

Enbridge Semi-Annual Report May 23, 2021, to November 22, 2021

DJ# 90-5-1-1-10099

January 18, 2022

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

AGM	Above Ground Marker
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
API	American Petroleum Institute
ATC	American Transmission Company
AUV	Autonomous Underwater Vehicle
AVB	Automated Volume Balance
BIWP	Biota Investigation Work Plan
BIA	Bureau of Indian Affairs
COTP	Coast Guard of the Port
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
DAS	Distributed Acoustic Sensing
DOC	Department of Commerce
DOJ	Department of Justice
DPR	Discharge Pressure Restriction
DQA	Data Quality Assessment
DQR	Data Quality Review
DSAW	Double Submerged Arc Welded
DWSMAs	Minnesota Department of Drinking Water Supply Management Areas
EA	Engineering Assessment
EGLE	Michigan Department of Environment, Great Lakes, and Energy
EIS	Environmental Impact Statement
EMOP	Established Maximum Operating Pressure
EPA	Environmental Protection Agency
ER	Emergency Response
ESA	Endangered Species Act
ESMOC	Enbridge Straits Maritime Operations Center
eAtoN	Electronic Aids to Navigation
FCC	Federal Communications Commission
FEA	Finite Element Analysis
FHLA	Field Level Hazard Assessment
FLIR	Forward-Looking Infrared
FMP	Fen Management Plan
FdL	Fond du Lac Band of Lake Superior Chippewa
FRT	Field Response Team
FR	Future Report
FRE	Features Requiring Excavation
FWT	Fluid Withdrawal Testing
GW	Girth Weld
HCA	High Consequence Area
HDD	Horizontal Directional Drill
HIVES	Hydrologic Imagery Visualization Enterprise System



ICP	Integrated Contingency Plan
ICS	Incident Command System
ILI	In-Line Inspection
ILIMRR	In-Line Inspection Minimum Reporting Requirements
IMT	Incident Management Team
IR	Information Request
ISD	In-service Date
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	Material Balance System
MSCA	Mackinac Straits Corridor Authority
MSEL	Master Scenario Events List
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
MRR	Minimum Reporting Requirement
MSP	Most Severe Point
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
NOAA	National Oceanic and Atmospheric Administration
NOV	Notice of Violation
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historical Properties
NTSB	National Transportation Safety Board
NWT	Nominal Wall Thickness
OD	Outside Diameter
OSRO	Oil Spill Response Organization
OMM	Operations & Maintenance Manual
PCSLD	Pipeline Control Systems and Leak Detection
PHMSA	Pipeline Hazardous Materials Safety Administration
P	Paragraph
PI	Pipeline Integrity
PLM	Pipeline Maintenance
PN	Priority Notification
PO	Purchase Order
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
RFBS	Rupture Flow-based Solution
RNA	Regulated Navigation Area
ROA	Record of Alarms
ROV	Remote Operated Vehicle
RPR	Rupture Pressure Ratio
SAR	Semi-Annual Report
SAW	Submerged Arc Welded
SAWP	Screw Anchor Work Plan
SCADA	Supervisory Control and Data Acquisition
SCC	Stress Crack Corrosion
SHPO	State Historic Preservation Office
SME	Subject Matter Expert
SML	Subject Matter Lead
SOA	Summary of Alarms
SOC	Security Operations Center
SoM	State of Michigan
SRAHC	Saginaw River All Hazards Committee
SRB	Sulfate Reducing Bacteria
STA	Senior Technical Advisor
TPC	Third Party Consultant
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
VAIS	Visual Aids to Navigation
VIR	Verification Issue Record
VCI	Vapor Corrosion Inhibitor
VSR	Verification Status Record
VMRS	Vessel Movement Reporting System
WLOA	Weekly List of Alarms
WMA	Wildlife Management Area
WQC	Water Quality Certification
WT	Wall Thickness



Introduction

Enbridge¹ submits this ninth Semi-Annual Report (also referred to herein as “SAR” or “Report”) in electronic form in accordance with United States Environmental Protection Agency (“EPA”) request and 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 ninth 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 ninth reporting period dated May 23, 2021 to November 22, 2021 (“the reporting period”), no later than six months after the submittal of the eighth SAR. Enbridge’s first SAR was submitted on January 18, 2018; the second on July 18, 2018; the third SAR on January 18, 2019; the fourth SAR on July 18, 2019; the fifth SAR on January 17, 2020; the sixth on July 17, 2020; the seventh on January 19, 2021; and the eighth on July 19, 2021. This ninth SAR is submitted on January 18, 2022, within six months of the eighth SAR. As per Paragraph 150 of the Consent Decree, this ninth 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 ninth 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 ninth reporting period. To facilitate ongoing termination discussions between Enbridge and the United States, this ninth SAR also provides information to the ITP concerning Enbridge’s compliance with certain requirements in Subsections VII.A-J from May 23, 2021 through November 22, 2021. Additional requirements implemented between November 23, 2021 and January 11, 2022 are also included in this report. 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 ninth 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, with each having 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 of features, 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 9 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

Table Intro-1 in Appendix 1 lists the Enbridge activities that are 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 this reporting period.

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

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

As explained in SARs 1 through 9, Enbridge vigorously pursued all necessary permits to complete the replacement of Line 3² as quickly as possible to meet the requirements under Paragraph 22.a. As of this Semi-Annual Report, Enbridge removed Original US Line 3 from service having completed construction of New US Line 3 (Line 93) and placing the line into service. Original US Line 3 was purged of oil between October 1 and November 3, 2021.

Permitting and Construction:

As of December 1, 2020, Enbridge received all necessary authorizations to begin construction of all segments of Line 93. Construction was initiated on December 1, 2020 for the remaining segments and line fill completed on October 13, 2021. Details on permits are in **Table B-1** in Appendix 1.

Table B-2 in Appendix 1 identifies key dates regarding the construction of Line 93. A planned mainline construction hiatus in April and May 2021 accommodated road weight restrictions and environmental work restriction dates. Construction at Line 93 facilities continued during this period and mainline construction resumed June 2, 2021. Line 93 line fill was completed on October 13, 2021.

22.b [Line 3 Decommissioning]

Enbridge purged the remaining oil from Original US Line 3 by running pigs through the line beginning on October 1, 2021 and completed the purge on November 3, 2021. The cleaning train was not run sequentially from Joliette to the Segment 18 Tie-In in order to facilitate Line 93 line fill. The timing for each segment is outlined in the list below and is based on the date the pigs were launched:

- Joliette, ND to Donaldson Station
 - Purge started October 1, 2021
 - Purge completed October 2, 2021
- Clearbrook Terminal to the Segment 18 Tie-In on Military Road in Superior, WI
 - Purge started October 2, 2021

² New US Line 3 as contemplated by the Consent Decree is now called Line 93 by Enbridge.



- Purge completed October 10, 2021
- Donaldson Station to Clearbrook Terminal
 - Purge started November 1, 2021
 - Purge completed November 3, 2021

As detailed above, Enbridge achieved the requirement to purge remaining oil in Original Line 3 within 90 Days after the Original Line 3 was taken out of service by completing the purge on November 3, 2021. The ITP was onsite between October 1 and November 5 to witness and verify purge and cleaning activities.

For the purposes of cleaning the pipeline, Enbridge divided Original US Line 3 into two sections. Section 1 applies to the segment from Joliette, ND to Clearbrook Terminal. Section 2 is Clearbrook Terminal to the Segment 18 Tie-In. For Section 2, the cleaning train was connected directly to the purge pigs; the cleaning train landed at the Segment 18 Tie-In on October 10 and the last pigs were removed on November 5. For Section 1, purge pigs were run through the pipeline to purge remaining oil from Original US Line 3. Enbridge will complete the final clean-out of Section 1 in the third quarter of 2022. A nitrogen blanket remains on Section 1 pending the final clean out. This schedule for the final clean-out of Section 1 complies with the Subparagraph 22.b requirement to complete final clean-out and decommissioning of Original US Line 3 within one year of Original Line 3 being taken out of service.

On December 23, 2021 Enbridge responded to the ITP's request for information about the cleaning program for Section 2 of Original US Line 3. The provided information included volumes of hydrocarbons and cleaning water, lab analysis reports, and an explanation about differences between the executed cleaning train design for the Section 2 cleaning program and the 2017 Deactivation Plan.

As documented in that response, the Original Line 3 cleaning program was designed to reduce the summed Total Petroleum Hydrocarbons from the pipe. The cleaning program sampling results verified the efficacy of the cleaning sequence for Section 2, consistent with the 2017 Line 3 Deactivation Plan Section 4.1.

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

Until taking Original US Line 3 out of service, Enbridge limited the operating pressure of all Original US Line 3 segments in accordance with MOP values specified at <https://www.epa.gov/enbridge-spill-michigan/enbridge-revised-maximum-operating-pressure-values>.

Enbridge did not increase operating pressures of Original US Line 3 above the specified MOP values; therefore, hydrostatic pressure tests were not required to be conducted. Although not required by the Consent Decree, each month, Enbridge has reported to the ITP the maximum pressure compared to the maximum allowable pressure on Original US Line 3.

Section 1 of Original US Line 3, as outlined in Subparagraph 22.b, has been purged and will have a nitrogen blanket in place until the final clean out. Until the clean out is complete, Enbridge continues to report to the ITP the maximum pressure compared to the maximum allowable pressure on Original US Line 3. Section 2 of Original US Line 3 is decommissioned and reporting of maximum operating pressures is complete.

During the commissioning of pressure transmitters on the suction side at Clearbrook station of Original US Line 3, two events occurred during this reporting period where Enbridge simulated pressure values that were over the maximum operating pressures ("MOP") for Original US Line 3. Simulating pressure values are required to verify the range and accuracy of instrumentation during testing and pose no safety issues. The two events are described in Paragraph 144, [Section B] September 3, 2021 and October 1, 2021 Simulated Overpressures on Original US Line 3 at Clearbrook during Commissioning of Line 93 – P. 22.c.



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

Portions of Original US Line 3 remained in service as of December 31, 2017 through this reporting period. As reported in Subparagraph 22.b, Enbridge purged oil from Original US Line 3 between October 1 and November 3, 2021. 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 for the periods that the line was operational.

- (1) There were no ILIs completed on Original US Line 3 in this reporting period as the line was in its final year of service.
- (2) The identification, excavation and mitigation or repair 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 2021 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**. The purging and deactivation of Original US Line 3 began on October 1, 2021 and therefore a biocide treatment was not required for Q4.

The biocide treatment vendors and specific biocide chemicals used in the Line 3 GF-CR and CR-PW segments were adjusted in 2020 to address seasonal requirements. Two different biocides were used for 2021. Spec-Aid 8Q5703, in which the active ingredient is Cocodiamine, is used when the biocide is exposed to winter conditions at the time of injection. Spec-Aid 8Q5700ULS, in which the active ingredient is Glutaraldehyde, is used when the biocide is exposed to other conditions at the time of injection. One biodispersant, Spec-Aid 8Q5701, is used in conjunction with each specific biocide. The biocide concentration requirement for each biocide remains unchanged at 500 ppm.

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

Original US Line 3 operated through October 1, 2021 when the purging operations commenced. As reported in Subparagraph 22.d, the purge was completed on November 3, 2021. Since November 3, 2021, Original US Line 3 has not been used for any operations, including to transport oil, gas, diluent or any hazardous substances. Final deactivation work, including segmentation work on Sections 1 and 2 and chemical cleaning on Section 1 of Original US Line 3, is planned for summer and fall of 2022.

23 [Line 10 Replacement Evaluation]

As reported in SAR4 this requirement is complete. On April 8, 2019, Enbridge received the ITP’s Evaluation of Enbridge US Line 10 Submittals Report, identifying that “the Collective Information, taken as a whole, complies with the requirements of CD P. 23”.

As previously reported to the EPA and ITP, on June 1, 2020, Enbridge closed on the sale of Line 10 to Kiantone Pipeline Corporation. Enbridge will continue to maintain responsibility for the operation of Line 10 during the term of the Consent Decree.

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 22 and November 22, 2021). 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 continues to implement the requirements for geometry, corrosion and axial cracking features.

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, in applying the Consent Decree 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 Paragraph 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 that Enbridge believes are currently required under Paragraphs 65 and 66 of the Consent Decree for all Lakehead System Pipelines have been completed. Those ILIs required to detect crack features on Line 2 were 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"). This was reported on in previous SARs.

Refer to **Table IX-1** in P. 144 Problems Anticipated in Appendix 1 for circumferential cracking details and the Paragraph 144 discussion regarding cracking: [Section D] Circumferential Cracking Engineering Assessment Process – Various Paragraphs.

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 8.3, version date March 1, 2020). This was updated from the previous version which was issued to all approved ILI vendors prior to the Consent Decree Effective Date. The requirements that vendors must submit Data Quality Assessments ("DQA") according to the deadlines specified in the Consent Decree are specified in the ILIMRR. 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 as reported in **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 Lakehead System 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, 66 and 70 of the Consent Decree and the ILI Stipulation agreed to by EPA and Enbridge and filed with the Court on May 2, 2018.

30 [ILI Schedule Modification]

ILIs have been performed by Enbridge, as shown **Table D-1**. During this reporting period, any failed or partially failed ILI runs that required a re-run are 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 SAR8. All schedule changes associated with the ILIs are planned to be completed as per the re-inspection interval requirements in Paragraphs 65, 66 and 70 of the Consent Decree and the ILI Stipulation agreed to by EPA and Enbridge and filed with the Court on May 2, 2018. The modified schedule was communicated to the ITP and EPA during monthly technical meetings.

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. As indicated in **Table D-5**, there were no incomplete or invalid ILIs in this reporting period.

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.

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.

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.

Incomplete or Invalid ILIs and Rerun Dates

Per **Table D-5** there were no incomplete or invalid ILIs in this reporting period.

ILIs with Minor Tool Performance Deficiencies (did not meet vendor specification)

Per **Table D-6** there were three ILIs with Minor Tool Performance Deficiencies in this reporting period.



Line 3 CR-PW UC (Tool Run ID 10228)

During the inspection, one sensor skid consisting of 7 clockwise and 7 counterclockwise crack sensors experienced lower than normal signal amplitude. The stated tool performance was achieved for 97.48% of the inline inspection, but higher than standard sizing uncertainty was expected for a total of 2.52% of the total pipe surface. The ILI vendor was unable to provide a revised performance specification for the affected area, but did complete a detailed signal analysis, determining that the degradation only affected the features that interacted with the long seam of Submerged Arc Welded ("SAW") and Double Submerged Arc Welded ("DSAW") pipes. Based on the detailed ILI vendor investigation, 11 features were found to be in the affected zone. All 11 features were identified in both the 2020 and 2021 inspections, confirming that flaw detection was not affected for these sensors. Since this segment was on a one-year reinspection interval, Enbridge and the vendor agreed that it was highly unlikely that there would be a significant flaw that would not have been previously detected by the ILIs and assessed. Since the 2020 ILI data in the affected zone was complete and within tool performance specifications, Enbridge determined that the 2020 ILI data could be utilized to supplement the 2021 inspection data for the assessment on this degraded portion of the inspection.

A conservative initial assessment was conducted on this degraded portion of the inspection data. The re-calculation of failure pressures was completed utilizing the largest reported depth from either the 2020 or 2021 inspection and twice the feature axial length from the 2020 inspection. Doubling the 2020 feature axial length conservatively considered the additional uncertainty associated with the 2021 inspection. The fatigue life assessment was completed utilizing the 2020 depths and lengths and applying the Consent Decree worst quarter pressure spectrum between the 2019 and 2020 inspections. This assessment resulted in Safety Factors between 1.61 and 2.62, and Remaining Lives between 15.9 years and greater than 50 years from the 2020 ILI tool pull date for the 11 features found to be in the affected zone.

The assessment was recently updated utilizing the standard data substitution approach in accordance with Enbridge's PI-36 process. The first portion of the fatigue life assessment was completed utilizing the 2020 feature dimensions and the Consent Decree worst quarter pressure cycling spectrum between the 2019 and 2020 inspections to establish conservative calculated feature depths at the time of the 2021 inspection. The feature Safety Factors were calculated utilizing these conservative calculated feature depths at the time of the 2021 inspection. The second portion of the fatigue life assessment was completed utilizing these conservative calculated feature depths at the time of the 2021 inspection and applying the CD worst quarter spectrum between 2020 and 2021 inline inspections. This updated assessment resulted in Safety Factors between 1.85 and 2.68, and Remaining Lives between 14.4 years and greater than 50 years from the 2021 ILI tool pull date for the 11 features found to be in the affected zone.

The initial assessment and the updated assessment both resulted in Safety Factors greater than 1.25 and Remaining Lives greater than 5 years. Therefore, as per Consent Decree requirements no FREs were identified in the degraded portion of the inspection data.

Line 5 WNO-WMA MFL4 Corrosion (Tool Run ID 10240)

During the inspection three main corrosion sensors (76 to 78) were intermittently faulty from 427m into the inspection until the end of the inspection. Two additional main corrosion sensors (88 to 90) also became faulty as the ILI tool entered the receiving trap. The ILI vendor was not able to meet the contractual tool specification for the locations where the main corrosion sensors were faulty. The areas affected by the faulty sensors were reviewed using the 2020 MFL inspection data and the ILI vendor determined that no features were found in these areas in the previous inspection data.



The internal and external discrimination sensor 26 was faulty from 690 m into the inspection until the end of the inspection. This did not affect the analysis for this inspection. Enbridge accepted the ILI run because the data was of sufficient quality to complete the required analysis.

Line 10 ENR-UT MFL4 Corrosion (Tool Run ID 6692)

During the inspection, radial sensor 106 was observed to be under responding from 667 m into the inspection until the end of the inspection. As a result, a “super high-resolution plus” specification could not be met for pinholes and slotting features detected by this sensor, however a “super high-resolution” specification was still achieved in the areas inspected by this sensor. This reduced specification affected approximately 1% of the pipe data. As Enbridge has multiple MFL inspections on Line 10 ENR-UT and is on a three-year re-inspection interval, the “super high-resolution” specification is acceptable for the approximately 1% of the pipe data affected.

(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. All Initial ILI Reports were received in accordance with the timelines outlined in Paragraph 32.a through c.

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.³

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

33.b [Priority Feature Definition]

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 and Exhibit 1 – Fifth Modification of the Consent Decree:

1. Features that the ILI Vendor may consider to be an immediate threat to the integrity of the pipeline.
2. Ovalities greater or equal than 10 percent of the outside diameter (“OD”) of the pipe.
3. Dent or geometric features (other than ovalities) greater than or equal to 5 percent of the outside diameter (“OD”) of the pipe.
4. Metal loss features with peak depth greater than or equal to 75 percent of the nominal wall thickness of the pipe.

³ *Enbridge has not applied Consent Decree Priority Notification requirements to circumferential cracking features and has not applied Appendix B to evaluate circumferential crack features as it is not suitable for such features.*



5. 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.
6. Metal loss features with an effective area RPR less than or equal to 0.85.
7. Unmatched metal loss features with a depth greater than or equal to 50 percent of the nominal wall thickness or actual wall thickness.
8. Crack features that meet or exceed the saturation limit of the crack detection tool.
9. 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.
10. 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 5. The appropriate application of Appendix A with regards to ovality features has been incorporated into the Fifth Modification of the Consent Decree. For the purposes of this reporting period, Enbridge has applied the Priority Notification Criteria for ovalities as per the Fifth Modification requirements. 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-9**.

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.

Line 10 ENR-UT MFL4 Corrosion (Tool Run ID 6692)

The priority notification on Line 10 was received on 6/2/2021 in accordance with the priority notification criteria in Appendix A due to a 54% deep and 0.8 RPR External Metal Loss on pipe joint 8910. The assessment on the priority notification feature was completed, approved, and added to the Dig List on 6/3/2021. As shown in **Table D-9**, this feature was mitigated/repared on October 15, 2021.

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**. This table 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 (**Table D-11**). Enbridge completed evaluations required to resolve all identified data quality concerns. Details regarding data quality issues are reported below.

Line 4 CS-DR UCM Corrosion (Tool Run ID 10991)

While performing the threat integration assessment for this inspection, it was noticed that there were inconsistencies between the long seam weld orientations in the ILI Report and those in the baseline pipe book. The inconsistencies between the ILI Report and baseline pipe book occurred on joints of pipe that had dual long seam welds. The threat integration assessment was able to be completed for this inspection by adjusting the orientation of the long seam welds in the ILI Report to match the baseline pipe book. Enbridge is planning to update the ILI Minimum Report Requirements Guide accordingly to prevent this issue from reoccurring. The updates are anticipated to occur in the first quarter of 2022.

Line 3 CR-PW UC (Tool Run ID 10228)

During the inspection, one sensor skid consisting of 7 clockwise and 7 counterclockwise crack sensors experienced lower than normal signal amplitude. The stated tool performance was achieved for 97.48% of the inline inspection, but higher than standard sizing uncertainty was expected for a total of 2.52% of the total pipe surface. The ILI vendor was unable to provide a revised performance specification for the affected area, but did complete a detailed signal analysis, determining that the degradation only affected the features that interacted with the long seam of SAW and DSAW pipes. Based on the detailed ILI vendor investigation, 11 features were found to be in the affected zone. All 11 features were identified in both the 2020 and 2021 inspections, confirming that flaw detection was not affected for these sensors. Since this segment was on a one-year reinspection interval, Enbridge and the vendor agreed that it was highly unlikely that there would be a significant flaw that would not have been previously detected by the ILIs and assessed. Since the 2020 ILI data in the affected zone was complete and within tool performance specifications, Enbridge determined that the 2020 ILI data could be utilized to supplement the 2021 inspection data for the assessment on this degraded portion of the inspection.

A conservative initial assessment was conducted on this degraded portion of the inspection data. The recalculation of failure pressures was completed utilizing the largest reported depth from either the 2020 or 2021 inspection and twice the feature axial length from the 2020 inspection. Doubling the 2020 feature axial length conservatively considered the additional uncertainty associated with the 2021 inspection. The fatigue life assessment was completed utilizing the 2020 depths and lengths and applying the Consent Decree worst quarter pressure spectrum between the 2019 and 2020 inspections. This assessment resulted in Safety Factors between 1.61 and 2.62, and Remaining Lives between 15.9 years and greater than 50 years from the 2020 ILI tool pull date for the 11 features found to be in the affected zone.

The assessment was recently updated utilizing the standard data substitution approach in accordance with Enbridge's PI-36 process. The first portion of the fatigue life assessment was completed utilizing the 2020 feature dimensions and the Consent Decree worst quarter pressure cycling spectrum between the 2019 and 2020 inspections to establish conservative calculated feature depths at the time of the 2021 inspection. The feature Safety Factors are calculated utilizing these conservative calculated feature depths at the time of the 2021 inspection. The second portion of the fatigue life assessment was completed utilizing these conservative calculated feature depths at the time of the 2021 inspection and applying the CD worst quarter spectrum between 2020 and 2021 inline inspections. This updated assessment resulted in Safety Factors between 1.85 and 2.68, and Remaining Lives between 14.4 years and greater than 50 years from the 2021 ILI tool pull date for the 11 features found to be in the affected zone.



The initial assessment and the updated assessment both resulted in Safety Factors greater than 1.25 and Remaining Lives greater than 5 years. Therefore, as per Consent Decree requirements no FREs were identified as a result of this degraded portion of the inspection data. This issue was also reported in Paragraph 31 above.

Line 3 CR-PW MFL4 Corrosion (Tool Run ID 10229/11019)

The first MFL4 inspection of this segment in 2021 (Tool Run ID 10229) failed due to data quality issues. During the second MFL4 inspection (Tool Run ID 11019) of this segment, nine main corrosion sensors (31 to 39) were faulty for two spans; a 37 m span and a 189 m span.

The 37 m span resulted in degraded Feature data. A review of the previous 2020 inspection data completed by the ILI vendor identified only one possible Feature, a 2% deep external metal loss Feature, in the 37 m area where the sensors were faulty. The ILI vendor also reviewed the ILI data from the first 2021 MFL4 inspection (Tool Run ID 10229) and determined that the one possible Feature was not located in the area of the degraded Feature data. As a result, Enbridge accepted the ILI run because the data was of sufficient quality to complete the required analysis.

The 189 m span did result in degraded Feature data. A revised specification for sizing and detection was developed by the ILI vendor for the area, but it was not used, as the ILI data from the first MFL4 inspection on this segment was not degraded and could be used to assess this area.

Line 3 CR-PW MFL4 Geometry (Tool Run ID 10229/11019)

During the second inspection of this segment (Tool Run ID 11019) with the MFL4 tool, there were two geometry sensors that were faulty for a portion of the inspection. There was no impact to the sizing and detection specification as the geometry sensors were not adjacent to each other.

Line 4 CS-DR UCM Crack (Tool Run ID 10991)

There were several isolated spots during this inspection where the pendulum speed (rotation) of the tool could have had an impact on the discrimination capability of the tool. The ILI vendor concluded that there was no impact to the stated performance specification and no corrective action is required. Enbridge accepted the ILI run because the data is of sufficient quality to complete the required analysis.

Line 5 ENO-EMA MFL4 Geometry (Tool Run ID 10241)

During the inspection, channel 28 was faulty for the entire inspection. The geometry sizing and detection specifications were not impacted by this faulty channel. Enbridge accepted the ILI run because the data is of sufficient quality to complete the required analysis.

Line 5 ENO-EMA MFL4 Corrosion (Tool Run ID 10241)

During the inspection there was a short speed excursion that exceeded the vendor specified maximum velocity. If the ILI tool exceeds the specified maximum velocity, then the performance of the inspection may be degraded. The ILI vendor determined that there were no features located within the area of the speed excursion and that the ILI vendor's specification was not affected. Enbridge accepted the ILI run because the data is of sufficient quality to complete the required analysis.



Line 5 WNO-WMA MFL4 Corrosion (Tool Run ID 10240)

During the inspection the main corrosion sensors 76 to 78 were intermittently faulty from 427 m into the inspection until the end of the inspection. The main corrosion sensors 88 to 90 also became faulty during the inspection while the ILI tool was entering the receiving trap. The ILI vendor was not able to meet the contractual tool specification for the locations where the main corrosion sensors were faulty. The areas affected by the faulty sensors were reviewed using the 2020 MFL inspection data and the ILI vendor determined that no features were found in these areas.

The ID/OD discrimination sensor 26 was faulty from 690 m into the inspection until the end of the inspection. This did not affect the analysis for this inspection. Enbridge accepted the ILI run because the data is of sufficient quality to complete the required analysis.

Line 6A PE-AM UMP Corrosion (Tool Run ID 6662)

During the inspection there were instances where the ILI tool experienced speed excursions. This had no impact to the ILI vendor's stated tool specification for this inspection. Enbridge accepted the ILI run because the data is of sufficient quality to complete the required analysis.

Line 10 ENR-UT UMP Corrosion (Tool Run ID 6691)

While performing the assessment on the Issue 1 ILI Report, an error was identified with the average wall thickness for pipe joint 18030. The average wall thickness listed in the ILI Report was 12.6 mm when the value should have been 6.3 mm. By overstating the actual average wall thickness on this joint, the percent depths and the RPR values of the features on this joint would be understated. An Issue 2 ILI Report was received correcting the average wall thickness along with any values in the report associated with the average wall thickness.

Line 10 ENR-UT MFL4 Corrosion (Tool Run ID 6692)

During the inspection radial sensor 106 was observed to be under responding from 667 m into the inspection until the end of the inspection. As a result, the super high-resolution plus specifications could not be met for pinholes and slots affected by this sensor. The super high-resolution specification was still achieved in the areas affected by this sensor. This issue was also reported in Paragraph 31 above.

Line 10 WNR-EB MFL4 Corrosion (Tool Run ID 6692) and Line 10 WNR-EB MFL4 Geometry (Tool Run ID 6692)

During the inspection the ILI tool experienced irregular tool rotation for the entire inspection. There was no impact to the corrosion or geometry data that was collected from this inspection.

Line 10 WNR-EB UCx Crack (Tool Run ID 6718)

During the inspection the ILI tool experienced excessive tool rotation near the end of the run, but the stated performance specification can be achieved over the entire pipeline length and circumference. Enbridge accepted the ILI run because the data is of sufficient quality to complete the required assessment.



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. As outlined in **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 Paragraph 34.c of this report and below.

Line 65 GF-CR USCD+ Crack (Tool Run ID 6555)

As previously reported in SAR8 this ILI was part of an Investigative Dig Program. Upon completion of the Investigative dig program the ILI vendor Provided an Issue 2 ILI report. The data quality evaluation for the Issue 2 ILI report was completed beyond 180 Days from the pull date, as allowed in Paragraph 34.d. The potential data quality issues with this inspection were identified and acted upon from the Issue 1 ILI Report with all potential FREs being issued for excavation.

Line 3 CR-PW MFL4 Corrosion (Tool Run ID 11019)

The Issue 1 ILI Report for this inspection was an expedited report that only reported on metal loss features with a peak depth over 50% based on the results from the previous 2020 MFL4 inspection. The Issue 2 ILI Report gave an entire feature listing for the 2021 inspection and not just the current depths of the metal loss features with a peak depth over 50% from the 2020 MFL4 inspection.

Line 10 ENR-UT UMP Corrosion (Tool Run ID 6691)

An Issue 2 ILI Report was required to correct the local wall thickness for pipe joint 18030. In the Issue 1 ILI Report the local wall thickness for this joint was listed as 12.6 mm. The measurement of the local wall thickness was reviewed by the ILI vendor and updated to 6.3 mm. The depth and rupture pressure ratios for five metal loss features located on this joint were updated using the updated local wall thickness.

34.e [Discrepancies between Two Successive ILI Runs]

Inspections with significant discrepancies in either feature population, severity, or type related to the previous assessment of the line segment were identified during Enbridge’s preliminary review of the initial ILI Reports and are reported in **Table D-13**. Enbridge conducted investigations to evaluate the accuracy and reliability of the data discrepancies for use in integrity assessments. Details of these discrepancies are reported below.

Line 4 CS-DR UCM Crack (Tool Run ID 10991)

There was a decrease in the feature population when compared to the 2017 UCM inspection. The decrease in feature population can be attributed to features near the detection threshold not being reported in 2021 due to inspection variability between successive ILIs.

Line 5 ENO-EMA UCc Crack (Tool Run ID 6693)

There was an increase in the feature population when compared to the 2020 UCc inspection. The overall reported feature population for both this inspection and the previous inspection was low, however the identification of one new crack-like anomaly resulted in a feature population increase of more than 20% when compared to the 2020 inspection.



Line 5 WNO-WMA MFL4 Geometry (Tool Run ID 10240)

There was an increase in the feature population when compared to the 2020 MFL4 Geometry inspection. The 2021 MFL4 tool reported two new dent features with a depth less than 1%. Both features were visible in the 2020 inspection data but were measured to be below the reporting threshold. The change in the feature population can be attributed to features near the detection threshold that were not previously reported.

Line 5 WNO-WMA UCc Crack (Tool Run ID 6666)

There was a decrease in the feature population when compared to the 2020 UCc inspection. The overall reported feature population for this inspection and the previous was low, so the reclassification of one crack-like feature from the 2020 inspection to a geometric anomaly in the 2021 inspection triggered a feature population decrease of more than 20%.

Line 10 EB-ENR GEMINI Geometry (Tool Run ID 6668)

There was an increase in the feature population when compared to the 2018 GEMINI inspection. The increase in the feature population is due to dents near the depth reporting threshold being reported for the first time.

Line 10 ENR-UT MFL4 Geometry (Tool Run ID 6692)

There was an increase in the feature population when compared to the 2018 MFL4 inspection. The increase in the feature population is due to dents near the depth reporting threshold being reported for the first time.

There was a decrease in the severity of the features when compared to the 2018 MFL4 inspection. Most of the decrease in the feature severity can be attributed to repairs and the rebound and rerounding of the dents following excavation.

Line 10 WNR-EB MFL4 Geometry (Tool Run ID 10986)

There was a decrease in the feature population when compared to the 2018 MFL4 inspection. The 2018 MFL4 inspection only reported one shallow geometric anomaly on this pipe segment. The 2021 MFL4 inspection did not report this feature, although it was visible in the ILI data, as it was below the reporting threshold.

Line 10 WNR-EB UCx Crack (Tool Run ID 6718)

There was an increase in the feature population when compared to the 2018 UC inspection. The increase in the feature population is due to several features near the reporting threshold being reported by the UCx tool. The UCx tool also has slightly higher resolution than the UC tool, which also explains the higher feature population.

Line 65 GF-CR USCD+ Crack (Tool Run ID 6555)

There was an increase in the number of reported features and the feature severity between the 2016 USCD+ and 2020 USCD+ inspections. Several of the features from the 2016 inspection were below the analysis and reporting threshold, while in the current 2020 inspection, they are above the minimum threshold. This accounts for the increase in the number of reported features and the feature severity between the inspections.



34.f-g [Investigative Digs]

There were no Investigative Dig Programs issued during this reporting period. There was one Investigative Dig Program issued during the SAR8 reporting period. Details for this Investigative Dig Program and the results from this reporting period are reported below.

Line 65 GF-CR USCD+ Crack (Tool Run ID 6555)

As previously reported in SAR8, there was an increase in the number of reported features and the feature severity between the 2016 USCD+ and 2020 USCD+ inspections. Several of the features from the 2016 inspection were below the analysis and reporting threshold, while in the 2020 inspection, they were above the minimum threshold. The discrepancies between the two inspections, particularly the feature severity, warranted an Investigative Dig Program to determine if there are any data quality concerns with this inspection.

The Investigative Dig Program consisted of 25 Potential FRE's on 14 joints. A total of 14 Digs were issued on April 21, 2021, with one dig requiring a 30 Day Repair deadline and 13 digs with a 180 Day repair deadline. All required Pressure Restrictions were imposed as per Consent Decree requirements.

