root Cause	Transient Condition
CRO and STA Actions	LDAM - Leak Detection System (LDS) Alarm - Flowing Pipeline
LDA Actions	LD - MBS - Leak Alarm
Shutdown Commenced	2019-09-05 07:48:48** **The line was in the process of shutting down when the alarm was generated. The 'Shutdown Commenced' time identifies when the shutdown was initiated.
Shutdown Completed	2019-09-05 08:05:25
Justification for Resumption	CCO investigation identified no leak triggers - Regional and CCO admin approvals granted
Startup Commenced	2019-09-05 10:30:37
Were Procedures Followed	Yes
Post Incident Report	

Pipeline	03
Alarming Event Start Time	2019-10-30 03:57:44
MBS Alarm Received Time **MBS Alarm Assessed Time** **MBS Alarm Received Time** **MBS Alarm Assessed Time**	2019-10-30 03:57:44 2019-10-30 04:03:53 2019-10-30 04:09:46 2019-10-30 06:53:54
Root Cause	Column Separation
CRO and STA Actions	LDAM - Leak Detection System (LDS) Alarm - Non-Flowing Pipeline
LDA Actions	LD - MBS - Leak Alarm
Shutdown Commenced	Not Applicable - pipeline was already Shutdown and Sectionalized
Shutdown Completed	Not Applicable - pipeline was already Shutdown and Sectionalized
Justification for Resumption	Visual inspection performed by field staff - Regional and CCO Admin approvals granted
Startup Commenced	2019-10-30 10:04:17
Were Procedures Followed	Yes
Post Incident Report	

Pipeline	03
Alarming Event Start Time	2019-10-30 10:13:56
MBS Alarm Received Time **MBS Alarm Assessed Time** **MBS Alarm Received Time** **MBS Alarm Assessed Time** **MBS Alarm Received Time** **MBS Alarm Assessed Time**	2019-10-30 10:13:56 2019-10-30 10:24:33 2019-10-30 10:14:25 2019-10-30 10:24:34 2019-10-30 10:15:24 2019-10-30 10:24:35
Root Cause	Column Separation
CRO and STA Actions	LDAM - Leak Detection System (LDS) Alarm - Flowing Pipeline LDAM - Leak Detection System (LDS) Alarm - Non-Flowing Pipeline
LDA Actions	LD - MBS - Leak Alarm
Shutdown Commenced	2019-10-30 10:23:59* *Each alarm was assessed individually to rule out the possibility of a leak within 10 minutes of the alarm in the event. Shutdown was commenced immediately, not to exceed 60 seconds upon completion of the 10-minute timer. This is in accordance with the Ten-Minute Rule as explained to the ITP on Sept 2017 and Jan 2018.
Shutdown Completed	2019-10-30 10:36:24
Justification for Resumption	After shutdown, alarm deemed invalid following LDA investigation and CCO investigation identified no leak triggers
Startup Commenced	2019-10-30 11:25:27
Were Procedures Followed	Yes
Post Incident Report	

Pipeline	03
Alarming Event Start Time	2019-10-30 10:22:25
MBS Alarm Received Time **MBS Alarm Assessed Time**	2019-10-30 10:22:25 2019-10-30 10:31:56
Root Cause	Column Separation
CRO and STA Actions	LDAM - Leak Detection System (LDS) Alarm - Flowing Pipeline
LDA Actions	LD - MBS - Leak Alarm
Shutdown Commenced	2019-10-30 10:23:59
Shutdown Completed	2019-10-30 10:36:24
Justification for Resumption	After shutdown, alarm deemed valid following LDA investigation. Column separation investigated by CCO with no unexplained leak triggers
Startup Commenced	2019-10-30 11:25:41
Were Procedures Followed	Yes
Post Incident Report	

Pipeline	06A
Alarming Event Start Time	2019-06-19 21:25:02
MBS Alarm Received Time **MBS Alarm Assessed Time**	2019-06-19 21:25:02 2019-06-19 21:32:26
Root Cause	Column Separation
CRO and STA Actions	LDAM - Leak Detection System (LDS) Alarm - Non-Flowing Pipeline
LDA Actions	LD - MBS - Leak Alarm
Shutdown Commenced	Not Applicable - pipeline was already Shutdown and Sectionalized
Shutdown Completed	Not Applicable - pipeline was already Shutdown and Sectionalized
Justification for Resumption	After shutdown, alarm deemed valid following LDA investigation. Column separation investigated by CCO with no unexplained leak triggers
Startup Commenced	2019-06-20 13:15:00
Were Procedures Followed	Yes
Post Incident Report	

Pipeline	06A
Alarming Event Start Time	2019-10-30 08:06:03
RDS Alarm Received Time **RDS Alarm Assessed Time**	2019-10-30 08:06:03 2019-10-30 08:29:28
Root Cause	Field Maintenance
CRO and STA Actions	Rupture Detection Alarm - Pipeline
LDA Actions	LD - RDS - Rupture Alarm
Shutdown Commenced	2019-10-30 08:06:03** **The Rupture alarm results in automated shutdown of the pipeline system.
Shutdown Completed	2019-10-30 08:30:42
Justification for Resumption	CCO investigation identified no leak triggers - Regional and CCO admin approvals granted
Startup Commenced	2019-10-30 10:14:35
Were Procedures Followed	Yes
Post Incident Report	

Pipeline	06A
Alarming Event Start Time	2019-10-30 08:10:34
MBS Alarm Received Time **MBS Alarm Assessed Time**	2019-10-30 08:10:34 2019-10-30 08:26:13
Root Cause	Field Maintenance
CRO and STA Actions	LDAM - Leak Detection System (LDS) Alarm - Flowing Pipeline
LDA Actions	LD - MBS - Leak Alarm
Shutdown Commenced	2019-10-30 08:06:03** **The line was in the process of shutting down when the alarm was generated. The 'Shutdown Commenced' time identifies when the shutdown was initiated.
Shutdown Completed	2019-10-30 08:30:42
Justification for Resumption	After shutdown, alarm deemed invalid following LDA investigation and CCO investigation identified no leak triggers
Startup Commenced	2019-10-30 10:14:19
Were Procedures Followed	Yes
Post Incident Report	

Pipeline	14
Alarming Event Start Time	2019-05-27 12:33:32
MBS Alarm Received Time **MBS Alarm Assessed Time**	2019-05-27 12:33:32 2019-05-27 12:40:16
Root Cause	Transient Condition
CRO and STA Actions	LDAM - Leak Detection System (LDS) Alarm - Non-Flowing Pipeline
LDA Actions	LD - MBS - Leak Alarm
Shutdown Commenced	Not Applicable - pipeline was already Shutdown and Sectionalized
Shutdown Completed	Not Applicable - pipeline was already Shutdown and Sectionalized
Justification for Resumption	CCO investigation identified no leak triggers - Regional and CCO admin approvals granted
Startup Commenced	2019-05-27 15:15:34
Were Procedures Followed	Yes
Post Incident Report	

Pipeline	14
Alarming Event Start Time	2019-09-04 00:12:02
MBS Alarm Received Time **MBS Alarm Assessed Time** **MBS Alarm Received Time** **MBS Alarm Assessed Time**	2019-09-04 00:12:02 2019-09-04 00:22:04 2019-09-04 00:17:33 2019-09-04 00:27:20
Root Cause	Instrument Error
CRO and STA Actions	LDAM - Leak Detection System (LDS) Alarm - Flowing Pipeline
LDA Actions	LD - MBS - Leak Alarm
Shutdown Commenced	2019-09-04 00:22:05* *Each alarm was assessed individually to rule out the possibility of a leak within 10 minutes of the alarm in the event. Shutdown was commenced immediately, not to exceed 60 seconds upon completion of the 10-minute timer. This is in accordance with the Ten-Minute Rule as explained to the ITP on Sept 2017 and Jan 2018.
Shutdown Completed	2019-09-04 00:38:08
Justification for Resumption	Aerial Patrol Performed - Regional and CCO admin approvals granted
Startup Commenced	2019-09-04 14:25:21
Were Procedures Followed	Yes
Post Incident Report	

Pipeline	61
Alarming Event Start Time	2019-07-20 11:54:46
MBS Alarm Received Time **MBS Alarm Assessed Time** **MBS Alarm Received Time** **MBS Alarm Assessed Time** **MBS Alarm Received Time** **MBS Alarm Assessed Time**	2019-07-20 11:54:46 2019-07-20 13:46:29 2019-07-20 11:58:48 2019-07-20 13:46:31 2019-07-20 11:59:47 2019-07-20 13:46:34
Root Cause	LDS Error
CRO and STA Actions	LDAM - Leak Detection System (LDS) Alarm - Non-Flowing Pipeline
LDA Actions	LD - MBS - Leak Alarm
Shutdown Commenced	Not Applicable - pipeline was already Shutdown and Sectionalized
Shutdown Completed	Not Applicable - pipeline was already Shutdown and Sectionalized
Justification for Resumption	After shutdown, alarm deemed invalid following LDA investigation and CCO investigation identified no leak triggers
Startup Commenced	2019-07-20 13:56:21
Were Procedures Followed	Yes
Post Incident Report	

Pipeline	61
Alarming Event Start Time	2019-07-20 14:55:20
MBS Alarm Received Time **MBS Alarm Assessed Time**	2019-07-20 14:55:20 2019-07-20 15:05:32
Root Cause	Transient Condition
CRO and STA Actions	LDAM - Leak Detection System (LDS) Alarm - Flowing Pipeline
LDA Actions	LD - MBS - Leak Alarm
Shutdown Commenced	2019-07-20 15:05:18
Shutdown Completed	2019-07-20 15:12:00
Justification for Resumption	Static Pressure Monitoring of System over 60 minutes and CCO investigation identified no additional leak triggers. Regional and CCO Admin approvals granted Visual inspection performed by field staff - Regional and CCO Admin approvals granted
Startup Commenced	2019-07-20 18:30:00
Were Procedures Followed	Yes
Post Incident Report	

Pipeline	61
Alarming Event Start Time	2019-10-16 05:45:24
MBS Alarm Received Time **MBS Alarm Assessed Time** **MBS Alarm Received Time** **MBS Alarm Assessed Time**	2019-10-16 05:45:24 2019-10-16 05:54:57 2019-10-16 05:46:54 2019-10-16 05:55:35
Root Cause	Transient Condition
CRO and STA Actions	LDAM - Leak Detection System (LDS) Alarm - Flowing Pipeline
LDA Actions	LD - MBS - Leak Alarm
Shutdown Commenced	2019-10-16 05:45:11** **The line was in the process of shutting down when the alarm was generated. The 'Shutdown Commenced' time identifies when the shutdown was initiated.
Shutdown Completed	2019-10-16 06:01:51
Justification for Resumption	Static Pressure Monitoring of System over 60 minutes and CCO investigation identified no additional leak triggers. Regional and CCO Admin approvals granted
Startup Commenced	2019-10-16 12:07:30
Were Procedures Followed	Yes
Post Incident Report	

Pipeline	65
Alarming Event Start Time	2019-10-28 21:17:13
MBS Alarm Received Time **MBS Alarm Assessed Time** **MBS Alarm Received Time** **MBS Alarm Assessed Time**	2019-10-28 21:17:13 2019-10-28 21:41:34 2019-10-28 21:20:43 2019-10-28 21:41:32
Root Cause	Transient Condition
CRO and STA Actions	LDAM - Leak Detection System (LDS) Alarm - Non-Flowing Pipeline
LDA Actions	LD - MBS - Leak Alarm
Shutdown Commenced	Not Applicable - pipeline was already Shutdown and Sectionalized
Shutdown Completed	Not Applicable - pipeline was already Shutdown and Sectionalized
Justification for Resumption	CCO investigation identified no leak triggers - Regional and CCO admin approvals granted
Startup Commenced	2019-10-28 23:00:00
Were Procedures Followed	Yes
Post Incident Report	

Pipeline	78
Alarming Event Start Time	2019-06-19 12:33:52
MBS Alarm Received Time **MBS Alarm Assessed Time**	2019-06-19 12:33:52 2019-06-19 12:41:41
Root Cause	Column Separation
CRO and STA Actions	LDAM - Leak Detection System (LDS) Alarm - Non-Flowing Pipeline
LDA Actions	LD - MBS - Leak Alarm
Shutdown Commenced	Not Applicable - pipeline was already Shutdown and Sectionalized
Shutdown Completed	Not Applicable - pipeline was already Shutdown and Sectionalized
Justification for Resumption	After shutdown, alarm deemed valid following LDA investigation. Column separation investigated by CCO with no unexplained leak triggers
Startup Commenced	2019-06-19 15:06:00
Were Procedures Followed	Yes
Post Incident Report	