The Investigative Dig Program commenced with 3 digs on GW's 37210, 87320 and 100330 to initially assess the Data Quality of the ILI. These 3 pipe joints had a combined 14 features reported on them. A sleeve repair was completed on GW 37210 on April 23, 2021 and GW 87320 on June 4, 2021. A recoat repair was completed on GW 100330 on June 3, 2021. The NDE results of the features on these 3 joints were compared with the ILI Data from the 2020 and prior inspections to determine if a Data Quality issue existed that may require corrective actions. Out of the 14 features reported on these three joints, 13 were identified as False Positives. Based on the results of the 3 initial investigative digs, the ILI vendor completed a review of the ILI data and determined that an additional 19 features showed the same characteristics as the 13 False Positives. The ILI vendor reclassified these 32 features from "Crack-Like" features to "Weld Imperfections" in Issue 2 of the 2020 ILI report which was received on 7/16/2021. The reclassification of the 32 features, with the Issue 2 ILI report, resulted in the cancellation of 7 digs on August 12, 2021 on GW's 6410, 11540, 14640, 26780, 27830, 32750 and 60930 as these features did not meet FRE criteria.

Of the three remaining CD digs, sleeve repairs were completed on GW 2220 on August 14, 2021, GW 7430 on August 11, 2021 and GW 100270 on August 5, 2021. The non-Consent Decree dig on GW 170 was repaired via recoat on December 10, 2021.

(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 as well as Program Summary Documents and other detailed documentation which the ITP has access to.

With respect to Geometric and Intersecting or Interacting features, Enbridge applied the Fifth Modification analysis process to identify features requiring excavation and to set pressure restrictions for these features. Refer to Section IX Implementation of Fifth Modification of the Consent Decree for Geometric and Intersecting or Interacting Features for more details.

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 Consent Decree provisions such as those relating to circumferential crack features.

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 notification FREs are excluded from this table as they are included in Paragraph 33 **Table D-9** of this SAR. ILI tool runs that did not identify any FREs are excluded from this table.

L4 DN-VG 2021 MFL

As reported in SAR8, on May 27, 2021 the ITP made an inquiry in regard to the possible omission of three Features Requiring Excavation from the Dig List for the 2021 Line 4, DN-VG, MFL ILI. Enbridge had confirmed that the original Assessment Sheet uploaded for ITP review on the ShareDrive was overwritten by an altered and incorrect Assessment Sheet. The alteration of the Assessment Sheet occurred as part of probability of failure (POF) analysis processes conducted by Enbridge after FRE approval and is outside the scope of the Consent Decree. Enbridge conducted a review of the POF process and has implemented process barriers and provided training to prevent this from re-occurring in the future.

38 [Establishing Excavation and Repair Deadlines for FREs]

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 implementing operating limits that use a combination of discharge and suction limits to manage pressures. These operating limits maintain pressures to a level that assured compliance with the PPR value at the location of the feature. On October 29, 2020, Enbridge submitted revisions to responses previously submitted in the SARs 1 through 6 with respect to Paragraph 38.b of the Consent Decree. Historically in these reports Enbridge referred only to discharge pressure but rather should have referenced using an operating limit pair.

During the SAR6 reporting period, and at the request of the ITP, Enbridge started providing a monthly summary of implemented Consent Decree PPRs and the maximum pressure achieved during each month at PPR locations. During the SAR8 reporting period, Enbridge provided the ITP with access to a PowerBI report that allows the ITP to generate their own PPR reports. Consequently, Enbridge ceased providing a monthly PPR report as it was no longer required. Consent Decree PPRs include all PPRs based on Consent Decree requirements and does not include other PPRs set by Enbridge or other regulatory bodies. This update is provided at the Pipeline Control Systems and Leak Detection/Control Centre Operations (“PCSLD/CCO”) monthly technical meetings. There were no exceedances of the Consent Decree PPRs in this SAR reporting period.

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 depths greater than 10% wall thickness 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 are 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").

During the reporting period, Enbridge, the EPA and the ITP discussed refinements to when excavations of FREs would be deemed "completed." Enbridge and the ITP have provided an interpretation document to provide clarity around this issue and are awaiting further comments or concurrence from the EPA on this issue.

Revised NDE Reports with Original NDE Report Approval Date Overwritten

During the SAR9 reporting period, Enbridge discovered an issue with how PowerBI reports displays the approval dates of previously approved NDE reports that were subsequently revised. When the revised reports were approved, the original NDE report approval date was overwritten with the approval date of the revised NDE report. To resolve this issue, OneSource will be updated to show both the original NDE report approval date and the most recent NDE report approval date. Both dates will be the same in OneSource if an NDE report has only been approved once. If an NDE report has been approved multiple times, the original NDE report approval date and the most recent NDE report approval date will both be listed in OneSource. The OneSource update is planned to be completed in Q1 of 2022. The NDE reports identified as overwritten during this reporting period, that could affect the tool bias determination date, are shown in **Table D-16a**. The initial NDE approval date is reported in the relevant SAR9 Tables. The trending and bias determination deadlines were based on the initial NDE approval date and were completed within the CD required timelines.

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 crack⁴ 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. Enbridge calculated the Predicted Burst Pressure of NDE features, as described in SAR5 Paragraph 144 [Section D] crack and corrosion Field Burst Pressure Calculations per Appendix B in the Consent Decree – Paragraph 43.

⁴ Enbridge has not applied Appendix B to evaluate circumferential crack features as it is not suitable for such features.



The ILI Assessment Sheets document 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-17 summarizes the timelines for completing initial Predicted Burst Pressure calculations and initial Remaining Life calculations for all crack⁵ 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-17**, all calculations for features 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.

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 features, and will continue to do so until five years after termination of the Consent Decree.

(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-18**. 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-18**.

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 as summarized in **Table D-20**. Note that when the imposition deadline of a PPR was a weekend or United States Federal holiday, the deadline was moved to the following business day in accordance with the definition of Day in Paragraph 10(m) of the Consent Decree.

During this reporting period, there were seven cancelled digs as reported in **Table D-19**. These 7 Digs were part of an Investigative Dig Program on Line 65 GF-CR USCD+ Crack (Tool Run ID 6555). Based on the results of the Investigative Dig Program, the ILI vendor reclassified these 32 features from "Crack-Like"

⁵ Enbridge has not applied Appendix B to evaluate circumferential crack features as it is not suitable for such features.



features to “Weld Imperfections” in Issue 2 of the 2020 ILI report which was received on 7/16/2021. The reclassification of the 32 features, with the Issue 2 ILI report, resulted in the cancellation of the 7 digs on August 12, 2021 as these features did not meet FRE criteria.

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

Enbridge submitted five new Alternate Plans (“APs”) during the reporting period of this SAR. The total number of Alternate Plans and Alternate Interim Pressure Restrictions submitted since the Effective Date of the Consent Decree to the end of this SAR reporting period are provided in **Table D-21**.

46.f [Saturated Signal Crack Feature]

Enbridge did not submit an Alternate Plan or an alternate pressure restriction for any saturated signal crack feature within the reporting period for this SAR.

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

Enbridge submitted five new Alternate Plans (APs 7, 8, 9, 10, 11) during the reporting period of this SAR. **Table D-22** reports the details related to these APs. All of these APs related to Original US Line 3, which was replaced by Line 93.

46.h [Alternate Plans and Temporary Pressure Restrictions]

No Temporary Pressure Restrictions were imposed during the reporting period of this SAR.

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

Enbridge submitted 5 new Alternate Plans during the reporting period of this SAR. During the implementation of Alternate Plans 7, 8, 9, 10 and 11, Enbridge complied with applicable laws and regulations.

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

Enbridge has implemented each proposed Alternate Plan and each proposed alternate interim pressure restriction and timetable in accordance with the timetable for implementation of such Alternate Plan or alternate interim pressure restriction as set forth in the applicable notification submitted pursuant to Paragraph 46.g.(2). Adjustments to Alternate Plans were communicated to the EPA and ITP via quarterly Alternate Plan or monthly Update meetings as required.

46.k [Documentation Maintenance]

Enbridge has maintained all documentation relating to the selection and implementation of the Alternate Plans. Enbridge is prepared to make such documents available to EPA upon request, consistent with the requirements of Section X (Information Collection and Retention). Information is being retained in an internal repository in conformance with this requirement.

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

Alternate Plan updates during this report period have been summarized in **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 of the Consent Decree. The crack features that meet the above criteria are 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 per Table 5 and Paragraph 59 of the Consent Decree, and associated Modifications to the Consent Decree⁶. 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 Paragraph 58 and 59.

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

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 features. Enbridge, the EPA, and the ITP continue to discuss ways to resolve this challenge and this item is included in **Table IX-1** in Paragraph 144 Problems Anticipated in Appendix 1.

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 beyond 180 Days based on environmental considerations per CD Paragraph 49.a. The dig deadline extension details are provided below.

Line 4 CS-DR GW 27260

The Dig deadline extension is from the Line 4 CS-DR UCM 2021 inspection. An FRE identified on GW27260 was added to the dig list on 5/18/2021 as Dig ID 30153 with an original excavation due date of 11/14/2021 (180 Days). No pressure restriction was required for this FRE based on CD criteria.

While planning to remediate this feature, Enbridge determined that due to the location, it would be environmentally beneficial to extend the dig deadline up to 365 days per Paragraph 49 to allow for winter construction. Conducting the work in the winter of 2021/2022 will reduce the impact to the extremely sensitive wetland ecosystem. It will allow Enbridge to adjust work and schedule plans so that impacts to state listed species (Hidden fruit Bladderwort) can be avoided to the extent possible and will allow Enbridge to conduct work at a time that we will have the least impact on the unique hydrology of the wetland ecosystem. Enbridge has determined that the risk that the identified feature will result in a leak or rupture is low. The Dig deadline was extended from 11/14/2021 to 3/15/2022 on 6/22/2021.

⁶ Enbridge does not interpret the CD to cover interacting or intersecting circumferential crack features.



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 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 Fifth Modification of the Consent Decree.⁷ 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.

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 $1.39 \times \text{MOP}$).

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 the Definition of Day in Paragraph 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, there were no Axial Slotting, Axial Grooving and Selective Seam Corrosion, or Weld Anomaly A/B FREs identified, as referenced in **Table D-28**.

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

There were no Pressure Restrictions required as a result of Axial Slotting, Axial Grooving, Selective Seam Corrosion features or Seam Weld anomaly A/B features, as referenced in **Table D-29**, in accordance with Table 3 of the Consent Decree.

⁷ Enbridge does not interpret the Consent Decree to cover interacting or intersecting circumferential crack features.



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 Fifth Modification and established pressure restrictions for identified interacting dents as provided in Paragraph 57.⁸ Enbridge met 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, where applicable.

56 [Dent and other Geometric Feature 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.

There were no features of this type reported during this SAR period.

57 [Dent and other Geometric Feature Pressure Restrictions]

Enbridge establishes PRs for dents within the timeframes identified in Paragraph 57 of the Consent Decree.

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.⁸ Enbridge excavated and repaired all such intersecting/interacting features that met the dig selection criteria set forth in Table 5 of the Fifth Modification of the Consent Decree, within the applicable timeframes identified in columns 2 and 3 of Table 5. 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 negotiated the Fifth Modification of the Consent Decree to resolve differences in interpretation in regard to this Paragraph. Consistent with the Fifth Modification, 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 report all deformations down to the tool tolerance of the geometric ILI tool that were not previously reported. The details associated with the assessment of these Catch Up ILI reports was provided in SAR6.

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 Fifth Modification of the Consent Decree for each interacting feature identified during the period of this SAR. 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

⁸ *Enbridge does not interpret the Consent Decree to cover interacting or intersecting circumferential crack features.*



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 Consent Decree requirement to remove a pressure restriction within a certain period of time after a feature is repaired.

There were no features of this type during this SAR period.

(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. **Table D-33** summarizes the remaining life calculations completed during this reporting period.

61 [Remaining Life Calculations]

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 pressures of pipeline segments for each month 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 which the ITP has access to for verification purposes.



Paragraph 44 of the Consent Decree discusses how all calculations were 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 segments 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 segments with no less than 0.005 inch per year, is illustrated in more detail in the ILI Assessment sheets which the ITP have access to for verification purposes.

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 (as per the Stipulation filed with the Court on May 2, 2018) were completed in 2020 and reported in SAR8.

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 is included in Paragraph 29 **Table D-3** of this SAR and the ILI runs completed during the reporting period of this SAR are included in Paragraph 28 **Table D-1**.

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 and Anchor Strike Mitigation]

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, as reported in SAR7. During the SAR9 reporting period, Enbridge implemented the same mitigation measures that are specified in SAR7.

Continuous Coverage

SAR8 summarizes Enbridge's position that survey data gathered in 2016, 2018, and 2020, as reflected in a Digital Terrain Model (“DTM”), confirms that all portions of the Line 5 Dual Pipelines located in less than 65-feet of water for which survey data is available are buried.



On May 28, 2021, Enbridge completed an additional survey that confirmed that all sections of the Dual Pipelines located in less than 65 feet of water are continuously covered. The ITP was present during that inspection.

Enbridge submitted its revised GL E023 response on June 30, 2021, providing ITP with video footage of the May 28 survey that confirmed that the Dual Pipelines located in less than 65 feet of water are continuously covered. The videos were provided to EPA on July 2, 2021.

On July 27, 2021, ITP issued its Observations of Enbridge's May 28 survey and June 2021 video footage submission, stating that "on review, all five of the videos demonstrate that the northern and southern segments of the Dual Pipelines from their respective exposure points to the shorelines are continuously covered."

Management of Spans

Enbridge operates and maintains the Dual Pipelines to ensure the pipelines are well-supported in areas where the pipeline is suspended above the lakebed ("spans"), in accordance with Paragraph 68.

Screw Anchor Installation Coating Repairs

In preparation for the 2021 work season, Enbridge submitted a revised copy of its Application of Underwater Repair Coatings for Line 5 Straits Version 4.0 dated May 5, 2021 (Coating Repair Procedures) to the EPA on May 14, 2021. EPA provided approval of the Coating Repair Procedures on May 28, 2021. **Table E-1** details past Screw Anchor installation locations.

Enbridge initiated its 2021 SAWP work on July 30, 2021 and completed inspection of the final coating repair location on September 19, 2021. On October 19, 2021, Enbridge notified EPA and ITP of its completion of activities required under the SAWP. On December 20, 2021, ITP issued a Task 2 letter report confirming that Enbridge completed all coating repairs and inspections in accordance with the SAWP.

Protection from Vessel Anchor Strikes

Enbridge operates and maintains the Dual Pipelines to reduce the risk of a vessel's anchor puncturing, dragging or otherwise damaging the pipelines. Prior to and since the Effective Date of the Consent Decree, Enbridge has led and supported several initiatives aimed at reducing the risk of a vessel anchor strike within the Straits.

Enbridge Coordinated System

As explained in detail in SAR7, Enbridge has, in satisfaction of Paragraph 68.a, operated its "Coordinated System" to reduce the risk of a vessel's anchor puncturing, dragging or otherwise damaging the Line 5 Dual Pipelines. As reported in SAR7, C-FER concluded in its October 13, 2020 report that the Coordinated System reduces the risk of a pipeline failure caused by intentional or unintentional anchor strike by 99.5% relative to the absence of any measures. Enbridge continuously operates the Coordinated System, including at all times during the reporting period.

Enbridge has continued to install cameras at the Straits. During this reporting period, Enbridge updated its Protocols to conduct observations of the Dual Pipelines' crossing of the Straits via use of two installed cameras. A copy of the revised Protocols were provided to the EPA on July 12, 2021.

GE Threatscan

In previous SARs, Enbridge provided information regarding the implementation of GE Threatscan. GE Threatscan is not part of the Coordinated System, and thus not considered by Enbridge as a measure to



comply with Paragraph 68.a. The effectiveness of the Coordinated System, as studied by C-FER, is not related to or dependent on GE Threatscan.

Contractor Anchoring Guidelines

See SAR7 for details concerning Enbridge's Contractor Anchoring Guidelines. Enbridge administers the Contractor Anchoring Guidelines for all vessels contracted by Enbridge to perform maintenance activities in proximity to the Line 5 Dual Pipelines. The anchoring plans for the contractor performing coating repairs in 2021 were reviewed and approved by Enbridge pursuant to the Contractor Anchoring Guidelines. In October 2021, as a result of Enbridge's internal review of its Contractor Anchoring Guidelines following the anchor shackle and rubber fender incidents, Enbridge updated the Guidelines to ensure that suitable equipment is used and inspected by contractor. Enbridge shared the updated Guidelines with the EPA/ITP on December 10, 2021. The Guidelines will be applied to all future contractor work requiring anchoring in the Straits.

69.a [Biota Investigation]

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

69.b [Biota Investigation Work Plan ("BIWP")]

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

69.c [Biota Work Plan Implementation]

On July 29, 2021, EPA approved the BIWP Final Report. This requirement has been met and is considered complete. No further update is required at this time or in future SARs.

70 [In-Line Inspections of the Dual Pipelines]

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

71 [Investigation and Repair of Axially-aligned Features]

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

72 [Pipeline Movement Investigation]

Enbridge's compliance with Paragraph 72 was previously reported in SAR1. 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 in this reporting period.

73 [Quarterly Inspections Using Acoustic Leak Detection Tool]

During the SAR9 reporting period and as shown in **Table E-2**, 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. 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 SAR1.

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 is limited to 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.

On October 13, 2021, Enbridge demonstrated the capability to combine two data sets for Line 78, GT-SK (one being a pre-Consent Decree 2014 Line 6B and the other a current Line 78) to generate one schematic image of a joint. On October 18, 2021 the ITP stated it was a successful demonstration.

76 [Successive ILI Data Sets]

Enbridge's compliance with this Paragraph is fully explained in SAR1 and has not changed since that submission. As explained in SAR1, with respect to each type of ILI Tool, OneSource includes at least two successive ILI data sets for lines that have operated since the effective date of the CD – 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]

As per Paragraph 77.a, Enbridge completed an update of OneSource and compliance with this Paragraph was reported in SAR1. Enbridge provided a demonstration of compliance regarding Paragraph 77.a-c on October 23, 2018. Enbridge has completed the requirements for Paragraph 77.a-c.



Enbridge continues to update the OneSource database with information collected from new NDE investigations as per Subparagraph 77.d of the Consent Decree. 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. The OneSource NDE updates for this covered period are summarized in **Table F-1**.

During this reporting period, Enbridge has fully complied with Paragraph 77 by timely uploading to OneSource all NDE data for FRE digs and investigative digs that are subject to Consent Decree requirements. Although Enbridge disagrees that the CD was intended to incorporate excavations that are not governed by the CD, Enbridge agreed that NDE reports from all integrity dig excavations issued from CD ILI programs, including CD FRE, investigative digs and non-CD digs, would be uploaded into OneSource within 60 days after completing the last field investigation related to an ILI.

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

78.a [OneSource ILI Updates]

All new ILI reports were uploaded to OneSource within 29 days after Enbridge's receipt of the Initial ILI report for this reporting period. 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 for axial cracking, corrosion and geometry features. All interacting feature reviews were completed within 180 days after the ILI tool was removed from the pipeline.

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]

Line 93 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”).

On June 9, 2021, Enbridge presented to the ITP, EPA, and DOJ an overview of leak detection activities, milestones, and timelines of Line 93. The following month, Enbridge started reporting regular L3 Replacement project updates as it relates to Section G through the monthly technical meeting.

On July 21, 2021, Enbridge responded to ITP’s additional follow-up information request on temperature transmitter instrumentation that were relocated and added as part of Line 93 design along with the purchase orders reflecting relevant specifications (i.e., make and model).

On September 22, 2021, Enbridge met with the ITP and EPA to review the timelines, leak detection activities, leak detection capabilities, and alternate leak detection methods employed during purging of Original US Line 3 and linefill of Line 93.

On September 24, Enbridge responded to EPA’s information request on the details of the alternate leak detection plan during the purging operations of the Original US Line 3 and linefill operations of Line 93. Following this response, ITP requested additional follow-up information on specific details of the plan (i.e., pressure monitoring, visual surveillance, volume comparison, etc.). Enbridge provided the relevant information to the ITP on October 1, 2021. Another set of clarification questions from ITP was received and was responded to by Enbridge on October 6, 2021.

On October 4, 2021, Enbridge filed a Force Majeure to the EPA to notify the United States of circumstances beyond Enbridge’s control that prevents the Material Balance System (“MBS”) from alarming during the purge process for Original US Line 3 and for up to 72 hours following Initial Linefill of Line 93, but (as described in several information request responses above) alternate leak detection measures were in place. The Force Majeure articulates the reasoning behind the suspension of MBS during purging and employing alternate leak detection to ensure safety while still maintaining alignment with appropriate CD requirements as specified therein; and the suspension of MBS for up to 72 hours after Line 93 start up.

On October 21, 2021, during the monthly technical meeting, Enbridge provided status updates on purging of Original US Line 3, of which two of three segments were completed at the time (Gretna to Donaldson, and Clearbrook to Segment 18); and on linefill of Line 93, which at that point was complete. On the same update, Enbridge confirmed with the ITP the dates for tuning the MBS, which commenced at start-up (October 13, 2021), and completed on the date when MBS went into service (October 15, 2021).

On October 13, 2021, as MBS was being tuned, the Rupture Detection System (“RDS”) was enabled, and on October 15, 2021, MBS, AVB 24-Hour Alarm, and the Rupture Flow-based Solution (“RFBS”) went into service.

On November 18, 2021, during the monthly technical meeting, Enbridge provided an update with regard to future deliverables post Line 93 line fill (refer to P. 90 for more details) and completion of the purging of the last remaining segment of the Original US Line 3 – Donaldson to Clearbrook. More details are available in Section B Paragraph 22.b about the Original Line 3 purging.



Enbridge's position continues to be that there were no other Replacement Segments or New Lakehead Pipeline projects executed during this reporting period except for Line 93. Nonetheless, to further the Parties' discussions concerning Line 61 and Line 62, Enbridge has provided the ITP, EPA, and DOJ with information concerning construction activities, instrumentation, ILIs, and leak detection for Line 61 and Line 62, as explained in the sections that follow. Note that all information provided below concerning Line 61 is limited to the four pump-to-pump segments that the ITP believes constitute Replacement Segments (Portage/Waterloo, Waterloo/Delavan, Belvidere/DeKalb, and DeKalb to Ottawa).

85 [Installation of Flowmeters]

Line 93 was designed to include flow meters which were installed at all locations where oil (a) enters into the pipeline, (b) leaves the pipeline, or (c) passes through a pump station. Flowmeters were commissioned in the field and to the Supervisory Control and Data Acquisition ("SCADA") system and integrated into the MBS and RDS, to continuously monitor flow data under all conditions, including during Startup and Shutdown. Enbridge provided to the ITP information on flow meter placements and relevant specifications in April 2021.

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.

Line 61 has flow meters at all pump stations, including existing stations Portage, Delevan, Belvidere, and Ottawa as well as at pump stations Waterloo and Dekalb that were put into a preserved state before the effective date of the Consent Decree and are now in operation.

Line 62 has flow meters at all pump stations including Hartsdale, Reddick, Kankakee, and Flanagan.

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

Lines 93, 61 and 62 have 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 these lines.

87 [Installation of Other Instrumentation]

The following instrumentation was installed on Line 93:

- 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.

Instrumentation was commissioned in the field, to the SCADA system, and integrated into the MBS and the RDS to continuously provide real-time pressure and temperature data, including during Startup and



Shutdown periods. Enbridge provided information on placements of these instrumentation and relevant specifications to the ITP between April and July of 2021.

Enbridge has provided the ITP with information concerning existing instrumentation on Line 61, including on September 17, 2021, November 24, 2021, and January 11, 2022. Information concerning existing instrumentation on Line 62 was provided to the ITP as part of the Enbridge response to Grocery List 74 on January 11, 2022.

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

Enbridge’s definition of “MBS Segment” aligns with the definition in Paragraph 88.

Line 93 has three MBS segments that have volumes of oil exceeding 45,000 m3. These segments are:

[REDACTED]

Enbridge has conducted API 1149 calculations, as outlined in Paragraph 89, to estimate the sensitivity performance of the MBS Leak Detection System on Line 93 during periods when the pipeline segment is in a steady state. The established MBS segments remain in compliance with the leak detection sensitivity requirements in Paragraph 89 below.

Line 61 has two MBS Segments with an inter-meter volume greater than 45,000 m3 upstream and downstream of [REDACTED]. These are: [REDACTED]

[REDACTED] Enbridge has conducted API 1149 calculations, as outlined in Paragraph 89, to estimate the sensitivity performance of the MBS Leak Detection System on these MBS Segments when the pipeline segment is in a steady state. These established MBS segments remain in compliance with the leak detection sensitivity requirements in Paragraph 89 below.

Line 62 has no MBS Segments with an inter-meter volume greater than 45,000 m3. Enbridge has conducted API 1149 calculations, as outlined in Paragraph 89, to estimate the sensitivity performance of the MBS Leak Detection System on these MBS Segments when the pipeline segment is in a steady state. These established MBS segments remain in 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 Line 93 design available at the time, which remains accurate for this reporting period. The API 1149 calculation used conservative inputs from the design and the results demonstrated that the MBS Leak Detection System would achieve each of the targets set forth in the Leak Detection Design and Construction Target for Line 93 table under this Paragraph of the Consent Decree. The complete set of input data used for the API 1149 calculation and an example calculation was provided to the ITP on March 11, 2020 for verification and Enbridge responded to ITP’s additional information request to clarify the API 1149 calculation on April 30, 2021.

API 1149 calculations were also conducted for Line 61 and 62. Line 61 estimated MBS sensitivity performance was provided to the ITP on September 17, 2021, and January 11, 2022. Line 62 performance was submitted as part of the Enbridge response to GL74 on January 11, 2022.



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

Based on the timeline reported to the ITP during the October technical meeting, Line 93 reached the completion of Initial Linefill on October 13, 2021. As reported to the ITP on November 18, 2021, a testing plan was submitted on January 7, 2022 to demonstrate the ability of the MBS Leak Detection System to detect leaks or ruptures within each MBS Segment that has a capacity to hold more than 45,000 m³ of oil. As described in Paragraph 88, the three segments that hold more than 45,000 m³ of oil include [REDACTED]. The Plan will be submitted within 90 days from October 13th.

The submitted plan for Line 93 includes the schedule for completing all required testing within twelve months after completion of Initial Linefill or no later than October 13, 2022. The Plan describes the methods to test the three MBS Segments stated above. Enbridge will perform fluid withdrawal testing ("FWT") method on segments where feasible. A software-based simulated testing methodology described in API Publication 1130 method will also be used on segments where FWT is not feasible due to a lack of on-site piping and/or tankage.

Enbridge will commence testing in accordance with the plan by February 10, 2022. The result of the testing ("Testing Report") will be submitted to the EPA within 30 days of completion. The Testing Report will include details required by Paragraph 90.b. In the event that the testing demonstrates that one or more tested MBS segments does not meet the leak detection sensitivity design and construction requirements mandated under Paragraph 89, Enbridge will concurrently submit a corrective action plan and schedule along with the Testing Report as required by Paragraph 90.c.

For Line 61, on December 10, 2021, Enbridge provided an MBS Leak Detection System Testing Plan for the following pump-to-pump segments with an inter-meter volume greater than 45,000 m³: [REDACTED]. Testing in accordance with the plan commenced on January 7, 2022. Testing in accordance with the plan will be completed no later than September 13, 2022.

91 [Establishment and Optimization of Alarm Thresholds]

As required by this Paragraph and sub-Paragraphs, Enbridge will conduct and complete an optimization study of MBS and 24-Hour Alarm on Line 93 within one year of Initial Linefill or no later than October 13, 2022, to ensure that sensitivity performance is met as per Paragraph 91.a. The result from this optimization study will be reported to the EPA as required by Paragraph 91.c. The optimized threshold of the 24-Hour Alarm will be implemented in accordance with Paragraph 103.

Enbridge will conduct and complete an optimization study of MBS and 24-Hour Alarm on Line 61 by September 13, 2022, to ensure that sensitivity performance is met as per Paragraph 91.a. The optimized threshold of the 24-Hour Alarm will be implemented in accordance with Paragraph 103.

Enbridge will conduct and complete an optimization study of MBS and 24-Hour Alarm on Line 62 by December 17, 2022, to ensure that sensitivity performance is met as per Paragraph 91.a. The optimized threshold of the 24-Hour Alarm will be implemented in accordance with Paragraph 103.



(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 Subparagraph 91.a, with the exception of seven lines that did not meet 24-hour alarm optimized thresholds reported in past SARs, and Line 65 as described below.

Due to a significant change in operations, the 24-hour alarm thresholds for Line 65 fell below the 95% confidence level during lower flow conditions. This is a similar event to Line 78 that was reported in SAR6, Lines 1, 5, and 10 reported in SAR7, and Line 02 and Lines 14/64 in SAR8, which required re-optimization per Subparagraph 103.g. The same exercise was undertaken for Line 65. Refer to Paragraphs 103 and 144 for details about this event.

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 RP 1130⁹ 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.

⁹ API RP 1130 – American Petroleum Institute Recommended Practice for Computational Pipeline Monitoring for Liquids



96 [Reporting of MBS Outages]

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. There were no events in this reporting period.

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. As agreed with the ITP, the updated Paragraph 99 Project Logbook will be provided within two weeks after release of SAR9 and will have details of those projects.

100 [Requirements for Valve Excavation]

During this reporting period, no projects or excavations were applicable per the criteria defined in this paragraph.

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 the Effective Date as reported in SAR1. This requirement is complete and no further reporting is required.

102 [Rupture Detection System Alarm]

The intent of the Rupture Detection System ("RDS") is to focus on detecting large releases with a quick onset. Enbridge continuously operates the RDS 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.



As reported in previous SARs, Enbridge, EPA, and ITP agreed to establish a solution to address the concern in Subparagraph 102.a, as it relates to clause (c) “an abnormal increase in the flow rate”. On December 10, 2019, Enbridge successfully completed the implementation of the Rupture Flow-based Solution (“RFBS”) on all Lakehead pipelines. ITP concluded that the RFBS implementation meets the intent of the CD by fulfilling the requirements of Subparagraph 102.a.(c) to monitor for and detect an abnormal increase in the flow rate, and further, the ITP found that the combination of RDS and RFBS meet the entirety of the rupture detection requirements in Paragraph 102.

Enbridge has continuously operated the combined RDS solution on all Lakehead pipelines in accordance with this Paragraph.

103.a-b [“24-hour” Alarm]

Enbridge implemented the 24-hour volume balance alarm, also known as the Automated Volume Balance or “AVB” alarm on the Lakehead system. AVB operates with MBS and was integrated with Enbridge’s SCADA system in advance of the 270-day deadline specified in Paragraph 103, and has since continuously monitored, tracked, and modeled the volume of oil for each MBS Segment over any rolling 24-hour period. AVB operates continuously to alarm, if it cannot detect, or otherwise account for, 3 percent (or within the set threshold per optimization study¹⁰) of oil pumped or injected into the MBS Segment over any rolling 24-hour period. When an AVB alarm occurs, each member of the Alarm Response Team (“ART”) is notified in accordance with Paragraphs 106 and 107 and 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 active 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, except for those segments affected by the operational issue described in Paragraph 144, [Section G] July 16, 2021 Optimization of 24-hour alarm thresholds due to lower flow rates on Line 65 – P. 103.

On September 21, 2021, Enbridge discovered an issue on the Line 2 MBS production model for the 24-hour alarm. The issue was immediately investigated and revealed that the thresholds were inadvertently reverted to the original optimized threshold. Enbridge corrected the issue on the same day of the discovery and restored the AVB 24-hour alarm thresholds to the correct re-optimized values. More details about this event are provided in Paragraph 145, [Section G] Inadvertent removal of 24-Hour Alarm re-optimized thresholds on Line 02 – P103c. There were no safety impacts, missed or false 24-alarm alarm events that occurred for the duration of the issue.

103.d [“24-hour” Alarm Optimization Study within one year of Initial Linefill of Line 93 or any other New Lakehead Pipeline or Replacement Segment]

The optimization study of 24-Hour Alarm for Lines 61, 62 and 93 will be completed as part of the study described in Paragraph 91.

¹⁰ 2019.04.12 Enbridge 24-Hour Alarm Threshold Optimization Study Results – per P.103.c



It is Enbridge's position that there are no confirmed Replacement Segments or New Lakehead Pipelines for this reporting period other than Line 93, as previously described.

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

As reported in SAR5, the original optimization study was completed and submitted to the EPA and ITP within the required timeframe. The report produced from this test was utilized by the ITP as part of the evaluation of the 24-Hour alarm. Enbridge will perform this testing as required by this Subparagraph for Line 93.

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

The testing as required by Paragraph 103.e was successful per the original optimization study; therefore, the corrective action plan and schedule required by this Subparagraph is not required. Enbridge will fulfill this requirement for unsuccessful testing of 24-Hour Alarm of Line 93, if required.

103.g(1)-(5) [Compliance and exceptions of compliance to 24-hour alarm optimized threshold and reporting]

Enbridge continuously complies with the optimized thresholds on each Lakehead pipeline in accordance with the study completed per Subparagraph c. Enbridge has not seen a significant increase of false alarms that could trigger relaxing of the optimized alarm thresholds. However, during the review of the Q2 2021 performance testing, it was discovered that one Lakehead line – Line 65 – fell below the 95% confidence level for its optimized leak alarm thresholds. A technical analysis was performed and subsequently concluded on July 16, 2021, confirming that the issue was caused by a decrease in pipeline flow rate during the Q1through Q2 2021 periods. These rates were lower than the rates used in the original 24-Hour alarm optimization study (per P.103.c). Refer to Paragraph 144, Section G July 16, 2021 Optimization of 24-hour alarm thresholds due to lower flow rates on Line 65 – P. 103, describing the details of re-optimization of this line as required by Subparagraph 103.g(5).