Pipeline	78
Alarming Event Start Time	2019-06-22 10:34:18
MBS Alarm Received Time **MBS Alarm Assessed Time** **MBS Alarm Received Time** **MBS Alarm Assessed Time** **MBS Alarm Received Time** **MBS Alarm Assessed Time**	2019-06-22 10:34:18 2019-06-22 10:40:18 2019-06-22 12:45:49 2019-06-22 12:48:27 2019-06-22 15:15:24 2019-06-22 15:17:55
Root Cause	Column Separation
CRO and STA Actions	LDAM - Leak Detection System (LDS) Alarm - Non-Flowing Pipeline
LDA Actions	LD - MBS - Leak Alarm
Shutdown Commenced	Not Applicable - pipeline was already Shutdown and Sectionalized
Shutdown Completed	Not Applicable - pipeline was already Shutdown and Sectionalized
Justification for Resumption	After shutdown, alarm deemed valid following LDA investigation. Column separation investigated by CCO with no unexplained leak triggers
Startup Commenced	2019-06-23 14:40:00
Were Procedures Followed	Yes
Post Incident Report	

Pipeline	78
Alarming Event Start Time	2019-07-20 22:19:14
MBS Alarm Received Time **MBS Alarm Assessed Time**	2019-07-20 22:19:14 2019-07-20 22:26:53
Root Cause	Column Separation
CRO and STA Actions	LDAM - Leak Detection System (LDS) Alarm - Non-Flowing Pipeline
LDA Actions	LD - MBS - Leak Alarm
Shutdown Commenced	Not Applicable - pipeline was already Shutdown and Sectionalized
Shutdown Completed	Not Applicable - pipeline was already Shutdown and Sectionalized
Justification for Resumption	After shutdown, alarm deemed valid following LDA investigation. Column separation investigated by CCO with no unexplained leak triggers
Startup Commenced	2019-07-21 11:00:00
Were Procedures Followed	Yes
Post Incident Report	

Pipeline	78
Alarming Event Start Time	2019-09-08 19:37:52
MBS Alarm Received Time **MBS Alarm Assessed Time**	2019-09-08 19:37:52 2019-09-08 19:41:04
Root Cause	Column Separation
CRO and STA Actions	LDAM - Leak Detection System (LDS) Alarm - Non-Flowing Pipeline
LDA Actions	LD - MBS - Leak Alarm
Shutdown Commenced	Not Applicable - pipeline was already Shutdown and Sectionalized
Shutdown Completed	Not Applicable - pipeline was already Shutdown and Sectionalized
Justification for Resumption	After shutdown, alarm deemed valid following LDA investigation. Column separation investigated by CCO with no unexplained leak triggers
Startup Commenced	2019-09-09 01:00:12
Were Procedures Followed	Yes
Post Incident Report	

Pipeline	78
Alarming Event Start Time	2019-09-09 15:43:34
MBS Alarm Received Time **MBS Alarm Assessed Time**	2019-09-09 15:43:34 2019-09-09 15:48:25
Root Cause	Column Separation
CRO and STA Actions	LDAM - Leak Detection System (LDS) Alarm - Non-Flowing Pipeline
LDA Actions	LD - MBS - Leak Alarm
Shutdown Commenced	Not Applicable - pipeline was already Shutdown and Sectionalized
Shutdown Completed	Not Applicable - pipeline was already Shutdown and Sectionalized
Justification for Resumption	After shutdown, alarm deemed valid following LDA investigation. Column separation investigated by CCO with no unexplained leak triggers
Startup Commenced	2019-09-09 16:34:11
Were Procedures Followed	Yes
Post Incident Report	

Pipeline	78
Alarming Event Start Time	2019-09-12 09:01:42
AVB Alarm Received Time **AVB Alarm Assessed Time**	2019-09-12 09:01:42 2019-09-12 09:12:06
Root Cause	Field Maintenance
CRO and STA Actions	LDAM - Leak Detection System (LDS) Alarm - Flowing Pipeline
LDA Actions	LD - AVB - Leak Alarm
Shutdown Commenced	2019-09-12 09:12:00* *Each alarm was assessed individually to rule out the possibility of a leak within 10 minutes of the alarm in the event. Shutdown was commenced immediately, not to exceed 60 seconds upon completion of the 10-minute timer. This is in accordance with the Ten-Minute Rule as explained to the ITP on Sept 2017 and Jan 2018.
Shutdown Completed	2019-09-12 09:19:00
Justification for Resumption	After shutdown, alarm deemed invalid following LDA investigation and CCO investigation identified no leak triggers
Startup Commenced	2019-09-12 10:03:00
Were Procedures Followed	Yes
Post Incident Report	

Pipeline	78
Alarming Event Start Time	2019-09-16 01:13:00
MBS Alarm Received Time **MBS Alarm Assessed Time** **MBS Alarm Received Time** **MBS Alarm Assessed Time**	2019-09-16 01:13:00 2019-09-16 01:16:54 2019-09-16 01:16:30 2019-09-16 01:18:19
Root Cause	Column Separation
CRO and STA Actions	LDAM - Leak Detection System (LDS) Alarm - Non-Flowing Pipeline
LDA Actions	LD - MBS - Leak Alarm
Shutdown Commenced	Not Applicable - pipeline was already Shutdown and Sectionalized
Shutdown Completed	Not Applicable - pipeline was already Shutdown and Sectionalized
Justification for Resumption	After shutdown, alarm deemed valid following LDA investigation. Column separation investigated by CCO with no unexplained leak triggers
Startup Commenced	2019-09-17 05:00:00
Were Procedures Followed	Yes
Post Incident Report	

Pipeline	78
Alarming Event Start Time	2019-09-20 03:56:04
MBS Alarm Received Time **MBS Alarm Assessed Time**	2019-09-20 03:56:04 2019-09-20 04:16:23
Root Cause	Instrument Error
CRO and STA Actions	LDAM - Leak Detection System (LDS) Alarm - Flowing Pipeline
LDA Actions	LD - MBS - Leak Alarm
Shutdown Commenced	2019-09-20 03:59:52
Shutdown Completed	2019-09-20 04:10:48
Justification for Resumption	After shutdown, alarm deemed invalid following LDA investigation and CCO investigation identified no leak triggers
Startup Commenced	2019-09-20 04:30:24
Were Procedures Followed	Yes
Post Incident Report	

Pipeline	78
Alarming Event Start Time	2019-10-17 03:31:13
MBS Alarm Received Time **MBS Alarm Assessed Time**	2019-10-17 03:31:13 2019-10-17 06:46:17
Root Cause	Instrument Error
CRO and STA Actions	LDAM - Leak Detection System (LDS) Alarm - Flowing Pipeline
LDA Actions	LD - MBS - Leak Alarm
Shutdown Commenced	2019-10-17 03:42:10* *Each alarm was assessed individually to rule out the possibility of a leak within 10 minutes of the alarm in the event. Shutdown was commenced immediately, not to exceed 60 seconds upon completion of the 10-minute timer. This is in accordance with the Ten-Minute Rule as explained to the ITP on Sept 2017 and Jan 2018.
Shutdown Completed	2019-10-17 03:55:38
Justification for Resumption	After shutdown, alarm deemed invalid following LDA investigation and CCO investigation identified no leak triggers
Startup Commenced	2019-10-17 08:26:00
Were Procedures Followed	Yes
Post Incident Report	

3. Weekly List of Alarms (“WLOA”)

The records in this report each contain data that are referenced by the Consent Decree. The terms are explained in the following table.

Table 3a: Description of fields in this Report

Data	Description
Week	ISO 8601 week date label to identify the week in the “weekly” list of alarms.
Pipeline	Name (number) of the pipeline.
Type	Type of alarm (AVB, MBS or RDS): • AVB are 24-hour MBS alarms • MBS are 5-minute, 20-minute, or 2-hour MBS alarms • RDS are Rupture Detection System alarms
Alarming Event Start Time	Start of the Alarming Event that caused the alarm(s) to trigger. It is always the receipt time of the earliest alarm in an Alarming Event.
Alarm Received Time	Time that the alarm was received for each individual alarm within the Alarming Event. Each alarm is simultaneously received by all members of the alarm response team.
Alarm Assessed Time	Time that the alarm was assessed for each individual alarm within the Alarming Event. Each alarm is assessed by each independent member of the alarm response team; an alarm is considered assessed when all members of the alarm response team has assessed.
Alarm Cleared Time	The date and time when the Alarm was cleared. An empty time indicates the Alarm has not yet been cleared as of the printing of this report.
Shutdown Required	Indication of whether this Alarm resulted in a shutdown.

Table 3b: Weekly List of Alarms

2019 Week 21: 1 Alarming Event in total

Pipeline	Alarming Event Start Time	Type	Alarm Received Time	Alarm Assessed Time	Alarm Cleared Time	Shutdown Required
14	2019-05-25 12:06:40	MBS	2019-05-25 12:06:40	2019-05-25 12:10:43	2019-05-25 12:10:43	No

2019 Week 22: 8 Alarming Events in total

Pipeline	Alarming Event Start Time	Type	Alarm Received Time	Alarm Assessed Time	Alarm Cleared Time	Shutdown Required
03	2019-05-29 00:33:01	MBS	2019-05-29 00:33:01	2019-05-29 00:41:06	2019-05-29 00:41:06	No
06A	2019-05-27 21:22:07	MBS	2019-05-27 21:22:07	2019-05-27 21:28:28	2019-05-27 21:28:28	No
		MBS	2019-05-27 21:22:07	2019-05-27 21:28:27	2019-05-27 21:28:27	
		MBS	2019-05-27 21:28:36	2019-05-27 21:31:42	2019-05-27 21:31:42	
14	2019-05-27 12:33:32	MBS	2019-05-27 12:33:32	2019-05-27 12:40:16	2019-05-27 15:15:06	Yes
14	2019-05-29 18:46:52	MBS	2019-05-29 18:46:52	2019-05-29 18:52:00	2019-05-29 18:52:00	No
14	2019-06-02 23:13:40	MBS	2019-06-02 23:13:40	2019-06-02 23:22:04	2019-06-02 23:22:04	No
61	2019-05-30 12:31:27	MBS	2019-05-30 12:31:27	2019-05-30 12:40:09	2019-05-30 12:40:09	No
		MBS	2019-05-30 12:31:27	2019-05-30 12:40:10	2019-05-30 12:40:10	
		MBS	2019-05-30 12:31:27	2019-05-30 12:40:11	2019-05-30 12:40:11	
78	2019-05-29 06:33:24	MBS	2019-05-29 06:33:24	2019-05-29 06:37:36	2019-05-29 06:37:36	No
78	2019-05-30 11:16:32	MBS	2019-05-30 11:16:32	2019-05-30 11:24:04	2019-05-30 11:24:04	No
		MBS	2019-05-30 11:17:01	2019-05-30 11:24:06	2019-05-30 11:24:06	
		MBS	2019-05-30 11:17:01	2019-05-30 11:24:07	2019-05-30 11:24:07	
		MBS	2019-05-30 11:17:01	2019-05-30 11:24:08	2019-05-30 11:24:08	
		MBS	2019-05-30 11:18:32	2019-05-30 11:24:10	2019-05-30 11:24:10	
		MBS	2019-05-30 11:20:02	2019-05-30 11:24:11	2019-05-30 11:24:11	

2019 Week 23: 6 Alarming Events in total

Pipeline	Alarming Event Start Time	Type	Alarm Received Time	Alarm Assessed Time	Alarm Cleared Time	Shutdown Required
02	2019-06-09 03:09:41	MBS	2019-06-09 03:09:41	2019-06-09 03:19:31	2019-06-09 03:19:31	No
03	2019-06-03 09:42:55	MBS	2019-06-03 09:42:55	2019-06-03 09:51:35	2019-06-03 11:36:17	Yes
03	2019-06-08 15:01:41	AVB AVB	2019-06-08 15:01:41 2019-06-08 15:01:41	2019-06-08 15:10:21 2019-06-08 15:10:19	2019-06-08 15:10:21 2019-06-08 15:10:19	No
10	2019-06-04 11:36:49	MBS	2019-06-04 11:36:49	2019-06-04 11:41:58	2019-06-04 11:41:58	No
14	2019-06-08 04:36:04	MBS	2019-06-08 04:36:04	2019-06-08 04:43:31	2019-06-08 04:43:31	No
61	2019-06-04 06:32:06	MBS	2019-06-04 06:32:06	2019-06-04 06:36:11	2019-06-04 06:36:11	No

2019 Week 24: 3 Alarming Events in total

Pipeline	Alarming Event Start Time	Type	Alarm Received Time	Alarm Assessed Time	Alarm Cleared Time	Shutdown Required
03	2019-06-15 00:13:30	MBS	2019-06-15 00:13:30	2019-06-15 00:17:56	2019-06-15 00:17:56	No
04	2019-06-12 01:46:17	MBS MBS	2019-06-12 01:46:17 2019-06-12 01:46:46	2019-06-12 01:52:43 2019-06-12 01:52:44	2019-06-12 01:52:43 2019-06-12 01:52:44	No
14	2019-06-13 05:04:59	MBS	2019-06-13 05:04:59	2019-06-13 05:12:33	2019-06-13 05:12:33	No

2019 Week 25: 4 Alarming Events in total

Pipeline	Alarming Event Start Time	Type	Alarm Received Time	Alarm Assessed Time	Alarm Cleared Time	Shutdown Required
01	2019-06-18 11:44:00	MBS MBS	2019-06-18 11:44:00 2019-06-18 11:44:00	2019-06-18 11:46:55 2019-06-18 11:46:53	2019-06-18 11:46:55 2019-06-18 11:46:53	No
06A	2019-06-19 21:25:02	MBS	2019-06-19 21:25:02	2019-06-19 21:32:26	2019-06-19 21:47:26	Yes
78	2019-06-19 12:33:52	MBS	2019-06-19 12:33:52	2019-06-19 12:41:41	2019-06-19 14:01:21	Yes
78	2019-06-22 10:34:18	MBS MBS MBS	2019-06-22 10:34:18 2019-06-22 12:45:49 2019-06-22 15:15:24	2019-06-22 10:40:18 2019-06-22 12:48:27 2019-06-22 15:17:55	2019-06-22 11:05:44 2019-06-22 11:05:44 2019-06-22 11:05:44	Yes

2019 Week 26: 4 Alarming Events in total

Pipeline	Alarming Event Start Time	Type	Alarm Received Time	Alarm Assessed Time	Alarm Cleared Time	Shutdown Required
06A	2019-06-30 12:24:37	MBS	2019-06-30 12:24:37	2019-06-30 12:28:40	2019-06-30 12:28:40	No
		MBS	2019-06-30 14:02:42	2019-06-30 14:04:18	2019-06-30 14:04:18	
10	2019-06-25 19:25:33	MBS	2019-06-25 19:25:33	2019-06-25 19:32:10	2019-06-25 19:32:10	No
		AVB	2019-06-25 19:28:32	2019-06-25 19:32:11	2019-06-25 19:32:11	
14	2019-06-25 11:17:40	MBS	2019-06-25 11:17:40	2019-06-25 11:25:03	2019-06-25 11:25:03	No
61	2019-06-26 09:19:12	MBS	2019-06-26 09:19:12	2019-06-26 09:26:28	2019-06-26 09:26:28	No
		MBS	2019-06-26 09:19:12	2019-06-26 09:26:31	2019-06-26 09:26:31	

2019 Week 27: 4 Alarming Events in total

Pipeline	Alarming Event Start Time	Type	Alarm Received Time	Alarm Assessed Time	Alarm Cleared Time	Shutdown Required
01	2019-07-04 04:08:15	MBS	2019-07-04 04:08:15	2019-07-04 04:15:01	2019-07-04 04:15:01	No
		MBS	2019-07-04 04:11:45	2019-07-04 04:16:05	2019-07-04 04:16:05	
		MBS	2019-07-04 04:14:15	2019-07-04 04:16:07	2019-07-04 04:16:07	
02	2019-07-05 21:16:52	MBS	2019-07-05 21:16:52	2019-07-05 21:25:04	2019-07-05 22:55:15	Yes
		MBS	2019-07-05 21:20:22	2019-07-05 21:25:08	2019-07-05 22:55:15	
03	2019-07-05 17:36:08	MBS	2019-07-05 17:36:08	2019-07-05 17:42:20	2019-07-05 17:42:20	No
		MBS	2019-07-05 17:36:08	2019-07-05 17:42:22	2019-07-05 17:42:22	
		MBS	2019-07-05 17:40:08	2019-07-05 17:42:24	2019-07-05 17:42:24	
78	2019-07-04 04:40:01	MBS	2019-07-04 04:40:01	2019-07-04 04:42:51	2019-07-04 04:42:51	No

2019 Week 28: 3 Alarming Events in total

Pipeline	Alarming Event Start Time	Type	Alarm Received Time	Alarm Assessed Time	Alarm Cleared Time	Shutdown Required
02	2019-07-09 23:07:39	MBS	2019-07-09 23:07:39	2019-07-10 00:47:13	2019-07-10 01:48:00	Yes
		MBS	2019-07-09 23:20:40	2019-07-10 00:47:15	2019-07-10 01:48:00	
05	2019-07-10 03:20:21	MBS	2019-07-10 03:20:21	2019-07-10 03:25:54	2019-07-10 03:25:54	No
		MBS	2019-07-10 03:20:21	2019-07-10 03:25:52	2019-07-10 03:25:52	
05	2019-07-14 18:55:54	MBS	2019-07-14 18:55:54	2019-07-14 19:00:30	2019-07-14 19:00:30	No
		MBS	2019-07-14 18:55:54	2019-07-14 19:00:33	2019-07-14 19:00:33	

2019 Week 29: 8 Alarming Events in total

Pipeline	Alarming Event Start Time	Type	Alarm Received Time	Alarm Assessed Time	Alarm Cleared Time	Shutdown Required
03	2019-07-17 19:52:06	MBS	2019-07-17 19:52:06	2019-07-17 19:59:39	2019-07-17 19:59:39	No
03	2019-07-18 03:09:54	MBS	2019-07-18 03:09:54	2019-07-18 03:12:56	2019-07-18 03:12:56	No
06A	2019-07-20 09:01:54	AVB	2019-07-20 09:01:54	2019-07-20 09:08:32	2019-07-20 09:08:32	No
14	2019-07-19 07:48:57	MBS	2019-07-19 07:48:57	2019-07-19 07:52:14	2019-07-19 07:52:14	No
14	2019-07-19 20:45:21	MBS	2019-07-19 20:45:21	2019-07-19 20:52:51	2019-07-19 20:52:51	No
		MBS	2019-07-19 20:45:21	2019-07-19 20:52:53	2019-07-19 20:52:53	
		MBS	2019-07-19 20:45:21	2019-07-19 20:52:55	2019-07-19 20:52:55	
61	2019-07-20 11:54:46	MBS	2019-07-20 11:54:46	2019-07-20 13:46:29	2019-07-20 13:56:11	Yes
		MBS	2019-07-20 11:58:48	2019-07-20 13:46:31	2019-07-20 13:56:11	
		MBS	2019-07-20 11:59:47	2019-07-20 13:46:34	2019-07-20 13:56:11	
61	2019-07-20 14:55:20	MBS	2019-07-20 14:55:20	2019-07-20 15:05:32	2019-07-20 17:58:00	Yes
78	2019-07-20 22:19:14	MBS	2019-07-20 22:19:14	2019-07-20 22:26:53	2019-07-20 22:55:42	Yes

2019 Week 30: 2 Alarming Events in total

Pipeline	Alarming Event Start Time	Type	Alarm Received Time	Alarm Assessed Time	Alarm Cleared Time	Shutdown Required
02	2019-07-23 18:38:08	MBS	2019-07-23 18:38:08	2019-07-23 18:44:24	2019-07-23 18:44:24	No
78	2019-07-25 22:24:03	MBS	2019-07-25 22:24:03	2019-07-25 22:30:45	2019-07-25 22:30:45	No

2019 Week 31: 3 Alarming Events in total

Pipeline	Alarming Event Start Time	Type	Alarm Received Time	Alarm Assessed Time	Alarm Cleared Time	Shutdown Required
14	2019-07-29 15:32:19	MBS	2019-07-29 15:32:19	2019-07-29 15:34:50	2019-07-29 15:34:50	No
14	2019-08-01 08:16:09	MBS	2019-08-01 08:16:09	2019-08-01 08:18:47	2019-08-01 08:18:47	No
		MBS	2019-08-01 08:16:40	2019-08-01 08:18:49	2019-08-01 08:18:49	
67	2019-07-30 06:28:24	MBS	2019-07-30 06:28:24	2019-07-30 06:35:48	2019-07-30 06:35:48	No
		MBS	2019-07-30 06:30:25	2019-07-30 06:35:50	2019-07-30 06:35:50	

2019 Week 32: 5 Alarming Events in total

Pipeline	Alarming Event Start Time	Type	Alarm Received Time	Alarm Assessed Time	Alarm Cleared Time	Shutdown Required
03	2019-08-08 05:14:32	MBS	2019-08-08 05:14:32	2019-08-08 05:23:23	2019-08-08 05:23:23	No
		MBS	2019-08-08 05:14:32	2019-08-08 05:23:25	2019-08-08 05:23:25	
14	2019-08-05 14:05:37	MBS	2019-08-05 14:05:37	2019-08-05 14:10:39	2019-08-05 14:10:39	No
78	2019-08-05 12:43:02	MBS	2019-08-05 12:43:02	2019-08-05 12:50:57	2019-08-05 12:50:57	No
78	2019-08-07 10:05:27	MBS	2019-08-07 10:05:27	2019-08-07 10:09:42	2019-08-07 10:09:42	No
78	2019-08-07 12:04:01	MBS	2019-08-07 12:04:01	2019-08-07 12:08:20	2019-08-07 12:08:20	No
		MBS	2019-08-07 12:46:33	2019-08-07 12:49:36	2019-08-07 12:49:36	

2019 Week 33: 3 Alarming Events in total

Pipeline	Alarming Event Start Time	Type	Alarm Received Time	Alarm Assessed Time	Alarm Cleared Time	Shutdown Required
04	2019-08-14 15:35:18	MBS	2019-08-14 15:35:18	2019-08-14 15:39:31	2019-08-14 15:39:31	No
05	2019-08-13 06:47:01	MBS	2019-08-13 06:47:01	2019-08-13 06:51:08	2019-08-13 06:51:08	No
		MBS	2019-08-13 06:47:01	2019-08-13 06:51:06	2019-08-13 06:51:06	
		MBS	2019-08-13 06:47:01	2019-08-13 06:51:05	2019-08-13 06:51:05	
05	2019-08-17 07:06:37	MBS	2019-08-17 07:06:37	2019-08-17 07:14:46	2019-08-17 07:14:46	No
		MBS	2019-08-17 07:07:06	2019-08-17 07:14:48	2019-08-17 07:14:48	

2019 Week 34: 7 Alarming Events in total

Pipeline	Alarming Event Start Time	Type	Alarm Received Time	Alarm Assessed Time	Alarm Cleared Time	Shutdown Required
03	2019-08-19 09:25:06	MBS	2019-08-19 09:25:06	2019-08-19 09:29:39	2019-08-19 09:29:39	No
		MBS	2019-08-19 09:25:06	2019-08-19 09:29:41	2019-08-19 09:29:41	
03	2019-08-21 12:46:52	MBS	2019-08-21 12:46:52	2019-08-21 12:54:52	2019-08-21 12:54:52	No
		MBS	2019-08-21 12:46:52	2019-08-21 12:54:51	2019-08-21 12:54:51	
14	2019-08-21 13:58:00	MBS	2019-08-21 13:58:00	2019-08-21 14:03:54	2019-08-21 14:03:54	No
		MBS	2019-08-21 13:59:59	2019-08-21 14:03:52	2019-08-21 14:03:52	
14	2019-08-22 08:04:59	MBS	2019-08-22 08:04:59	2019-08-22 08:12:48	2019-08-22 08:12:48	No
		MBS	2019-08-22 08:04:59	2019-08-22 08:12:50	2019-08-22 08:12:50	
		MBS	2019-08-22 08:04:59	2019-08-22 08:12:45	2019-08-22 08:12:45	
14	2019-08-22 15:53:43	MBS	2019-08-22 15:53:43	2019-08-22 15:58:51	2019-08-22 15:58:51	No
14	2019-08-22 19:02:53	MBS	2019-08-22 19:02:53	2019-08-22 19:07:55	2019-08-22 19:07:55	No
78	2019-08-21 04:55:50	MBS	2019-08-21 04:55:50	2019-08-21 05:05:21	2019-08-21 05:05:21	No