The 24-hour alarm re-optimization study of Line 65 was completed and the revised thresholds were implemented on August 3, 2021. The re-optimization report of this line was submitted to the ITP and EPA on October 6, 2021, in accordance with Subparagraph 103.c, and is under evaluation by the ITP at the time of this SAR.

(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 and AVB leak detection systems 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 as reported in SAR1. All alarms that occurred in the SAR9 reporting period were addressed by the ART.



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 as reported in SAR1. Remote notification capabilities were in place for all Alarms that occurred in the SAR9 reporting period as required by this paragraph.

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 as reported in SAR1. Audible and visual alarm capabilities have remained compliant with the requirements of this paragraph through the SAR9 reporting period.

108.a-f [Alarm Clearance Procedures]

Enbridge implemented the Alarm Clearance procedures required under Paragraph 108.a-f within 180 days of the Effective Date of the Consent Decree as reported in SAR1. Alarm Clearance procedures have been employed and adhered to throughout the SAR9 reporting period as described 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.a-d [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 SAR1. Unscheduled Shutdown procedures have been employed and adhered to throughout the SAR9 reporting period as described below.

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.c.

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 appropriate authority 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]

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 this 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 **Table G-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 leak on the Lakehead System Mainline within the reporting period of 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 this reporting period.

On August 9, 2021, a 1-barrel leak from Line 1 GW 171580 was discovered during a scheduled environmental inspection. The pipeline was immediately shutdown and Enbridge proceeded without delay to dispatch emergency response personnel.

Additional details regarding the Line 1 release and PHMSA-reportable releases of one or more barrels from the Lakehead facilities that occurred during this reporting period are provided in response to Paragraph 146. PHMSA-reportable releases from Lakehead facilities are not reportable per Paragraph 146 of the Consent Decree. Enbridge proceeded, without delay, to dispatch trained personnel to the location of the leaks and took action to prevent any migration of oil into waters of the United States or adjoining shorelines.

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]

The Cass Lake, Des Plains, and Wisconsin River Agreed Exercises are complete. Information about these exercises is reported in previous SARs.



In accordance with Paragraph 115.a through f, all activities related to the Stockbridge, Michigan Agreed Exercise are complete and reported in previous SAR reports. In accordance with Paragraph 115.g through i, the Stockbridge exercise was successfully completed in a hybrid format on July 15 followed by an After-Action Meeting on July 16, 2021. Following the After-Action Meeting, Enbridge drafted and submitted the After-Action Report (“AAR”) to the EPA on August 26, 2021 and was notified by the EPA that they had no comments on the AAR on November 17, 2021. On December 8 and 9, 2021 the final AAR was submitted to the EPA and planning participants, respectively. Information about problems encountered or anticipated in implementing Consent Decree Requirements due to the COVID-19 pandemic is further discussed in Paragraph 144 under the heading [Section H] Stockbridge Agreed Exercise - P. 115.

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 (“FDE”) during this reporting period:

- St. Joseph River, Niles, MI on May 26, 2021
- Sheldon, WI on June 10, 2021
- Wrenshall, MN on June 24, 2021
- Gilman, WI on September 14, 2021

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

- Cohasset, MN on August 5, 2021
- Dyer, IN on August 19, 2021
- Crystal Falls, MI on September 21, 2021
- Oxford, WI on September 21, 2021
- Owen, WI on October 14, 2021.

Information about problems encountered or anticipated in implementing Consent Decree Requirements due to COVID-19 restrictions is further discussed in Paragraph 144 under the heading Various Paragraphs [Section H] COVID-19 Restriction Impacts to FDE, TTX, Community Outreach.

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 and 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
- After Action Review (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 116.b, an after-action review and discussion was held after each of the Field Exercises. Specific details for each exercise are summarized in the following sections.

All field exercises were conducted face to face.

St. Joseph River, Niles, MI on May 26, 2021

This exercise was attended by 13 Enbridge employees and 4 external participants. The exercise took place on the St. Joseph River near Niles, MI. 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 GLRCP0607 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 included: Boom, Emergency Response ("ER") trailer, vessels, PPE including life jackets, skimmer, rope, rope ascenders, shackles, capstan winch and boom anchors.

During the after-action review, discussion of both positive observations and areas for improvement were identified and documented. Positive observations included:

- Coupling the boom anchors with 20-foot shackled ballast chain allowed for ideal position placement and hold of the boom once deployed.
- The Capstan winch proved a great tool in pulling boom tight and securing handling lines.
- The use of rope ascenders locked lines in place and reduced slack in set boom. This ensured proper position placement and maintenance of the tactic.



Areas for improvement included:

- Additional spools of rope at pre-identified length sections will allow for quick assessment and deployment of anchor lines to accommodate the depth of the water course. Pre-labeled spools will provide greater inventory for quick deployment at a variety of control points with varying depths of water.
- Islets with carabiners should be installed on the ropes to reduce instances where the rope is cut, knotted, and tied. Cutting continually changes the rope length while knot tying can be unreliable.
- The jet boat used as a safety platform developed a leak in the hull on the port side of the keel, aft of midships (beyond the center towards the rear of the boat) resulting in the boat taking on minor volumes of water. The design of the vessel hinders the ability to accurately assess and effect repairs. The crew patched the leak with "flex-seal". A permanent solution or replacement should be considered.

Sheldon WI on June 10, 2021

This exercise was attended by 13 Enbridge employees and 4 external participants. The exercise took place on the Chippewa River. The objectives of this field exercise were as follows:

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

Objective 2: Test containment and recovery tactics.

Objective 3: Utilize the Incident Command System to manage equipment deployment.

Equipment used included: Boom, Skimmer, ER trailer, bridle, rope, anchors, winch, PPE including lifejackets, waders, gloves.

During the after-action review, discussion of both positive observations and areas for improvement were identified and documented. Positive observations included:

- Crew were able to access control point easily and set up for containment boom easily.
- Crew established a plan for deployment and addressed safety concerns prior to the start of the exercise.
- Crew executed the tactical plan successfully.

Areas of Improvement were:

- One incorrect spool of rope was in the trailer and was used during the exercise. It should be noted that correct rope was also on site. Vesper and Superior boats are adequate, but wider boats would make tasks easier.
- Additional boom sets and collection locations may be needed due to width and bends of river.

Wrenshall MN on June 24, 2021

This exercise was attended by 7 Enbridge employees and 6 external participants. The exercise took place on Little Otter Creek. The objectives of this field exercise were as follows:

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

Objective 2: Test containment and recovery tactics.



Objective 3: Utilize the Incident Command System to manage equipment deployment.

Equipment used included: Watergate, Skimmer, ER trailer, rope, t-post anchors, PPE including lifejackets, waders, gloves.

During the after-action review, discussion of both positive observations and areas for improvement were identified and documented. Positive observations included:

- Crew was able to access site and establish containment point quickly.
- Watergate worked well and was an effective and efficient tool.
- Local Fire Department and Minnesota Pollution Control Agency were both very impressed with speed, ability, and thoroughness of response demonstration.

Areas of Improvement were:

- Local Fire Departments would benefit from continued involvement and explanation of Enbridge tactics and capabilities.
- Ropes or other methods may be necessary to hold up leading edge of Watergate if current is strong.
- Control point SURCP0238 is directly next to a road with very little shoulder. Caution should be taken if work is to be done at this location.

Gilman WI on September 14, 2021

This exercise was attended by 6 Enbridge employees and 3 external participants. The exercise took place on the Fisher River. The objectives of this field exercise were as follows:

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

Objective 2: Test containment and recovery tactics.

Objective 3: Utilize the Incident Command System to manage equipment deployment.

Equipment used included: Boom, Watergate, Skimmer, ER trailer, bridle, rope, anchors, t-posts, PPE including lifejackets, waders, gloves.

During the after-action review, discussion of both positive observations and areas for improvement were identified and documented. Positive observations included:

- Crew was able to access site and establish containment point quickly.
- Watergate functioned well with two sections connected together. It may be the most effective and efficient tool in this location, depending on river depth and flow.
- Boom and skimmer worked as planned and demonstrated benefit of multiple tools and tactics for same location depending on conditions.

Areas of Improvement were:

- Watergate needs to overlap shoreline on both sides to remain effective.
- Ropes or other methods may be necessary to hold up leading edge of Watergate if current is strong.
- Control point SURCP0817 is directly next to a road with very little shoulder and narrow bridge. Caution should be taken if work is to be done at this location.



All items identified under the “Areas for Improvement” categories above are reviewed and addressed prior to the next Field Deployment Exercise as they improve the response capabilities of 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 participants in relation to a release of crude oil from a pipeline. It utilizes multiple Emergency Response Plans to map out the combined response to the incident using the Incident Command System (“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.

Information about problems encountered or anticipated in implementing Consent Decree Requirements due to COVID-19 restrictions is further discussed in Paragraph 144 under the heading Various Paragraphs [Section H] COVID-19 Restriction Impacts to FDE, TTX, Community Outreach, and Coordination with Government Planners.

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 are included in the following sections.

Cohasset MN on August 5, 2021

The hybrid virtual/in person exercise was attended by 6 Enbridge members and 3 external participants. There were 7 in-person participants.



Discussion points included:

- Additional TTX or meetings held during evening hours may be beneficial to encourage participation from local volunteer fire department members.
- Itasca County has a state hazmat team that could respond if needed.
- The City of Cohasset does not have lodging or other infrastructure needed if an emergency event occurred and therefore Grand Rapids resources would need to be utilized.

Dyer, IN on August 19, 2021

The hybrid virtual/in person exercise was attended by 5 Enbridge members and 7 external participants. There were 11 in-person participants. Discussion topics included:

- Which notifications, based on the scenario, would be made to all of the government entities, private entities, tribal authorities, and those which are identified in applicable emergency response plans.
- Identification of response actions that would be taken by both the Enbridge responsible party and other agencies to address the spill in both short-term and long-term operations.
- Determining the anticipated response times for Enbridge, municipal, state, tribal, and federal response personnel, and equipment to arrive at the incident location.
- The risks that a release from the pipeline would pose to public health and the environment
- Identification of any protective measures to prevent damages or injury to the local community, including evacuation procedures, as identified in applicable emergency response plans.

Crystal Falls, MI on September 21, 2021

The hybrid virtual/in person exercise was attended by 2 Enbridge members and 8 external participants. There were 10 in-person participants. Discussion topics included:

- Which notifications, based on the scenario, would be made to all of the government entities, private entities, tribal authorities, and those which are identified in applicable emergency response plans.
- Identification of response actions that would be taken by both the Enbridge responsible party and other agencies to address the spill in both short-term and long-term operations.
- Determining the anticipated response times for Enbridge, municipal, state, tribal, and federal response personnel, and equipment to arrive at the incident location.
- The risks that a release from the pipeline would pose to public health and the environment.
- Identification of any protective measures to prevent damages or injury to the local community, including evacuation procedures, as identified in applicable emergency response plans.
- Determining documentation procedures and inter-agency communications.

Oxford WI on September 21, 2021

The hybrid virtual/in person exercise was attended by 4 Enbridge members and 9 external participants. There were 11 in-person participants.

Discussion points included:

- There is limited lodging and food service in the Oxford, WI. Wisconsin Dells is about 25-30 minutes from Oxford and has extensive lodging and food service.
- Cell phone service is poor in the area. Radio communication will be important.
- Oxford Fire Department is a good location for Incident Command Post.



- The town hall may be a good location for the Joint Information Centre.
- Nearby gravel lot locations could serve as staging areas.

Owen WI on October 14, 2021

The hybrid virtual/in person exercise was attended by 3 Enbridge members and 17 external participants. There were 20 in-person participants.

Discussion points included:

- There is limited lodging and food service in the Owen, WI. Temporary housing and food service may need to be brought in.
- There are several large, paved areas that would serve well as a staging area as well as locations to set up temporary housing.
- The Owen Fire Department would serve well as Incident Command Post.
- The Owen Fire Department serves as local Emergency Management Services. Hospitals that are close are limited in capabilities and therefore medical response may need to be brought in.

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 2021 Table-Top and Field Exercises on December 21, 2020. Details regarding these invitations were reported on in SAR8.

The invitations provided recipients with more than four weeks' notice of the exercise date. 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 (<http://emergencyresponderexercises.com/>) wherein they could register, in addition to being provided with a contact telephone number and e-mail address. During the reporting period three registrations were submitted using the online system, zero calls were received using the telephone system, and zero e-mail requests for additional information were received and responded to.

Improvements made to the exercise registration program during the past SAR reporting cycles continued as originally implemented. Due to COVID-19 impacts, the postcard mailings (which were a supplemental effort not required by the Consent Decree) continued to be placed on hold, as exercise locations and formats were fluid due to evolving state and local restrictions. Information regarding the virtual exercises was updated on the website as appropriate with regional Emergency Response Coordinators conducting follow up as needed with invitees, including providing situation manuals as needed.

116.e [Community Outreach Sessions]

During the reporting period, Enbridge continued to comply with Subparagraph 116.e of the Consent Decree regarding the required Community Outreach Sessions. Enbridge conducted the following Community Outreach sessions during this reporting period:

- Hayward, WI on September 28, 2021
- Janesville, WI on October 6, 2021
- Marquette, MI on October 19, 2021
- Bessemer, MI on October 20, 2021
- Iron Mountain, MI on October 21, 2021



All five sessions during the SAR9 reporting period (listed above) were held in person. A total of 9,678 invitations were sent to landowners, elected officials, the general public, and community leaders.

A designed outreach program including invitations, advertising, and direct stakeholder outreach was executed to support meeting attendance for each of the meetings. Print and digital advertising campaigns were placed to invite general public participants to the meetings and to help boost overall meeting attendance. A total of 9 publications were selected for advertising within or near meeting communities, and each campaign was run for two weeks prior to each meeting. Digital advertising campaigns were placed via Facebook, targeting community members by zip code, and running for two weeks prior to each meeting as well. Finally, additional stakeholder outreach was completed via phone calls, emails, and Enbridge corporate communications channels such as e-Newsletters encouraging stakeholder attendance. In total, 154 documented external attendees participated in these 5 sessions.

Information about problems encountered or anticipated in implementing Consent Decree Requirements due to COVID-19 is further discussed in Paragraph 144 under heading Various Paragraphs [Section H] COVID-19 Restriction Impacts to FDE, TTX, Community Outreach, and Coordination with Government Planners.

Each Community Outreach session was conducted in an open-house format with exhibit-style 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.

Enbridge subject matter experts were assigned to each booth and were available to talk with meeting attendees and answer questions regarding the topics listed above. In addition, pipeline and operation models, videos, and informational handouts were made available for education and awareness purposes. Some of the informational handouts that were available for participants to take home included:

- Potential hazards of different crude 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.

Attendees were offered the opportunity to provide feedback regarding the event anonymously via feedback cards at the events. The overwhelming majority of the feedback received during the reporting period, whether through the formal feedback card or from direct conversations with community members was positive. Attendees stated they appreciated having access to Enbridge and the information provided.

117 [Control Point Plans]

In accordance with Subparagraph 117.a and b, Enbridge has updated and maintained the information for the Control Point locations set forth in Appendix D of the Consent Decree.

The Control Point information was submitted to the EPA on May 21, 2020 by Enbridge and was provided in the electronic formats specified in Subparagraph 117.e. Information about Subparagraph 117 c, d, f, and g have been addressed in previous SARs. This activity is complete.



118 [Response Time]

As reported in SAR6 and SAR7, this activity is complete.

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, virtually, due to COVID-19 restrictions:

Northern Michigan Area Committee, June 10, 2021

- A variety of topics were discussed including the following: a presentation on oil spill monitoring and technology that can be used to detect oil on surface water, a presentation from Lake Superior State University on the use of acoustics to detect oil under ice, Tribal treaty rights and planning in response, and a presentation was given on Per- and Polyfluoroalkyl substances (PFAS).

Northwest Indian Sub-Area Committee, November 2, 2021

- A number of topics were discussed including sampling capabilities on Lake Michigan, an overview of the Northwest Indiana Sub area plan and a discussion on remediation of PFAS foam.

Northwest Ohio and Southeast Michigan Area Committee, November 10, 2021

- A variety of topics were discussed including various agency and sub-committee updates, a presentation was given on the Flat Rock emergency response, and current jurisdictional boundaries between inland and coastal zones were reviewed.

Eastern Great Lakes Buffalo Area Committee, November 16, 2021

- A variety of topics were covered including the use of Autonomous Underwater Vehicles and Unmanned Aircraft Systems, discussion about the Great Lakes National Center of Excellence, a review of releases on the Buffalo River and Lower Niagara River and exercise review.

Enbridge also attended the fall Regional Response Team meeting held on October 20 and 21, 2021. This meeting was held virtually due to COVID-19 restrictions. This meeting fell outside of the Sub-Area planning meetings.

119.b(1) and (2) [Sub-Area Activities Participation]

Enbridge was invited and attended the following field exercises and other training events during this reporting period:

Webinar: National Oceanic and Atmospheric Administration Training, June 17, 2021

- This webinar discussed aerial imagery on NOAA aircraft and the use of this information post storm to assist in response and restoration.



Webinar: Virtual Exercise & Safe Exercise Best Practices - The Homeland Security Exercise and Evaluation Program (HSEEP) June 17, 2021

- This webinar discussed the Virtual Exercise Best Practices Guide and provided some examples of exercises that were conducted in a virtual environment.

Webinar: National Oceanic and Atmospheric Administration Training, September 16, 2021

This webinar presented a summary of past literature on oil spill impacts on physical, biological, social, and economic resources specifically examining:

- Air and water resources
- Habitats and Wildlife
- Fish and invertebrates
- Human use and socioeconomics

Webinar: Introduction to Hydrologic Imagery Visualization Enterprise System (“HIVES”), October 14, 2021

- This webinar presented an introduction to HIVES which is a tool using a series of time-lapse photographic images that provide data on waterbodies.

Webinar: National Oceanic and Atmospheric Administration (“NOAA”) Training, October 28, 2021

- The webinar discussed NOAA’s short-term and seasonal ice cover forecasts. The discussion centered around gaining an understanding of ice variability and why this is important, improving our ability to interpret data, and identified ice information sources.

Webinar on Emergency Preparedness at Department of Transportation (DOT) Pipeline and Hazardous Materials Safety Administration (PHMSA), November 10, 2021.

- This webinar discussed PHMSA’s role and regulatory authority in the context of various examples.

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]

Enbridge did not receive a request to meet and discuss response planning strategies to ensure consistency with the Area Plan during this reporting period.

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 and reported in SAR1; accordingly, this activity is complete.



119.h [Emergency Response Equipment]

Enbridge continues to maintain, in good working order, its prepositioned emergency response equipment and materials.

Enbridge made the following equipment additions in this reporting period:

- Boat Landing Craft Thirty-four Foot, Twin 300 HP Outboard Propeller: St. Ignace, MI PLM Shop
- Boat Landing Craft Thirty-four Foot, Twin 300 HP Outboard Propeller: Mackinaw City, MI Mackinaw City Station
- Boat King Fisher 2175 Jet Boat: Griffith, IN PLM Yard

In the future, Enbridge will also be adding emergency response equipment to support the newly constructed Line 93.

119.i [Inland Spill Response Tactics Guide on Website]

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

119.j [Inland Spill Response Guide to EPA]

As reported in SAR3, this activity is complete.

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 Specialist Coordinators: ICS 100B - 400 training.



- All emergency management department personnel: ICS 100B – 300 training within 90 days of being assigned.
- Any person designated as Vice President of U.S. Operations, or in an equivalent capacity: ICS 402 training.
- 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.

No training has taken place during this reporting period for the above training scenarios.

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]

Between the SAR 1 and SAR 7 reporting periods, Enbridge successfully installed and commissioned 14 new, remotely controlled valves on Lines 5, 6A, and 14 within the MP ranges specified under Paragraph 122. The 2020 Line 6A MP 80 has reached final restoration and the environmental permit has been closed. Monitoring of the 2020 site Line 6A MP 198 is in progress and will continue until the site reaches final restoration/revegetation. Enbridge considers Paragraph 121 and 122 to be complete.

123. [Enbridge Computer Modeling for Valve Locations]

Enbridge identified the optimal locations for the 14 valves listed in Paragraph 122 by employing our Intelligent Valve Placement (“IVP”) methodology to meet the requirements of Paragraph 123. The details of this methodology have been explained in past SARs, information requests, and an in-person demonstration to the ITP. Paragraph 123 requirements are complete and no further reporting is required.

124. [Valve Design and Closure]

During each instance of valve commissioning, valve closure timing tests were conducted and recorded to show each valve fully closed and sealed within three minutes of the operator engaging the valve-closure control on the control panel. After commissioning of each valve, Enbridge provided the commissioning forms to the ITP for their verification of closure timing of the valves installed in that reporting period. All the commissioning forms for the 14 valves have been provided to ITP for verification. Paragraph 124 requirements are complete and no further reporting is required in this SAR.



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, if necessary.

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 reports.

134.I [General Requirements – ITP Annual Certification]

On January 4, 2022, the ITP provided its annual certification to the United States, verifying that it complies with the General Requirements of Subparagraphs 134.g-k.

135. [Enbridge Enforcement of the Agreement]

As reported in the first through eighth SARs, Enbridge is prepared to enforce the terms of its written agreement with the ITP if needed to ensure compliance with Section VII.J of the Consent Decree, but to date has not been required to take such action.

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 Consent Decree requirements. However, Enbridge has selected the activities reported below to draw specific attention to challenges encountered during the reporting period, pursuant to Paragraph 144.

In support of transparency about interpretation issues with the Consent Decree as well as problems encountered, Enbridge included a table listing the interpretation issues (details below) as well as a bulleted list of problems encountered with a discussion for each following the list.

Consent Decree Interpretation Issues

There are a number of Consent Decree interpretation issues that the parties have resolved or that Enbridge is working to resolve with the ITP and EPA. Enbridge is proceeding using the current 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

The following is a list of the problems encountered or anticipated in implementing Consent Decree requirements for reporting period 9. Each of these are discussed in more detail in the sections below and are referenced in the applicable injunctive paragraph.

- [Section B] Minnesota Department of Natural Resources Comprehensive Enforcement Resolution Related to Line 3 Replacement Construction – P. 22.a
- [Section B] September 3, 2021 and October 1, 2021 Simulated Overpressures on Original US Line 3 at Clearbrook during Commissioning of New US Line 3 (Line 93) – P. 22.c
- [Section D] Circumferential Cracking Engineering Assessment Process – Various Paragraphs
- [Section G] July 16, 2021 Optimization of 24-hour Alarm Thresholds Due to Lower Flow Rates on Line 65 – P. 103
- [Section H] Stockbridge Agreed Exercise – P. 115
- [Section H] COVID-19 Restriction Impacts to FDE, TTX, Community Outreach, and Coordination with Government Planners - Various Paragraphs



[Section B] Minnesota Department of Natural Resources Comprehensive Enforcement Resolution Related to Line 3 Replacement Construction

The Minnesota Department of Natural Resources alleges that Enbridge breached the confining layer of an artesian aquifer during the construction of the Line 3 replacement project near Enbridge's Clearbrook Terminal. The alleged breach may have resulted in an unauthorized groundwater appropriation. The Minnesota Department of Natural Resources issued an initial administrative penalty order outlining the allegations on September 16, 2021. Enbridge is in the process of negotiating a comprehensive enforcement resolution with the State.

[Section B] September 3, 2021 and October 1, 2021 Simulated Overpressures on Original US Line 3 at Clearbrook during Commissioning of New US Line 3 (Line 93) – P. 22c

During the commissioning of pressure transmitters on the suction side at Clearbrook station of Line 93, Enbridge simulated pressure values that were over the maximum operating pressures ("MOP") as per the commissioning procedure. Simulated pressure values are required to verify the range and accuracy of instrumentation during testing.

There were two events relating to the commission of pressure transmitters that occurred during this SAR period. Both events were reported to the ITP and EPA during the monthly technical meetings (October 21 and November 18, 2021 respectively). The first event occurred on September 3, 2021 and the second event occurred on October 1, 2021, both on the same location.

These events resulted from planned field work. Since these values were simulated, no safety issue occurred in the pipeline or in the field. Actual pipeline pressures on the Original US Line 3 were maintained well below EMOP and procedures were followed accordingly by field and control room personnel. Supporting evidence of actual and simulated pressure values were provided to the ITP during the associated monthly technical meetings.

[Section D] Circumferential Cracking Engineering Assessment Process and Associated Discussions of the Parties – Various Paragraphs

In earlier reporting periods Enbridge, the ITP, and the government identified a difference in interpretation regarding how and whether circumferential crack ILI, which historically has not been used on the Lakehead system, was intended to be incorporated within the Consent Decree. Enbridge believes that the use of this technology is not required based on the level of risk to the Lakehead system and that technical assessment processes within the Consent Decree are not suitable to analyze circumferential crack features. As a result, Enbridge agreed to provide the ITP a total of three Engineering Assessments related to circumferential cracking features. Two of these Engineering Assessments provide technical analysis of eleven circumferential crack features detected by circumferential crack ILI on two lines, and one Engineering Assessment that details the level of risk of circumferential crack hazards on the Lakehead system as a whole and the Enbridge approach to managing this low level threat.

The Parties retained a third party engineering consultant, selected by the ITP, to complete an evaluation of all three circumferential crack Engineering Assessments.

On May 25, 2021 the Third Party Consultant ("TPC") provided its evaluation of Enbridge's Engineering Assessment of Circumferential Crack Management on the Lakehead System. The TPC found, consistent with Enbridge's position, that circumferential cracking failures are a "relatively low probability event" on a system-wide basis and that industry pipeline failures due to various types of circumferential cracking are



“infrequent... in comparison to failures due to other threat types”. Further the TPC “agrees that the information presented in the Programmatic EA suggests that no additional circumferential crack ILI runs on the Lakehead System are necessarily required at this time” and that the need for utilizing circumferential crack ILI “is dependent on the results of ongoing integrity assessments”. The TPC also recommended certain revisions and additions to Enbridge procedures and documentation in order for Enbridge to “continue to assess the ongoing potential threat posed by circumferentially aligned linear features that could represent cracks”.

On April 22, 2021, Enbridge ran the circumferential crack tool on Line 10 on two segments as part of ongoing efforts to resolve the circumferential cracking issue. No integrity actions, such as excavations or pressure restrictions, were required as a result of these inspections. Enbridge does not believe it was required or necessary to run or report on circumferential crack ILI under the language of the Consent Decree. Enbridge has not included the Line 10 UCc data in Section D of SAR9.

On June 11, 2021 the TPC provided their evaluation of Enbridge’s two Engineering Assessments for eleven circumferential crack features. The TPC concluded that “the fitness-for-service (FFS) assessments conducted by Enbridge... are reasonable and... are currently an appropriate means of demonstrating adequate safety in operations. The assessments indicate that all features examined as part of this review... are currently fit for service.”

On July 5, 2021 the ITP provided a “White Paper” that addressed the issue of circumferential stress corrosion cracking on certain segments of Line 4. Enbridge and the ITP continue to discuss potential approaches identified in the White Paper to address circumferential cracking on the segments of Line 4 at issue.

Discussions between Enbridge, the government, and the ITP regarding treatment of circumferential cracks occurred during the period of this Semi-Annual Report and are ongoing.

[Section G] July 16, 2021 Optimization of 24-hour alarm thresholds due to lower flow rates on Line 65 – P. 103

During the execution of the Q2 2021¹¹ sensitivity performance testing of the 24-Hour alarm, it was discovered that Lakehead Line 65 fell below the 95% confidence level for the leak sensitivity detection threshold of 2.3% of nominal flow.

On July 16, 2021, Enbridge concluded a technical analysis identifying the root cause of the issue. It was determined that the line was operating at a flow rate lower than the range observed and used during the 24-Hour Alarm Optimization Study¹² (“study”).

Table IX-2: Line 65 Flow Rates outlines the operational flow rates during the Q1 2021 through Q2 2021 period versus the range of operational flow rates during the study. This change in flow rates is considered a “significant change in pipeline operation” as flow at this minimum rate was not observed during the optimization study data set. This change in operation is considered significant and triggered the need for re-optimization.

¹¹ Q2 2021 performance testing covers Q1 to Q2 operating periods

¹² 2019.04.12 Enbridge 24-Hour Alarm Threshold Optimization Study Results – per P. 103.c



Enbridge completed a re-optimization study for Line 65 to determine a revised threshold¹³ so as to continue to meet the sensitivity requirement under persistent lower flow rate conditions. The revised threshold was implemented on August 3, 2021. This re-optimization was carried out in accordance with Subparagraph 103.g(3) and to meet the sensitivity requirements per Subparagraph 103.g(4). Subparagraph 103.g(5) will not be applicable for this event as neither the sensitivity is relaxed, nor a temporary sensitivity is established.

The Line 65 24-hour alarm re-optimization report was submitted to the ITP and EPA on October 6, 2021 in accordance with Subparagraph 103.c.

[Section H] Spill Response and Preparedness

The information below outlines problems encountered or anticipated in implementing Consent Decree requirements for Section H – Spill Response and Preparedness, due to COVID-19.

[Section H] Stockbridge Agreed Exercise - P. 115

The Exercise postponement required Enbridge to revise the Stockbridge Exercise Plan to reflect the new date and included the option to conduct a part of it virtually, subject to the support of the EPA and stakeholders. The final exercise plan was submitted to the EPA on May 11, 2021. The exercise was completed and the draft After Action Report (“AAR”) was submitted to the EPA on August 26, 2021, and the EPA responded with no comments on November 17th. On December 8 and 9, 2021 the final AAR was submitted to the EPA and planning participants. **Table IX-3** summarizes the meeting and exercise activities in the State of Michigan, related to the Stockbridge Agreed Exercise.

[Section H] COVID-19 Restriction Impacts to FDE, TTX, Community Outreach, and Coordination with Government Planners - Various Paragraphs

The scheduling and format of several spill response and preparedness activities were impacted by COVID-19 restrictions. All Field Deployment Exercises were completed face to face. A number of TTXs were completed in a hybrid format. The EPA was notified of all changes per the Force Majeure notification process and approval for these changes was granted by the EPA. **Table IX-4** summarizes the TTXs and FDEs that occurred in this reporting period. Coordination with Government Planners, as required by Paragraph 119 of the Consent Decree, including meetings and training were held. The Force Majeure notification process from Enbridge to the EPA is detailed in **Table IX-5**.

Reports to State Agencies

Enbridge is currently party to litigation involving Line 3 in Minnesota, Line 5 in Michigan and Line 5 in Wisconsin. In connection with these matters, the company periodically provides legal filings to agencies in those states. Enbridge does not consider those submissions, most of which are publicly available, to be “reports” of the type covered by the Consent Decree. Similarly, Enbridge is in the process of seeking state and federal permits relating to construction of a line replacement project on Line 5 in the vicinity of the Bad River Reservation in Wisconsin. As well, Enbridge has submitted materials to Michigan state agencies in

¹³ The term “threshold” in this context refers to the Enbridge definition, which is the flow range of when the alarm is triggered. “Threshold” per CD definition is synonymous to “sensitivity,” as per Enbridge definition and CD’s intent.



connection with the planned replacement of the Straits Pipelines at the Straits of Mackinac. Enbridge does not consider permit applications of this type to be “reports” covered by Paragraph 144.

Any significant changes or issues since the previous SAR

Any significant changes or issues since the previous SAR are addressed in the following summary.

Established MOP Modification Discussions

In 2015, Enbridge began an MOP Verification Project to verify the accuracy of information used in determining the MOP values previously established by the company, including the MOP values incorporated into the Consent Decree through Paragraph 10.s of the Consent Decree. As a result of its MOP Validation Project, Enbridge determined that a number of MOP values on the Lakehead Pipelines required updating. If revised information is considered, MOP values at a number of locations on the Lakehead System would be different than the values established pursuant to Paragraph 10.s of the Consent Decree.

In this reporting period, the Sixth Modification, which revises MOP values to be consistent with the MOP Verification Project, was entered by the US District Court for the Western District of Michigan on December 20, 2021.

145. [Non-Compliance]

Enbridge has identified one potential non-compliance during the SAR9 reporting period (see **Table IX-6**).

[Section G] Inadvertent Removal of 24-Hour Alarm Re-optimized Thresholds on Line 02 – P. 103.c

In September 2021, during a routine operational review, Enbridge discovered an issue related to the Line 2 24-Hour Alarm thresholds. It was discovered that the Line 2 production AVB 24-hour alarm threshold did not match the re-optimized value (-810 m³) reported to the EPA and ITP in April 2021. The re-optimized threshold was required as a result of lower flow rates on Line 2.

Enbridge’s review of the event identified that the issue was introduced with a production change to the Line 2 MBS model on April 15, 2021, which inadvertently modified the AVB 24-hour alarm thresholds. The change replaced the optimized threshold (-810 m³) with the previous threshold (-1075 m³). The -1075 m³ threshold had been put in place as part of the original 24-Hour alarm optimization in March 2019.

Enbridge restored the AVB 24-hour alarm thresholds to the correct re-optimized values on September 21, 2021, the same day the issue was discovered.

Additionally, the following actions were taken by Enbridge:

- Completed sensitivity testing using the original optimized thresholds (-1075 m³) between April and September 2021 and verified the system was meeting 3% re-optimized sensitivity performance at 95% confidence for the entire period.
- Completed reliability checks using re-optimized thresholds (-810 m³) between April and September 2021 and verified there was no occurrence of false alarms or missed alarm events.



The 24-Hour alarm remained fully functional and effective during the period in question. No alarms were unassessed or unreported as a result of the threshold discrepancy. Finally, Enbridge put in place additional action plans around training, process, and procedures to prevent future re-occurrence.