2019 Week 35: 5 Alarming Events in total

Pipeline	Alarming Event Start Time	Type	Alarm Received Time	Alarm Assessed Time	Alarm Cleared Time	Shutdown Required
01	2019-08-28 23:14:13	MBS	2019-08-28 23:14:13	2019-08-28 23:23:01	2019-08-29 00:06:02	Yes
01	2019-08-29 01:58:20	MBS	2019-08-29 01:58:20	2019-08-29 02:06:05	2019-08-29 02:06:05	No
02	2019-09-01 05:49:14	MBS MBS	2019-09-01 05:49:14 2019-09-01 05:49:45	2019-09-01 07:01:24 2019-09-01 07:01:27	2019-09-01 07:12:52 2019-09-01 07:12:52	Yes
05	2019-08-29 03:07:35	MBS MBS MBS	2019-08-29 03:07:35 2019-08-29 03:08:06 2019-08-29 03:08:36	2019-08-29 03:14:15 2019-08-29 03:14:19 2019-08-29 03:14:24	2019-08-29 03:14:15 2019-08-29 03:14:19 2019-08-29 03:14:24	No
14	2019-08-27 12:20:23	MBS	2019-08-27 12:20:23	2019-08-27 12:26:37	2019-08-27 12:26:37	No

2019 Week 36: 8 Alarming Events in total

Pipeline	Alarming Event Start Time	Type	Alarm Received Time	Alarm Assessed Time	Alarm Cleared Time	Shutdown Required
02	2019-09-08 14:47:18	MBS	2019-09-08 14:47:18	2019-09-08 14:55:05	2019-09-08 14:55:05	No
		MBS	2019-09-08 14:50:20	2019-09-08 14:55:07	2019-09-08 14:55:07	
03	2019-09-05 07:49:51	MBS	2019-09-05 07:49:51	2019-09-05 07:55:31	2019-09-05 10:21:15	Yes
14	2019-09-04 00:12:02	MBS	2019-09-04 00:12:02	2019-09-04 00:22:04	2019-09-04 14:17:54	Yes
		MBS	2019-09-04 00:17:33	2019-09-04 00:27:20	2019-09-04 14:17:54	
14	2019-09-04 11:19:51	MBS	2019-09-04 11:19:51	2019-09-04 11:24:27	2019-09-04 11:24:27	No
		MBS	2019-09-04 11:19:51	2019-09-04 11:24:29	2019-09-04 11:24:29	
		MBS	2019-09-04 11:22:52	2019-09-04 11:24:30	2019-09-04 11:24:30	
		MBS	2019-09-04 11:22:52	2019-09-04 11:24:31	2019-09-04 11:24:31	
14	2019-09-06 11:53:15	MBS	2019-09-06 11:53:15	2019-09-06 11:59:00	2019-09-06 11:59:00	No
		MBS	2019-09-06 11:53:15	2019-09-06 11:59:01	2019-09-06 11:59:01	
78	2019-09-04 23:13:55	MBS	2019-09-04 23:13:55	2019-09-04 23:17:32	2019-09-04 23:17:32	No
78	2019-09-05 07:44:08	MBS	2019-09-05 07:44:08	2019-09-05 07:47:31	2019-09-05 07:47:31	No
		MBS	2019-09-05 07:44:38	2019-09-05 07:47:34	2019-09-05 07:47:34	
78	2019-09-08 19:37:52	MBS	2019-09-08 19:37:52	2019-09-08 19:41:04	2019-09-08 19:51:31	Yes

2019 Week 37: 12 Alarming Events in total

Pipeline	Alarming Event Start Time	Type	Alarm Received Time	Alarm Assessed Time	Alarm Cleared Time	Shutdown Required
02	2019-09-12 10:57:30	MBS	2019-09-12 10:57:30	2019-09-12 11:01:47	2019-09-12 11:01:47	No
04	2019-09-10 21:09:20	MBS	2019-09-10 21:09:20	2019-09-10 21:18:50	2019-09-10 21:18:50	No
04	2019-09-10 21:35:51	MBS MBS MBS	2019-09-10 21:35:51 2019-09-10 21:35:51 2019-09-10 21:35:51	2019-09-10 21:40:39 2019-09-10 21:40:35 2019-09-10 21:40:33	2019-09-10 21:40:39 2019-09-10 21:40:35 2019-09-10 21:40:33	No
06A	2019-09-11 06:01:56	AVB	2019-09-11 06:01:56	2019-09-11 06:06:29	2019-09-11 06:06:29	No
06A	2019-09-12 07:05:14	AVB	2019-09-12 07:05:14	2019-09-12 07:11:31	2019-09-12 07:11:31	No
10	2019-09-12 06:33:38	MBS	2019-09-12 06:33:38	2019-09-12 06:41:19	2019-09-12 06:41:19	No
14	2019-09-15 00:54:05	MBS MBS	2019-09-15 00:54:05 2019-09-15 00:54:05	2019-09-15 01:01:28 2019-09-15 01:01:26	2019-09-15 01:01:28 2019-09-15 01:01:26	No
67	2019-09-13 19:14:23	MBS	2019-09-13 19:14:23	2019-09-13 19:21:18	2019-09-13 19:21:18	No
78	2019-09-09 07:55:19	MBS MBS	2019-09-09 07:55:19 2019-09-09 07:56:49	2019-09-09 08:05:12 2019-09-09 08:05:13	2019-09-09 08:05:12 2019-09-09 08:05:13	No
78	2019-09-09 15:43:34	MBS	2019-09-09 15:43:34	2019-09-09 15:48:25	2019-09-09 16:15:12	Yes
78	2019-09-09 16:36:37	MBS	2019-09-09 16:36:37	2019-09-09 16:45:35	2019-09-09 16:45:35	No
78	2019-09-12 09:01:42	AVB	2019-09-12 09:01:42	2019-09-12 09:12:06	2019-09-12 09:50:00	Yes

2019 Week 38: 7 Alarming Events in total

Pipeline	Alarming Event Start Time	Type	Alarm Received Time	Alarm Assessed Time	Alarm Cleared Time	Shutdown Required
01	2019-09-18 04:18:53	MBS	2019-09-18 04:18:53	2019-09-18 04:22:25	2019-09-18 04:22:25	No
02	2019-09-18 16:56:40	MBS MBS	2019-09-18 16:56:40 2019-09-18 16:58:10	2019-09-18 17:04:42 2019-09-18 17:04:44	2019-09-18 17:04:42 2019-09-18 17:04:44	No
03	2019-09-17 12:33:05	MBS	2019-09-17 12:33:05	2019-09-17 12:35:57	2019-09-17 12:35:57	No
03	2019-09-21 01:01:06	MBS	2019-09-21 01:01:06	2019-09-21 01:05:06	2019-09-21 01:05:06	No
05	2019-09-17 16:27:57	MBS MBS	2019-09-17 16:27:57 2019-09-17 16:28:27	2019-09-17 16:35:38 2019-09-17 16:35:40	2019-09-17 16:35:38 2019-09-17 16:35:40	No
78	2019-09-16 01:13:00	MBS MBS	2019-09-16 01:13:00 2019-09-16 01:16:30	2019-09-16 01:16:54 2019-09-16 01:18:19	2019-09-16 03:06:21 2019-09-16 03:06:21	Yes
78	2019-09-20 03:56:04	MBS	2019-09-20 03:56:04	2019-09-20 04:16:23	2019-09-20 04:18:35	Yes

2019 Week 39: 5 Alarming Events in total

Pipeline	Alarming Event Start Time	Type	Alarm Received Time	Alarm Assessed Time	Alarm Cleared Time	Shutdown Required
05	2019-09-23 03:07:55	MBS	2019-09-23 03:07:55	2019-09-23 03:13:33	2019-09-23 03:13:33	No
		MBS	2019-09-23 03:07:55	2019-09-23 03:13:35	2019-09-23 03:13:35	
14	2019-09-24 23:36:51	MBS	2019-09-24 23:36:51	2019-09-24 23:42:42	2019-09-24 23:42:42	No
		MBS	2019-09-24 23:37:21	2019-09-24 23:42:43	2019-09-24 23:42:43	
		MBS	2019-09-24 23:37:21	2019-09-24 23:42:45	2019-09-24 23:42:45	
		MBS	2019-09-24 23:38:21	2019-09-24 23:42:47	2019-09-24 23:42:47	
		MBS	2019-09-24 23:39:21	2019-09-24 23:42:49	2019-09-24 23:42:49	
		MBS	2019-09-25 00:25:21	2019-09-25 00:28:41	2019-09-25 00:28:41	
		MBS	2019-09-25 00:25:21	2019-09-25 00:28:57	2019-09-25 00:28:57	
		MBS	2019-09-25 00:27:21	2019-09-25 00:28:55	2019-09-25 00:28:55	
		MBS	2019-09-25 00:29:21	2019-09-25 00:29:50	2019-09-25 00:29:50	
14	2019-09-27 22:02:08	MBS	2019-09-27 22:02:08	2019-09-27 22:09:47	2019-09-27 22:09:47	No
14	2019-09-29 19:47:26	MBS	2019-09-29 19:47:26	2019-09-29 19:51:11	2019-09-29 19:51:11	No
78	2019-09-26 10:43:40	MBS	2019-09-26 10:43:40	2019-09-26 10:53:15	2019-09-26 10:53:15	No

2019 Week 40: 1 Alarming Event in total

Pipeline	Alarming Event Start Time	Type	Alarm Received Time	Alarm Assessed Time	Alarm Cleared Time	Shutdown Required
03	2019-10-02 08:04:47	MBS	2019-10-02 08:04:47	2019-10-02 08:11:43	2019-10-02 08:11:43	No
		MBS	2019-10-02 08:04:47	2019-10-02 08:11:45	2019-10-02 08:11:45	
		MBS	2019-10-02 08:05:17	2019-10-02 08:11:49	2019-10-02 08:11:49	
		MBS	2019-10-02 08:06:17	2019-10-02 08:11:52	2019-10-02 08:11:52	
		MBS	2019-10-02 08:06:17	2019-10-02 08:11:55	2019-10-02 08:11:55	

2019 Week 41: 5 Alarming Events in total

Pipeline	Alarming Event Start Time	Type	Alarm Received Time	Alarm Assessed Time	Alarm Cleared Time	Shutdown Required
01	2019-10-08 09:38:21	MBS	2019-10-08 09:38:21	2019-10-08 09:46:26	2019-10-08 09:46:26	No
05	2019-10-07 09:55:54	MBS	2019-10-07 09:55:54	2019-10-07 09:58:41	2019-10-07 09:58:41	No
		MBS	2019-10-07 09:56:24	2019-10-07 09:58:45	2019-10-07 09:58:45	
		MBS	2019-10-07 09:56:24	2019-10-07 09:58:46	2019-10-07 09:58:46	
06A	2019-10-11 07:27:33	AVB	2019-10-11 07:27:33	2019-10-11 07:31:20	2019-10-11 07:31:20	No
		AVB	2019-10-11 07:43:34	2019-10-11 07:44:13	2019-10-11 07:44:13	
14	2019-10-11 12:54:34	MBS	2019-10-11 12:54:34	2019-10-11 12:58:46	2019-10-11 12:58:46	No
67	2019-10-08 13:57:39	AVB	2019-10-08 13:57:39	2019-10-08 13:58:09	2019-10-08 13:58:09	No
		AVB	2019-10-08 13:59:09	2019-10-08 13:59:22	2019-10-08 13:59:22	

2019 Week 42: 9 Alarming Events in total

Pipeline	Alarming Event Start Time	Type	Alarm Received Time	Alarm Assessed Time	Alarm Cleared Time	Shutdown Required
03	2019-10-14 08:59:00	MBS	2019-10-14 08:59:00	2019-10-14 09:03:40	2019-10-14 09:03:40	No
04	2019-10-18 11:46:00	MBS	2019-10-18 11:46:00	2019-10-18 11:49:01	2019-10-18 11:49:01	No
		MBS	2019-10-18 11:46:00	2019-10-18 11:49:00	2019-10-18 11:49:00	
05	2019-10-14 11:09:14	MBS	2019-10-14 11:09:14	2019-10-14 11:12:26	2019-10-14 11:12:26	No
		MBS	2019-10-14 11:09:44	2019-10-14 11:12:27	2019-10-14 11:12:27	
		MBS	2019-10-14 11:09:44	2019-10-14 11:12:29	2019-10-14 11:12:29	
05	2019-10-16 12:34:50	AVB	2019-10-16 12:34:50	2019-10-16 12:35:56	2019-10-16 12:35:56	No
		AVB	2019-10-16 12:35:51	2019-10-16 12:36:05	2019-10-16 12:36:05	
14	2019-10-17 22:29:20	MBS	2019-10-17 22:29:20	2019-10-17 22:33:15	2019-10-17 22:33:15	No
		MBS	2019-10-17 22:29:50	2019-10-17 22:33:17	2019-10-17 22:33:17	
14	2019-10-17 23:44:53	MBS	2019-10-17 23:44:53	2019-10-17 23:51:52	2019-10-17 23:51:52	No
		MBS	2019-10-17 23:44:53	2019-10-17 23:51:54	2019-10-17 23:51:54	
		MBS	2019-10-17 23:45:23	2019-10-17 23:51:56	2019-10-17 23:51:56	
14	2019-10-17 23:57:23	MBS	2019-10-17 23:57:23	2019-10-18 00:01:32	2019-10-18 00:01:32	No
61	2019-10-16 05:45:24	MBS	2019-10-16 05:45:24	2019-10-16 05:54:57	2019-10-16 07:38:00	Yes
		MBS	2019-10-16 05:46:54	2019-10-16 05:55:35	2019-10-16 07:38:00	
78	2019-10-17 03:31:13	MBS	2019-10-17 03:31:13	2019-10-17 06:46:17	2019-10-17 07:15:00	Yes