146. [Discharges from a Lakehead System Pipeline]

Table IX-7 in Appendix 1 identifies one discharge from the Lakehead System Mainline of one or more barrels of oil that occurred during the reporting period for this SAR. Additionally, Enbridge discloses two PHMSA-reportable discharges at Lakehead System facilities in the table. Enbridge confirms that these discharges 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. These reports are provided in Appendix 3.

As discussed above, during this reporting period, two releases occurred at Lakehead System facilities that triggered PHMSA reporting requirements that did not meet the CD reporting threshold per this paragraph. When applicable, releases are 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 the releases, when they occur, Enbridge proceeds without delay to dispatch trained personnel to the location of the leak and takes action to prevent any migration of oil into waters of the United States, including shutting down the affected line.

147. [Update on Discharges from a Lakehead System Pipeline reported in SAR8]

There was one discharge from a Lakehead System facility reported in SAR8 as shown in **Table IX-8**. There were no updates from past reports prior to SAR8. This was not a CD reportable event but for reporting consistency with previous SARs the information has been included in the table.

148. [Copies of all Post Incident Reports in SAR9]

A copy of each post incident report is provided in Appendix 3.



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]
[REDACTED] Vice President [REDACTED]
[REDACTED]

FOR DEFENDANTS:

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

[REDACTED]
[REDACTED], Executive Vice President and President,
[REDACTED]

Appendix 1 SAR9 Sections A-J and IX Tables

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Introduction

The following 4 pages are Table Intro-1: Implemented Requirements per P. 203(i).

Introduction

Table Intro-1: Implemented Requirements per P. 203(i)			
CD Section and Paragraph	Short description	Reported in	Enbridge status
Section A P. 21	No operation of original US Line 6B	SAR1	Implemented
Section B P. 22.a	Replacement of Line 3 in the United States, expeditiously as practicable, take Line 3 out of service	SAR9	Implemented
Section B P. 22.c	Original US Line 3 Maximum Operating Pressure	SAR1-SAR9	Implemented
Section B P. 22.d(1)-(3)	Complete Line 3 ILIs, FREs, and biocide treatments	SAR9	Implemented
Section B P. 23	Line 10 evaluation	SAR1-SAR4	Implemented
Section D ILI Stipulation	Stipulation and Agreement Regarding Assessment and Payment of Stipulated Penalties Relating to Timeliness of Certain In-Line Inspection	SAR2-SAR7	Implemented
Section D P. 46	Completion of Alternate Plans AP01 to AP 11	AP01 – SAR2 AP02 – SAR2 AP03 – SAR7 AP04 – SAR6 AP05 to AP11 – SAR9	Implemented
Section E P. 68.c; 38.d; 68.e	Periodic visual inspections of the Dual Pipelines	SAR1-SAR9	Implemented
Section E P. 69.a; 69.b; 69.c	Biota Investigation Work Plan, report, and implementation	SAR1-SAR4	Implemented
Section E P. 70.a; 70.b	Line 5 ILI corrosion, circumferential crack, and geometric features	SAR1	Implemented
Section E P. 71.a; 71.b	Line 5 ILI axially-aligned crack features or hydrotest	SAR1	Implemented

Table Intro-1: Implemented Requirements per P. 203(i)			
CD Section and Paragraph	Short description	Reported in	Enbridge status
Section E P. 72.a; 72.b	If cracks identified pursuant to P. 70, investigate and report	SAR1	Implemented
Section F P. 77.a-c	Updated OneSource within 365 days of CD Effective Date per requirements	SAR1	Implemented
Section G P. 79.a-c; 80.a-d	Assessment of Alternative Leak Detection Technologies and report	SAR1	Implemented
Section G P. 81-83	Report on Feasibility of Installing External Leak Detection System at the Straits of Mackinac	SAR1-SAR2	Implemented
Section G P. 85	Installation of Flowmeters	SAR9	Implemented
Section G P. 87	Installation of other Instrumentation	SAR9	Implemented
Section G P. 88	Establishment of MBS Segment	SAR9	Implemented
Section G P.89	Leak Detection Sensitivity Requirements	SAR9	Implemented
Section G P. 91a	Establishment and Optimization of Alarm Thresholds	SAR9	Implemented
Section G P. 101	Transient-State Sensitivity Analysis	SAR1	Implemented
Section G P. 102.a-d	Rupture Detection System Alarm	SAR7	Implemented
Section G P. 103	"24-hour" Alarm within 270 days of Effective Date and re-optimization of 24-Hour Alarm	SAR2, SAR7	Implemented
Section H P. 115a., 115.b(1), 115.b(2), 115.b(3); 115.b(4)	Cass Lake, Des Plaines, Wisconsin River, and Stockbridge Agreed Exercises	SAR1-SAR6; SAR8-SAR9	Implemented

Table Intro-1: Implemented Requirements per P. 203(i)			
CD Section and Paragraph	Short description	Reported in	Enbridge status
Section H P. 115.d	Invitations to the Agreed Exercises no later than 10 months prior to the Exercises	SAR5	Implemented
Section H P. 115.e(1)-(4)	Planning meetings, invitations, and draft plans	SAR1-SAR6; SAR8	Implemented
Section H P. 115.f	EPA review of each Agreed Exercise Plan	SAR1-SAR6; SAR8	Implemented
Section H P. 115.g	Enbridge conducts the Agreed Exercises in accordance with the approved Plans	SAR1-SAR6; SAR8-9	Implemented
Section H P. 115.h	Enbridge conducts After Action Review meetings	SAR1-SAR6; SAR8-9	Implemented
Section H P. 115.i	After Action Report to EPA and Planning Participants	SAR1-SAR6; SAR8-9	Implemented
Section H P. 117.a	Control Point updates and maintenance	SAR1-SAR9	Implemented
Section H P. 117.b(1)-(4)	Control Point (CP) details	SAR6	Implemented
Section H P. 117.c	Straits of Mackinac CPs	SAR3	Implemented
Section H P. 117.d and 117.e	CPs for the Agreed Exercises no later than 6 months prior to the Exercise and in the format required by the CD	SAR5	Implemented
Section H P. 118.a-e	Review of Response Times report and distribution EPA, Sub-Area Committees, USCG, PHMSA, and Enbridge OSROs	SAR6 and SAR7	Implemented

Table Intro-1: Implemented Requirements per P. 203(i)			
CD Section and Paragraph	Short description	Reported in	Enbridge status
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	Implemented
Section H P. 119.f	Unredacted electronic copies of the Lakehead ICPs	SAR1	Implemented
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	Implemented
Section H P. 119.j	Copy of Inland Spill Response Guide to EPA	SAR3	Implemented
Section I P. 122-124	New Remotely Controlled Valves	SAR7	Implemented
Section J P. 125	Retain ITP	SAR1	Implemented
Section J P. 127.a-e	ITP candidates and eligibility terms	SAR1	Implemented
Section J P. 129	EPA approves ITP	SAR1	Implemented
Section J P. 131	Enbridge provides agreement to the ITP	SAR1	Implemented
Section J P. 132.a	Initial Planning Meeting with Region 5 in Chicago	SAR1	Implemented
Section J P. 133.b	Enbridge provides response to ITP's Verification Report	SAR4	Implemented
Section J P. 134.a-m	Enbridge written agreement with ITP	SAR1	Implemented

Section A

There are no tables associated with Section A.

Section B

The following 7 pages are Table B-1: Permits/Approvals Required for Line 3 Replacement Project (U.S.).

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: Received WI: Received
	Section 408 Authorization	Authorizes crossing of USACE civil works projects	Received
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 Complete 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: Permit Received MN: 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
Bureau of Indian Affairs ("BIA")	Grant of Right-of - Way	Enbridge applied for easement approval to cross the Fond du Lac Reservation along the routing authorized by the MPUC's Route Permit order	Easement granted May 1, 2020 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	Received
Minnesota Public Utilities Commission ("MPUC")	Certificate of Need	Determines need for the pipeline, including questions of size, type and timing	Construction authorization issued November 24, 2020

Table B-1: Permits/Approvals Required for Line 3 Replacement Project (U.S.)			
Unit of Government	Type of Application	Reason Required	Permit Status
Minnesota Public Utilities Commission ("MPUC")	Route Permit	Authorizes construction of the pipeline along a specific route, subject to certain conditions	Construction authorization issued November 24, 2020
Minnesota Department of Natural Resources ("MDNR")	License to Cross Public Waters	50-year license that allows for crossing of public waters with proposed utility	Received
	Work in Public Waters Permit	Authorizes in-water activities in public waters located on private lands	Received
	License to Cross Public Lands	50-year license that allows for crossing of public lands with proposed utility	Received
	Short-term Leases	Authorizes activities such as construction dewatering, water appropriation, and discharge on MDNR-managed lands	Received
	Access Roads Leases	Authorizes use of MDNR- managed access roads during construction and/or operation	Received
	Endangered Species Permit	Outlines plans for avoidance, minimization, and mitigation of take of state-listed flora species and authorizes take of individuals	Received

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 Natural Resources ("MDNR")	Gully 30 Calcareous Fen Management Plan ("FMP") Authorization	Outlines the site-specific construction, restoration, and monitoring requirements for this wetland crossing	Received
	Individual Water Appropriation Permit for Construction Dewatering	Authorizes withdrawal of groundwater associated with dewatering of trench and excavations	Received
	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	Received
	Individual Water Appropriation Permit for Dust Suppression	Authorizes withdrawal and use of water from sources to support fugitive dust control	Received
	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	Received
Minnesota Pollution Control Agency ("MPCA")	Section 401 WQC and Antidegradation Assessment	Section 401 WQC required to issue the USACE Section 404/10 Permit	Received
	Clearbrook Terminal Air Quality Permit – Capped Emissions Permit	Authorizes construction and operation at the modified Clearbrook Terminal	Received

Table B-1: Permits/Approvals Required for Line 3 Replacement Project (U.S.)			
Unit of Government	Type of Application	Reason Required	Permit Status
Minnesota Pollution Control Agency ("MPCA")	National Pollutant Discharge Elimination System ("NPDES") Industrial Hydrostatic Discharge Permit and Antidegradation Analysis	Authorizes discharge of water from hydrostatic testing activities	Received
	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	Received
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 Complete

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 Complete
North Dakota State Water Commission ("NDSWC")	Sovereign Lands Permit	Authorizes crossing of state Sovereign Lands and navigable waters	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")	Dunklee Wildlife Management Area ("WMA") Consultation	Consult with NDGF to identify special seeding or restoration measures on WMA	Consultations Complete

Table B-1: Permits/Approvals Required for Line 3 Replacement Project (U.S.)			
Unit of Government	Type of Application	Reason Required	Permit Status
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
	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
City of Superior	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 extends and modifies 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 submitted cultural resources survey data, valuation appraisals, and allotment easement consents to BIA in support of the application.

The following 1 page is Table B-2: Line 93 Construction Milestone Schedule.

Table B-2: Line 93 Construction Milestone Schedule		
Line 93 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.	Complete	
Line 93 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	Substantially complete	
Execution of Mainline and Facilities Construction Contracts	Complete	
Line 93 Construction Start – North Dakota	August 2020	Complete October 2020 Note that a segment of Line 3 near the U.S.-Canada border in North Dakota was replaced prior to 2020.
Line 93 Construction Start – Minnesota	December 1, 2020	In receipt of all authorizations for construction
Line 93 Construction Complete	Line fill complete October 13, 2021	

The following 1 page is Table B-3: P. 22.d(3) Original US Line 3 Biocide Treatments.

Table B-3: P. 22.d(3) Original US Line 3 Biocide Treatments ²		
Segment	Type of Tool Run	Completion Date (MM/DD/YYYY)
Gretna to Clearbrook	Biocide Treatment	06/14/2021
Gretna to Clearbrook	Biocide Treatment	08/24/2021 ¹
Clearbrook to Superior	Biocide Treatment	08/26/2021

TABLE NOTES:

¹ The biocide injection started on 08/23/2021 but it was not completed until 08/24/2021.

² All Original US Line 3 Biocide Treatments to date meet the requirements set forth in Subparagraph 22.d.(3) of the Consent Decree. There were no biocide injections required during Q4 2021 as Line 3 was removed from service.

Section C

There are no tables associated with Section C.

Section D

The following 1 page is Table D-1: P. 28.a-b ILI Runs Completed During this Reporting Period.

Section D

Notes for Section D tables:

1. Dates below are in month/day/year format.
2. For all dates where the deadline fell on a weekend or US holiday the date required was adjusted to the next business day per Consent Decree Definition for "Day" under IV.10.m.

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
6679	04		DuDi UCM	9/10/2021	Corrosion	12/7/2021
6679	04		DuDi UCM	9/10/2021	Crack	9/21/2021
10241	05		MFL4	5/26/2021	Corrosion	8/24/2021
10241	05		MFL4	5/26/2021	Geometry	8/24/2021
10240	05		MFL4	5/27/2021	Corrosion	7/1/2021
10240	05		MFL4	5/27/2021	Geometry	7/1/2021
6662	06A		UMP	6/7/2021	Corrosion	8/30/2021

The following 1 page is Table D-2: P. 28.c Incomplete or Invalid ILLs and Rerun Dates.

Table D-2: P. 28.c Incomplete or Invalid ILIs and Rerun Dates									
Tool Run ID	Line	Segment	Tool	Threat Monitored	Inspection Deadline	Pull Date	Date of DQA Notification	Rerun Tool Run ID	Rerun Date
N/A ¹									

TABLE NOTE:

¹ There are no incomplete or invalid ILIs in this SAR period

The following 2 pages are Table D-3: P. 29 12-Month Lakehead ILI Schedule (November 23, 2021 – November 22, 2022).

Table D-3: P. 29 12-Month Lakehead ILI Schedule (November 23, 2021 – November 22, 2022)

Run ID	Line	Segment	Tool	Threat Monitored	Required Completion Date ¹
10858	02		GEMINI	Corrosion	11/2/2022
10858	02		GEMINI	Geometry	11/2/2022
10859	02		Proton	Crack	12/15/2022
10888	04		DuDi UCM	Corrosion	10/17/2022
10888	04		DuDi UCM	Crack	10/17/2022
10895	04		DuDi UCM	Corrosion	6/29/2022
10895	04		DuDi UCM	Crack	6/13/2022
10879	04		DuDi UCM	Corrosion	6/27/2022
10879	04		DuDi UCM	Crack	6/27/2022
10904	05		GEMINI	Corrosion	8/23/2022
10904	05		GEMINI	Geometry	8/23/2022
10905	05		UCx	Crack	8/8/2022
10901	05		MFL4	Corrosion	5/31/2022
10901	05		MFL4	Geometry	5/31/2022
10902	05		UCc	Crack	1/19/2022
10907	05		UCx	Crack	7/25/2022
10909	05		UCx	Crack	7/18/2022
10910	05		MFL4	Corrosion	5/31/2022
10910	05		MFL4	Geometry	5/31/2022
10911	05		UCc	Crack	1/20/2022
10915	06A		AFD	Corrosion	1/3/2023
10917	06A		Vectra	Corrosion	6/6/2022
10919	06A		USWM+	Corrosion	3/28/2022
11053 ¹	06A		UCx	Crack	9/16/2022
10912	06A		Vectra	Corrosion	4/27/2022
10914	06A		AFD	Corrosion	1/3/2023
11028	62		MFL4	Corrosion	9/26/2022
11028	62		MFL4	Geometry	9/26/2023

Table D-3: P. 29 12-Month Lakehead ILI Schedule (November 23, 2021 – November 22, 2022)					
Run ID	Line	Segment	Tool	Threat Monitored	Required Completion Date ¹
11029	62		CD+	Crack	2/22/2023
10969	78		MFL4	Corrosion	12/14/2022
10969	78		MFL4	Geometry	12/14/2022
10301	93		MFL-A	Corrosion	Table Note 2
10301	93		MFL-A	Geometry	Table Note 2
10300	93		UC	Crack	Table Note 2
10297	93		MFL-A	Corrosion	Table Note 2
10297	93		MFL-A	Geometry	Table Note 2
10296	93		UC	Crack	Table Note 2
10299	93		MFL-A	Corrosion	Table Note 2
10299	93		MFL-A	Geometry	Table Note 2
10298	93		UC	Crack	Table Note 2

TABLE NOTE:

¹ILI 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.

² Enbridge has not calculated Required Completion Dates for Line 93, which is a new line. Enbridge expects that all segments of Line 93 will be inspected in accordance with Enbridge processes for new lines

The following 1 page is Table D-4: P. 30 Changes to Previous 12-Month ILI Schedule (May 23, 2021 to May 22, 2022).

Table D-4: P. 30 Changes to Previous 12-Month ILI Schedule (May 23, 2021 – May 22, 2022)							
Original Run ID	Revised Run ID	Line	Segment Name	Tool	Threat Monitored	Required Completion Date	Schedule Revision Comments
10918	11053	06A		DUO CD	Crack	9/16/2022	Running UCx tool (RID 11053) instead of DUO CD (RID 10918)
6725	11029	62		CD+	Crack	2/22/2023	
6735	11028	62		GEMINI	Corrosion	9/26/2022	
6735	11028	62		GEMINI	Geometry	9/26/2023	
10301		93		MFL-A	Corrosion	FR	Table Note 1
10301		93		MFL-A	Geometry	FR	Table Note 1
10300		93		UC	Crack	FR	Table Note 1
10297		93		MFL-A	Corrosion	FR	Table Note 1
10297		93		MFL-A	Geometry	FR	Table Note 1
10296		93		UC	Crack	FR	Table Note 1
10299		93		MFL-A	Corrosion	FR	Table Note 1
10299		93		MFL-A	Geometry	FR	Table Note 1
10298		93		UC	Crack	FR	Table Note 1

TABLE NOTE:

¹ Enbridge has not calculated Required Completion Dates for Line 93, which is a new line. Enbridge expects that all segments of Line 93 will be inspected in accordance with Enbridge processes for new lines.

The following 1 page is Table D-5: P. 31 Incomplete or Invalid ILIs and Rerun Dates.

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
N/A ¹								

TABLE NOTE:

¹ There are no incomplete or invalid ILIs in this SAR period

The following 1 page is Table D-6: P. 31 ILLs with Minor Tool Performance Deficiencies.

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?
10228	03		UC	3/23/2021	3/5/2021	Yes	No
10240	05		MFL4	7/1/2021	5/27/2021	Yes	No
6692	10		MFL4	7/12/2021	3/17/2021	Yes	No

TABLE NOTE:

¹ Table includes ILIs that occurred in SAR8. The Data Quality Review and ILI assessment for these ILIs occurred in SAR9.

The following 1 page is Table D-7: P. 32.a-c Valid In-line Inspection Runs with Initial ILI Report Received.

Table D-7: P. 32.a-c Valid In-line Inspection Runs with Initial ILI Report Received							
Tool Run ID ¹	Line	Segment	Tool	Report Type	Report Due Date	Report Received Date	Report Received On Time?
10228	03		UC	Crack	7/6/2021	7/5/2021	Yes
11019 ¹	03		MFL4	Corrosion	8/19/2021	7/12/2021	Yes
11019	03		MFL4	Geometry	8/19/2021	7/20/2021	Yes
10991	04		UCM	Crack	5/27/2021	5/27/2021	Yes
10241	05		MFL4	Corrosion	8/24/2021	8/24/2021	Yes
10241	05		MFL4	Geometry	8/24/2021	8/24/2021	Yes
10240	05		MFL4	Corrosion	8/25/2021	8/25/2021	Yes
10240	05		MFL4	Geometry	8/25/2021	8/25/2021	Yes
6662	06A		UMP	Corrosion	9/7/2021	9/7/2021	Yes
6668	10		GEMINI	Corrosion	6/14/2021	6/14/2021	Yes
6668	10		GEMINI	Geometry	6/14/2021	6/14/2021	Yes
6691	10		UMP	Corrosion	6/23/2021	6/23/2021	Yes
6692	10		MFL4	Corrosion	6/15/2021	6/15/2021	Yes
6692	10		MFL4	Geometry	6/15/2021	6/15/2021	Yes
10986	10		MFL4	Corrosion	6/22/2021	6/22/2021	Yes
10986	10		MFL4	Geometry	6/22/2021	6/22/2021	Yes
6718	10		UCx	Crack	7/21/2021	7/21/2021	Yes

TABLE NOTE:

¹ The Issue 1 report only contained features with a depth >50% as seen in the 2020 MFL4 Inspection. A full Issue 2 Report was received on 8/19/2021.

The following 1 page is Table D-8: P. 33.b ILIMRR Version 8.3 Table 5 Inside Diameter Priority Notification Criteria for Ovalities and Other Deformation Features.

Table D-8: P. 33.b ILIMRR Version 8.3 Table 5 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

The following 1 page is Table D-9: P. 33.c-d Priority Features.

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 (Valid PN)	Date of Discovery/ Date Features Added to Dig List	Pressure Restriction Required?	Date Pressure Restriction Imposed	Repair/ Mitigation Deadline	Date of Repair/ Mitigation
6692	10		MFL4	8910	6/2/2021	6/3/2021	6/3/2021	No	N/A	11/30/2021	10/15/2021

The following 1 page is Table D-10: P. 34.a Preliminary Review of Initial ILI Reports.

Table D-10: P. 34.a Preliminary Review of Initial ILI Reports									
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?
10228	03		UC	7/5/2021	Crack	8/4/2021	7/30/2021	Yes	Yes
11019	03		MFL4	7/12/2021	Corrosion	8/11/2021	8/9/2021	Yes	Yes
11019	03		MFL4	7/20/2021	Geometry	8/19/2021	8/11/2021	Yes	Yes
10991	04		UCM	5/27/2021	Crack	6/28/2021	6/18/2021	Yes	Yes
10241	05		MFL4	8/24/2021	Corrosion	9/23/2021	9/21/2021	Yes	Yes
10241	05		MFL4	8/24/2021	Geometry	9/23/2021	9/20/2021	Yes	Yes
6693	05		UCc	5/19/2021	Crack	6/18/2021	6/15/2021	Yes	No
10240	05		MFL4	8/25/2021	Corrosion	9/24/2021	9/21/2021	Yes	Yes
10240	05		MFL4	8/25/2021	Geometry	9/24/2021	9/20/2021	Yes	No
6666	05		UCc	5/20/2021	Crack	6/21/2021	6/15/2021	Yes	No
6662	06A		UMP	9/7/2021	Corrosion	10/7/2021	10/5/2021	Yes	Yes
6668	10		GEMINI	6/14/2021	Corrosion	7/14/2021	7/12/2021	Yes	No
6668	10		GEMINI	6/14/2021	Geometry	7/14/2021	7/7/2021	Yes	No
6692	10		MFL4	6/15/2021	Corrosion	7/15/2021	7/12/2021	Yes	Yes
6692	10		MFL4	6/15/2021	Geometry	7/15/2021	7/13/2021	Yes	No
10986	10		MFL4	6/22/2021	Corrosion	7/22/2021	7/15/2021	Yes	No
10986	10		MFL4	6/22/2021	Geometry	7/22/2021	7/7/2021	Yes	No
6718	10		UCx	7/21/2021	Crack	8/20/2021	8/17/2021	Yes	Yes

The following 1 page is Table D-11: P. 34.c ILI Reports with Reporting and/or Data Quality Issues.

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
10228	03		UC	Crack	7/5/2021	8/4/2021	7/30/2021	Yes
11019	03		MFL4	Corrosion	7/12/2021	8/11/2021	8/9/2021	Yes ¹
11019	03		MFL4	Geometry	7/20/2021	8/19/2021	8/11/2021	Yes
10991	04		UCM	Crack	5/27/2021	6/28/2021	6/18/2021	Yes
10241	05		MFL4	Corrosion	8/24/2021	9/23/2021	9/21/2021	Yes
10241	05		MFL4	Geometry	8/24/2021	9/23/2021	9/20/2021	Yes
10240	05		MFL4	Corrosion	8/25/2021	9/24/2021	9/21/2021	Yes
6662	06A		UMP	Corrosion	9/7/2021	10/7/2021	10/5/2021	Yes
6691	10		UMP	Corrosion (Issue 1)	6/23/2021	7/23/2021	N/A ²	Yes
6692	10		MFL4	Corrosion	6/15/2021	7/15/2021	7/12/2021	Yes
6718	10		UCx	Crack	7/21/2021	8/20/2021	8/17/2021	Yes

TABLE NOTE:

¹ The Issue 1 report only contained features with a depth >50% as seen in the 2020 MFL4 Inspection. The dates reported in this table are for Issue 1. A full Issue 2 Report was received on 8/19/2021. The Preliminary Review of the Issue 2 ILI Report was completed on 9/10/2021.

² There was no program approval for the Issue 1 ILI report. Since there was a data quality Issue identified with the Issue 1 report an Issue 2 ILI report was requested from the ILI vendor to correct the data quality issue. The program approval for Issue 2 was completed on 7/20/2021 within 30 days of receipt of the Issue 1 ILI report as the ILI vendor quickly addressed the data quality problem. The Issue 2 ILI does not appear in Table D-11 as there was no data quality issue associated with it.

The following 1 page is Table D-12: P. 34.d Data Quality Evaluation Timelines.

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	Data Quality Evaluations Completed Within 180 Days? ¹
10228	03		UC	3/5/2021	Crack	9/1/2021	Yes
11019	03		MFL4	5/21/2021	Corrosion	11/17/2021	Yes
11019	03		MFL4	5/21/2021	Corrosion	11/17/2021	Yes
11019	03		MFL4	5/21/2021	Geometry	11/17/2021	Yes
10991	04		UCM	1/27/2021	Crack	7/26/2021	Yes
10241	05		MFL4	5/26/2021	Corrosion	11/22/2021	Yes
10241	05		MFL4	5/26/2021	Geometry	11/22/2021	Yes
6693	05		UCc	1/19/2021	Crack	7/19/2021	Yes
10240	05		MFL4	5/27/2021	Corrosion	11/23/2021	Yes
10240	05		MFL4	5/27/2021	Geometry	11/23/2021	Yes
6666	05		UCc	1/20/2021	Crack	7/19/2021	Yes
6662	06A		UMP	6/7/2021	Corrosion	12/6/2021	Yes
6668	10		GEMINI	3/16/2021	Corrosion	9/13/2021	Yes
6668	10		GEMINI	3/16/2021	Geometry	9/13/2021	Yes
6691	10		UMP	3/25/2021	Corrosion	9/21/2021	Yes
6692	10		MFL4	3/17/2021	Corrosion	9/13/2021	Yes
6692	10		MFL4	3/17/2021	Geometry	9/13/2021	Yes
10986	10		MFL4	3/24/2021	Corrosion	9/20/2021	Yes
10986	10		MFL4	3/24/2021	Geometry	9/20/2021	Yes
6718	10		UCx	3/23/2021	Crack	9/20/2021	Yes
6555	65		CD+	11/20/2020	Crack (Issue 2)	5/19/2021	No ²

TABLE NOTE:

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

² As previously reported in SAR8 this ILI was part of an Investigative Dig Program. Upon completion of the Investigative dig program the ILI vendor Provided an Issue 2 ILI report. The data quality evaluation for the Issue 2 ILI report was completed beyond 180 Days from the pull date, as allowed in Paragraph 34.d. The potential data quality issues with this inspection were identified and acted upon from the Issue 1 ILI Report with all potential FREs being issued for excavation.

The following 1 page is Table D-13: P. 34.e Discrepancies between Two Successive ILI Runs.

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?
10228	03		UC	Crack	No	No	No
11019	03		MFL4	Corrosion (Issue 1)	N/A ¹	N/A ¹	N/A ¹
11019	03		MFL4	Corrosion (Issue 2)	No	No	No
11019	03		MFL4	Geometry	No	No	No
10991	04		UCM	Crack	No	Yes	No
10241	05		MFL4	Corrosion	No	No	No
10241	05		MFL4	Geometry	No	No	No
6693	05		UCc	Crack	No	Yes	No
10240	05		MFL4	Corrosion	No	No	No
10240	05		MFL4	Geometry	No	Yes	No
6666	05		UCc	Crack	No	Yes	No
6662	06A		UMP	Corrosion	No	No	No
6668	10		GEMINI	Corrosion	No	No	No
6668	10		GEMINI	Geometry	No	Yes	No
6691	10		UMP	Corrosion (Issue 2) ²	No	No	No
6692	10		MFL4	Corrosion	No	No	No
6692	10		MFL4	Geometry	Yes	Yes	No
10986	10		MFL4	Corrosion	No	No	No
10986	10		MFL4	Geometry	No	Yes	No
6718	10		UCx	Crack	No	Yes	No
6555	65		CD+	Crack	Yes	Yes	No

TABLE NOTES:

¹ The Issue 1 report for this inspection only included features with a depth >50%. The Issue 2 report contains the entire corrosion feature dataset and was used for the severity, density, and feature type comparison.² There was no program approval for the Issue 1 ILI report. Since there was a data quality Issue identified with the Issue 1 report an Issue 2 ILI report was requested from the ILI vendor to correct the data quality issue. The program approval for Issue 2 was completed on 7/20/2021 within 30 days of receipt of the Issue 1 ILI report as the ILI vendor quickly addressed the data quality problem.

The following 1 page is Table D-14: P. 37 Deadlines for Placing Features Requiring Excavation on the Dig List.

Table D-14: P. 37 Deadlines for Placing Features Requiring Excavation on the Dig List													
Tool Run ID	Line	Segment	Tool	Threat Type	Pull Date	Burst Pressure Calculation Date	Remaining Life Calculation Date	Other Features Identified Date	SQuAD and QuAD Completion date	Number of Features Identified	Date All Features Added to Dig List	Within 180 Days of Tool Pull Date?	Within 5 Days of Calculations?
11019	03		MFL4CAL	Interacting	5/21/2021	8/11/2021	8/11/2021	8/11/2021	8/11/2021	1	8/11/2021	Yes	Yes
6662	06A		UMP	Corrosion	6/7/2021	10/5/2021	10/5/2021	10/5/2021	10/5/2021	8	10/5/2021	Yes	Yes
6692	10		MFL4MFL	Corrosion	3/17/2021	7/12/2021	7/12/2021	7/12/2021	7/12/2021	3	7/12/2021	Yes	Yes
6691	10		UMP	Corrosion	3/25/2021	7/20/2021	7/20/2021	7/20/2021	7/20/2021	4	7/20/2021	Yes	Yes

The following 3 pages are Table D-15: P. 39.a-b FREs Repaired and Planned for Repair.

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 ¹	Crack Features	Corrosion Features	Axial Grooving Features	Interacting Features	Geometry Features
30356 ²	L0003		115680	11019	10/10/2021	0	0	0	1	0
24805 ³	L0003		58670	3829	10/10/2021	0	1	0	0	0
28338 ⁴	L0003		58690	6606	10/10/2021	0	1	0	0	0
28926 ⁵	L0003		71850	10001	11/3/2021	1	0	0	0	0
28929 ⁶	L0003		117440	10001	11/3/2021	1	0	0	0	0
28932 ⁷	L0003		153080	10001	11/3/2021	1	0	0	0	0
28933 ⁸	L0003		156430	10001	11/3/2021	1	0	0	0	0
30153	L0004		27260	10991	FR	0	1	0	0	0
30120	L0004		45560	6729	11/4/2021	0	1	0	0	0
30129	L0004		38460	6738	11/2/2021	0	1	0	0	0
30130	L0004		39000	6738	10/20/2021	0	1	0	0	0
30131	L0004		45220	6738	11/5/2021	0	1	0	0	0
30154	L0004		34710	6740	10/2/2021	0	1	0	0	0
30155	L0004		35090	6740	8/21/2021	0	1	0	0	0
30156	L0004		35100	6740	8/26/2021	0	1	0	0	0
30157	L0004		35670	6740	8/21/2021	0	1	0	0	0
30158	L0004		35690	6740	8/30/2021	0	3	0	0	0
30159	L0004		35830	6740	9/28/2021	0	10	0	0	0
30160	L0004		35850	6740	10/7/2021	0	1	0	0	0
30161	L0004		35970	6740	9/1/2021	0	1	0	0	0
30162	L0004		36550	6740	9/22/2021	0	3	0	0	0
30163	L0004		37560	6740	9/18/2021	0	1	0	0	0
30164	L0004		37710	6740	9/18/2021	0	1	0	0	0
30165	L0004		37750	6740	9/27/2021	0	4	0	0	0
30166	L0004		38770	6740	9/24/2021	0	1	0	0	0
30167	L0004		38780	6740	9/24/2021	0	3	0	0	0
30168	L0004		38790	6740	10/11/2021	0	1	0	0	0
30169	L0004		38800	6740	9/16/2021	0	1	0	0	0
30170	L0004		38920	6740	9/24/2021	0	1	0	0	0
30171	L0004		39000	6740	10/1/2021	0	1	0	0	0
30172	L0004		39010	6740	10/1/2021	0	1	0	0	0
30173	L0004		39170	6740	10/12/2021	0	1	0	0	0

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 ¹	Crack Features	Corrosion Features	Axial Grooving Features	Interacting Features	Geometry Features
30174	L0004		39210	6740	10/18/2021	0	2	0	0	0
30175	L0004		39600	6740	10/23/2021	0	1	0	0	0
30176	L0004		39720	6740	10/15/2021	0	1	0	0	0
30068	L0005		116570	6593	10/27/2021	1	0	0	0	0
30069	L0005		213390	6593	10/9/2021	1	0	0	0	0
30152	L0005		260790	6743	10/15/2021	0	1	0	0	0
30532	L0006A		58980	6662	FR	0	1	0	0	0
30533	L0006A		95690	6662	FR	0	1	0	0	0
30534	L0006A		101320	6662	FR	0	1	0	0	0
30535	L0006A		148530	6662	FR	0	1	0	0	0
30536	L0006A		213650	6662	11/10/2021	0	1	0	0	0
30537	L0006A		215280	6662	FR	0	1	0	0	0
30538	L0006A		220610	6662	FR	0	1	0	0	0
30539	L0006A		233330	6662	FR	0	1	0	0	0
30334	L0010		1020	6691	11/3/2021	0	2	0	0	0
30335	L0010		12830	6691	11/15/2021	0	2	0	0	0
30326	L0010		2690	6692	FR	0	1	0	0	0
30328	L0010		16460	6692	10/27/2021	0	1	0	0	0
30329	L0010		17550	6692	10/26/2021	0	1	0	0	0
30015	L0014		22220	6553	7/14/2021	1	0	0	0	0
30016	L0014		22320	6553	7/16/2021	1	0	0	0	0
30017	L0014		42750	6553	7/1/2021	2	0	0	0	0
30018	L0014		57160	6553	6/11/2021	1	0	0	0	0
30019	L0014		61350	6553	7/24/2021	1	0	0	0	0
30020	L0014		70210	6553	6/18/2021	1	0	0	0	0
30021	L0014		72140	6553	6/23/2021	1	0	0	0	0
30022	L0014		100590	6553	6/15/2021	1	0	0	0	0
30023	L0014		111300	6553	6/5/2021	1	0	0	0	0
30024	L0014		112170	6553	6/9/2021	1	0	0	0	0
30025	L0014		112840	6553	6/25/2021	1	0	0	0	0
30026	L0014		118740	6553	7/1/2021	5	0	0	0	0
30027	L0014		120350	6553	7/20/2021	1	0	0	0	0

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 ¹	Crack Features	Corrosion Features	Axial Grooving Features	Interacting Features	Geometry Features
30028	L0014		121170	6553	6/28/2021	1	0	0	0	0
30029	L0014		121180	6553	6/30/2021	1	0	0	0	0
30030	L0014		131750	6553	6/14/2021	2	0	0	0	0
30031	L0014		132340	6553	6/19/2021	1	0	0	0	0
30032	L0014		148230	6553	7/13/2021	1	0	0	0	0
30033	L0014		150780	6553	6/22/2021	1	0	0	0	0
30034	L0014		168380	6553	6/24/2021	1	0	0	0	0
30035	L0014		172430	6553	6/29/2021	2	0	0	0	0
30077	L0065		2220	6555	8/14/2021	1	0	0	0	0
30079	L0065		7430	6555	8/11/2021	1	0	0	0	0
30087	L0065		87320	6555	6/4/2021	4	0	0	0	0
30088	L0065		100270	6555	8/5/2021	1	0	0	0	0
30089	L0065		100330	6555	6/3/2021	6	0	0	0	0
Total: 113						47	65	0	1	0

TABLE NOTE:

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

² AP7

³ AP5

⁴ AP6

⁵ AP8

⁶ AP9

⁷ AP10

⁸ AP11

The following 1 page is Table D-16: P. 40 ILI Programs with all Features Requiring Excavation Repaired/Mitigated during the reporting period.