2019 Week 43: 4 Alarming Events in total

Pipeline	Alarming Event Start Time	Type	Alarm Received Time	Alarm Assessed Time	Alarm Cleared Time	Shutdown Required
02	2019-10-24 07:47:14	MBS	2019-10-24 07:47:14	2019-10-24 07:51:13	2019-10-24 07:51:13	No
03	2019-10-21 11:44:18	MBS AVB	2019-10-21 11:44:18 2019-10-21 11:48:19	2019-10-21 11:46:54 2019-10-21 11:57:40	2019-10-21 11:46:54 2019-10-21 11:57:40	No
78	2019-10-22 21:32:37	MBS MBS	2019-10-22 21:32:37 2019-10-22 21:38:37	2019-10-22 21:41:14 2019-10-22 21:41:46	2019-10-22 21:41:14 2019-10-22 21:41:46	No
78	2019-10-23 17:11:37	MBS	2019-10-23 17:11:37	2019-10-23 17:20:43	2019-10-23 17:20:43	No

2019 Week 44: 10 Alarming Events in total

Pipeline	Alarming Event Start Time	Type	Alarm Received Time	Alarm Assessed Time	Alarm Cleared Time	Shutdown Required
01	2019-10-30 12:19:15	MBS	2019-10-30 12:19:15	2019-10-30 12:21:52	2019-10-30 12:21:52	No
		MBS	2019-10-30 12:19:15	2019-10-30 12:21:54	2019-10-30 12:21:54	
		MBS	2019-10-30 12:19:15	2019-10-30 12:21:55	2019-10-30 12:21:55	
		MBS	2019-10-30 12:19:15	2019-10-30 12:21:56	2019-10-30 12:21:56	
		MBS	2019-10-30 12:19:15	2019-10-30 12:21:58	2019-10-30 12:21:58	
		MBS	2019-10-30 12:24:45	2019-10-30 12:27:05	2019-10-30 12:27:05	
		MBS	2019-10-30 12:24:45	2019-10-30 12:27:03	2019-10-30 12:27:03	
		MBS	2019-10-30 12:25:15	2019-10-30 12:27:01	2019-10-30 12:27:01	
03	2019-10-29 11:19:51	MBS	2019-10-29 11:19:51	2019-10-29 11:23:11	2019-10-29 11:23:11	No
		MBS	2019-10-29 11:19:51	2019-10-29 11:23:09	2019-10-29 11:23:09	
03	2019-10-30 03:57:44	MBS	2019-10-30 03:57:44	2019-10-30 04:03:53	2019-10-30 09:55:02	Yes
		MBS	2019-10-30 04:09:46	2019-10-30 06:53:54	2019-10-30 09:55:02	
03	2019-10-30 10:13:56	MBS	2019-10-30 10:13:56	2019-10-30 10:24:33	2019-10-30 10:40:54	Yes
		MBS	2019-10-30 10:14:25	2019-10-30 10:24:34	2019-10-30 10:40:54	
		MBS	2019-10-30 10:15:24	2019-10-30 10:24:35	2019-10-30 10:40:54	
03	2019-10-30 10:22:25	MBS	2019-10-30 10:22:25	2019-10-30 10:31:56	2019-10-30 11:04:56	Yes
03	2019-11-01 09:13:10	MBS	2019-11-01 09:13:10	2019-11-01 09:18:23	2019-11-01 09:18:23	No
06A	2019-10-30 08:06:03	RDS	2019-10-30 08:06:03	2019-10-30 08:29:28	2019-10-30 09:06:13	Yes
06A	2019-10-30 08:10:34	MBS	2019-10-30 08:10:34	2019-10-30 08:26:13	2019-10-30 09:10:07	Yes
65	2019-10-28 21:17:13	MBS	2019-10-28 21:17:13	2019-10-28 21:41:34	2019-10-28 22:44:00	Yes
		MBS	2019-10-28 21:20:43	2019-10-28 21:41:32	2019-10-28 22:44:00	
78	2019-10-28 11:32:12	MBS	2019-10-28 11:32:12	2019-10-28 11:39:47	2019-10-28 11:39:47	No

2019 Week 45: 7 Alarming Events in total

Pipeline	Alarming Event Start Time	Type	Alarm Received Time	Alarm Assessed Time	Alarm Cleared Time	Shutdown Required
02	2019-11-10 02:26:00	MBS	2019-11-10 02:26:01	2019-11-10 02:34:00	2019-11-10 02:34:00	No
02	2019-11-10 07:32:18	MBS MBS	2019-11-10 07:32:18 2019-11-10 07:38:49	2019-11-10 08:58:36 2019-11-10 08:58:38	2019-11-10 09:15:02 2019-11-10 09:15:02	Yes
02	2019-11-10 14:14:38	MBS MBS	2019-11-10 14:14:39 2019-11-10 14:14:39	2019-11-10 14:23:42 2019-11-10 14:23:44	2019-11-10 14:23:42 2019-11-10 14:23:44	No
03	2019-11-07 03:12:20	MBS MBS	2019-11-07 03:12:20 2019-11-07 03:13:51	2019-11-07 03:19:39 2019-11-07 03:19:41	2019-11-07 03:19:39 2019-11-07 03:19:41	No
03	2019-11-07 07:58:27	MBS	2019-11-07 07:58:28	2019-11-07 08:01:57	2019-11-07 08:01:57	No
05	2019-11-04 20:47:59	MBS MBS	2019-11-04 20:48:00 2019-11-04 20:48:31	2019-11-04 20:57:27 2019-11-04 20:57:29	2019-11-04 20:57:27 2019-11-04 20:57:29	No
78	2019-11-05 05:09:03	MBS	2019-11-05 05:09:04	2019-11-05 05:14:52	2019-11-05 05:14:52	No

2019 Week 46: 6 Alarming Events in total

Pipeline	Alarming Event Start Time	Type	Alarm Received Time	Alarm Assessed Time	Alarm Cleared Time	Shutdown Required
02	2019-11-14 03:23:25	MBS	2019-11-14 03:23:25	2019-11-14 03:29:08	2019-11-14 03:29:08	No
03	2019-11-15 09:29:50	MBS	2019-11-15 09:29:50	2019-11-15 09:38:47	2019-11-15 09:38:47	No
		MBS	2019-11-15 09:29:50	2019-11-15 09:38:50	2019-11-15 09:38:50	
		MBS	2019-11-15 09:39:50	2019-11-15 09:43:14	2019-11-15 09:43:14	
		MBS	2019-11-15 09:39:50	2019-11-15 09:43:12	2019-11-15 09:43:12	
		MBS	2019-11-15 09:40:50	2019-11-15 09:43:09	2019-11-15 09:43:09	
		MBS	2019-11-15 09:40:50	2019-11-15 09:43:05	2019-11-15 09:43:05	
		MBS	2019-11-15 09:40:50	2019-11-15 09:43:07	2019-11-15 09:43:07	
03	2019-11-15 14:00:24	MBS	2019-11-15 14:00:24	2019-11-15 14:09:33	2019-11-15 14:09:33	No
		MBS	2019-11-15 14:00:24	2019-11-15 14:09:35	2019-11-15 14:09:35	
03	2019-11-17 21:43:32	MBS	2019-11-17 21:43:32	2019-11-17 21:47:32	2019-11-17 21:47:32	No
		MBS	2019-11-17 21:43:32	2019-11-17 21:47:34	2019-11-17 21:47:34	
		MBS	2019-11-17 21:43:32	2019-11-17 21:47:33	2019-11-17 21:47:33	
		MBS	2019-11-17 21:44:32	2019-11-17 21:47:36	2019-11-17 21:47:36	
04	2019-11-14 15:32:48	MBS	2019-11-14 15:32:49	2019-11-14 15:35:49	2019-11-14 15:35:49	No
14	2019-11-17 13:11:07	MBS	2019-11-17 13:11:08	2019-11-17 13:17:40	2019-11-17 13:17:40	No

2019 Week 47: 1 Alarming Event in total

Pipeline	Alarming Event Start Time	Type	Alarm Received Time	Alarm Assessed Time	Alarm Cleared Time	Shutdown Required
03	2019-11-18 18:47:09	MBS	2019-11-18 18:47:09	2019-11-18 18:56:15	2019-11-18 18:56:15	No
		MBS	2019-11-18 18:48:09	2019-11-18 18:56:16	2019-11-18 18:56:16	

4. Instrumentation Outage Report

The records in this report each contain data that are referenced by the Consent Decree. The terms are explained in the following table.

Table 4a: Description of fields in this Report

Data	Description
Pipeline	Name (number) of the pipeline on which the instrument is located
Station	Location of the instrument
Outage Start	Date and time when the instrumentation outage began
Outage End	Date and time when the instrumentation outage was resolved
Root Cause	Reason for instrumentation outage (root cause analysis performed by the Leak Detection Analyst)

The records report instances when the outage exceeds time periods set forth in section VII.G.IV.97 of the decree.

Note Enbridge uses root cause descriptions to categorize the outage. The root cause has a finer granularity than the "Reason for Instrumentation Outage" listed in section VII.G.IV.97 of the decree, but is equivalent. The following table maps the fixed set of root causes that result in the "Reason for Instrumentation Outage" listed in section VII.G.IV.97 of the decree as well as their corresponding fixed set of actions to resolve each outage type.

Table 4b: Description of reasons for outage and actions taken to resolve it***

Reason for Instrumentation Outage	Time Limit to Restore	Root Cause	Actions Taken to Resolve the Outage
Instrumentation Failure	10 days	Instrumentation Error	Fixed the Instrument
Scheduled Maintenance or Repairs	4 days	Field Maintenance	Finished the Maintenance

***Bypass of ILI Tool events are managed in a separate tracker, which is external to this system. Reporting of instrumentation outages due to ILI tool bypass exceeding the required time period (4 hours) will be reported outside of this Lakehead Leak Alarm Report.

Table 4c: Instrumentation Outage Report

Pipeline	Station	Outage Start	Outage End	Root Cause

Appendix 3 – Spill Response and Preparedness Additional Information [116]

Reporting Period: May 23, 2019 to November 22, 2019

ENBRIDGE PIPELINES IN ILLINOIS:

Important Pipeline Safety Information

Proudly operating in Illinois for more than 50 years, Illinois is home to more than 81 Enbridge employees. Our pipelines transport the energy resources we rely on every day to fuel our vehicles, heat our homes and feed our families. The safe and reliable operation of our pipeline system is our top priority.

What are the characteristics and hazards of the products being transported by Enbridge?

Crude oil is naturally occurring, unrefined petroleum. Enbridge transports light, medium and heavy crude oil on its liquids pipeline system. The words light, medium and heavy are often used to describe a crude oil's density and resistance to flow (viscosity). Crude oil's color can range from yellow to black and it has an odor similar to gasoline or diesel fuel. If released, crude oil will flow with the land profile. Flow depends on temperature and viscosity; it can be thick and slow-moving or light and able to move quickly. Crude oil can be flammable and explosive if vapors mix with the atmosphere and an ignition source is present.

Diluent is a light hydrocarbon that is blended with heavy crude oil to make it thinner and easier to transport by pipeline. Enbridge has a dedicated pipeline to transport diluent that has been recovered from the diluted heavy crude oil. Diluent is very light and fluid. It's liquid when inside the pipeline but quickly evaporates if released into the atmosphere, like all hydrocarbons transported by Enbrdige, diluent is extremely flammable and vapors may ignite if an ignition source is present. The toxicity and potential health effects from exposure to diluent are similar to other petroleum products. During normal operations, the liquid petroleum Enbridge transports is contained within the pipeline system and there are no hazards to those who live and work along the pipelines transporting diluent.