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 ^{1,2}
6743	L0005		GEMINIMFL	MFL	11/4/2021	FR
6553	L0014		ECLIPSE	UTCD	8/25/2021	9/7/2021
6555	L0065		CD+	UTCD	9/29/2021	10/1/2021

TABLE NOTE:

¹ During the reporting period, Enbridge, the EPA and the ITP discussed refinements to when excavations of FREs would be deemed "completed." Enbridge and the ITP have provided an interpretation document to provide clarity around this issue and are awaiting further comments or concurrence from the EPA on this issue. For the purposes of this SAR the Statistical Analysis Completed by the SML date is being used.

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

The following 1 page is Table D-16a: P. 40 Revised NDE Reports with Original NDE Report Approval Date Overwritten.

Table D-16a: P. 40 Revised NDE Reports with Original NDE Report Approval Date Overwritten					
Dig ID	Line	Segment	Girth Weld	Original NDE Report Approval Date	Most Recent NDE Report Approval Date
28360	67		53660	3/17/2021	7/26/2021
27332	6A		301370	7/29/2020	8/18/2021
30026	14		118740	7/26/2021	10/7/2021
30028	14		121170	8/4/2021	9/30/2021
30027	14		120350	8/25/2021	9/17/2021
30077	65		2220	9/3/2021	9/29/2021
30085	65		37210	5/10/2021	9/16/2021

The following 1 page is Table D-17: P. 44.a-b Initial Predicted Burst Pressure and Initial Remaining Life Calculations.

Table D-17: 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) ¹	Calculation Deadline (2) ¹	Burst Pressure Calculation Date	Remaining Life Calculation Date
10228	03		UC	Crack	3/5/2021	7/30/2021	Yes	9/24/2021	8/27/2021	7/30/2021	7/30/2021
11019	03		MFL4	Corrosion	5/21/2021	8/9/2021	Yes	10/4/2021	11/12/2021	8/9/2021	8/9/2021
11019	03		MFL4	Geometry	5/21/2021	8/11/2021	Yes	10/6/2021	11/12/2021	8/11/2021	8/11/2021
10991	04		UCM	Crack	1/27/2021	6/18/2021	Yes	8/13/2021	7/21/2021	6/18/2021	6/18/2021
6693	05		UCc	Crack	1/19/2021	6/15/2021	No	8/10/2021	7/13/2021	6/15/2021	6/15/2021
10241	05		MFL4	Corrosion	5/26/2021	9/21/2021	Yes	11/16/2021	11/17/2021	9/21/2021	9/21/2021
10241	05		MFL4	Geometry	5/26/2021	9/20/2021	Yes	11/15/2021	11/17/2021	9/20/2021	9/20/2021
6666	05		UCc	Crack	1/20/2021	6/15/2021	No	8/10/2021	7/14/2021	6/15/2021	6/15/2021
10240	05		MFL4	Corrosion	5/27/2021	9/21/2021	Yes	11/16/2021	11/18/2021	9/21/2021	9/21/2021
10240	05		MFL4	Geometry	5/27/2021	9/20/2021	No	11/15/2021	11/18/2021	9/20/2021	9/20/2021
6662	06A		UMP	Corrosion	6/7/2021	10/5/2021	Yes	11/30/2021	11/29/2021	10/5/2021	10/5/2021
6668	10		GEMINI	Corrosion	3/16/2021	7/12/2021	No	9/6/2021	9/7/2021	7/12/2021	7/12/2021
6668	10		GEMINI	Geometry	3/16/2021	7/7/2021	No	9/1/2021	9/7/2021	7/7/2021	7/7/2021
6692	10		MFL4	Corrosion	3/17/2021	7/12/2021	Yes	9/7/2021	9/8/2021	7/12/2021	7/12/2021
6692	10		MFL4	Geometry	3/17/2021	7/13/2021	No	9/7/2021	9/8/2021	7/13/2021	7/13/2021
6718	10		UCx	Crack	3/23/2021	8/17/2021	Yes	10/12/2021	9/14/2021	8/17/2021	8/17/2021
10986	10		MFL4	Corrosion	3/24/2021	7/15/2021	No	9/9/2021	9/15/2021	7/15/2021	7/15/2021
10986	10		MFL4	Geometry	3/24/2021	7/7/2021	No	9/1/2021	9/15/2021	7/7/2021	7/7/2021

TABLE NOTE:

¹ Calculation Deadline (1) – 8 weeks after completing data quality review with respect to the feature and/or pipeline section where the feature is located.
Calculation Deadline (2) – 175 days after the ILI tool pull date.

The following 3 pages are Table D-18: P. 46.a, c Identified Digs.

Table D-18: P. 46.a, c Identified Digs								
Dig ID	Line	Segment	Girth Weld	Tool Run ID	Tech-nology	Date of Discovery / Feature Added to Dig List	Repair / Mitigation Deadline	Date of Repair / Mitigation ¹
30356 ²	L0003		115680	11019	CALIPER	8/11/2021	12/31/2021	10/10/2021
24805 ³	L0003		58670	3829	MFL	12/10/2018	4/17/2032	10/10/2021
28338 ⁴	L0003		58690	6606	MFL	9/3/2020	12/2/2026	10/10/2021
28926 ⁵	L0003		71850	10001	PHASED ARRAY	11/10/2020	4/9/2023	11/3/2021
28929 ⁶	L0003		117440	10001	PHASED ARRAY	11/10/2020	2/22/2023	11/3/2021
28932 ⁷	L0003		153080	10001	PHASED ARRAY	11/10/2020	1/30/2023	11/3/2021
28933 ⁸	L0003		156430	10001	PHASED ARRAY	11/10/2020	6/25/2022	11/3/2021
30153	L0004		27260	10991	UTWM	5/18/2021	3/15/2022	FR
30120	L0004		45560	6729	MFL	5/5/2021	5/5/2022	11/4/2021
30129	L0004		38460	6738	MFL	5/6/2021	5/4/2022	11/2/2021
30130	L0004		39000	6738	MFL	5/6/2021	5/4/2022	10/20/2021
30131	L0004		45220	6738	MFL	5/6/2021	5/4/2022	11/5/2021
30154	L0004		34710	6740	MFL	5/18/2021	11/15/2021	10/2/2021
30155	L0004		35090	6740	MFL	5/18/2021	11/15/2021	8/21/2021
30156	L0004		35100	6740	MFL	5/18/2021	11/15/2021	8/26/2021
30157	L0004		35670	6740	MFL	5/18/2021	11/15/2021	8/21/2021
30158	L0004		35690	6740	MFL	5/18/2021	11/15/2021	8/30/2021
30159	L0004		35830	6740	MFL	5/18/2021	11/15/2021	9/28/2021
30160	L0004		35850	6740	MFL	5/18/2021	11/15/2021	10/7/2021
30161	L0004		35970	6740	MFL	5/18/2021	11/15/2021	9/1/2021
30162	L0004		36550	6740	MFL	5/18/2021	11/15/2021	9/22/2021
30163	L0004		37560	6740	MFL	5/18/2021	11/15/2021	9/18/2021
30164	L0004		37710	6740	MFL	5/18/2021	11/15/2021	9/18/2021
30165	L0004		37750	6740	MFL	5/18/2021	11/15/2021	9/27/2021
30166	L0004		38770	6740	MFL	5/18/2021	11/15/2021	9/24/2021
30167	L0004		38780	6740	MFL	5/18/2021	11/15/2021	9/24/2021
30168	L0004		38790	6740	MFL	5/18/2021	11/15/2021	10/11/2021
30169	L0004		38800	6740	MFL	5/18/2021	11/15/2021	9/16/2021
30170	L0004		38920	6740	MFL	5/18/2021	11/15/2021	9/24/2021
30171	L0004		39000	6740	MFL	5/18/2021	11/15/2021	10/1/2021
30172	L0004		39010	6740	MFL	5/18/2021	11/15/2021	10/1/2021
30173	L0004		39170	6740	MFL	5/18/2021	11/15/2021	10/12/2021
30174	L0004		39210	6740	MFL	5/18/2021	11/15/2021	10/18/2021
30175	L0004		39600	6740	MFL	5/18/2021	11/15/2021	10/23/2021
30176	L0004		39720	6740	MFL	5/18/2021	11/15/2021	10/15/2021
30068	L0005		116570	6593	UTCD	4/9/2021	4/11/2022	10/27/2021
30069	L0005		213390	6593	UTCD	4/9/2021	4/11/2022	10/9/2021

Table D-18: P. 46.a, c Identified Digs								
Dig ID	Line	Segment	Girth Weld	Tool Run ID	Tech-nology	Date of Discovery / Feature Added to Dig List	Repair / Mitigation Deadline	Date of Repair / Mitigation ¹
30152	L0005		260790	6743	MFL	5/17/2021	5/17/2022	10/15/2021
30532	L0006A		58980	6662	UTWM	10/5/2021	10/4/2022	FR
30533	L0006A		95690	6662	UTWM	10/5/2021	4/4/2022	FR
30534	L0006A		101320	6662	UTWM	10/5/2021	4/4/2022	FR
30535	L0006A		148530	6662	UTWM	10/5/2021	10/4/2022	FR
30536	L0006A		213650	6662	UTWM	10/5/2021	4/4/2022	11/10/2021
30537	L0006A		215280	6662	UTWM	10/5/2021	10/4/2022	FR
30538	L0006A		220610	6662	UTWM	10/5/2021	10/4/2022	FR
30539	L0006A		233330	6662	UTWM	10/5/2021	4/4/2022	FR
30334	L0010		1020	6691	UTWM	7/20/2021	1/18/2022	11/3/2021
30335	L0010		12830	6691	UTWM	7/20/2021	1/18/2022	11/15/2021
30326	L0010		2690	6692	MFL	7/12/2021	1/10/2022	FR
30328	L0010		16460	6692	MFL	7/12/2021	1/10/2022	10/27/2021
30329	L0010		17550	6692	MFL	7/12/2021	7/12/2022	10/26/2021
30015	L0014		22220	6553	UTCD	4/1/2021	9/28/2021	7/14/2021
30016	L0014		22320	6553	UTCD	4/1/2021	9/28/2021	7/16/2021
30017	L0014		42750	6553	UTCD	4/1/2021	9/28/2021	7/1/2021
30018	L0014		57160	6553	UTCD	4/1/2021	9/28/2021	6/11/2021
30019	L0014		61350	6553	UTCD	4/1/2021	9/28/2021	7/24/2021
30020	L0014		70210	6553	UTCD	4/1/2021	9/28/2021	6/18/2021
30021	L0014		72140	6553	UTCD	4/1/2021	9/28/2021	6/23/2021
30022	L0014		100590	6553	UTCD	4/1/2021	9/28/2021	6/15/2021
30023	L0014		111300	6553	UTCD	4/1/2021	9/28/2021	6/5/2021
30024	L0014		112170	6553	UTCD	4/1/2021	9/28/2021	6/9/2021
30025	L0014		112840	6553	UTCD	4/1/2021	9/28/2021	6/25/2021
30026	L0014		118740	6553	UTCD	4/1/2021	9/28/2021	7/1/2021
30027	L0014		120350	6553	UTCD	4/1/2021	9/28/2021	7/20/2021
30028	L0014		121170	6553	UTCD	4/1/2021	9/28/2021	6/28/2021
30029	L0014		121180	6553	UTCD	4/1/2021	9/28/2021	6/30/2021
30030	L0014		131750	6553	UTCD	4/1/2021	9/28/2021	6/14/2021
30031	L0014		132340	6553	UTCD	4/1/2021	9/28/2021	6/19/2021
30032	L0014		148230	6553	UTCD	4/1/2021	4/1/2022	7/13/2021
30033	L0014		150780	6553	UTCD	4/1/2021	9/28/2021	6/22/2021
30034	L0014		168380	6553	UTCD	4/1/2021	9/28/2021	6/24/2021
30035	L0014		172430	6553	UTCD	4/1/2021	9/28/2021	6/29/2021
30077	L0065		2220	6555	UTCD	4/21/2021	10/18/2021	8/14/2021
30079	L0065		7430	6555	UTCD	4/21/2021	10/18/2021	8/11/2021
30087	L0065		87320	6555	UTCD	4/21/2021	10/18/2021	6/4/2021
30088	L0065		100270	6555	UTCD	4/21/2021	10/18/2021	8/5/2021
30089	L0065		100330	6555	UTCD	4/21/2021	10/18/2021	6/3/2021

TABLE NOTES:

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

² AP7

³ AP5

⁴ AP6

⁵ AP8

⁶ AP9

⁷ AP10

⁸ AP11

The following 1 page is Table D-19: P. 46.a Cancelled Digs.

Table D-19: P. 46.a Cancelled Digs						
Dig ID	Line	Segment	Girth Weld	Tool Run ID	Technology	Reason for Dig Cancellation
30078	L0065		6410	6555	UTCD	Based on feedback from the first few digs in this program, these features were reclassified as "Weld Imperfection" and are no longer reportable in Issue 2.0. Cancellation of these digs was approved by PI on 8/12/2021.
30080	L0065		11540	6555	UTCD	
30081	L0065		14640	6555	UTCD	
30082	L0065		26780	6555	UTCD	
30083	L0065		27830	6555	UTCD	
30084	L0065		32750	6555	UTCD	
30086	L0065		60930	6555	UTCD	

The following 3 pages are Table D-20: P. 46.b, d PPRs.

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
34225	L0004		45560	5/5/2021	5/5/2022	5/7/2021	11/4/2021	FR
34222	L0004		38460	5/6/2021	5/4/2022	5/7/2021	11/2/2021	FR
34223	L0004		39000	5/6/2021	5/4/2022	5/7/2021	10/20/2021	FR
34224	L0004		45220	5/6/2021	5/4/2022	5/7/2021	11/5/2021	FR
34260	L0004		34710	5/18/2021	11/15/2021	5/20/2021	10/2/2021	FR
34261	L0004		35090	5/18/2021	11/15/2021	5/20/2021	8/21/2021	FR
34262	L0004		35100	5/18/2021	11/15/2021	5/20/2021	8/26/2021	FR
34263	L0004		35670	5/18/2021	11/15/2021	5/20/2021	8/21/2021	FR
34264	L0004		35690	5/18/2021	11/15/2021	5/20/2021	8/30/2021	FR
34265	L0004		35830	5/18/2021	11/15/2021	5/20/2021	9/28/2021	FR
34266	L0004		35850	5/18/2021	11/15/2021	5/20/2021	10/7/2021	FR
34267	L0004		35970	5/18/2021	11/15/2021	5/20/2021	9/1/2021	FR
34268	L0004		36550	5/18/2021	11/15/2021	5/20/2021	9/22/2021	FR
34269	L0004		37560	5/18/2021	11/15/2021	5/20/2021	9/18/2021	FR
34270	L0004		37750	5/18/2021	11/15/2021	5/20/2021	9/27/2021	FR
34271	L0004		38770	5/18/2021	11/15/2021	5/20/2021	9/24/2021	FR
34272	L0004		38780	5/18/2021	11/15/2021	5/20/2021	9/24/2021	FR
34273	L0004		38800	5/18/2021	11/15/2021	5/20/2021	9/16/2021	FR
34274	L0004		38920	5/18/2021	11/15/2021	5/20/2021	9/24/2021	FR
34275	L0004		39000	5/18/2021	11/15/2021	5/20/2021	10/1/2021	FR
34276	L0004		39010	5/18/2021	11/15/2021	5/20/2021	10/1/2021	FR
34277	L0004		39170	5/18/2021	11/15/2021	5/20/2021	10/12/2021	FR
34278	L0004		39210	5/18/2021	11/15/2021	5/20/2021	10/18/2021	FR
34279	L0004		39600	5/18/2021	11/15/2021	5/20/2021	10/23/2021	FR
34280	L0004		39720	5/18/2021	11/15/2021	5/20/2021	10/15/2021	FR
35672	L0006A		58980	10/4/2021	10/4/2022	10/5/2021	FR	FR
35673	L0006A		95690	10/4/2021	4/3/2022	10/5/2021	FR	FR
35674	L0006A		148530	10/4/2021	10/4/2022	10/5/2021	FR	FR
35675	L0006A		233330	10/4/2021	4/3/2022	10/5/2021	FR	FR
34072	L0014		22220	4/1/2021	9/28/2021	4/5/2021	7/14/2021	10/4/2021
34073	L0014		22320	4/1/2021	9/28/2021	4/5/2021	7/16/2021	10/25/2021
34074	L0014		42750	4/1/2021	9/28/2021	4/5/2021	7/1/2021	10/4/2021

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
34075	L0014		57160	4/1/2021	9/28/2021	4/5/2021	6/11/2021	10/4/2021
34076	L0014		61350	4/1/2021	9/28/2021	4/5/2021	7/24/2021	10/25/2021
34077	L0014		70210	4/1/2021	9/28/2021	4/5/2021	6/18/2021	9/28/2021
34078	L0014		72140	4/1/2021	9/28/2021	4/5/2021	6/23/2021	9/28/2021
34079	L0014		100590	4/1/2021	9/28/2021	4/5/2021	6/15/2021	9/28/2021
34080	L0014		111300	4/1/2021	9/28/2021	4/5/2021	6/5/2021	9/28/2021
34081	L0014		112170	4/1/2021	9/28/2021	4/5/2021	6/9/2021	9/28/2021
34082	L0014		112840	4/1/2021	9/28/2021	4/5/2021	6/25/2021	10/4/2021
34083	L0014		118740	4/1/2021	9/28/2021	4/5/2021	7/1/2021	10/4/2021
34084	L0014		120350	4/1/2021	9/28/2021	4/5/2021	7/20/2021	10/25/2021
34085	L0014		121170	4/1/2021	9/28/2021	4/5/2021	6/30/2021	10/4/2021 ³
34086	L0014		121180	4/1/2021	9/28/2021	4/5/2021	6/30/2021	10/4/2021
34087	L0014		131750	4/1/2021	9/28/2021	4/5/2021	6/14/2021	9/28/2021
34088	L0014		132340	4/1/2021	9/28/2021	4/5/2021	6/19/2021	9/28/2021
34089	L0014		150780	4/1/2021	9/28/2021	4/5/2021	6/22/2021	FR
34090	L0014		168380	4/1/2021	9/28/2021	4/5/2021	6/24/2021	9/28/2021
34091	L0014		172430	4/1/2021	9/28/2021	4/5/2021	6/29/2021	10/4/2021
34203	L0065		2220	4/21/2021	10/18/2021	4/23/2021	8/14/2021	11/10/2021
34204	L0065		6410	4/21/2021	10/18/2021	4/23/2021	Table Note 4	8/19/2021
34205	L0065		7430	4/21/2021	10/18/2021	4/23/2021	8/11/2021	11/10/2021
34206	L0065		11540	4/21/2021	10/18/2021	4/23/2021	Table Note 4	8/19/2021
34207	L0065		14640	4/21/2021	10/18/2021	4/23/2021	Table Note 4	8/19/2021
34208	L0065		26780	4/21/2021	10/18/2021	4/23/2021	Table Note 4	8/19/2021
34209	L0065		27830	4/21/2021	10/18/2021	4/23/2021	Table Note 4	8/19/2021
34210	L0065		32750	4/21/2021	10/18/2021	4/23/2021	Table Note 4	8/19/2021
34212	L0065		60930	4/21/2021	10/18/2021	4/23/2021	Table Note 4	8/19/2021
34213	L0065		87320	4/21/2021	10/18/2021	4/23/2021	6/4/2021	9/3/2021

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
34214	L0065		100270	4/21/2021	10/18/2021	4/23/2021	8/5/2021	11/10/2021
34215	L0065		100330	4/21/2021	10/18/2021	4/23/2021	6/3/2021	9/3/2021
33833	L0067		53660	9/8/2020	3/8/2021	9/9/2020	2/27/2021	8/3/2021
33834	L0067		53700	9/8/2020	3/8/2021	9/9/2020	3/3/2021	8/3/2021

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 There were 2 sleeves installed on this joint, the second of which extended onto the D/S joint (121180). The Repair/Mitigation date presented in this table are for when the second sleeve was installed. Sleeve 1 was installed on 6/28/2021 and sleeve 2 installed on 6/30/2021.

⁴ This Dig was part of the Line 65 2020 USCD+ Investigative Dig Program. This Dig was cancelled on 8/12/2021 upon receiving the Issue 2 ILI report.

The following 1 page is Table D-21: P. 46.e Alternate Plans and Alternate Pressure Restrictions.

Table D-21: P. 46.e 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:	11 of maximum 40
46.e. Cumulative Excavations of Joints	11 of maximum 200
46.e. Maximum number of contiguous joints for each Alternate Plans or Alternate Interim Pressure Restriction	1 of maximum 10

The following 10 pages are Table D-22: P. 46.g Alternate Plan #.

Table D-22: P. 46.g Alternate Plan #7 L3 [REDACTED]	
Alternate Plan Line	3
Alternate Plan Tool Run	2021 BHGE MFL4CAL Issue 1
Alternate Plan Joint	115680
46.I. (iv) Date Engineering Assessment was Completed OR the original feature repair/mitigation deadline	Original Feature Repair/Mitigation Deadline: September 10, 2021
46.I.(vii) Alternate Plan Implementation Date	8/30/2021
46.I.(iv) Alternate Plan Reporting/Notification Date	8/30/2021
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	Enbridge proposed to either remove the feature from the dig list or adopt and implement the Line 3 Replacement Project (L3R) as the alternate repair plan. Enbridge has extended the dig deadline to December 31, 2021.
Number of Features Requiring Excavation covered by the Alternate Plan	1
46.c.(1) Extraordinary Scope or Complexity	No
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
<p>"46.I(i) Alternate Plan Detailed Description:</p> <p>The Alternate Plan 7 feature is a Line 3, [REDACTED] topside 1.31% dent (FID 321900-CL315199) identified with a caliper tool run on July 12, 2021. Due to a failed MFL tool run, the accompanying MFL data was not available until August 19, 2021. To meet CD deadlines under the Fifth Modification, Enbridge designated the feature to be an FRE on August 11, 2021, based on data obtained from a prior MFL tool run in 2020 that indicated the presence of corrosion. The MFL data obtained on August 19, 2021, indicated that no corrosion was present, such that the feature would not be considered an FRE based on currently available data from the latest tool run.</p> <p>The Engineering Assessment (EA) detailed in the AP demonstrated that the Feature is safe far beyond Line 3 replacement date as the safety factor for the feature is >100.</p>	
<p>46.I.(iii) Basis for selection of the Alternate Plan and alternate timetables</p> <p>Based on an engineering assessment, the AP recommended:</p> <p>a) extending the dig deadline from September 10, 2021 to December 31, 2021, while maintaining an equivalent level of safety in accordance with Paragraph 46 of the Consent Decree.; and,</p> <p>b) mitigating the feature via the L3 replacement project pursuant to Paragraph 46 c. (2)</p> <p>c) it was not practicable to obtain all permits needed to complete the excavation of the feature in accordance with the applicable CD timelines.</p> <p>d) the updated analysis demonstrated that the feature is not an FRE.</p>	

Table D-22: P. 46.g Alternate Plan #7 L3

46.I(v) 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)

The AP used ILI data, operational conditions, and Finite Element Analysis to determine operational and safety requirements were met until the feature was mitigated by the Line 3 Replacement Project. Consistent with Appendix H, a QuAD analysis was completed. The analysis showed that (using the 2020 MFL data) the feature's Strain Safety Factor (1.18) did not meet the required 1.25 threshold. The 2021 MFL data, however, showed no corrosion present at the dent location. Applying the 2021 data, the Appendix H methodology is no longer appropriate for this feature type (plain dent). The Appendix H QuAD Safety Factor methodology is intentionally conservative to account for the presence of potential corrosion, by taking the worst-case strain capacity (5th percentile of strain capacity statistical distribution) versus the worst-case strain demand (95th percentile of the strain demand statistical distribution). This approach is conservative and does not account for the remote likelihood of both these worst-case scenarios happening simultaneously. Under standard probabilistic analysis approaches (without the assumption of both instances occurring simultaneously) this feature met targets and was considered safe for continued operation.

The Engineering Assessment (EA) determined that, based on the 2020 MFL data, the Feature will be safe far beyond when Original US Line 3 is taken out of service as the safety factor for this feature is >100.

The dig deadline extension to the estimated replacement date of Line 3 in Q4 2021 assessed in this AP achieves an equivalent level of safety to the Consent Decree. Upon completion of the review of the 2021 MFL re-run Issue 2 data, received on August 19, 2021, Enbridge determined the feature is not an FRE.

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

On August 30, 2021 Enbridge submitted this AP to the ITP and EPA.

Enbridge pursued a Clean Water Act 401 certification request since this dig is in a wetland and on Leech Lake Band of Ojibwe (LLBO) property.

On September 7, 2021 Enbridge notified (LLBO) via phone call about the new AP7, LLBO did not raise any concerns.

On September 14, 2021 Enbridge met with the ITP and EPA to provide the L3 Replacement Project Update.

On October 10, 2021 the segment of the pipe containing the feature was purged. This is considered the date the feature was mitigated and, as a result, AP7 is considered to be complete.

On November 3, 2021 Enbridge submitted notice of closure of AP7 to the ITP and EPA.

Enbridge completed quarterly cleaning and biocide injections, except for Q4 as this portion of Line 3 was out of service.

Table D-22: P. 46.g Alternate Plan #8 L3 [REDACTED]	
Alternate Plan Line	3
Alternate Plan Tool Run	2020 BHGE DUOCD Issue 1
Alternate Plan Joint	71850
46.I. (iv) Date Engineering Assessment was Completed OR the original feature repair/mitigation deadline	Original Feature Repair/Mitigation Deadline: November 10, 2021
46.I.(vii) Alternate Plan Implementation Date	10/27/2021
46.I.(iv) Alternate Plan Reporting/Notification Date	10/29/2021
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	Enbridge proposed Line 3 Replacement Project (L3RP) as the mitigation for this feature. In adopting and implementing the L3RP as the repair method, Enbridge will continue to manage risk associated with this feature. Enbridge has extended the dig deadline to April 9, 2023.
Number of Features Requiring Excavation covered by the Alternate Plan	1
46.c.(1) Extraordinary Scope or Complexity	No
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
<p>46.I(i) Alternate Plan Detailed Description:</p> <p>The Alternate Plan 8 (AP8) feature is a crack field feature (FID 055-010063) on Joint 71850 of the Line 3 [REDACTED] segment reported by the 2020 BHGE DuoCD (Issue 1) in-line inspection (ILI).</p> <p>Based on an engineering assessment, the AP recommended:</p> <p>a) extending the dig deadline from November 10, 2021 to April 9, 2023, while maintaining an equivalent level of safety in accordance with Paragraph 46 of the Consent Decree.; and,</p> <p>b) mitigating the feature via the L3 replacement project pursuant to Paragraph 46 c. (2)</p>	
<p>46.I.(iii) Basis for selection of the Alternate Plan and alternate timetables</p> <p>An AP with an alternate dig deadline was selected as:</p> <p>a) the engineering assessment demonstrated that the feature was safe until April 9, 2023.</p> <p>b) under Paragraph 46 c. (2), it is permissible to adopt a pipeline replacement as a mitigation measure in lieu of a repair.</p>	
<p>46.I(v) 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)</p>	

Table D-22: P. 46.g Alternate Plan #8 L3

The AP used ILI data, operational conditions, and fatigue analysis to demonstrate that even in the most conservative scenario the feature has a remaining life of 4.03 years, indicating this feature does not have a significant risk of fatigue induced failure within the expected mitigation timeline.

The AP also determined there is a low likelihood of the target Feature being a material threat due to the multiple barriers already in place at the location, including: low operating pressure regime at target Feature location with last 60-day high of 310 psi and 365-day high of 315 psi, light pressure cycling, and conservative assessment methods.

A probabilistic analysis confirmed that results are below both the burst and leak targets well beyond the dig extension deadline of April 9, 2023. AP8 achieves an equivalent level of safety to the Consent Decree.

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

On October 29, 2021 Enbridge submitted AP8 to the ITP and EPA.

On November 3, 2021 the segment of the pipe containing the feature was purged. This is considered the date the feature was mitigated and, as a result, AP8 is considered to be complete.

Enbridge completed quarterly cleaning and biocide injections, with the exception of Q4 as this portion of Line 3 was out of service.

On January 5 and 6, 2022, Enbridge submitted an update to this Alternate Plan to the ITP and EPA. The update clarified dates associated with Remaining Life calculations. Enbridge's notice of closure for APs 8, 9, 10 and 11 was also filed on these dates.

Table D-22: P. 46.g Alternate Plan #9 L3 [REDACTED]	
Alternate Plan Line	3
Alternate Plan Tool Run	2020 BHGE DUOCD Issue 1
Alternate Plan Joint	117440
46.I. (iv) Date Engineering Assessment was Completed OR the original feature repair/mitigation deadline	Original Feature Repair/Mitigation Deadline: November 10, 2021
46.I.(vii) Alternate Plan Implementation Date	10/27/2021
46.I.(iv) Alternate Plan Reporting/Notification Date	10/29/2021
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	Enbridge proposed Line 3 Replacement Project (L3RP) as the mitigation for this feature. In adopting and implementing the L3RP as the repair method, Enbridge will continue to manage risk associated with this Feature. Enbridge has extended the dig deadline to February 22, 2023.
Number of Features Requiring Excavation covered by the Alternate Plan	1
46.c.(1) Extraordinary Scope or Complexity	No
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
<p>"46.I(i) Alternate Plan Detailed Description:</p> <p>The Alternate Plan 9 (AP9) feature is a crack field feature (FID 090-000464) on Joint 117440 for the Line 3 [REDACTED] segment reported by the 2020 BHGE DuoCD (Issue 1) in-line inspection (ILI).</p> <p>Based on an engineering assessment, the AP recommended:</p> <p>a) extending the dig deadline from November 10, 2021 to February 22, 2023, while maintaining an equivalent level of safety in accordance with Paragraph 46 of the Consent Decree.; and,</p> <p>b) mitigating the feature via the L3 replacement project pursuant to Paragraph 46 c. (2)</p>	
<p>46.I.(iii) Basis for selection of the Alternate Plan and alternate timetables</p> <p>An AP with an alternate dig deadline was selected as:</p> <p>a) the engineering assessment demonstrated that the feature was safe until April 9, 2023.</p> <p>b) under Paragraph 46 c. (2), it is permissible to adopt a pipeline replacement as a mitigation measure in lieu of a repair.</p>	
<p>46.I(v) 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)</p>	

Table D-22: P. 46.g Alternate Plan #9 L3

The AP used, ILI data, operational conditions, and fatigue analysis to demonstrate that even in the most conservative scenario this feature has a remaining life of 3.97 years, indicating this feature does not have a significant risk of fatigue induced failure within the expected mitigation timeline.

The AP also determined there is a low likelihood of the target Feature being a material threat due to the multiple barriers already in place at this location including: low operating pressure regime at target Feature location with last 60-day high of 284 psi and 365-day high of 295 psi, light pressure cycling, and conservative assessment methods.

A probabilistic analysis confirmed that results are below both the burst and leak targets well beyond the dig extension deadline of February 22, 2023. AP9 achieves an equivalent level of safety to the Consent Decree.