How do I know where Enbridge pipelines are located?

Pipeline operators, including Enbridge, are required to submit transmission pipeline maps to the National Pipeline Mapping System. You can access these maps at **npms.phmsa.dot.gov**. Pipeline markers also indicate the approximate location of pipelines and can be found along the pipeline right-of-way and near road and water crossings. All pipeline markers provide the name of the pipeline operator, product being transported and a telephone number for reporting pipeline emergencies.

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What should I do if I suspect a pipeline leak?

If you are in immediate danger, damage the pipeline, or observe or suspect a leak—even if you are uncertain of the severity—take the following steps:

1. If you can do so safely, turn off any mechanized equipment. Move as far away from the leak as possible in an upwind direction, avoiding contact with escaping liquids and gases.
2. Call **911**.
3. Call the toll-free, 24-hour Enbridge emergency number for your area: **800-858-5253**.
4. Follow instructions provided to you by Enbridge and local emergency responders.

You can also report emergencies and other sudden threats to public health, such as oil and/or chemical spills, to the federal government's centralized reporting center, the National Response Center (NRC) at **800-424-8802**. The NRC is staffed 24 hours a day by personnel who will ask you to provide as much information about the incident as possible.

Please include the following:

- Your name, location, organization, and telephone number.
- Name and address of the party responsible for the incident; or name of the carrier or vessel, the railcar/truck number, or other identifying information.
- Date and time of the incident.
- Location of the incident.
- Source and cause of the release or spill.
- Types of material(s) released or spilled.
- Quantity of materials released or spilled.
- Medium (e.g. land, water) affected by the release or spill.
- Danger or threat posed by the release or spill.
- Number and types of injuries or fatalities (if any).
- Weather conditions at the incident location.
- Whether an evacuation has occurred.
- Other agencies notified or about to be notified.
- Any other information that may help emergency personnel respond to the incident.

If reporting directly to the NRC is not possible, reports also can be made to the EPA Regional office where the incident occurred.

Illinois is located within EPA Region 5:

U.S. EPA - Region 5
77 W. Jackson Boulevard
Chicago, IL 60604-3590

312-353-2318 (in Region 5 only)

* epa.gov/emergency-response/what-information-needed-when-reporting-oil-spill-or-hazardous-substance-release

What not to do in an emergency situation:

- Do not touch any liquid or vapor that may have come from the pipeline.
- Do not drive into the area or start your car.
- Do not light a match.
- Do not turn on or off anything that may create a spark—including cell phones, telephones, light switches, vehicle alarms, vehicle keyless entry and flashlights—until you are in a safe location.
- Do not operate pipeline valves.
- Do not remain in a building if the smell is stronger inside than outside.

How can I obtain information from Enbridge?

During an incident, Enbridge representatives will work diligently to keep the public informed through local news media. We will also post information about the spill on our website and social media channels.

- Website: **enbridge.com**
- Facebook: **facebook.com/enbridge**
- Twitter: **@Enbridge**

You can also visit the EPA website and use the "Cleanups in My Community" tool to find the EPA's current and past emergency response activities in your community.

- **epa.gov/emergency-response/emergency-response-my-community**

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Please include the following:

- Your name, location, organization, and telephone number.
- Name and address of the party responsible for the incident; or name of the carrier or vessel, the railcar/truck number, or other identifying information.
- Date and time of the incident.
- Location of the incident.
- Source and cause of the release or spill.
- Types of material(s) released or spilled.
- Quantity of materials released or spilled.
- Medium (e.g. land, water) affected by the release or spill.
- Danger or threat posed by the release or spill.
- Number and types of injuries or fatalities (if any).
- Weather conditions at the incident location.
- Whether an evacuation has occurred.
- Other agencies notified or about to be notified.
- Any other information that may help emergency personnel respond to the incident.

If reporting directly to the NRC is not possible, reports also can be made to the EPA Regional office where the incident occurred.

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Appendix 4 – PHMSA Reports from Lakehead Discharges [146] and Update on Discharges from a Lakehead System Pipelines [147]

Reporting Period: May 23, 2019 to November 22, 2019

NOTICE: This report is required by 49 CFR Part 195. Failure to report can result in a civil penalty not to exceed $100,000 for each violation for each day that such violation persists except that the maximum civil penalty shall not exceed $1,000,000 as provided in 49 USC 60122.	OMB NO: 2137-0047 EXPIRATION DATE: 8/31/2020

U.S Department of Transportation Pipeline and Hazardous Materials Safety Administration	**Original Report Date:**	08/02/2019
	No.	20190242 - 33024 ---------- (DOT Use Only)

ACCIDENT REPORT - HAZARDOUS LIQUID PIPELINE SYSTEMS

INSTRUCTIONS

Important: *Please read the separate instructions for completing this form before you begin. They clarify the information requested and provide specific examples. If you do not have a copy of the instructions, you can obtain one from the PHMSA Pipeline Safety Community Web Page at http://www.phmsa.dot.gov/pipeline/library/forms.*

PART A - KEY REPORT INFORMATION

Report Type: *(select all that apply)*	**Original:**	**Supplemental:**	**Final:**
		Yes	

Last Revision Date:	12/05/2019
1. Operator's OPS-issued Operator Identification Number (OPID):	11169
2. Name of Operator	ENBRIDGE ENERGY, LIMITED PARTNERSHIP
3. Address of Operator:	
3a. Street Address	5400 WESTHEIMER COURT
3b. City	HOUSTON
3c. State	Texas
3d. Zip Code	77056
4. Local time *(24-hr clock)* and date of the Accident:	07/04/2019 21:50
5. Location of Accident:	
Latitude:	[redacted]
Longitude:	
6. National Response Center Report Number (if applicable):	1251072
7. Local time *(24-hr clock)* and date of initial telephonic report to the National Response Center (if applicable):	07/05/2019 14:13
8. Commodity released: *(select only one, based on predominant volume released)*	Crude Oil
- Specify Commodity Subtype:	
- If "Other" Subtype, Describe:	
- If Biofuel/Alternative Fuel and Commodity Subtype is Ethanol Blend, then % Ethanol Blend:	
- If Biofuel/Alternative Fuel and Commodity Subtype is Biodiesel, then Biodiesel Blend e.g. B2, B20, B100	
9. Estimated volume of commodity released unintentionally (Barrels):	6.70
10. Estimated volume of intentional and/or controlled release/blowdown (Barrels):	
11. Estimated volume of commodity recovered (Barrels):	6.70
12. Were there fatalities?	No
- If Yes, specify the number in each category:	
12a. Operator employees	
12b. Contractor employees working for the Operator	
12c. Non-Operator emergency responders	
12d. Workers working on the right-of-way, but NOT associated with this Operator	
12e. General public	
12f. Total fatalities (sum of above)	
13. Were there injuries requiring inpatient hospitalization?	No
- If Yes, specify the number in each category:	
13a. Operator employees	
13b. Contractor employees working for the Operator	
13c. Non-Operator emergency responders	
13d. Workers working on the right-of-way, but NOT associated with this Operator	
13e. General public	

13f. Total injuries (sum of above)	
14. Was the pipeline/facility shut down due to the Accident?	Yes
- If No, Explain:	
- If Yes, complete Questions 14a and 14b: *(use local time, 24-hr clock)*	
14a. Local time and date of shutdown:	07/04/2019 22:03
14b. Local time pipeline/facility restarted:	07/05/2019 04:17
- Still shut down? (* Supplemental Report Required)	
15. Did the commodity ignite?	No
16. Did the commodity explode?	No
17. Number of general public evacuated:	0
18. Time sequence *(use local time, 24-hour clock)*:	
18a. Local time Operator identified Accident - effective 7- 2014 changed to "Local time Operator identified failure":	07/04/2019 22:30
18b. Local time Operator resources arrived on site:	07/04/2019 22:30
PART B - ADDITIONAL LOCATION INFORMATION	
1. Was the origin of the Accident onshore?	Yes
If Yes, Complete Questions (2-12)	
If No, Complete Questions (13-15)	
- If Onshore:	
2. State:	Minnesota
3. Zip Code:	55736
4. City	Floodwood
5. County or Parish	St. Louis
6. Operator-designated location:	Milepost/Valve Station
Specify:	1044
7. Pipeline/Facility name:	Floodwood Station
8. Segment name/ID:	Line 4 Unit 2
9. Was Accident on Federal land, other than the Outer Continental Shelf (OCS)?	No
10. Location of Accident:	Totally contained on Operator-controlled property
11. Area of Accident (as found):	Aboveground
Specify:	Inside a building
- If Other, Describe:	
Depth-of-Cover (in):	
12. Did Accident occur in a crossing?	No
- If Yes, specify type below:	
- If Bridge crossing –	
Cased/ Uncased:	
- If Railroad crossing –	
Cased/ Uncased/ Bored/drilled	
- If Road crossing –	
Cased/ Uncased/ Bored/drilled	
- If Water crossing –	
Cased/ Uncased	
- Name of body of water, if commonly known:	
- Approx. water depth (ft) at the point of the Accident:	
- Select:	
- If Offshore:	
13. Approximate water depth (ft) at the point of the Accident:	
14. Origin of Accident:	
- In State waters - Specify:	
- State:	
- Area:	
- Block/Tract #:	
- Nearest County/Parish:	
- On the Outer Continental Shelf (OCS) - Specify:	
- Area:	
- Block #:	
15. Area of Accident:	
PART C - ADDITIONAL FACILITY INFORMATION	
1. Is the pipeline or facility:	Interstate
2. Part of system involved in Accident:	Onshore Pump/Meter Station Equipment and Piping
- If Onshore Breakout Tank or Storage Vessel, Including Attached Appurtenances, specify:	
3. Item involved in Accident:	Auxiliary Piping (e.g. drain lines)
- If Pipe, specify:	
3a. Nominal diameter of pipe (in):	

3b. Wall thickness (in):	
3c. SMYS (Specified Minimum Yield Strength) of pipe (psi):	
3d. Pipe specification:	
3e. Pipe Seam , specify:	
- If Other, Describe:	
3f. Pipe manufacturer:	
3g. Year of manufacture:	
3h. Pipeline coating type at point of Accident, specify:	
- If Other, Describe:	
- If Weld, including heat-affected zone, specify. If Pipe Girth Weld, 3a through 3h above are required:	
- If Other, Describe:	
- If Valve, specify:	
- If Mainline, specify:	
- If Other, Describe:	
3i. Manufactured by:	
3j. Year of manufacture:	
- If Tank/Vessel, specify:	
- If Other - Describe:	
- If Other, describe:	
4. Year item involved in Accident was installed:	1970
5. Material involved in Accident:	Carbon Steel
- If Material other than Carbon Steel, specify:	
6. Type of Accident Involved:	Leak
- If Mechanical Puncture – Specify Approx. size:	
in. (axial) by	
in. (circumferential)	
- If Leak - Select Type:	Pinhole
- If Other, Describe:	
- If Rupture - Select Orientation:	
- If Other, Describe:	
Approx. size: in. (widest opening) by	
in. (length circumferentially or axially)	
- If Other – Describe:	

PART D - ADDITIONAL CONSEQUENCE INFORMATION

1. Wildlife impact:	No
1a. If Yes, specify all that apply:	
- Fish/aquatic	
- Birds	
- Terrestrial	
2. Soil contamination:	Yes
3. Long term impact assessment performed or planned:	No
4. Anticipated remediation:	No
4a. If Yes, specify all that apply:	
- Surface water	
- Groundwater	
- Soil	
- Vegetation	
- Wildlife	
5. Water contamination:	No
5a. If Yes, specify all that apply:	
- Ocean/Seawater	
- Surface	
- Groundwater	
- Drinking water: *(Select one or both)*	
- Private Well	
- Public Water Intake	
5b. Estimated amount released in or reaching water (Barrels):	
5c. Name of body of water, if commonly known:	
6. At the location of this Accident, had the pipeline segment or facility been identified as one that "could affect" a High Consequence Area (HCA) as determined in the Operator's Integrity Management Program?	No
7. Did the released commodity reach or occur in one or more High Consequence Area (HCA)?	No
7a. If Yes, specify HCA type(s): *(Select all that apply)*	
- Commercially Navigable Waterway:	
Was this HCA identified in the "could affect" determination for this Accident site in the Operator's	

Integrity Management Program?	
- High Population Area:	
Was this HCA identified in the "could affect" determination for this Accident site in the Operator's Integrity Management Program?	
- Other Populated Area	
Was this HCA identified in the "could affect" determination for this Accident site in the Operator's Integrity Management Program?	
- Unusually Sensitive Area (USA) - Drinking Water	
Was this HCA identified in the "could affect" determination for this Accident site in the Operator's Integrity Management Program?	
- Unusually Sensitive Area (USA) - Ecological	
Was this HCA identified in the "could affect" determination for this Accident site in the Operator's Integrity Management Program?	
8. Estimated cost to Operator – effective 12-2012, changed to "Estimated Property Damage":	
8a. Estimated cost of public and non-Operator private property damage paid/reimbursed by the Operator – effective 12-2012, "paid/reimbursed by the Operator" removed	$ [redacted]
8b. Estimated cost of commodity lost	$ [redacted]
8c. Estimated cost of Operator's property damage & repairs	$ [redacted]
8d. Estimated cost of Operator's emergency response	$ [redacted]
8e. Estimated cost of Operator's environmental remediation	$ [redacted]
8f. Estimated other costs	$ [redacted]
Describe:	
8g. Estimated total costs (sum of above) – effective 12-2012, changed to "Total estimated property damage (sum of above)"	$ [redacted]

PART E - ADDITIONAL OPERATING INFORMATION

1. Estimated pressure at the point and time of the Accident (psig):	727.00
2. Maximum Operating Pressure (MOP) at the point and time of the Accident (psig):	879.00
3. Describe the pressure on the system or facility relating to the Accident (psig):	Pressure did not exceed MOP
4. Not including pressure reductions required by PHMSA regulations (such as for repairs and pipe movement), was the system or facility relating to the Accident operating under an established pressure restriction with pressure limits below those normally allowed by the MOP?	No
- If Yes, Complete 4.a and 4.b below:	
4a. Did the pressure exceed this established pressure restriction?	
4b. Was this pressure restriction mandated by PHMSA or the State?	
5. Was "Onshore Pipeline, Including Valve Sites" OR "Offshore Pipeline, Including Riser and Riser Bend" selected in PART C, Question 2?	No
- If Yes - (*Complete 5a. – 5f below)* effective 12-2012, changed to *"(Complete 5.a – 5.e below)"*	
5a. Type of upstream valve used to initially isolate release source:	
5b. Type of downstream valve used to initially isolate release source:	
5c. Length of segment isolated between valves (ft):	
5d. Is the pipeline configured to accommodate internal inspection tools?	
- If No, Which physical features limit tool accommodation? (*select all that apply)*	
- Changes in line pipe diameter	
- Presence of unsuitable mainline valves	
- Tight or mitered pipe bends	
- Other passage restrictions (i.e. unbarred tee's, projecting instrumentation, etc.)	
- Extra thick pipe wall (applicable only for magnetic flux leakage internal inspection tools)	
- Other -	
- If Other, Describe:	
5e. For this pipeline, are there operational factors which significantly complicate the execution of an internal inspection tool run?	
- If Yes, Which operational factors complicate execution? (*select all that apply*)	

- Excessive debris or scale, wax, or other wall buildup	
- Low operating pressure(s)	
- Low flow or absence of flow	
- Incompatible commodity	
- Other -	
- If Other, Describe:	
5f. Function of pipeline system:	> 20% SMYS Regulated Trunkline/Transmission
6. Was a Supervisory Control and Data Acquisition (SCADA)-based system in place on the pipeline or facility involved in the Accident?	Yes
If Yes -	
6a. Was it operating at the time of the Accident?	Yes
6b. Was it fully functional at the time of the Accident?	Yes
6c. Did SCADA-based information (such as alarm(s), alert(s), event(s), and/or volume calculations) assist with the detection of the Accident?	Yes
6d. Did SCADA-based information (such as alarm(s), alert(s), event(s), and/or volume calculations) assist with the confirmation of the Accident?	Yes
7. Was a CPM leak detection system in place on the pipeline or facility involved in the Accident?	Yes
- If Yes:	
7a. Was it operating at the time of the Accident?	Yes
7b. Was it fully functional at the time of the Accident?	Yes
7c. Did CPM leak detection system information (such as alarm (s), alert(s), event(s), and/or volume calculations) assist with the detection of the Accident?	No
7d. Did CPM leak detection system information (such as alarm (s), alert(s), event(s), and/or volume calculations) assist with the confirmation of the Accident?	No
8. How was the Accident initially identified for the Operator?	CPM leak detection system or SCADA-based information (such as alarm(s), alert(s), event(s), and/or volume calculations)
- If Other, Specify:	
8a. If "Controller", "Local Operating Personnel", including contractors", "Air Patrol", or "Ground Patrol by Operator or its contractor" is selected in Question 8, specify:	
9. Was an investigation initiated into whether or not the controller(s) or control room issues were the cause of or a contributing factor to the Accident?	No, the Operator did not find that an investigation of the controller(s) actions or control room issues was necessary due to: (provide an explanation for why the Operator did not investigate)
- If No, the Operator did not find that an investigation of the controller(s) actions or control room issues was necessary due to: *(provide an explanation for why the operator did not investigate)*	Actions from the Operator would not have had an impact on the event
- If Yes, specify investigation result(s): *(select all that apply)*	
- Investigation reviewed work schedule rotations, continuous hours of service (while working for the Operator), and other factors associated with fatigue	
- Investigation did NOT review work schedule rotations, continuous hours of service (while working for the Operator), and other factors associated with fatigue	
Provide an explanation for why not:	
- Investigation identified no control room issues	
- Investigation identified no controller issues	
- Investigation identified incorrect controller action or controller error	
- Investigation identified that fatigue may have affected the controller(s) involved or impacted the involved controller(s) response	
- Investigation identified incorrect procedures	
- Investigation identified incorrect control room equipment operation	
- Investigation identified maintenance activities that affected control room operations, procedures, and/or controller response	
- Investigation identified areas other than those above:	
Describe:	

PART F - DRUG & ALCOHOL TESTING INFORMATION

1. As a result of this Accident, were any Operator employees tested under the post-accident drug and alcohol testing requirements of DOT's Drug & Alcohol Testing regulations?	No
- If Yes:	
1a. Specify how many were tested:	
1b. Specify how many failed:	
2. As a result of this Accident, were any Operator contractor employees tested under the post-accident drug and alcohol testing requirements of DOT's Drug & Alcohol Testing regulations?	No
- If Yes:	
2a. Specify how many were tested:	
2b. Specify how many failed:	

PART G – APPARENT CAUSE

Select only one box from PART G in shaded column on left representing the APPARENT Cause of the Accident, and answer the questions on the right. Describe secondary, contributing or root causes of the Accident in the narrative (PART H).

Apparent Cause:	G8 - Other Incident Cause

G1 - Corrosion Failure - only one **sub-cause** can be picked from shaded left-hand column

Corrosion Failure – Sub-Cause:	
- If External Corrosion:	
1. Results of visual examination:	
- If Other, Describe:	
2. Type of corrosion: *(select all that apply)*	
- Galvanic	
- Atmospheric	
- Stray Current	
- Microbiological	
- Selective Seam	
- Other:	
- If Other, Describe:	
3. The type(s) of corrosion selected in Question 2 is based on the following: *(select all that apply)*	
- Field examination	
- Determined by metallurgical analysis	
- Other:	
- If Other, Describe:	
4. Was the failed item buried under the ground?	
- If Yes :	
□4a. Was failed item considered to be under cathodic protection at the time of the Accident?	
If Yes - Year protection started:	
4b. Was shielding, tenting, or disbonding of coating evident at the point of the Accident?	
4c. Has one or more Cathodic Protection Survey been conducted at the point of the Accident?	
If "Yes, CP Annual Survey" – Most recent year conducted:	
If "Yes, Close Interval Survey" – Most recent year conducted:	
If "Yes, Other CP Survey" – Most recent year conducted:	
- If No:	
4d. Was the failed item externally coated or painted?	
5. Was there observable damage to the coating or paint in the vicinity of the corrosion?	
- If Internal Corrosion:	
6. Results of visual examination:	
- Other:	
7. Type of corrosion *(select all that apply)*: -	
- Corrosive Commodity	
- Water drop-out/Acid	
- Microbiological	
- Erosion	
- Other:	
- If Other, Describe:	
8. The cause(s) of corrosion selected in Question 7 is based on the following *(select all that apply)*: -	
- Field examination	
- Determined by metallurgical analysis	
- Other:	

- If Other, Describe:	
9. Location of corrosion *(select all that apply)*: -	
- Low point in pipe	
- Elbow	
- Other:	
- If Other, Describe:	
10. Was the commodity treated with corrosion inhibitors or biocides?	
11. Was the interior coated or lined with protective coating?	
12. Were cleaning/dewatering pigs (or other operations) routinely utilized?	
13. Were corrosion coupons routinely utilized?	
Complete the following if any Corrosion Failure sub-cause is selected AND the "Item Involved in Accident" (from PART C, Question 3) is Tank/Vessel.	
14. List the year of the most recent inspections:	
14a. API Std 653 Out-of-Service Inspection	
- No Out-of-Service Inspection completed	
14b. API Std 653 In-Service Inspection	
- No In-Service Inspection completed	
Complete the following if any Corrosion Failure sub-cause is selected AND the "Item Involved in Accident" (from PART C, Question 3) is Pipe or Weld.	
15. Has one or more internal inspection tool collected data at the point of the Accident?	
15a. If Yes, for each tool used, select type of internal inspection tool and indicate most recent year run: -	
- Magnetic Flux Leakage Tool	
Most recent year:	
- Ultrasonic	
Most recent year:	
- Geometry	
Most recent year:	
- Caliper	
Most recent year:	
- Crack	
Most recent year:	
- Hard Spot	
Most recent year:	
- Combination Tool	
Most recent year:	
- Transverse Field/Triaxial	
Most recent year:	
- Other	
Most recent year:	
Describe:	
16. Has one or more hydrotest or other pressure test been conducted since original construction at the point of the Accident?	
If Yes -	
Most recent year tested:	
Test pressure:	
17. Has one or more Direct Assessment been conducted on this segment?	
- If Yes, and an investigative dig was conducted at the point of the Accident::	
Most recent year conducted:	
- If Yes, but the point of the Accident was not identified as a dig site:	
Most recent year conducted:	
18. Has one or more non-destructive examination been conducted at the point of the Accident since January 1, 2002?	
18a. If Yes, for each examination conducted since January 1, 2002, select type of non-destructive examination and indicate most recent year the examination was conducted:	
- Radiography	
Most recent year conducted:	
- Guided Wave Ultrasonic	
Most recent year conducted:	
- Handheld Ultrasonic Tool	
Most recent year conducted:	
- Wet Magnetic Particle Test	
Most recent year conducted:	
- Dry Magnetic Particle Test	
Most recent year conducted:	
- Other	
Most recent year conducted:	
Describe:	

G2 - Natural Force Damage - only one **sub-cause** can be picked from shaded left-handed column	
Natural Force Damage – Sub-Cause:	
- If Earth Movement, NOT due to Heavy Rains/Floods:	
1. Specify:	
- If Other, Describe:	
- If Heavy Rains/Floods:	
2. Specify:	
- If Other, Describe:	
- If Lightning:	
3. Specify:	
- If Temperature:	
4. Specify:	
- If Other, Describe:	
- If Other Natural Force Damage:	
5. Describe:	
Complete the following if any Natural Force Damage sub-cause is selected.	
6. Were the natural forces causing the Accident generated in conjunction with an extreme weather event?	
6a. If Yes, specify: *(select all that apply)*	
- Hurricane	
- Tropical Storm	
- Tornado	
- Other	
- If Other, Describe:	
G3 - Excavation Damage - only one **sub-cause** can be picked from shaded left-hand column	
Excavation Damage – Sub-Cause:	
- If Previous Damage due to Excavation Activity: Complete Questions 1-5 ONLY IF the "Item Involved in Accident" (from PART C, Question 3) is Pipe orWeld.	
1. Has one or more internal inspection tool collected data at the point of the Accident?	
1a. If Yes, for each tool used, select type of internal inspection tool and indicate most recent year run: -	
- Magnetic Flux Leakage	
Most recent year conducted:	
- Ultrasonic	
Most recent year conducted:	
- Geometry	
Most recent year conducted:	
- Caliper	
Most recent year conducted:	
- Crack	
Most recent year conducted:	
- Hard Spot	
Most recent year conducted:	
- Combination Tool	
Most recent year conducted:	
- Transverse Field/Triaxial	
Most recent year conducted:	
- Other	
Most recent year conducted:	
Describe:	
2. Do you have reason to believe that the internal inspection was completed BEFORE the damage was sustained?	
3. Has one or more hydrotest or other pressure test been conducted since original construction at the point of the Accident?	
- If Yes:	
Most recent year tested:	
Test pressure (psig):	
4. Has one or more Direct Assessment been conducted on the pipeline segment?	
- If Yes, and an investigative dig was conducted at the point of the Accident:	
Most recent year conducted:	
- If Yes, but the point of the Accident was not identified as a dig site:	
Most recent year conducted:	
5. Has one or more non-destructive examination been conducted at the point of the Accident since January 1, 2002?	