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

On October 29, 2021 Enbridge submitted AP9 to the ITP and EPA.

On November 3, 2021 the segment of the pipe containing the feature was purged. This is considered the date the feature was mitigated and, as a result, AP9 is considered to be complete.

Enbridge completed quarterly cleaning and biocide injections, with the exception of Q4 as this portion of Line 3 was out of service.

On January 5 and 6, 2022, Enbridge submitted an update to this Alternate Plan to the ITP and EPA. The update clarified dates associated with Remaining Life calculations. Enbridge's notice of closure for APs 8, 9, 10 and 11 was also filed on these dates.

Table D-22: P. 46.g Alternate Plan #10 L3 [REDACTED]	
Alternate Plan Line	3
Alternate Plan Tool Run	2020 BHGE DUOCD Issue 1
Alternate Plan Joint	153080
46.I. (iv) Date Engineering Assessment was Completed OR the original feature repair/mitigation deadline	Original Feature Repair/Mitigation Deadline: November 10, 2021
46.I.(vii) Alternate Plan Implementation Date	10/27/2021
46.I.(iv) Alternate Plan Reporting/Notification Date	10/29/2021
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	Enbridge proposed Line 3 Replacement Project (L3RP) as the mitigation for this feature. In adopting and implementing the L3RP as the repair method, Enbridge will continue to manage risk associated with this feature. Enbridge has extended the dig deadline to January 30, 2023.
Number of Features Requiring Excavation covered by the Alternate Plan	1
46.c.(1) Extraordinary Scope or Complexity	No
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
<p>"46.I(i) Alternate Plan Detailed Description:</p> <p>The Alternate Plan 10 (AP10) feature is a crack field feature (FID 117-005719) on Joint 153080 for the Line 3 [REDACTED] segment reported by the 2020 BHGE DuoCD (Issue 1) in-line inspection (ILI).</p> <p>Based on an engineering assessment, the AP recommended:</p> <p>a) extending the dig deadline from November 10, 2021 to January 30, 2023, while maintaining an equivalent level of safety in accordance with Paragraph 46 of the Consent Decree.; and,</p> <p>b) mitigating the feature via the L3 replacement project pursuant to Paragraph 46 c. (2)</p>	
<p>46.I.(iii) Basis for selection of the Alternate Plan and alternate timetables</p> <p>An AP with an alternate dig deadline was selected as:</p> <p>a) the engineering assessment demonstrated that the feature was safe until January 30, 2023.</p> <p>b) under Paragraph 46 c. (2), it is permissible to adopt a pipeline replacement as a mitigation measure in lieu of a repair.</p>	
<p>46.I.(v) 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)</p>	

Table D-22: P. 46.g Alternate Plan #10 L3

The AP used ILI data, operational conditions, and fatigue analysis to demonstrate that even in the most conservative scenario the feature has a remaining life of 3.78 years, indicating this feature does not have a significant risk of fatigue induced failure within the expected mitigation timeline.

The AP also determined there is a low likelihood of the target Feature being a material threat due to the multiple barriers already in place at the location, including: low operating pressure regime at target Feature location with last 60-day high of 360 psi and 365-day high of 385 psi, light pressure cycling, and conservative assessment methods.

A probabilistic analysis confirmed that results are below both the burst and leak targets well beyond the dig extension deadline of January 30, 2023. AP10 achieves an equivalent level of safety to the Consent Decree.

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

On October 29, 2021 Enbridge submitted AP10 to the ITP and EPA.

On November 3, 2021 the segment of the pipe containing the feature was purged. This is considered the date the feature was mitigated and, as a result, AP10 is considered to be complete.

Enbridge completed quarterly cleaning and biocide injections, with the exception of Q4 as this portion of Line 3 was out of service.

On January 5 and 6, 2022, Enbridge submitted an update to this Alternate Plan to the ITP and EPA. The update clarified dates associated with Remaining Life calculations. Enbridge's notice of closure for APs 8, 9, 10 and 11 was also filed on these dates.

Table D-22: P. 46.g Alternate Plan #11 L3 [REDACTED]	
Alternate Plan Line	3
Alternate Plan Tool Run	2020 BHGE DUOCD Issue 1
Alternate Plan Joint	156430
46.I. (iv) Date Engineering Assessment was Completed OR the original feature repair/mitigation deadline	Original Feature Repair/Mitigation Deadline: November 10, 2021
46.I.(vii) Alternate Plan Implementation Date	10/27/2021
46.I.(iv) Alternate Plan Reporting/Notification Date	10/29/2021
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	Enbridge proposed Line 3 Replacement Project (L3RP) as the mitigation for this feature. In adopting and implementing the L3RP as the repair method, Enbridge will continue to manage risk associated with this Feature. Enbridge has extended the dig deadline to June 25, 2022.
Number of Features Requiring Excavation covered by the Alternate Plan	1
46.c.(1) Extraordinary Scope or Complexity	No
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
<p>"46.I(i) Alternate Plan Detailed Description:</p> <p>The Alternate Plan 11 (AP11) feature is a crack field feature (FID 120-000058) on Joint 156430 for the Line 3 [REDACTED] segment reported by the 2020 BHGE DuoCD (Issue 1) in-line inspection (ILI).</p> <p>Based on an engineering assessment, the AP recommended:</p> <p>a) extending the dig deadline from November 10, 2021 to June 25, 2023, while maintaining an equivalent level of safety in accordance with Paragraph 46 of the Consent Decree.; and,</p> <p>b) mitigating the feature via the L3 replacement project pursuant to Paragraph 46 c. (2)</p>	
<p>46.I.(iii) Basis for selection of the Alternate Plan and alternate timetables</p> <p>An AP with an alternate dig deadline was selected as:</p> <p>a) the engineering assessment demonstrated that the feature was safe until June 25, 2023.</p> <p>b) under Paragraph 46 c. (2), it is permissible to adopt a pipeline replacement as a mitigation measure in lieu of a repair.</p>	
<p>46.I(v) 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)</p>	

Table D-22: P. 46.g Alternate Plan #11 L3

The AP used ILI data, operational conditions, and fatigue analysis to demonstrate that even in the most conservative scenario the feature has a remaining life of 2.52 years, indicating this feature does not have a significant risk of fatigue induced failure within the expected mitigation timeline.

The AP also determined there is a low likelihood of the target Feature being a material threat due to the multiple barriers already in place at the location, including: low operating pressure regime at target Feature location with last 60-day high of 350 psi and 365-day high of 379 psi, light pressure cycling, and conservative assessment methods.

A probabilistic analysis confirmed that results are below both the burst and leak targets well beyond the dig extension deadline of June 25, 2023. AP11 achieves an equivalent level of safety to the Consent Decree.

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

On October 29, 2021 Enbridge submitted AP11 to the ITP and EPA.

On November 3, 2021 the segment of the pipe containing the feature was purged. This is considered the date the feature was mitigated and, as a result, AP11 is considered to be complete.

Enbridge completed quarterly cleaning and biocide injections, with the exception of Q4 as this portion of Line 3 was out of service.

On January 5 and 6, 2022, Enbridge submitted an update to this Alternate Plan to the ITP and EPA. The update clarified dates associated with Remaining Life calculations. Enbridge's notice of closure for APs 8, 9, 10 and 11 was also filed on these dates.

The following 1 page is Table D-23: P. 46.I Previous Alternate Plan Status Update.

Table D-23: P. 46.I Previous Alternate Plan Status Update	
Alternate Plan #5	<p><u>05/23/2021:</u></p> <p>Enbridge completed the re-run on May 21, 2021. As a result of the data quality issues associated with the initial inspection and the re-run inspection, the data from both of the inspections was stitched together where necessary to provide a complete ILI data set for feature analysis and assessment.</p> <p><u>07/14/2021:</u></p> <p>Update provided to the EPA. Update to Alternate Plan 5 as a result of the expedited analysis of pipeline joint GW 58670, which was inspected by the MFL tool on May 21, 2021.</p> <p><u>07/20/2021:</u></p> <p>Email sent to LLBO to provide the AP5 update.</p> <p><u>08/26/2021:</u></p> <p>Enbridge completed quarterly cleaning and biocide injections, except for Q4 as this portion of Line 3 was out of service.</p> <p><u>10/10/2021:</u></p> <p>Enbridge purged this portion of Line 3. This is considered the date the feature was mitigated.</p> <p><u>11/03/2021:</u></p> <p>Enbridge's notice of closure for AP5 was filed with the EPA and ITP.</p>
Alternate Plan #6	<p><u>07/14/2021:</u></p> <p>Update provided to the EPA. Update to Alternate Plan 6 (AP6) as a result of the expedited analysis of pipeline joint GW 58690, which was inspected by the MFL tool on May 21, 2021.</p> <p><u>07/20/2021:</u></p> <p>Email sent to LLBO to provide the AP6 update.</p> <p><u>08/26/2021:</u></p> <p>Enbridge completed quarterly cleaning and biocide injections, except for Q4 as this portion of Line 3 was purged.</p> <p><u>10/10/2021:</u></p> <p>Enbridge purged this portion of Line 3. This is considered the date the feature was mitigated.</p> <p><u>11/03/2021:</u></p> <p>Enbridge's notice of closure for AP6 was filed with the EPA and ITP.</p>

The following 1 page is Table D-24: P. 47 Crack Features Requiring Excavation.

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 ¹
28926 ²	L0003		71850	11/10/2020	4/9/2023	11/3/2021
28929 ³	L0003		117440	11/10/2020	2/22/2023	11/3/2021
28932 ⁴	L0003		153080	11/10/2020	1/30/2023	11/3/2021
28933 ⁵	L0003		156430	11/10/2020	6/25/2022	11/3/2021
30068	L0005		116570	4/9/2021	4/11/2022	10/27/2021
30069	L0005		213390	4/9/2021	4/11/2022	10/9/2021
30015	L0014		22220	4/1/2021	9/28/2021	7/14/2021
30016	L0014		22320	4/1/2021	9/28/2021	7/16/2021
30017	L0014		42750	4/1/2021	9/28/2021	7/1/2021
30018	L0014		57160	4/1/2021	9/28/2021	6/11/2021
30019	L0014		61350	4/1/2021	9/28/2021	7/24/2021
30020	L0014		70210	4/1/2021	9/28/2021	6/18/2021
30021	L0014		72140	4/1/2021	9/28/2021	6/23/2021
30022	L0014		100590	4/1/2021	9/28/2021	6/15/2021
30023	L0014		111300	4/1/2021	9/28/2021	6/5/2021
30024	L0014		112170	4/1/2021	9/28/2021	6/9/2021
30025	L0014		112840	4/1/2021	9/28/2021	6/25/2021
30026	L0014		118740	4/1/2021	9/28/2021	7/1/2021
30027	L0014		120350	4/1/2021	9/28/2021	7/20/2021
30028	L0014		121170	4/1/2021	9/28/2021	6/28/2021
30029	L0014		121180	4/1/2021	9/28/2021	6/30/2021
30030	L0014		131750	4/1/2021	9/28/2021	6/14/2021
30031	L0014		132340	4/1/2021	9/28/2021	6/19/2021
30032	L0014		148230	4/1/2021	4/1/2022	7/13/2021
30033	L0014		150780	4/1/2021	9/28/2021	6/22/2021
30034	L0014		168380	4/1/2021	9/28/2021	6/24/2021
30035	L0014		172430	4/1/2021	9/28/2021	6/29/2021
30077	L0065		2220	4/21/2021	10/18/2021	8/14/2021
30079	L0065		7430	4/21/2021	10/18/2021	8/11/2021
30087	L0065		87320	4/21/2021	10/18/2021	6/4/2021
30088	L0065		100270	4/21/2021	10/18/2021	8/5/2021
30089	L0065		100330	4/21/2021	10/18/2021	6/3/2021

TABLE NOTE:

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

² AP8

³ AP9

⁴ AP10

⁵ AP11

The following 2 pages are Table D-25: P. 47 Crack Feature Pressure Restrictions.

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 ²	PPR Removal Date ^{1, 2}
34072	L0014		22220	4/1/2021	9/28/2021	4/5/2021	7/14/2021	10/4/2021	10/4/2021
34073	L0014		22320	4/1/2021	9/28/2021	4/5/2021	7/16/2021	10/25/2021	10/25/2021
34074	L0014		42750	4/1/2021	9/28/2021	4/5/2021	7/1/2021	10/4/2021	10/4/2021
34075	L0014		57160	4/1/2021	9/28/2021	4/5/2021	6/11/2021	10/4/2021	10/4/2021
34076	L0014		61350	4/1/2021	9/28/2021	4/5/2021	7/24/2021	10/25/2021	10/25/2021
34077	L0014		70210	4/1/2021	9/28/2021	4/5/2021	6/18/2021	9/28/2021	9/28/2021
34078	L0014		72140	4/1/2021	9/28/2021	4/5/2021	6/23/2021	9/28/2021	9/28/2021
34079	L0014		100590	4/1/2021	9/28/2021	4/5/2021	6/15/2021	9/28/2021	9/28/2021
34080	L0014		111300	4/1/2021	9/28/2021	4/5/2021	6/5/2021	9/28/2021	9/28/2021
34081	L0014		112170	4/1/2021	9/28/2021	4/5/2021	6/9/2021	9/28/2021	9/28/2021
34082	L0014		112840	4/1/2021	9/28/2021	4/5/2021	6/25/2021	10/4/2021	10/4/2021
34083	L0014		118740	4/1/2021	9/28/2021	4/5/2021	7/1/2021	10/4/2021	10/4/2021
34084	L0014		120350	4/1/2021	9/28/2021	4/5/2021	7/20/2021	10/25/2021	10/25/2021
34085	L0014		121170	4/1/2021	9/28/2021	4/5/2021	6/30/2021	10/4/2021	10/4/2021 ³
34086	L0014		121180	4/1/2021	9/28/2021	4/5/2021	6/30/2021	10/4/2021	10/4/2021
34087	L0014		131750	4/1/2021	9/28/2021	4/5/2021	6/14/2021	9/28/2021	9/28/2021
34088	L0014		132340	4/1/2021	9/28/2021	4/5/2021	6/19/2021	9/28/2021	9/28/2021
34089	L0014		150780	4/1/2021	9/28/2021	4/5/2021	6/22/2021	11/29/2021	FR
34090	L0014		168380	4/1/2021	9/28/2021	4/5/2021	6/24/2021	9/28/2021	9/28/2021
34091	L0014		172430	4/1/2021	9/28/2021	4/5/2021	6/29/2021	10/4/2021	10/4/2021
34203	L0065		2220	4/21/2021	10/18/2021	4/23/2021	8/14/2021	11/10/2021	11/10/2021
34204	L0065		6410	4/21/2021	10/18/2021	4/23/2021	Table Note 4	8/19/2021	8/19/2021
34205	L0065		7430	4/21/2021	10/18/2021	4/23/2021	8/11/2021	11/10/2021	11/10/2021
34206	L0065		11540	4/21/2021	10/18/2021	4/23/2021	Table Note 4	8/19/2021	8/19/2021
34207	L0065		14640	4/21/2021	10/18/2021	4/23/2021	Table Note 4	8/19/2021	8/19/2021
34208	L0065		26780	4/21/2021	10/18/2021	4/23/2021	Table Note 4	8/19/2021	8/19/2021

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 ²	PPR Removal Date ^{1, 2}
34209	L0065		27830	4/21/2021	10/18/2021	4/23/2021	Table Note 4	8/19/2021	8/19/2021
34210	L0065		32750	4/21/2021	10/18/2021	4/23/2021	Table Note 4	8/19/2021	8/19/2021
34212	L0065		60930	4/21/2021	10/18/2021	4/23/2021	Table Note 4	8/19/2021	8/19/2021
34213	L0065		87320	4/21/2021	10/18/2021	4/23/2021	6/4/2021	9/3/2021	9/3/2021
34214	L0065		100270	4/21/2021	10/18/2021	4/23/2021	8/5/2021	11/10/2021	11/10/2021
34215	L0065		100330	4/21/2021	10/18/2021	4/23/2021	6/3/2021	9/3/2021	9/3/2021

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 period of this SAR and will be included in a future SAR

³ There were 2 sleeves installed on this joint, the second of which extended onto the D/S joint (121180). The Repair/Mitigation date presented in this table are for when the second sleeve was installed. Sleeve 1 was installed on 6/28/2021 and sleeve 2 installed on 6/30/2021.

⁴ This Dig was part of the Line 65 2020 USCD+ Investigative Dig Program. This Dig was cancelled on 8/12/2021 upon receiving the Issue 2 ILI report.

The following 2 pages are the D-26: P. 50 Corrosion Features Requiring Excavation.

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
24805 ²	L0003		58670	12/10/2018	4/17/2032	10/10/2021
28338 ³	L0003		58690	9/3/2020	12/2/2026	10/10/2021
30153	L0004		27260	5/18/2021	3/15/2022	FR
30120	L0004		45560	5/5/2021	5/5/2022	11/4/2021
30129	L0004		38460	5/6/2021	5/4/2022	11/2/2021
30130	L0004		39000	5/6/2021	5/4/2022	10/20/2021
30131	L0004		45220	5/6/2021	5/4/2022	11/5/2021
30154	L0004		34710	5/18/2021	11/15/2021	10/2/2021
30155	L0004		35090	5/18/2021	11/15/2021	8/21/2021
30156	L0004		35100	5/18/2021	11/15/2021	8/26/2021
30157	L0004		35670	5/18/2021	11/15/2021	8/21/2021
30158	L0004		35690	5/18/2021	11/15/2021	8/30/2021
30159	L0004		35830	5/18/2021	11/15/2021	9/28/2021
30160	L0004		35850	5/18/2021	11/15/2021	10/7/2021
30161	L0004		35970	5/18/2021	11/15/2021	9/1/2021
30162	L0004		36550	5/18/2021	11/15/2021	9/22/2021
30163	L0004		37560	5/18/2021	11/15/2021	9/18/2021
30164	L0004		37710	5/18/2021	11/15/2021	9/18/2021
30165	L0004		37750	5/18/2021	11/15/2021	9/27/2021
30166	L0004		38770	5/18/2021	11/15/2021	9/24/2021
30167	L0004		38780	5/18/2021	11/15/2021	9/24/2021
30168	L0004		38790	5/18/2021	11/15/2021	10/11/2021
30169	L0004		38800	5/18/2021	11/15/2021	9/16/2021
30170	L0004		38920	5/18/2021	11/15/2021	9/24/2021
30171	L0004		39000	5/18/2021	11/15/2021	10/1/2021
30172	L0004		39010	5/18/2021	11/15/2021	10/1/2021
30173	L0004		39170	5/18/2021	11/15/2021	10/12/2021
30174	L0004		39210	5/18/2021	11/15/2021	10/18/2021
30175	L0004		39600	5/18/2021	11/15/2021	10/23/2021
30176	L0004		39720	5/18/2021	11/15/2021	10/15/2021
30152	L0005		260790	5/17/2021	5/17/2022	10/15/2021
30532	L0006A		58980	10/5/2021	10/4/2022	FR
30533	L0006A		95690	10/5/2021	4/4/2022	FR

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
30534	L0006A		101320	10/5/2021	4/4/2022	FR
30535	L0006A		148530	10/5/2021	10/4/2022	FR
30536	L0006A		213650	10/5/2021	4/4/2022	11/10/2021
30537	L0006A		215280	10/5/2021	10/4/2022	FR
30538	L0006A		220610	10/5/2021	10/4/2022	FR
30539	L0006A		233330	10/5/2021	4/4/2022	FR
30334	L0010		1020	7/20/2021	1/18/2022	11/3/2021
30335	L0010		12830	7/20/2021	1/18/2022	11/15/2021
30326	L0010		2690	7/12/2021	1/10/2022	FR
30328	L0010		16460	7/12/2021	1/10/2022	10/27/2021
30329	L0010		17550	7/12/2021	7/12/2022	10/26/2021

TABLE NOTES:

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

² AP5

³ AP6

The following 2 pages are Table D-27: P. 52 Corrosion Feature Pressure Restrictions.

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
34225	L0004		45560	5/5/2021	5/5/2022	594	5/7/2021	11/4/2021	FR
34222	L0004		38460	5/6/2021	5/4/2022	619	5/7/2021	11/2/2021	FR
34223	L0004		39000	5/6/2021	5/4/2022	614	5/7/2021	10/20/2021	FR
34224	L0004		45220	5/6/2021	5/4/2022	606	5/7/2021	11/5/2021	FR
34260	L0004		34710	5/18/2021	11/15/2021	620	5/20/2021	10/2/2021	FR
34261	L0004		35090	5/18/2021	11/15/2021	592	5/20/2021	8/21/2021	FR
34262	L0004		35100	5/18/2021	11/15/2021	609	5/20/2021	8/26/2021	FR
34263	L0004		35670	5/18/2021	11/15/2021	616	5/20/2021	8/21/2021	FR
34264	L0004		35690	5/18/2021	11/15/2021	602	5/20/2021	8/30/2021	FR
34265	L0004		35830	5/18/2021	11/15/2021	585	5/20/2021	9/28/2021	FR
34266	L0004		35850	5/18/2021	11/15/2021	614	5/20/2021	10/7/2021	FR
34267	L0004		35970	5/18/2021	11/15/2021	617	5/20/2021	9/1/2021	FR
34268	L0004		36550	5/18/2021	11/15/2021	596	5/20/2021	9/22/2021	FR
34269	L0004		37560	5/18/2021	11/15/2021	606	5/20/2021	9/18/2021	FR
34270	L0004		37750	5/18/2021	11/15/2021	612	5/20/2021	9/27/2021	FR
34271	L0004		38770	5/18/2021	11/15/2021	604	5/20/2021	9/24/2021	FR
34272	L0004		38780	5/18/2021	11/15/2021	596	5/20/2021	9/24/2021	FR
34273	L0004		38800	5/18/2021	11/15/2021	606	5/20/2021	9/16/2021	FR
34274	L0004		38920	5/18/2021	11/15/2021	601	5/20/2021	9/24/2021	FR
34275	L0004		39000	5/18/2021	11/15/2021	609	5/20/2021	10/1/2021	FR
34276	L0004		39010	5/18/2021	11/15/2021	584	5/20/2021	10/1/2021	FR
34277	L0004		39170	5/18/2021	11/15/2021	598	5/20/2021	10/12/2021	FR
34278	L0004		39210	5/18/2021	11/15/2021	602	5/20/2021	10/18/2021	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
34279	L0004		39600	5/18/2021	11/15/2021	604	5/20/2021	10/23/2021	FR
34280	L0004		39720	5/18/2021	11/15/2021	599	5/20/2021	10/15/2021	FR
35672	L0006A		58980	10/4/2021	10/4/2022	617	10/5/2021	FR	FR
35673	L0006A		95690	10/4/2021	4/4/2022	602	10/5/2021	FR	FR
35674	L0006A		148530	10/4/2021	10/4/2022	600	10/5/2021	FR	FR
35675	L0006A		233330	10/4/2021	4/4/2022	612	10/5/2021	FR	FR
33833	L0067		53660	9/8/2020	3/8/2021	1257	9/9/2020	2/27/2021	8/3/2021
33834	L0067		53700	9/8/2020	3/8/2021	1255	9/9/2020	3/3/2021	8/3/2021

TABLE NOTES:

¹Repair/ 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. "FR" indicates that this information is outside the reporting period of this SAR and will be included in a future SAR

The following 1 page is Table D-28: P. 53 Digs for Axial Slotting, Axial Grooving, Selective Seam Corrosion and Seam Weld anomaly A/B Features.

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
N/A ¹						

TABLE NOTES:

¹ This table is blank for this SAR period

The following 1 page is Table D-29: P. 54 Axial Slotting, Axial Grooving, Selective Seam Corrosion, and Weld Anomaly A/B Feature Pressure Restrictions.

Table D-29: P. 54 Axial Slotting, Axial Grooving, Selective Seam Corrosion, and Weld Anomaly A/B Feature Pressure Restrictions									
PR ID	Line	Segment	Girth Weld	Date of Discovery	Repair / Mitigation Deadline	PPR Set (psi)	PPR Imposition Date	Repair / Mitigation Date	PPR Removal Date
N/A ¹									

TABLE NOTES:

¹ There are no features of this type to report in this SAR period

The following 1 page is Table D-30: P. 56 Geometry Features Mitigation Timelines.

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
N/A ¹						

TABLE NOTE:

¹ There are no features of this type to report in this SAR period

The following 1 page is Table D-31: P. 58 Interacting Features Requiring Excavation.

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
30356 ¹	L0003		115680	CALIPER	7/20/2021	7/20/2021	8/11/2021	12/31/2021	MFL Corrosion	10/10/2021

TABLE NOTES:

¹ AP7

The following 1 page is Table D-32: P. 59 Interacting Features Pressure Restrictions.

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}
N/A ¹									

TABLE NOTES:

¹ There are no features of this type to report in this SAR period

The following 1 page is Table D-33: P. 60 Remaining Life Calculations.

Table D-33: P. 60 Remaining Life Calculations					
Tool Run ID	Line	Segment	Tool	Report Type	Remaining Life Calculation Completion Date
10228	03		UC	Crack	7/30/2021
11019	03		MFL4	Corrosion	8/9/2021
10991	04		UCM	Crack	6/18/2021
6693	05		UCc	Crack	6/15/2021
10241	05		MFL4	Corrosion	9/21/2021
6666	05		UCc	Crack	6/15/2021
10240	05		MFL4	Corrosion	9/21/2021
6662	06A		UMP	Corrosion	10/5/2021
6668	10		GEMINI	Corrosion	7/12/2021
6692	10		MFL4	Corrosion	7/12/2021
6718	10		UCx	Crack	8/17/2021
10986	10		MFL4	Corrosion	7/15/2021

The following 1 page is Table D-34: P. 63 Crack Feature Remaining Life Calculations.

Table D-34: P. 63 Crack Feature Remaining Life Calculations					
Tool Run ID	Line	Segment	Tool	Report Type	Remaining Life Calculation Completion Date
10228	03		UC	Crack	7/30/2021
10991	04		UCM	Crack	6/18/2021
6693	05		UCc	Crack	6/15/2021
6666	05		UCc	Crack	6/15/2021
6718	10		UCx	Crack	8/17/2021

Section E

The following 2 pages are Table E-1 (Revision 1): P. 68 Consent Decree Screw Anchor Installation Summary.

Section E

Table E-1 (Revision 1): P. 68 Consent Decree Screw Anchor Installation Summary				
Location	Installed	Installation Year	Long.	Lat.
EP-17-1 (removed)	Y	2018		
EP-17-1R	Y	2020		
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	Y	2020		
WP-17-14	Y	2020		
WP-17-15	Y	2018		
WP-17-16	Y	2018		
WP-17-17	Y	2019		
EAP-1	Y	2019		
EAP-2	Y	2020		
EAP-3	Y	2020		
EAP-4	Y	2020		
EAP-5	Y	2019		
EAP-6	Y	2020		
EAP-7	Y	2020		
EAP-8	Y	2020		
EAP-9	Y	2020		
EAP-10	Y	2020		
EAP-11	Y	2020		
EAP-12	Y	2020		
EAP-13	Y	2019		
EAP-14	Y	2019		
EAP-15	Y	2019		

Table E-1 (Revision 1): P. 68 Consent Decree Screw Anchor Installation Summary				
Location	Installed	Installation Year	Long.	Lat.
EAP-16	Y	2019		
EAP-17	Y	2019		
EAP-18	Y	2019		
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	Y	2020		
EAP-26	Y	2019		
EAP-27	Y	2019		
EAP-28	Y	2020		
EAP-29	Y	2020		
EAP-30	Y	2019		
WAP-1	Y	2019		
WAP-2	Y	2019		
WAP-3	Y	2020		
WAP-4	Y	2020		
WAP-5	Y	2019		
WAP-6	Y	2020		
WAP-7	Y	2019		
WAP-8	Y	2019		
WAP-9	Y	2019		
WAP-10	Y	2019		
WAP-11	Y	2019		
WAP-12	Y	2020		
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	Y	2020		

The following 1 page is Table E-2: P. 73 Acoustic Leak Detection.

Table E-2: P. 73 Acoustic Leak Detection		
Segment	Quarter	Leak Detection Tool Run Date
Dual Pipelines (West and East)	Q2 2021	06/02/2021
Dual Pipelines (West and East)	Q3 2021	09/01/2021

Section F

The following 1 page is Table F-1: P. 77 OneSource NDE Updates.

Section F

Table F-1: P. 77 OneSource NDE Updates						
Tool Run ID	Line	Segment	Tool	Report Type	Last NDE Report Approved Date ^{1,2}	OneSource Load Date
4506	02		PROTON	Crack	10/25/2021	10/28/2021
6579	05		GEMINICAL	Geometry	10/25/2021	10/28/2021
4674	06A		USWM+	Corrosion	8/18/2021	8/20/2021
6553	14		ECLIPSE	Crack	8/25/2021	8/26/2021
6555	65		CD	Crack	9/3/2021	9/6/2021

TABLE NOTE:

¹ The last NDE report approved date was the date the last CD FRE NDE report for that particular ILI program was approved.

² There may be instances where an NDE report reissue is required to correct clerical issues. In these instances, the Last NDE Report Approved Date is the approval date of the Initial NDE report.

The following 1 page is Table F-2: P. 78.a OneSource ILI Updates.

Table F-2: P. 78.a OneSource ILI Updates						
Tool Run ID	Line	Segment	Tool	Report Type	Report Received Date	OneSource Upload Date
10228	03		UC	Crack	7/5/2021	7/5/2021
11019 ¹	03		MFL4	Corrosion (Issue 2)	8/19/2021	8/23/2021
11019 ¹	03		MFL4	Corrosion (Issue 1)	7/12/2021	7/12/2021
11019	03		MFL4	Geometry	7/20/2021	7/20/2021
10052	03		MFL4	Corrosion	7/5/2021	7/7/2021
10991	04		UCM	Crack	5/27/2021	5/28/2021
10241	05		MFL4	Corrosion	8/24/2021	8/25/2021
10241	05		MFL4	Geometry	8/24/2021	8/25/2021
10240	05		MFL4	Corrosion	8/25/2021	8/25/2021
10240	05		MFL4	Geometry	8/25/2021	8/25/2021
6662	06A		UMP	Corrosion	9/7/2021	9/9/2021
6668	10		GEMINI	Corrosion	6/14/2021	6/14/2021
6668	10		GEMINI	Geometry	6/14/2021	6/14/2021
6691	10		UMP	Corrosion (Issue 2)	7/14/2021	7/14/2021
6691	10		UMP	Corrosion (Issue 1)	6/23/2021	6/24/2021
6692	10		MFL4	Corrosion	6/15/2021	6/21/2021
6692	10		MFL4	Geometry	6/15/2021	6/21/2021
10986	10		MFL4	Corrosion	6/22/2021	6/22/2021
10986	10		MFL4	Geometry	6/22/2021	6/22/2021
6718	10		UCx	Crack	7/21/2021	7/22/2021
6555	65		CD+	Crack	7/16/2021	7/19/2021

TABLE NOTE:

¹ The Issue 1 report only contained features with a depth >50% as seen in the 2020 MFL4 Inspection. A full Issue 2 Report was received on 8/19/2021.

The following 2 pages are Table F-3: P. 78.b Interacting Feature Reviews.

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	SQuAD and QuAD Completion Date ¹	Issue #
10228 ¹	03		UC	Crack	3/5/2021	7/5/2021	7/30/2021	N/A	1
11019	03		MFL4	Corrosion	5/21/2021	7/12/2021	8/9/2021	8/9/2021	1
11019	03		MFL4	Corrosion	5/21/2021	8/19/2021	9/10/2021	9/10/2021	2
11019	03		MFL4	Geometry	5/21/2021	7/20/2021	8/11/2021	8/11/2021	1
6606	03		MFL4	Corrosion	5/7/2020	5/10/2021	6/4/2021	6/4/2021	3
10052	03		MFL4	Corrosion	5/22/2020	5/3/2021	5/27/2021	5/27/2021	2
10052	03		MFL4	Corrosion	5/22/2020	7/5/2021	8/3/2021	8/3/2021	3
10991 ¹	04		UCM	Crack	1/27/2021	5/27/2021	6/18/2021	N/A	1
10241	05		MFL4	Corrosion	5/26/2021	8/24/2021	9/21/2021	9/21/2021	1
10241	05		MFL4	Geometry	5/26/2021	8/24/2021	9/20/2021	9/20/2021	1
6693 ¹	05		UCc	Crack	1/19/2021	5/19/2021	6/15/2021	N/A	1
10240	05		MFL4	Corrosion	5/27/2021	8/25/2021	9/21/2021	9/21/2021	1
10240	05		MFL4	Geometry	5/27/2021	8/25/2021	9/20/2021	9/20/2021	1
6666 ¹	05		UCc	Crack	1/20/2021	5/20/2021	6/15/2021	N/A	1
6662	06A		UMP	Corrosion	6/7/2021	9/7/2021	10/5/2021	10/5/2021	1
6668	10		GEMINI	Corrosion	3/16/2021	6/14/2021	7/12/2021	7/12/2021	1
6668	10		GEMINI	Geometry	3/16/2021	6/14/2021	7/7/2021	7/7/2021	1
6691	10		UMP	Corrosion	3/25/2021	7/14/2021	7/20/2021	7/20/2021	2
6692	10		MFL4	Corrosion	3/17/2021	6/15/2021	7/12/2021	7/12/2021	1
6692	10		MFL4	Geometry	3/17/2021	6/15/2021	7/13/2021	7/13/2021	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	SQuAD and QuAD Completion Date ¹	Issue #
10986	10		MFL4	Corrosion	3/24/2021	6/22/2021	7/15/2021	7/15/2021	1
10986	10		MFL4	Geometry	3/24/2021	6/22/2021	7/7/2021	7/7/2021	1
6718 ¹	10		UCx	Crack	3/23/2021	7/21/2021	8/17/2021	N/A	1
6555 ¹	65		CD+	Crack	11/20/2020	7/16/2021	8/12/2021	N/A	2

TABLE NOTE:

¹ SQuAD/QuAD is not applicable to the crack program

Section G

The following 1 page is Table G-1: P. 93-94, 96-97 Temporary MBS Suspension.

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	29	0
Bypass of ILI Tool	4 hours	15	0
Scheduled maintenance or repairs	4 days	115	0

The following 1 page is Table G-2: P. 99 Projects.

Table G-2: P. 99 Projects				
Line	Milepost	Valve Tag No.	Installation Date	Triggers Paragraph 99?
5		E1334.38-5-V	Aug 2021	Yes, PT and TT required on upstream side of valve. PT already exists on downstream side.
5		E1406.45-5-V	Aug 2021	Yes, PTs to be installed on upstream and downstream side. TT to be installed on upstream side.
62		HF0037.36-62-V-1	Oct 2021	Yes, PTs to be installed on upstream and downstream side. TT to be installed on upstream side.

The following 10 pages are Table G-3: P. 112 Lakehead System Pipeline Incident Reporting.

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
	06/13/2021 12:36 MST	06/13/2021 12:41 MST	06/13/2021 12:48 MST			Line 6A Line 14 Line 61
	07/20/2021 14:12 MST	07/20/2021 14:17 MST	07/20/2021 14:15 MST			Line 6A Line 62 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
	07/21/2021 04:02 MST	07/21/2021 04:08 MST	07/21/2021 04:08 MST			Line 05
	08/04/2021 18:50 MST	08/04/2021 18:53 MST	08/04/2021 18:51 MST			All Lakehead Lines

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
	08/09/2021 09:38 MST	08/09/2021 09:44 MST	08/09/2021 09:47 MST			Line 01 Line 3/93 Line 67
	08/13/2021 17:46 MST	08/13/2021 17:55 MST	08/13/2021 17:54 MST			Line 05 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
	08/20/2021 01:15 MST	08/20/2021 01:18 MST	08/20/2021 01:20 MST			Line 05
	08/27/2021 13:07 MST	08/27/2021 13:09 MST	08/27/2021 13:12 MST			All Lakehead Lines

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
	09/14/2021 12:26 MST	09/14/2021 12:30 MST	09/14/2021 12:33 MST			Line 6A Line 14 Line 62 Line 64 Line 78
	09/15/2021 20:10 MST	09/15/2021 20:16 MST	09/15/2021 20:19 MST			Line 6A Line 14 Line 62 Line 64 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
	09/26/2021 09:42 MST	09/26/2021 09:48 MST	09/26/2021 09:48 MST			Line 6A Line 14 Line 61
	10/10/2021 17:57 MST	10/10/2021 18:01 MST	10/10/2021 18:07 MST			Line 10

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
	10/15/2021 06:29 MST	10/15/2021 06:33 MST	10/15/2021 06:34 MST			Line 5
	10/17/2021 08:09 MST	10/17/2021 08:16 MST	10/17/2021 08:16 MST			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
	10/19/2021 09:10 MST	10/19/2021 09:10 MST	10/19/2021 09:12 MST			Line 5
	10/19/2021 09:38 MST	10/19/2021 09:38 MST	Line was already shutdown, unrelated to this event.			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
	10/24/2021 06:11 MST	10/24/2021 06:17 MST	10/24/2021 06:20 MST			Line 6A Line 62 Line 64 Line 78
	10/26/2021 18:45 MST	10/26/2021 18:54 MST	10/26/2021 18:53 MST			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
	10/29/2021 12:36 MST	10/29/2021 12:44 MST	10/29/2021 12:44 MST			Line 06 Line 14 Line 61

Section H

There are no tables associated with Section H.

Section I

There are no tables associated with Section I.

Section J

There are no tables associated with Section J.

Section IX

The following 1 page is Table IX-1: P. 144 Problems Anticipated, Consent Decree Interpretation Issues in Discussion by the Parties.

Section IX

Table IX-1: P. 144 Problems Anticipated, Consent Decree Interpretation Issues in Discussion by the Parties		
Section and Title	Relevant Paragraph or Reference	Enbridge Position
[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. Enbridge has identified difficulties encountered, from a technical perspective, of applying the Consent Decree to circumferential Cracking. Enbridge, the EPA, and the ITP continue to discuss ways to resolve this challenge.
[Section D] Analysis Process Utilized for "Topside" Dents	Paragraph 36, 40, and 56	Throughout the term of the CD and prior, Enbridge has consistently applied the assessment of topside versus bottomside to address regulatory requirements and determine the location of the dent as described in Enbridge's Minimum Reporting Requirements (MRR). Enbridge's interpretation of topside has been clearly documented within Enbridge's MRR and accessible to the ITP for the entirety of the CD. While Enbridge did not (and does not), believe the Line 14, AM-MK, Geometry, 6-19-2020 – DNT 25 feature to be an FRE under the CD, Enbridge agreed to complete the excavation and repair of this single dent feature, at the request of EPA. Enbridge considers this work to be a non-CD excavation. The Line 14, AM-MK, Geometry, 6-19-2020 – DNT 25 feature was subsequently repaired on 4/8/2021 in advance of the "potential FRE" repair deadline.
[Section E] Coverage of Dual Pipelines in Less Than 65-ft of Water	Paragraph 68.b	Enbridge believes that inspection data gathered in 2016, 2018, and 2020 adequately confirms that portions of the Dual Pipelines located in water less than 65-feet in depth remain buried. In addition, Enbridge completed visual inspections in 2021 that confirmed the DTMs which show the Dual Pipelines covered in less than 65-feet of water. Enbridge submitted a revision to the Paragraph 68.b language in previous SARs.

The following 1 page is Table IX-2: Lines 65 Flow Rates.

Table IX-2: Line 65 Flow Rates		
Lakehead Pipeline	Operating flow rate range during original study (m ³ /hr)	Minimum flow rate line was operated at in Q1-Q2 2021 (m ³ /hr)
65	1,000 – 1,400	750

The following 1 page is Table IX-3: P. 115 Stockbridge Agreed Exercise Activities.

Table IX-3: P. 115 Stockbridge Agreed Exercise Activities			
Date	Planned Exercise Activity	City	State
06/19/19	Concept and Objectives Meeting	Chicago	Illinois
11/05/19	Initial Planning Meeting	Lansing	Michigan
3/2/20	Midterm Planning Meeting	Lansing	Michigan
05/13/20	Stockbridge Master Scenario Events List (MSEL) Meeting (Virtual)	-	-
05/05/2021	Stockbridge Final Planning Meeting (Virtual)	-	-
07/14/21 – 07/15/21	Stockbridge Exercise (Hybrid – virtual and face to face)	Lansing	Michigan
07/16/21	Stockbridge After Action Meeting (Hybrid – virtual and face to face)	Lansing	Michigan

The following 1 page is Table IX-4: TTX and FDE in SAR9 Reporting Period.

Table IX-4: TTX and FDE in SAR9 Reporting Period			
Date	Exercise Type	City	State
August 5	TTX	Cohasset	Minnesota
August 19	TTX	Dyer	Indiana
September 21	TTX	Crystal Falls	Michigan
September 21	TTX	Oxford	Wisconsin
October 14	TTX	Owen	Wisconsin
May 26	FDE	St. Joseph	Michigan
June 10	FDE	Sheldon	Wisconsin
June 24	FDE	Wrenshall	Minnesota
September 14	FDE	Gilman	Wisconsin

The following 1 page is Table IX-5: Section H P. 174 Force Majeure Notifications.

Table IX-5: Section H P. 174 Force Majeure Notifications	
Step	Summary of Section H Action
Step 1 Verbal Immediate	As soon as Enbridge is aware of an issue that will result in not meeting Consent Decree requirements then they must notify the EPA immediately. <i>There were no verbal notifications during this reporting period.</i>
Step 2 notification within 5 Days of Knowing ¹	A notification is made to the EPA. <i>There were no notifications during this reporting period.</i>
Step 3 Written Follow up within 10 Days of the initial Notification	A follow up written notification is made to the EPA by legal following the initial written notification. <ul style="list-style-type: none"> • <u>Thirteenth Written Notification</u>: A written notification was sent on June 23, 2021 requesting virtual TTX for August 5 and 19th TTX. The EPA approved the virtual format. • <u>Fourteenth Written Notification</u>: A written notification was sent on August 5, 2021 requesting virtual TTX and COE that are held in September and October 2021. The EPA approved holding the exercises and COE virtually as listed in the letter.
Step 4 Enbridge Continues to Monitor the Situation	Enbridge staff have regular meetings to discuss and monitor the situation.
Step 5 Enbridge Identifies a Work Around, if Possible, and Notifies EPA ²	For Section H, the events impacted by the COVID-19 Force Majeures include TTXs, Community Outreach Sessions and FSE planning meetings for Stockbridge.

TABLE NOTE:

¹As of April 30, 2020 – This step is no longer required and is replaced by the 10-day written follow up (Step 3).

²In the event EPA is not in support of the proposed plan, Enbridge will revise and resubmit it within 7 days.

The following 1 page is Table IX-6: P. 145 List of Potential Non-Compliances.

Table IX-6: P. 145 List of Potential Non-Compliances	
Potential Non-Compliance	Summary Location
[Section G] Inadvertent Removal of 24-Hour Alarm Re-optimized Thresholds on Line 02 – P103.c	Section IX – Paragraph 145

The following 2 pages are Table IX-7: P. 146 Discharges from a Lakehead System Pipeline.

Table IX-7: P. 146 Discharges from a Lakehead System Pipeline

Spill Date (MM/DD/YYYY)	8/2/2021	8/9/2021	10/18/2021
National Response Center #	1312603	1313243	1319752
Spill Location	Griffith, Lake County, IN ¹	Wawina, Itasca County, MN	Viking, Marshall County, MN ¹
MP#/Facility Name	Griffith Terminal	MP 1032	Viking Station
Equipment or Line Number	Transfer Line 1 Flange	Line 1	Line 4 Flange
Cause of spill	Equipment Failure	Material Failure of Pipe or Weld. ²	Equipment Failure
Spill Material	Crude Oil	Crude Oil	Crude Oil
Quantity of Spill	1 Barrel	1 Barrel	4 Barrels
Distance Spill Travelled	15 feet	50 feet	20 feet
Sheen, Sludge or Emulsion Observed	None	None	None
Name of Water that Spill Entered (if applicable)	Not Applicable	Not Applicable	Not Applicable
Water Quality Standard Exceeded/Violated	Not Applicable	Not Applicable	Not Applicable
Actions Taken or Planned to Address Spill	The bolts were removed from the flange connection and have been sent for a third-party analysis and field investigation is being conducted. All contaminated soil was removed from the release site.	A Plidco sleeve was installed on August 11, 2021 and the line was returned to service. ³ All contaminated soil was removed from the release site.	The failed gasket was replaced, and all contaminated soil was removed from the release site.
Actions Taken or Planned to Prevent Future Spills and Schedule for Future Actions	No further actions warranted at this time.	The release location was cut out and sent for metallurgical analysis in order to determine the direct cause of the release. Results from this analysis will then be integrated with other known information about this feature and location to determine if further actions are needed.	No further actions warranted.
Environmental Impacts from Spill	Soil (Solely on Enbridge Property)	Soil	Soil (Solely on Enbridge Property)

Table IX-7: P. 146 Discharges from a Lakehead System Pipeline

Root Cause	Non-Threaded Connection Failure	Construction, Installation, or Fabrication Related	Non-Threaded Connection Failure
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TABLE NOTES:

¹ Not a CD-reportable event but disclosed for reporting consistency with previous SARs.

² Material Failure of Pipe or Weld is the cause classification from the PHMSA Accident Report.

³ On August 30, 2021 a cutout was performed; that section was submitted for metallurgical analysis which identified a through-wall girth weld manufacturing anomaly associated with burn-through from original construction.

The following 1 page is Table IX-8: P. 147 Update on Discharges from a Lakehead System Facility.

Table IX-8: P. 147 Update on Discharges from a Lakehead System Facility

Spill Date (MM/DD/YYYY)	3/2/2021
National Response Center #	Not Required
Spill Location	Viking, Marshall County, MN
MP#/Facility Name	Viking Station
Equipment or Line Number	Line 4 Pressure Transmitter Flex Hose
Cause of spill	Equipment Failure
Spill Material	Crude Oil
Quantity of Spill	4 Barrels
Distance Spill Travelled	20 feet
Sheen, Sludge or Emulsion Observed	None
Name of Water that Spill Entered (if applicable)	Not Applicable
Water Quality Standard Exceeded/Violated	Not Applicable
Actions Taken or Planned to Address Spill	The failed flex hose was replaced, and all contaminated soil was removed from the release site.
Actions Taken or Planned to Prevent Future Spills and Schedule for Future Actions	A Quality Bulletin will be issued company wide as it relates to the configuration of the flex hose and the role it played in the failure. For existing flex hoses, the Quality Bulletin will provide direction regarding the inspection of the hoses to confirm whether they adhere to the applicable installation guide as recommended by the manufacturer
Final Actions Taken or Planned to Prevent Future Spills and Schedule for Future Actions	<i>A service request is being issued for Operations personnel to review the condition and installation of similar flex hoses. Each flex hose will be categorized and ranked based on their condition to determine replacement.</i>
Environmental Impacts from Spill	Soil (Solely on Enbridge Property)
Preliminary Root Cause	Other Equipment Failure
Final Root Cause	No Change

TABLE NOTE:

¹ Updates to the discharges reported in SAR8 are italicized

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

Reporting Period: May 23, 2021 to November 22, 2021



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 November 26, 2021

For reporting period May 23, 2021 to November 22, 2021

Company Confidential

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	<p>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.</p> <p><i>Note: Line 6B has been renamed to Line 78. 6B and 78 are equivalent and the same pipeline.</i></p>
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	<p>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:</p> <ol style="list-style-type: none"> 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]

Name

[Redacted Signature]

Signature

[Redacted Date]

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	<p>(Alarming) Number of times Enbridge did not comply with the 10-Minute Rule in responding to Alarms</p> <p>(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</p>
Reasons and Corrective Actions for each Non-Compliance	<p>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.</p> <p>An empty reference indicates either zero non-compliance to the 10-minute rule or the Post Incident Report is not yet generated.</p>

Table 1b: Summary of Alarms (Reporting Period: May 23, 2021 to November 22, 2021)

Pipeline	Total Alarms	Total Non-Compliance (Alarming)	Total Non-Compliance (Non-Alarming)	Reasons and Corrective Actions for each Non-Compliance
01	6	0	0	
02	10	0	0	
03	16	0	0	
04	9	0	0	
05	17	0	0	
06A	16	0	0	
10	5	0	0	
14	10	0	0	
61	12	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	10	0	0	
67	7	0	0	
78	15	0	0	
93	41	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	2021-10-28 23:23:51
MBS Alarm Received Time MBS Alarm Assessed Time	2021-10-28 23:23:53 2021-10-28 23:29:05
Root Cause	Communication Interruption
CRO and STA Actions	LDAM - Leak Detection System (LDS) Alarm - Flowing Pipeline
LDA Actions	LD - MBS - Leak Alarm
Shutdown Commenced	2021-10-28 23:26:25^ ^ Assessed as flow-based rupture event
Shutdown Completed	2021-10-28 23:45:18
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	2021-10-29 03:12:00
Were Procedures Followed	Yes
Post Incident Report	

Pipeline	01
Alarming Event Start Time	2021-11-06 06:33:40
MBS Alarm Received Time MBS Alarm Assessed Time	2021-11-06 06:33:41 2021-11-06 07:22:41
MBS Alarm Received Time MBS Alarm Assessed Time	2021-11-06 06:36:41 2021-11-06 07:22:39
Root Cause	Field Maintenance
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	2021-11-06 07:24:50
Were Procedures Followed	Yes
Post Incident Report	

Pipeline	02
Alarming Event Start Time	2021-11-04 10:45:41
MBS Alarm Received Time MBS Alarm Assessed Time	2021-11-04 10:45:41 2021-11-04 10:48:06
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	2021-11-04 11:25:00
Were Procedures Followed	Yes
Post Incident Report	

Pipeline	03
Alarming Event Start Time	2021-08-04 19:06:27
MBS Alarm Received Time MBS Alarm Assessed Time	2021-08-04 19:06:28 2021-08-04 19:53:16
MBS Alarm Received Time MBS Alarm Assessed Time	2021-08-04 19:07:58 2021-08-04 19:53:13
MBS Alarm Received Time MBS Alarm Assessed Time	2021-08-04 19:15:59 2021-08-04 19:53:08
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	2021-08-04 21:05:00
Were Procedures Followed	Yes
Post Incident Report	

Pipeline	03
Alarming Event Start Time	2021-08-20 02:14:25
MBS Alarm Received Time MBS Alarm Assessed Time	2021-08-20 02:14:25 2021-08-20 02:22:23
Root Cause	Column Separation
CRO and STA Actions	LDAM - Leak Detection System (LDS) Alarm - Flowing Pipeline
LDA Actions	LD - MBS - Leak Alarm
Shutdown Commenced	2021-08-20 02:09:23** <small>** The line was in the process of shutting down when the alarm was generated. The 'Shutdown Commenced' is the time when the shutdown was initiated.</small>
Shutdown Completed	2021-08-20 02:34:28
Justification for Resumption	After shutdown, alarm deemed valid following LDA investigation. Column separation investigated by CCO with no unexplained leak triggers
Startup Commenced	2021-08-20 04:00:30
Were Procedures Followed	Yes
Post Incident Report	

Pipeline	03
Alarming Event Start Time	2021-09-03 08:59:10
MBS Alarm Received Time MBS Alarm Assessed Time	2021-09-03 08:59:10 2021-09-03 09:08:25
MBS Alarm Received Time MBS Alarm Assessed Time	2021-09-03 08:59:10 2021-09-03 09:08:27
MBS Alarm Received Time MBS Alarm Assessed Time	2021-09-03 08:59:10 2021-09-03 09:08:21
MBS Alarm Received Time MBS Alarm Assessed Time	2021-09-03 09:00:39 2021-09-03 09:08:20
Root Cause	Field Maintenance
CRO and STA Actions	LDAM - Leak Detection System (LDS) Alarm - Flowing Pipeline
LDA Actions	LD - MBS - Leak Alarm
Shutdown Commenced	2021-09-03 08:59:18
Shutdown Completed	2021-09-03 09:29:49
Justification for Resumption	After shutdown, alarm deemed invalid following LDA investigation and CCO investigation identified no leak triggers
Startup Commenced	2021-09-03 10:00:21
Were Procedures Followed	Yes
Post Incident Report	

Pipeline	03
Alarming Event Start Time	2021-10-01 10:20:09
MBS Alarm Received Time	2021-10-01 10:20:09
MBS Alarm Assessed Time	2021-10-01 10:40:44
MBS Alarm Received Time	2021-10-01 10:20:40
MBS Alarm Assessed Time	2021-10-01 10:40:42
MBS Alarm Received Time	2021-10-01 10:32:40
MBS Alarm Assessed Time	2021-10-01 10:40:45
MBS Alarm Received Time	2021-10-01 10:32:40
MBS Alarm Assessed Time	2021-10-01 10:40:47
Root Cause	LDS Error
CRO and STA Actions	LDAM - Leak Detection System (LDS) Alarm - Flowing Pipeline
LDA Actions	LD - MBS - Leak Alarm
Shutdown Commenced	2021-10-01 10:20:34
Shutdown Completed	2021-10-01 10:23:58
Justification for Resumption	After shutdown, alarm deemed invalid following LDA investigation and CCO investigation identified no leak triggers
Startup Commenced	2021-10-01 12:11:36
Were Procedures Followed	Yes
Post Incident Report	

Pipeline	05
Alarming Event Start Time	2021-07-23 13:58:36
MBS Alarm Received Time MBS Alarm Assessed Time	2021-07-23 13:58:37 2021-07-23 14:29:16
MBS Alarm Received Time MBS Alarm Assessed Time	2021-07-23 13:58:37 2021-07-23 14:29:19
MBS Alarm Received Time MBS Alarm Assessed Time	2021-07-23 13:59:37 2021-07-23 14:29:21
MBS Alarm Received Time MBS Alarm Assessed Time	2021-07-23 13:59:37 2021-07-23 14:29:23
MBS Alarm Received Time MBS Alarm Assessed Time	2021-07-23 14:09:37 2021-07-23 14:29:25
MBS Alarm Received Time MBS Alarm Assessed Time	2021-07-23 14:10:37 2021-07-23 14:29:52
MBS Alarm Received Time MBS Alarm Assessed Time	2021-07-23 14:18:08 2021-07-23 14:29:53
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	2021-07-23 15:14:00
Were Procedures Followed	Yes
Post Incident Report	

Pipeline	06A
Alarming Event Start Time	2021-06-19 20:19:22
MBS Alarm Received Time MBS Alarm Assessed Time	2021-06-19 20:19:23 2021-06-19 20:28:48
MBS Alarm Received Time MBS Alarm Assessed Time	2021-06-19 20:19:23 2021-06-19 20:28:46
Root Cause	Transient Condition
CRO and STA Actions	LDAM - Leak Detection System (LDS) Alarm - Flowing Pipeline
LDA Actions	LD - MBS - Leak Alarm
Shutdown Commenced	2021-06-19 20:29:43* <small>*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.</small>
Shutdown Completed	2021-06-19 20:48:15
Justification for Resumption	CCO investigation identified no leak triggers - Regional and CCO admin approvals granted Static Pressure Monitoring of System over 60 minutes and CCO investigation identified no additional leak triggers. Regional and CCO Admin approvals granted
Startup Commenced	2021-06-19 22:55:13
Were Procedures Followed	Yes
Post Incident Report	

Pipeline	06A
Alarming Event Start Time	2021-09-14 09:32:30
MBS Alarm Received Time MBS Alarm Assessed Time	2021-09-14 09:32:31 2021-09-14 09:44:35
Root Cause	Field Maintenance
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	2021-09-14 17:00:36
Were Procedures Followed	Yes
Post Incident Report	

Pipeline	10
Alarming Event Start Time	2021-09-04 07:04:34
MBS Alarm Received Time MBS Alarm Assessed Time	2021-09-04 07:04:34 2021-09-04 08:10:10
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	Static Pressure Monitoring of System over 60 minutes and CCO investigation identified no additional leak triggers. Regional and CCO Admin approvals granted
Startup Commenced	2021-09-04 09:15:19
Were Procedures Followed	Yes
Post Incident Report	

Pipeline	10
Alarming Event Start Time	2021-11-09 22:52:50
MBS Alarm Received Time MBS Alarm Assessed Time	2021-11-09 22:52:50 2021-11-10 11:14:45
Root Cause	Communication Interruption
CRO and STA Actions	LDAM - Leak Detection System (LDS) Alarm - Flowing Pipeline
LDA Actions	LD - MBS - Leak Alarm
Shutdown Commenced	2021-11-09 22:44:00** <small>** The line was in the process of shutting down when the alarm was generated. The 'Shutdown Commenced' is the time when the shutdown was initiated.</small>
Shutdown Completed	2021-11-09 23:40:00
Justification for Resumption	Aerial Patrol Performed - Regional and CCO admin approvals granted CCO investigation identified no leak triggers - Regional and CCO admin approvals granted Visual inspection performed by field staff - Regional and CCO Admin approvals granted
Startup Commenced	2021-11-10 12:25:00
Were Procedures Followed	Yes
Post Incident Report	

Pipeline	61
Alarming Event Start Time	2021-08-17 14:36:01
MBS Alarm Received Time MBS Alarm Assessed Time MBS Alarm Received Time MBS Alarm Assessed Time MBS Alarm Received Time MBS Alarm Assessed Time	2021-08-17 14:36:01 2021-08-17 14:40:28 2021-08-17 14:38:31 2021-08-17 14:40:36 2021-08-17 14:39:02 2021-08-17 14:40:40
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	2021-08-17 22:00:00
Were Procedures Followed	Yes
Post Incident Report	

Pipeline	61
Alarming Event Start Time	2021-10-04 15:21:48
MBS Alarm Received Time MBS Alarm Assessed Time	2021-10-04 15:21:49 2021-10-04 15:27:39
MBS Alarm Received Time MBS Alarm Assessed Time	2021-10-04 15:23:49 2021-10-04 15:27:40
MBS Alarm Received Time MBS Alarm Assessed Time	2021-10-04 15:25:18 2021-10-04 15:27:36
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	2021-10-04 19:35:13
Were Procedures Followed	Yes
Post Incident Report	

Pipeline	61
Alarming Event Start Time	2021-10-04 18:58:25
MBS Alarm Received Time MBS Alarm Assessed Time	2021-10-04 18:58:26 2021-10-04 19:01:59
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	2021-10-04 19:35:58
Were Procedures Followed	Yes
Post Incident Report	

Pipeline	61
Alarming Event Start Time	2021-11-06 10:03:10
MBS Alarm Received Time MBS Alarm Assessed Time	2021-11-06 10:03:10 2021-11-06 10:06:43
MBS Alarm Received Time MBS Alarm Assessed Time	2021-11-06 10:03:10 2021-11-06 10:05:58
MBS Alarm Received Time MBS Alarm Assessed Time	2021-11-06 10:03:10 2021-11-06 10:06:02
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	2021-11-06 10:22:48
Were Procedures Followed	Yes
Post Incident Report	

Pipeline	65
Alarming Event Start Time	2021-08-04 19:43:42
MBS Alarm Received Time MBS Alarm Assessed Time	2021-08-04 19:43:43 2021-08-04 20:12:47
MBS Alarm Received Time MBS Alarm Assessed Time	2021-08-04 19:44:42 2021-08-04 20:12:48
Root Cause	Instrument 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	2021-08-04 22:09:00
Were Procedures Followed	Yes
Post Incident Report	

Pipeline	78
Alarming Event Start Time	2021-09-23 20:59:53
MBS Alarm Received Time MBS Alarm Assessed Time	2021-09-23 20:59:53 2021-09-23 21:02:59
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	2021-09-23 22:11:00
Were Procedures Followed	Yes
Post Incident Report	

Pipeline	93
Alarming Event Start Time	2021-10-23 16:58:46
MBS Alarm Received Time MBS Alarm Assessed Time	2021-10-23 16:58:47 2021-10-23 17:06:09
MBS Alarm Received Time MBS Alarm Assessed Time	2021-10-23 17:00:47 2021-10-23 17:06:11
MBS Alarm Received Time MBS Alarm Assessed Time	2021-10-23 17:02:47 2021-10-23 17:06:12
MBS Alarm Received Time MBS Alarm Assessed Time	2021-10-23 17:04:18 2021-10-23 17:06:14
MBS Alarm Received Time MBS Alarm Assessed Time	2021-10-23 18:41:19 2021-10-23 18:47:32
Root Cause	Transient Condition
CRO and STA Actions	LDAM - Leak Detection System (LDS) Alarm - Flowing Pipeline
LDA Actions	LD - MBS - Leak Alarm
Shutdown Commenced	2021-10-23 16:29:50** <div> ** The line was in the process of shutting down when the alarm was generated. The 'Shutdown Commenced' is the time when the shutdown was initiated. </div>
Shutdown Completed	2021-10-23 17:18:32
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	2021-10-23 18:55:46
Were Procedures Followed	Yes
Post Incident Report	

Pipeline	93
Alarming Event Start Time	2021-10-23 19:37:54
MBS Alarm Received Time MBS Alarm Assessed Time MBS Alarm Received Time MBS Alarm Assessed Time	2021-10-23 19:37:54 2021-10-23 20:21:17 2021-10-23 19:41:54 2021-10-23 20:21:19
Root Cause	LDS Error
CRO and STA Actions	LDAM - Leak Detection System (LDS) Alarm - Flowing Pipeline
LDA Actions	LD - MBS - Leak Alarm
Shutdown Commenced	2021-10-23 19:48:06* <small>*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.</small>
Shutdown Completed	2021-10-23 20:08:43
Justification for Resumption	After shutdown, alarm deemed invalid following LDA investigation and CCO investigation identified no leak triggers
Startup Commenced	2021-10-23 21:30:00
Were Procedures Followed	Yes
Post Incident Report	

Pipeline	93
Alarming Event Start Time	2021-10-23 19:47:53
MBS Alarm Received Time	2021-10-23 19:47:54
MBS Alarm Assessed Time	2021-10-23 20:21:20
MBS Alarm Received Time	2021-10-23 19:50:25
MBS Alarm Assessed Time	2021-10-23 20:21:21
MBS Alarm Received Time	2021-10-23 19:51:54
MBS Alarm Assessed Time	2021-10-23 20:21:22
MBS Alarm Received Time	2021-10-23 19:51:54
MBS Alarm Assessed Time	2021-10-23 20:21:25
MBS Alarm Received Time	2021-10-23 19:51:54
MBS Alarm Assessed Time	2021-10-23 20:21:26
MBS Alarm Received Time	2021-10-23 19:51:54
MBS Alarm Assessed Time	2021-10-23 20:21:28
MBS Alarm Received Time	2021-10-23 19:51:54
MBS Alarm Assessed Time	2021-10-23 20:21:24
MBS Alarm Received Time	2021-10-23 19:52:54
MBS Alarm Assessed Time	2021-10-23 20:21:29
Root Cause	Transient Condition
CRO and STA Actions	LDAM - Leak Detection System (LDS) Alarm - Flowing Pipeline
LDA Actions	LD - MBS - Leak Alarm
Shutdown Commenced	2021-10-23 19:48:06
Shutdown Completed	2021-10-23 20:07:43
Justification for Resumption	After shutdown, alarm deemed invalid following LDA investigation and CCO investigation identified no leak triggers
Startup Commenced	2021-10-23 21:30:00
Were Procedures Followed	Yes
Post Incident Report	

Pipeline	93
Alarming Event Start Time	2021-10-26 16:28:32
MBS Alarm Received Time MBS Alarm Assessed Time	2021-10-26 16:28:33 2021-10-26 16:40:36
MBS Alarm Received Time MBS Alarm Assessed Time	2021-10-26 16:28:33 2021-10-26 16:40:33
Root Cause	Transient Condition
CRO and STA Actions	LDAM - Leak Detection System (LDS) Alarm - Flowing Pipeline
LDA Actions	LD - MBS - Leak Alarm
Shutdown Commenced	2021-10-26 16:11:09** <small>** The line was in the process of shutting down when the alarm was generated. The 'Shutdown Commenced' is the time when the shutdown was initiated.</small>
Shutdown Completed	2021-10-26 16:48:55
Justification for Resumption	CCO investigation identified no leak triggers - Regional and CCO admin approvals granted
Startup Commenced	2021-10-26 20:41:00
Were Procedures Followed	Yes
Post Incident Report	

Pipeline	93
Alarming Event Start Time	2021-10-27 22:13:19
MBS Alarm Received Time MBS Alarm Assessed Time	2021-10-27 22:13:20 2021-10-27 22:21:09
Root Cause	Transient Condition
CRO and STA Actions	LDAM - Leak Detection System (LDS) Alarm - Flowing Pipeline
LDA Actions	LD - MBS - Leak Alarm
Shutdown Commenced	2021-10-27 21:48:59** <small>** The line was in the process of shutting down when the alarm was generated. The 'Shutdown Commenced' is the time when the shutdown was initiated.</small>
Shutdown Completed	2021-10-27 22:28:38
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	2021-10-28 00:10:00
Were Procedures Followed	Yes
Post Incident Report	

Pipeline	93
Alarming Event Start Time	2021-11-03 01:06:26
MBS Alarm Received Time MBS Alarm Assessed Time	2021-11-03 01:06:27 2021-11-03 02:07:30
MBS Alarm Received Time MBS Alarm Assessed Time	2021-11-03 01:14:57 2021-11-03 02:07:32
Root Cause	LDS Error
CRO and STA Actions	LDAM - Leak Detection System (LDS) Alarm - Flowing Pipeline
LDA Actions	LD - MBS - Leak Alarm
Shutdown Commenced	2021-11-03 01:07:00
Shutdown Completed	2021-11-03 01:45:46
Justification for Resumption	After shutdown, alarm deemed invalid following LDA investigation and CCO investigation identified no leak triggers
Startup Commenced	2021-11-03 02:30:02
Were Procedures Followed	Yes
Post Incident Report	

Pipeline	93
Alarming Event Start Time	2021-11-04 12:42:47
MBS Alarm Received Time MBS Alarm Assessed Time	2021-11-04 12:42:48 2021-11-04 19:07:13
MBS Alarm Received Time MBS Alarm Assessed Time	2021-11-04 12:45:19 2021-11-04 19:07:14
MBS Alarm Received Time MBS Alarm Assessed Time	2021-11-04 13:09:18 2021-11-04 19:07:16
MBS Alarm Received Time MBS Alarm Assessed Time	2021-11-04 13:12:48 2021-11-04 19:07:17
MBS Alarm Received Time MBS Alarm Assessed Time	2021-11-04 13:27:18 2021-11-04 19:07:20
MBS Alarm Received Time MBS Alarm Assessed Time	2021-11-04 14:48:50 2021-11-04 19:07:30
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	2021-11-04 22:56:00
Were Procedures Followed	Yes
Post Incident Report	

Pipeline	93
Alarming Event Start Time	2021-11-04 19:59:10
MBS Alarm Received Time MBS Alarm Assessed Time	2021-11-04 19:59:11 2021-11-04 20:07:24
MBS Alarm Received Time MBS Alarm Assessed Time	2021-11-04 19:59:41 2021-11-04 20:07:26
MBS Alarm Received Time MBS Alarm Assessed Time	2021-11-04 20:00:41 2021-11-04 20:07:27
MBS Alarm Received Time MBS Alarm Assessed Time	2021-11-04 20:01:41 2021-11-04 20:07:29
MBS Alarm Received Time MBS Alarm Assessed Time	2021-11-04 20:02:11 2021-11-04 20:07:31
MBS Alarm Received Time MBS Alarm Assessed Time	2021-11-04 20:09:43 2021-11-04 20:12:17
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	2021-11-04 22:56:00
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): <ul style="list-style-type: none"> • 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**2021 Week 21: 1 Alarming Event in total**