5a. If Yes, for each examination, conducted since January 1, 2002, select type of non-destructive examination and indicate most recent year the examination was conducted:	
- Radiography	
Most recent year conducted:	
- Guided Wave Ultrasonic	
Most recent year conducted:	
- Handheld Ultrasonic Tool	
Most recent year conducted:	
- Wet Magnetic Particle Test	
Most recent year conducted:	
- Dry Magnetic Particle Test	
Most recent year conducted:	
- Other	
Most recent year conducted:	
Describe:	
Complete the following if Excavation Damage by Third Party is selected as the sub-cause.	
6. Did the operator get prior notification of the excavation activity?	
6a. If Yes, Notification received from: *(select all that apply)* -	
- One-Call System	
- Excavator	
- Contractor	
- Landowner	
Complete the following mandatory CGA-DIRT Program questions if any Excavation Damage sub-cause is selected.	
7. Do you want PHMSA to upload the following information to CGA-DIRT (www.cga-dirt.com)?	
8. Right-of-Way where event occurred: *(select all that apply)* -	
- Public	
- If "Public", Specify:	
- Private	
- If "Private", Specify:	
- Pipeline Property/Easement	
- Power/Transmission Line	
- Railroad	
- Dedicated Public Utility Easement	
- Federal Land	
- Data not collected	
- Unknown/Other	
9. Type of excavator:	
10. Type of excavation equipment:	
11. Type of work performed:	
12. Was the One-Call Center notified?	
12a. If Yes, specify ticket number:	
12b. If this is a State where more than a single One-Call Center exists, list the name of the One-Call Center notified:	
13. Type of Locator:	
14. Were facility locate marks visible in the area of excavation?	
15. Were facilities marked correctly?	
16. Did the damage cause an interruption in service?	
16a. If Yes, specify duration of the interruption (hours)	
17. Description of the CGA-DIRT Root Cause *(select only the one predominant first level CGA-DIRT Root Cause and then, where available as a choice, the one predominant second level CGA-DIRT Root Cause as well):*	
Root Cause:	
- If One-Call Notification Practices Not Sufficient, specify:	
- If Locating Practices Not Sufficient, specify:	
- If Excavation Practices Not Sufficient, specify:	
- If Other/None of the Above, explain:	
G4 - Other Outside Force Damage - *only one **sub-cause** can be selected from the shaded left-hand column*	
Other Outside Force Damage – Sub-Cause:	
- If Damage by Car, Truck, or Other Motorized Vehicle/Equipment NOT Engaged in Excavation:	
1. Vehicle/Equipment operated by:	
- If Damage by Boats, Barges, Drilling Rigs, or Other Maritime Equipment or Vessels Set Adrift or Which Have Otherwise Lost Their Mooring:	
2. Select one or more of the following IF an extreme weather event was a factor:	
- Hurricane	
- Tropical Storm	
- Tornado	

- Heavy Rains/Flood	
- Other	
- If Other, Describe:	
- If Previous Mechanical Damage NOT Related to Excavation: Complete Questions 3-7 ONLY IF the "Item Involved in Accident" (from PART C, Question 3) is Pipe or Weld.	
3. Has one or more internal inspection tool collected data at the point of the Accident?	
3a. If Yes, for each tool used, select type of internal inspection tool and indicate most recent year run:	
- Magnetic Flux Leakage	
Most recent year conducted:	
- Ultrasonic	
Most recent year conducted:	
- Geometry	
Most recent year conducted:	
- Caliper	
Most recent year conducted:	
- Crack	
Most recent year conducted:	
- Hard Spot	
Most recent year conducted:	
- Combination Tool	
Most recent year conducted:	
- Transverse Field/Triaxial	
Most recent year conducted:	
- Other	
Most recent year conducted:	
Describe:	
4. Do you have reason to believe that the internal inspection was completed BEFORE the damage was sustained?	
5. Has one or more hydrotest or other pressure test been conducted since original construction at the point of the Accident?	
- If Yes:	
Most recent year tested:	
Test pressure (psig):	
6. Has one or more Direct Assessment been conducted on the pipeline segment?	
- If Yes, and an investigative dig was conducted at the point of the Accident:	
Most recent year conducted:	
- If Yes, but the point of the Accident was not identified as a dig site:	
Most recent year conducted:	
7. Has one or more non-destructive examination been conducted at the point of the Accident since January 1, 2002?	
7a. If Yes, for each examination conducted since January 1, 2002, select type of non-destructive examination and indicate most recent year the examination was conducted:	
- Radiography	
Most recent year conducted:	
- Guided Wave Ultrasonic	
Most recent year conducted:	
- Handheld Ultrasonic Tool	
Most recent year conducted:	
- Wet Magnetic Particle Test	
Most recent year conducted:	
- Dry Magnetic Particle Test	
Most recent year conducted:	
- Other	
Most recent year conducted:	
Describe:	
- If Intentional Damage:	
8. Specify:	
- If Other, Describe:	
- If Other Outside Force Damage:	
9. Describe:	
G5 - Material Failure of Pipe or Weld - only one **sub-cause** can be selected from the shaded left-hand column	
Use this section to report material failures ONLY IF the "Item Involved in Accident" (from PART C, Question 3) is "Pipe" or "Weld."	
Material Failure of Pipe or Weld – Sub-Cause:	
1. The sub-cause shown above is based on the following: *(select all that apply)*	

- Field Examination	
- Determined by Metallurgical Analysis	
- Other Analysis	
- If "Other Analysis", Describe:	
- Sub-cause is Tentative or Suspected; Still Under Investigation (Supplemental Report required)	
- If Construction, Installation, or Fabrication-related:	
2. List contributing factors: *(select all that apply)*	
- Fatigue or Vibration-related	
Specify:	
- If Other, Describe:	
- Mechanical Stress:	
- Other	
- If Other, Describe:	
- If Environmental Cracking-related:	
3. Specify:	
- If Other - Describe:	
Complete the following if any Material Failure of Pipe or Weld sub-cause is selected.	
4. Additional factors: (*select all that apply*):	
- Dent	
- Gouge	
- Pipe Bend	
- Arc Burn	
- Crack	
- Lack of Fusion	
- Lamination	
- Buckle	
- Wrinkle	
- Misalignment	
- Burnt Steel	
- Other:	
- If Other, Describe:	
5. Has one or more internal inspection tool collected data at the point of the Accident?	
5a. If Yes, for each tool used, select type of internal inspection tool and indicate most recent year run:	
- Magnetic Flux Leakage	
Most recent year run:	
- Ultrasonic	
Most recent year run:	
- Geometry	
Most recent year run:	
- Caliper	
Most recent year run:	
- Crack	
Most recent year run:	
- Hard Spot	
Most recent year run:	
- Combination Tool	
Most recent year run:	
- Transverse Field/Triaxial	
Most recent year run:	
- Other	
Most recent year run:	
Describe:	
6. Has one or more hydrotest or other pressure test been conducted since original construction at the point of the Accident?	
- If Yes:	
Most recent year tested:	
Test pressure (psig):	
7. Has one or more Direct Assessment been conducted on the pipeline segment?	
- If Yes, and an investigative dig was conducted at the point of the Accident -	
Most recent year conducted:	
- If Yes, but the point of the Accident was not identified as a dig site -	
Most recent year conducted:	
8. Has one or more non-destructive examination(s) been conducted at the point of the Accident since January 1, 2002?	
8a. If Yes, for each examination conducted since January 1, 2002, select type of non-destructive examination and indicate most recent year the examination was conducted: -	

- Radiography	
Most recent year conducted:	
- Guided Wave Ultrasonic	
Most recent year conducted:	
- Handheld Ultrasonic Tool	
Most recent year conducted:	
- Wet Magnetic Particle Test	
Most recent year conducted:	
- Dry Magnetic Particle Test	
Most recent year conducted:	
- Other	
Most recent year conducted:	
Describe:	
G6 – **Equipment Failure** - only one **sub-cause** can be selected from the shaded left-hand column	
Equipment Failure – **Sub-Cause:**	
- If Malfunction of Control/Relief Equipment:	
1. Specify: *(select all that apply)* -	
- Control Valve	
- Instrumentation	
- SCADA	
- Communications	
- Block Valve	
- Check Valve	
- Relief Valve	
- Power Failure	
- Stopple/Control Fitting	
- ESD System Failure	
- Other	
- If Other – Describe:	
- If Pump or Pump-related Equipment:	
2. Specify:	
- If Other – Describe:	
- If Threaded Connection/Coupling Failure:	
3. Specify:	
- If Other – Describe:	
- If Non-threaded Connection Failure:	
4. Specify:	
- If Other – Describe:	
- If Other Equipment Failure:	
5. Describe:	
Complete the following if any Equipment Failure sub-cause is selected.	
6. Additional factors that contributed to the equipment failure: *(select all that apply)*	
- Excessive vibration	
- Overpressurization	
- No support or loss of support	
- Manufacturing defect	
- Loss of electricity	
- Improper installation	
- Mismatched items (different manufacturer for tubing and tubing fittings)	
- Dissimilar metals	
- Breakdown of soft goods due to compatibility issues with transported commodity	
- Valve vault or valve can contributed to the release	
- Alarm/status failure	
- Misalignment	
- Thermal stress	
- Other	
- If Other, Describe:	
G7 - Incorrect Operation - only one **sub-cause** can be selected from the shaded left-hand column	
Incorrect Operation – **Sub-Cause:**	

- If Tank, Vessel, or Sump/Separator Allowed or Caused to Overfill or Overflow	
1. Specify:	
- If Other, Describe:	
- If Other Incorrect Operation	
2. Describe:	
Complete the following if any Incorrect Operation sub-cause is selected.	
3. Was this Accident related to *(select all that apply)*: -	
- Inadequate procedure	
- No procedure established	
- Failure to follow procedure	
- Other:	
- If Other, Describe:	
4. What category type was the activity that caused the Accident?	
5. Was the task(s) that led to the Accident identified as a covered task in your Operator Qualification Program?	
5a. If Yes, were the individuals performing the task(s) qualified for the task(s)?	
G8 - Other Accident Cause - only one **sub-cause** can be selected from the shaded left-hand column	
Other Accident Cause – Sub-Cause:	Unknown
- If Miscellaneous:	
1. Describe:	
- If Unknown:	
2. Specify:	Still under investigation, cause of Accident to be determined* (*Supplemental Report required)

PART H - NARRATIVE DESCRIPTION OF THE ACCIDENT

On July 4, 2019 at 9:50 PM CDT, the on-call technician was dispatched by the Edmonton Control Center to the Floodwood Line 4 Station due to a gas alarm. While the technician was enroute to the station, the Control Center received another gas alarm, initiating the Line 4 shut down at 10:03 PM CDT. Upon arriving at the station at 10:30 PM CDT, the technician confirmed oil on the pump room floor and the interior walls of the building. Additional personnel were dispatched to assist with clean up. It was discovered that the source of the crude oil was a pinhole leak on the 1/2" tubing on the Line 4 Unit 2 pump.

The NRC was notified on July 5, 2019 at 2:13 PM CDT (#1251072) after the Unit 2 motor was found to have oil inside the housing unit and the costs were estimated to exceed the NRC reporting threshold to clean and repair the motor. A 48-hour update was made to the NRC on July 7, 2019 at 8:23 AM CDT (#1251215). The cause of the release is under investigation and will be determined with a metallurgical analysis to be completed by a third party. The pump is currently locked out until the motor is cleaned and the piping replaced. Approximately three cubic yards of contaminated soil has been properly disposed of.

PART I - PREPARER AND AUTHORIZED SIGNATURE

Preparer's Name	[redacted]
Preparer's Title	Sr Compliance Analyst
Preparer's Telephone Number	[redacted]
Preparer's E-mail Address	[redacted]
Preparer's Facsimile Number	
Authorized Signer Name	[redacted]
Authorized Signer Title	Supervisor US Pipeline Compliance
Authorized Signer Telephone Number	[redacted]
Authorized Signer Email	[redacted]
Date	12/05/2019