Pipeline	Alarming Event Start Time	Type	Alarm Received Time	Alarm Assessed Time	Alarm Cleared Time	Shutdown Required
03	2021-05-28 07:02:12	AVB	2021-05-28 07:02:13	2021-05-28 07:05:01	2021-05-28 07:05:01	No

2021 Week 22: 2 Alarming Events in total

Pipeline	Alarming Event Start Time	Type	Alarm Received Time	Alarm Assessed Time	Alarm Cleared Time	Shutdown Required
02	2021-06-06 09:07:56	MBS	2021-06-06 09:07:56	2021-06-06 09:14:12	2021-06-06 09:14:12	No
		MBS	2021-06-06 09:07:56	2021-06-06 09:14:14	2021-06-06 09:14:14	
		MBS	2021-06-06 09:08:56	2021-06-06 09:14:16	2021-06-06 09:14:16	
06A	2021-06-05 21:34:49	MBS	2021-06-05 21:34:49	2021-06-05 21:40:01	2021-06-05 21:40:01	No
		MBS	2021-06-05 21:35:20	2021-06-05 21:39:59	2021-06-05 21:39:59	

2021 Week 23: 9 Alarming Events in total

Pipeline	Alarming Event Start Time	Type	Alarm Received Time	Alarm Assessed Time	Alarm Cleared Time	Shutdown Required
02	2021-06-10 20:42:39	MBS	2021-06-10 20:42:39	2021-06-10 20:47:53	2021-06-10 20:47:53	No
		MBS	2021-06-10 20:42:39	2021-06-10 20:47:55	2021-06-10 20:47:55	
		MBS	2021-06-10 20:42:39	2021-06-10 20:51:57	2021-06-10 20:51:57	
05	2021-06-07 18:46:38	MBS	2021-06-07 18:46:39	2021-06-07 18:53:43	2021-06-07 18:53:43	No
		MBS	2021-06-07 18:49:39	2021-06-07 18:53:44	2021-06-07 18:53:44	
05	2021-06-08 04:45:32	MBS	2021-06-08 04:45:32	2021-06-08 04:51:41	2021-06-08 04:51:41	No
		MBS	2021-06-08 04:49:32	2021-06-08 04:51:44	2021-06-08 04:51:44	
05	2021-06-08 12:15:56	MBS	2021-06-08 12:15:57	2021-06-08 12:20:52	2021-06-08 12:20:52	No
05	2021-06-10 13:36:17	MBS	2021-06-10 13:36:18	2021-06-10 13:46:05	2021-06-10 13:46:05	No
06A	2021-06-09 10:39:53	MBS	2021-06-09 10:39:54	2021-06-09 10:45:46	2021-06-09 10:45:46	No
		MBS	2021-06-09 10:42:24	2021-06-09 10:45:56	2021-06-09 10:45:56	
06A	2021-06-13 12:51:18	MBS	2021-06-13 12:51:18	2021-06-13 12:56:40	2021-06-13 12:56:40	No
61	2021-06-13 14:42:06	MBS	2021-06-13 14:42:07	2021-06-13 14:51:33	2021-06-13 14:51:33	No
		MBS	2021-06-13 14:49:36	2021-06-13 14:51:35	2021-06-13 14:51:35	
65	2021-06-09 00:00:08	MBS	2021-06-09 00:00:08	2021-06-09 00:07:18	2021-06-09 00:07:18	No
		MBS	2021-06-09 00:00:08	2021-06-09 00:07:16	2021-06-09 00:07:16	

2021 Week 24: 6 Alarming Events in total

Pipeline	Alarming Event Start Time	Type	Alarm Received Time	Alarm Assessed Time	Alarm Cleared Time	Shutdown Required
03	2021-06-15 08:01:56	AVB	2021-06-15 08:01:57	2021-06-15 08:06:16	2021-06-15 08:06:16	No
04	2021-06-15 09:01:57	AVB	2021-06-15 09:01:57	2021-06-15 09:05:34	2021-06-15 09:05:34	No
06A	2021-06-19 20:19:22	MBS	2021-06-19 20:19:23	2021-06-19 20:28:48	2021-06-19 22:13:38	Yes
		MBS	2021-06-19 20:19:23	2021-06-19 20:28:46	2021-06-19 22:13:38	
67	2021-06-15 07:52:15	MBS	2021-06-15 07:52:15	2021-06-15 07:56:55	2021-06-15 07:56:55	No
		MBS	2021-06-15 07:52:15	2021-06-15 07:56:56	2021-06-15 07:56:56	
78	2021-06-15 08:31:09	MBS	2021-06-15 08:31:10	2021-06-15 08:39:14	2021-06-15 08:39:14	No
78	2021-06-16 09:31:22	MBS	2021-06-16 09:31:23	2021-06-16 09:35:44	2021-06-16 09:35:44	No

2021 Week 25: 2 Alarming Events in total

Pipeline	Alarming Event Start Time	Type	Alarm Received Time	Alarm Assessed Time	Alarm Cleared Time	Shutdown Required
04	2021-06-22 01:04:23	AVB	2021-06-22 01:04:24	2021-06-22 01:07:18	2021-06-22 01:07:18	No
78	2021-06-22 20:10:52	MBS	2021-06-22 20:10:53	2021-06-22 20:17:47	2021-06-22 20:17:47	No

2021 Week 26: 2 Alarming Events in total

Pipeline	Alarming Event Start Time	Type	Alarm Received Time	Alarm Assessed Time	Alarm Cleared Time	Shutdown Required
10	2021-06-29 13:27:17	MBS	2021-06-29 13:27:18	2021-06-29 13:33:24	2021-06-29 13:33:24	No
14	2021-06-28 18:04:40	MBS	2021-06-28 18:04:40	2021-06-28 18:08:56	2021-06-28 18:08:56	No

2021 Week 27: 3 Alarming Events in total

Pipeline	Alarming Event Start Time	Type	Alarm Received Time	Alarm Assessed Time	Alarm Cleared Time	Shutdown Required
03	2021-07-08 10:39:44	MBS	2021-07-08 10:39:45	2021-07-08 10:43:46	2021-07-08 10:43:46	No
04	2021-07-10 13:55:37	MBS	2021-07-10 13:55:38	2021-07-10 14:01:35	2021-07-10 14:01:35	No
		MBS	2021-07-10 14:00:08	2021-07-10 14:01:36	2021-07-10 14:01:36	
65	2021-07-09 12:09:53	MBS	2021-07-09 12:09:53	2021-07-09 12:11:59	2021-07-09 12:11:59	No

2021 Week 28: 7 Alarming Events in total

Pipeline	Alarming Event Start Time	Type	Alarm Received Time	Alarm Assessed Time	Alarm Cleared Time	Shutdown Required
02	2021-07-13 15:38:27	MBS	2021-07-13 15:38:28	2021-07-13 15:44:45	2021-07-13 15:44:45	No
		MBS	2021-07-13 15:38:28	2021-07-13 15:44:43	2021-07-13 15:44:43	
		MBS	2021-07-13 15:40:27	2021-07-13 15:44:49	2021-07-13 15:44:49	
		MBS	2021-07-13 15:40:27	2021-07-13 15:44:54	2021-07-13 15:44:54	
03	2021-07-13 06:07:57	MBS	2021-07-13 06:07:58	2021-07-13 06:14:44	2021-07-13 06:14:44	No
		MBS	2021-07-13 06:07:58	2021-07-13 06:14:46	2021-07-13 06:14:46	
		MBS	2021-07-13 06:11:30	2021-07-13 06:14:42	2021-07-13 06:14:42	
04	2021-07-12 06:04:27	MBS	2021-07-12 06:04:28	2021-07-12 06:13:06	2021-07-12 06:13:06	No
		MBS	2021-07-12 06:04:58	2021-07-12 06:13:09	2021-07-12 06:13:09	
05	2021-07-13 05:47:23	MBS	2021-07-13 05:47:24	2021-07-13 05:54:28	2021-07-13 05:54:28	No
65	2021-07-15 17:10:49	MBS	2021-07-15 17:10:49	2021-07-15 17:15:56	2021-07-15 17:15:56	No
		MBS	2021-07-15 17:10:49	2021-07-15 17:15:55	2021-07-15 17:15:55	
67	2021-07-14 04:12:14	MBS	2021-07-14 04:12:14	2021-07-14 04:16:06	2021-07-14 04:16:06	No
67	2021-07-15 04:36:30	MBS	2021-07-15 04:36:30	2021-07-15 04:42:19	2021-07-15 04:42:19	No
		MBS	2021-07-15 04:36:30	2021-07-15 04:42:13	2021-07-15 04:42:13	
		MBS	2021-07-15 04:37:30	2021-07-15 04:42:12	2021-07-15 04:42:12	

2021 Week 29: 4 Alarming Events in total

Pipeline	Alarming Event Start Time	Type	Alarm Received Time	Alarm Assessed Time	Alarm Cleared Time	Shutdown Required
05	2021-07-23 13:58:36	MBS	2021-07-23 13:58:37	2021-07-23 14:29:16	2021-07-23 14:45:10	Yes
		MBS	2021-07-23 13:58:37	2021-07-23 14:29:19	2021-07-23 14:45:10	
		MBS	2021-07-23 13:59:37	2021-07-23 14:29:21	2021-07-23 14:45:10	
		MBS	2021-07-23 13:59:37	2021-07-23 14:29:23	2021-07-23 14:45:10	
		MBS	2021-07-23 14:09:37	2021-07-23 14:29:25	2021-07-23 14:45:10	
		MBS	2021-07-23 14:10:37	2021-07-23 14:29:52	2021-07-23 14:45:10	
		MBS	2021-07-23 14:18:08	2021-07-23 14:29:53	2021-07-23 14:45:10	
05	2021-07-24 12:47:51	MBS	2021-07-24 12:47:52	2021-07-24 12:57:13	2021-07-24 12:57:13	No
		MBS	2021-07-24 12:48:22	2021-07-24 12:57:11	2021-07-24 12:57:11	
67	2021-07-19 07:12:36	MBS	2021-07-19 07:12:37	2021-07-19 07:17:21	2021-07-19 07:17:21	No
		MBS	2021-07-19 07:12:37	2021-07-19 07:17:22	2021-07-19 07:17:22	
78	2021-07-21 02:59:46	MBS	2021-07-21 02:59:46	2021-07-21 03:03:54	2021-07-21 03:03:54	No
		MBS	2021-07-21 02:59:46	2021-07-21 03:03:50	2021-07-21 03:03:50	
		MBS	2021-07-21 02:59:46	2021-07-21 03:03:52	2021-07-21 03:03:52	

2021 Week 30: 3 Alarming Events in total

Pipeline	Alarming Event Start Time	Type	Alarm Received Time	Alarm Assessed Time	Alarm Cleared Time	Shutdown Required
05	2021-07-26 15:24:31	MBS	2021-07-26 15:24:32	2021-07-26 15:31:26	2021-07-26 15:31:26	No
		MBS	2021-07-26 15:25:02	2021-07-26 15:31:17	2021-07-26 15:31:17	
05	2021-07-29 04:19:01	MBS	2021-07-29 04:19:01	2021-07-29 04:26:26	2021-07-29 04:26:26	No
78	2021-07-30 15:34:22	MBS	2021-07-30 15:34:23	2021-07-30 15:38:01	2021-07-30 15:38:01	No

2021 Week 31: 9 Alarming Events in total

Pipeline	Alarming Event Start Time	Type	Alarm Received Time	Alarm Assessed Time	Alarm Cleared Time	Shutdown Required
02	2021-08-04 22:13:00	MBS	2021-08-04 22:13:01	2021-08-04 22:18:22	2021-08-04 22:18:22	No
		MBS	2021-08-04 22:13:30	2021-08-04 22:18:20	2021-08-04 22:18:20	
03	2021-08-04 19:06:27	MBS	2021-08-04 19:06:28	2021-08-04 19:53:16	2021-08-04 20:20:00	Yes
		MBS	2021-08-04 19:07:58	2021-08-04 19:53:13	2021-08-04 20:20:00	
		MBS	2021-08-04 19:15:59	2021-08-04 19:53:08	2021-08-04 20:20:00	
03	2021-08-05 16:54:45	AVB	2021-08-05 16:54:45	2021-08-05 16:56:35	2021-08-05 16:56:35	No
05	2021-08-04 06:01:46	AVB	2021-08-04 06:01:47	2021-08-04 06:06:56	2021-08-04 06:06:56	No
		AVB	2021-08-04 17:01:41	2021-08-04 17:06:45	2021-08-04 17:06:45	
05	2021-08-04 21:33:49	MBS	2021-08-04 21:33:49	2021-08-04 21:40:26	2021-08-04 21:40:26	No
		MBS	2021-08-04 21:33:49	2021-08-04 21:40:23	2021-08-04 21:40:23	
05	2021-08-05 17:55:36	MBS	2021-08-05 17:55:37	2021-08-05 18:03:34	2021-08-05 18:03:34	No
		MBS	2021-08-05 17:55:37	2021-08-05 18:03:37	2021-08-05 18:03:37	
14	2021-08-03 16:27:22	MBS	2021-08-03 16:27:23	2021-08-03 16:34:11	2021-08-03 16:34:11	No
		MBS	2021-08-03 16:27:23	2021-08-03 16:34:09	2021-08-03 16:34:09	
65	2021-08-04 19:43:42	MBS	2021-08-04 19:43:43	2021-08-04 20:12:47	2021-08-04 20:20:00	Yes
		MBS	2021-08-04 19:44:42	2021-08-04 20:12:48	2021-08-04 20:20:00	
65	2021-08-06 16:33:17	MBS	2021-08-06 16:33:17	2021-08-06 16:41:06	2021-08-06 16:41:06	No
		MBS	2021-08-06 16:33:17	2021-08-06 16:41:03	2021-08-06 16:41:03	

2021 Week 32: 7 Alarming Events in total

Pipeline	Alarming Event Start Time	Type	Alarm Received Time	Alarm Assessed Time	Alarm Cleared Time	Shutdown Required
02	2021-08-09 18:14:50	MBS	2021-08-09 18:14:50	2021-08-09 18:23:53	2021-08-09 18:23:53	No
03	2021-08-12 09:19:55	MBS	2021-08-12 09:19:55	2021-08-12 09:26:07	2021-08-12 09:26:07	No
05	2021-08-10 16:45:59	MBS	2021-08-10 16:45:59	2021-08-10 16:52:51	2021-08-10 16:52:51	No
		MBS	2021-08-10 17:09:30	2021-08-10 17:11:15	2021-08-10 17:11:15	
10	2021-08-14 14:09:51	MBS	2021-08-14 14:09:52	2021-08-14 14:14:57	2021-08-14 14:14:57	No
		MBS	2021-08-14 14:22:52	2021-08-14 14:27:01	2021-08-14 14:27:01	
		MBS	2021-08-14 14:24:22	2021-08-14 14:26:58	2021-08-14 14:26:58	
61	2021-08-09 07:04:20	MBS	2021-08-09 07:04:21	2021-08-09 07:08:55	2021-08-09 07:08:55	No
61	2021-08-11 12:06:11	MBS	2021-08-11 12:06:11	2021-08-11 12:12:19	2021-08-11 12:12:19	No
		MBS	2021-08-11 12:06:41	2021-08-11 12:12:20	2021-08-11 12:12:20	
65	2021-08-11 08:58:02	MBS	2021-08-11 08:58:03	2021-08-11 09:00:24	2021-08-11 09:00:24	No

2021 Week 33: 5 Alarming Events in total

Pipeline	Alarming Event Start Time	Type	Alarm Received Time	Alarm Assessed Time	Alarm Cleared Time	Shutdown Required
03	2021-08-20 02:14:25	MBS	2021-08-20 02:14:25	2021-08-20 02:22:23	2021-08-20 03:08:55	Yes
04	2021-08-19 07:16:34	MBS	2021-08-19 07:16:34	2021-08-19 07:24:41	2021-08-19 07:24:41	No
		MBS	2021-08-19 07:16:34	2021-08-19 07:24:43	2021-08-19 07:24:43	
06A	2021-08-19 14:29:01	MBS	2021-08-19 14:29:02	2021-08-19 14:32:53	2021-08-19 14:32:53	No
61	2021-08-17 14:36:01	MBS	2021-08-17 14:36:01	2021-08-17 14:40:28	2021-08-17 14:47:07	Yes
		MBS	2021-08-17 14:38:31	2021-08-17 14:40:36	2021-08-17 14:47:07	
		MBS	2021-08-17 14:39:02	2021-08-17 14:40:40	2021-08-17 14:47:07	
78	2021-08-20 22:17:58	MBS	2021-08-20 22:17:58	2021-08-20 22:26:01	2021-08-20 22:26:01	No
		MBS	2021-08-20 22:17:58	2021-08-20 22:26:02	2021-08-20 22:26:02	

2021 Week 34: 3 Alarming Events in total

Pipeline	Alarming Event Start Time	Type	Alarm Received Time	Alarm Assessed Time	Alarm Cleared Time	Shutdown Required
03	2021-08-26 06:52:55	MBS	2021-08-26 06:52:55	2021-08-26 06:55:12	2021-08-26 06:55:12	No
		MBS	2021-08-26 06:52:55	2021-08-26 06:55:10	2021-08-26 06:55:10	
04	2021-08-27 15:56:17	MBS	2021-08-27 15:56:17	2021-08-27 16:02:21	2021-08-27 16:02:21	No
05	2021-08-26 04:17:14	MBS	2021-08-26 04:17:14	2021-08-26 04:20:16	2021-08-26 04:20:16	No

2021 Week 35: 5 Alarming Events in total

Pipeline	Alarming Event Start Time	Type	Alarm Received Time	Alarm Assessed Time	Alarm Cleared Time	Shutdown Required
03	2021-09-03 08:59:10	MBS	2021-09-03 08:59:10	2021-09-03 09:08:25	2021-09-03 09:36:14	Yes
		MBS	2021-09-03 08:59:10	2021-09-03 09:08:27	2021-09-03 09:36:14	
		MBS	2021-09-03 08:59:10	2021-09-03 09:08:21	2021-09-03 09:36:14	
		MBS	2021-09-03 09:00:39	2021-09-03 09:08:20	2021-09-03 09:36:14	
04	2021-08-31 06:25:40	MBS	2021-08-31 06:25:41	2021-08-31 06:31:54	2021-08-31 06:31:54	No
		MBS	2021-08-31 06:25:41	2021-08-31 06:31:52	2021-08-31 06:31:52	
		MBS	2021-08-31 07:04:13	2021-08-31 07:06:52	2021-08-31 07:06:52	
10	2021-09-04 07:04:34	MBS	2021-09-04 07:04:34	2021-09-04 08:10:10	2021-09-04 08:34:43	Yes
14	2021-09-05 12:28:32	MBS	2021-09-05 12:28:32	2021-09-05 12:35:16	2021-09-05 12:35:16	No
61	2021-08-31 11:21:13	MBS	2021-08-31 11:21:14	2021-08-31 11:25:27	2021-08-31 11:25:27	No
		MBS	2021-08-31 11:21:14	2021-08-31 11:25:24	2021-08-31 11:25:24	
		MBS	2021-08-31 11:25:44	2021-08-31 11:27:14	2021-08-31 11:27:14	

2021 Week 36: 1 Alarming Event in total

Pipeline	Alarming Event Start Time	Type	Alarm Received Time	Alarm Assessed Time	Alarm Cleared Time	Shutdown Required
02	2021-09-09 18:24:57	MBS	2021-09-09 18:24:58	2021-09-09 18:28:20	2021-09-09 18:28:20	No
		MBS	2021-09-09 18:26:27	2021-09-09 18:28:21	2021-09-09 18:28:21	

2021 Week 37: 5 Alarming Events in total

Pipeline	Alarming Event Start Time	Type	Alarm Received Time	Alarm Assessed Time	Alarm Cleared Time	Shutdown Required
05	2021-09-13 14:30:11	MBS	2021-09-13 14:30:11	2021-09-13 14:36:26	2021-09-13 14:36:26	No
		MBS	2021-09-13 15:14:12	2021-09-13 15:17:11	2021-09-13 15:17:11	
06A	2021-09-14 09:32:30	MBS	2021-09-14 09:32:31	2021-09-14 09:44:35	2021-09-14 09:56:28	Yes
06A	2021-09-14 23:01:28	AVB	2021-09-14 23:01:29	2021-09-14 23:04:22	2021-09-14 23:04:22	No
06A	2021-09-15 06:22:37	MBS	2021-09-15 06:22:38	2021-09-15 06:27:27	2021-09-15 06:27:27	No
06A	2021-09-15 16:22:06	AVB	2021-09-15 16:22:07	2021-09-15 16:23:07	2021-09-15 16:23:07	No

2021 Week 38: 6 Alarming Events in total

Pipeline	Alarming Event Start Time	Type	Alarm Received Time	Alarm Assessed Time	Alarm Cleared Time	Shutdown Required
14	2021-09-23 19:57:54	MBS	2021-09-23 19:58:03	2021-09-23 20:02:52	2021-09-23 20:02:52	No
78	2021-09-20 11:01:59	MBS	2021-09-20 11:02:00	2021-09-20 11:07:35	2021-09-20 11:07:35	No
		MBS	2021-09-20 11:02:30	2021-09-20 11:07:37	2021-09-20 11:07:37	
		MBS	2021-09-20 11:05:00	2021-09-20 11:07:38	2021-09-20 11:07:38	
78	2021-09-22 06:54:03	MBS	2021-09-22 06:54:03	2021-09-22 07:01:29	2021-09-22 07:01:29	No
		MBS	2021-09-22 06:57:03	2021-09-22 07:01:31	2021-09-22 07:01:31	
		MBS	2021-09-22 06:59:03	2021-09-22 07:01:33	2021-09-22 07:01:33	
		MBS	2021-09-22 07:02:33	2021-09-22 07:06:45	2021-09-22 07:06:45	
78	2021-09-23 12:45:39	MBS	2021-09-23 12:45:40	2021-09-23 12:48:18	2021-09-23 12:48:18	No
		MBS	2021-09-23 12:45:40	2021-09-23 12:48:16	2021-09-23 12:48:16	
78	2021-09-23 20:59:53	MBS	2021-09-23 20:59:53	2021-09-23 21:02:59	2021-09-23 21:19:49	Yes
78	2021-09-26 04:16:09	MBS	2021-09-26 04:16:09	2021-09-26 04:23:06	2021-09-26 04:23:06	No

2021 Week 39: 7 Alarming Events in total

Pipeline	Alarming Event Start Time	Type	Alarm Received Time	Alarm Assessed Time	Alarm Cleared Time	Shutdown Required
03	2021-10-01 10:20:09	MBS	2021-10-01 10:20:09	2021-10-01 10:40:44	2021-10-01 10:47:11	Yes
		MBS	2021-10-01 10:20:40	2021-10-01 10:40:42	2021-10-01 10:47:11	
		MBS	2021-10-01 10:32:40	2021-10-01 10:40:45	2021-10-01 10:47:11	
		MBS	2021-10-01 10:32:40	2021-10-01 10:40:47	2021-10-01 10:47:11	
03	2021-10-02 12:09:08	MBS	2021-10-02 12:09:08	2021-10-02 12:16:52	2021-10-02 12:16:52	No
		MBS	2021-10-02 12:12:09	2021-10-02 12:16:54	2021-10-02 12:16:54	
		MBS	2021-10-02 12:12:09	2021-10-02 12:16:56	2021-10-02 12:16:56	
		MBS	2021-10-02 12:23:39	2021-10-02 12:32:42	2021-10-02 12:32:42	
03	2021-10-02 21:08:47	MBS	2021-10-02 21:08:48	2021-10-02 21:13:16	2021-10-02 21:13:16	No
		MBS	2021-10-02 21:23:49	2021-10-02 21:26:43	2021-10-02 21:26:43	
03	2021-10-03 00:04:20	MBS	2021-10-03 00:04:21	2021-10-03 00:06:52	2021-10-03 00:06:52	No
06A	2021-09-30 10:01:38	AVB	2021-09-30 10:01:39	2021-09-30 10:05:52	2021-09-30 10:05:52	No
		AVB	2021-09-30 10:01:39	2021-09-30 10:05:50	2021-09-30 10:05:50	
14	2021-09-28 10:45:20	MBS	2021-09-28 10:45:20	2021-09-28 10:53:22	2021-09-28 10:53:22	No
14	2021-09-28 20:45:41	MBS	2021-09-28 20:45:42	2021-09-28 20:50:30	2021-09-28 20:50:30	No
		MBS	2021-09-28 20:45:42	2021-09-28 20:50:33	2021-09-28 20:50:33	
		MBS	2021-09-28 20:46:42	2021-09-28 20:50:35	2021-09-28 20:50:35	

2021 Week 40: 9 Alarming Events in total

Pipeline	Alarming Event Start Time	Type	Alarm Received Time	Alarm Assessed Time	Alarm Cleared Time	Shutdown Required
05	2021-10-07 07:36:36	MBS	2021-10-07 07:36:36	2021-10-07 07:40:12	2021-10-07 07:40:12	No
06A	2021-10-05 06:26:31	AVB	2021-10-05 06:26:32	2021-10-05 06:28:25	2021-10-05 06:28:25	No
		AVB	2021-10-05 06:26:32	2021-10-05 06:28:22	2021-10-05 06:28:22	
		AVB	2021-10-05 06:26:32	2021-10-05 06:28:24	2021-10-05 06:28:24	
06A	2021-10-05 11:36:42	AVB	2021-10-05 11:36:42	2021-10-05 11:38:52	2021-10-05 11:38:52	No
		AVB	2021-10-05 11:36:42	2021-10-05 11:38:50	2021-10-05 11:38:50	
		AVB	2021-10-05 11:36:42	2021-10-05 11:38:54	2021-10-05 11:38:54	
06A	2021-10-06 12:33:33	AVB	2021-10-06 12:33:34	2021-10-06 12:37:38	2021-10-06 12:37:38	No
		AVB	2021-10-06 12:33:34	2021-10-06 12:37:32	2021-10-06 12:37:32	
		AVB	2021-10-06 12:33:34	2021-10-06 12:37:35	2021-10-06 12:37:35	
61	2021-10-04 15:21:48	MBS	2021-10-04 15:21:49	2021-10-04 15:27:39	2021-10-04 16:18:17	Yes
		MBS	2021-10-04 15:23:49	2021-10-04 15:27:40	2021-10-04 16:18:17	
		MBS	2021-10-04 15:25:18	2021-10-04 15:27:36	2021-10-04 16:18:17	
61	2021-10-04 18:58:25	MBS	2021-10-04 18:58:26	2021-10-04 19:01:59	2021-10-04 19:08:50	Yes
61	2021-10-04 19:41:56	MBS	2021-10-04 19:41:56	2021-10-04 19:48:56	2021-10-04 19:48:56	No
		MBS	2021-10-04 19:43:26	2021-10-04 19:48:54	2021-10-04 19:48:54	
61	2021-10-06 13:36:59	MBS	2021-10-06 13:37:00	2021-10-06 13:37:58	2021-10-06 13:37:58	No
		AVB	2021-10-06 13:42:31	2021-10-06 13:44:42	2021-10-06 13:44:42	
61	2021-10-09 08:32:29	MBS	2021-10-09 08:32:29	2021-10-09 08:36:07	2021-10-09 08:36:07	No

2021 Week 41: 6 Alarming Events in total

Pipeline	Alarming Event Start Time	Type	Alarm Received Time	Alarm Assessed Time	Alarm Cleared Time	Shutdown Required
14	2021-10-12 22:27:38	MBS	2021-10-12 22:27:39	2021-10-12 22:31:22	2021-10-12 22:31:22	No
65	2021-10-17 04:26:22	MBS	2021-10-17 04:26:22	2021-10-17 04:30:35	2021-10-17 04:30:35	No
		MBS	2021-10-17 04:26:53	2021-10-17 04:30:36	2021-10-17 04:30:36	
67	2021-10-14 12:59:33	MBS	2021-10-14 12:59:34	2021-10-14 13:05:07	2021-10-14 13:05:07	No
		MBS	2021-10-14 13:00:34	2021-10-14 13:05:00	2021-10-14 13:05:00	
67	2021-10-14 15:53:43	MBS	2021-10-14 15:53:44	2021-10-14 15:58:01	2021-10-14 15:58:01	No
		MBS	2021-10-14 15:53:44	2021-10-14 15:57:56	2021-10-14 15:57:56	
		MBS	2021-10-14 15:53:44	2021-10-14 15:57:58	2021-10-14 15:57:58	
78	2021-10-12 05:39:29	MBS	2021-10-12 05:39:29	2021-10-12 05:44:34	2021-10-12 05:44:34	No
93	2021-10-15 18:21:18	MBS	2021-10-15 18:21:19	2021-10-15 18:22:50	2021-10-15 18:22:50	No
		AVB	2021-10-15 18:25:19	2021-10-15 18:25:45	2021-10-15 18:25:45	

2021 Week 42: 10 Alarming Events in total

Pipeline	Alarming Event Start Time	Type	Alarm Received Time	Alarm Assessed Time	Alarm Cleared Time	Shutdown Required
01	2021-10-21 13:09:58	MBS	2021-10-21 13:09:59	2021-10-21 13:17:11	2021-10-21 13:17:11	No
06A	2021-10-23 08:30:15	MBS	2021-10-23 08:30:16	2021-10-23 08:36:59	2021-10-23 08:36:59	No
		MBS	2021-10-23 08:33:46	2021-10-23 08:37:37	2021-10-23 08:37:37	
14	2021-10-21 12:01:55	MBS	2021-10-21 12:01:56	2021-10-21 12:08:36	2021-10-21 12:08:36	No
61	2021-10-24 15:21:05	AVB	2021-10-24 15:21:05	2021-10-24 15:23:48	2021-10-24 15:23:48	No
93	2021-10-21 13:57:19	MBS	2021-10-21 13:57:19	2021-10-21 13:59:08	2021-10-21 13:59:08	No
		MBS	2021-10-21 13:57:19	2021-10-21 13:59:05	2021-10-21 13:59:05	
93	2021-10-23 16:58:46	MBS	2021-10-23 16:58:47	2021-10-23 17:06:09	2021-10-23 18:36:31	Yes
		MBS	2021-10-23 17:00:47	2021-10-23 17:06:11	2021-10-23 18:36:31	
		MBS	2021-10-23 17:02:47	2021-10-23 17:06:12	2021-10-23 18:36:31	
		MBS	2021-10-23 17:04:18	2021-10-23 17:06:14	2021-10-23 18:36:31	
		MBS	2021-10-23 18:41:19	2021-10-23 18:47:32	2021-10-23 18:36:31	
93	2021-10-23 19:37:54	MBS	2021-10-23 19:37:54	2021-10-23 20:21:17	2021-10-23 20:35:00	Yes
		MBS	2021-10-23 19:41:54	2021-10-23 20:21:19	2021-10-23 20:35:00	
93	2021-10-23 19:47:53	MBS	2021-10-23 19:47:54	2021-10-23 20:21:20	2021-10-23 20:35:00	Yes
		MBS	2021-10-23 19:50:25	2021-10-23 20:21:21	2021-10-23 20:35:00	
		MBS	2021-10-23 19:51:54	2021-10-23 20:21:22	2021-10-23 20:35:00	
		MBS	2021-10-23 19:51:54	2021-10-23 20:21:25	2021-10-23 20:35:00	
		MBS	2021-10-23 19:51:54	2021-10-23 20:21:26	2021-10-23 20:35:00	
		MBS	2021-10-23 19:51:54	2021-10-23 20:21:28	2021-10-23 20:35:00	
		MBS	2021-10-23 19:51:54	2021-10-23 20:21:24	2021-10-23 20:35:00	
		MBS	2021-10-23 19:52:54	2021-10-23 20:21:29	2021-10-23 20:35:00	
93	2021-10-23 20:46:24	AVB	2021-10-23 20:46:25	2021-10-23 20:53:53	2021-10-23 20:53:53	No
93	2021-10-24 17:01:29	AVB	2021-10-24 17:01:30	2021-10-24 17:09:36	2021-10-24 17:09:36	No
		AVB	2021-10-24 17:01:30	2021-10-24 17:09:38	2021-10-24 17:09:38	

2021 Week 43: 14 Alarming Events in total

Pipeline	Alarming Event Start Time	Type	Alarm Received Time	Alarm Assessed Time	Alarm Cleared Time	Shutdown Required
01	2021-10-28 23:23:51	MBS	2021-10-28 23:23:53	2021-10-28 23:29:05	2021-10-29 02:12:00	Yes
01	2021-10-28 23:24:51	MBS	2021-10-28 23:24:52	2021-10-28 23:31:07	2021-10-28 23:31:07	No
01	2021-10-29 08:08:38	MBS	2021-10-29 08:08:39	2021-10-29 08:13:40	2021-10-29 08:13:40	No
		MBS	2021-10-29 08:08:39	2021-10-29 08:13:38	2021-10-29 08:13:38	
		MBS	2021-10-29 08:09:10	2021-10-29 08:13:36	2021-10-29 08:13:36	
		MBS	2021-10-29 08:09:10	2021-10-29 08:13:30	2021-10-29 08:13:30	
		MBS	2021-10-29 08:09:10	2021-10-29 08:13:33	2021-10-29 08:13:33	
02	2021-10-31 08:42:21	MBS	2021-10-31 08:42:21	2021-10-31 08:50:41	2021-10-31 08:50:41	No
03	2021-10-30 11:46:57	MBS	2021-10-30 11:46:57	2021-10-30 11:53:10	2021-10-30 11:53:10	No
		MBS	2021-10-30 11:46:57	2021-10-30 11:53:14	2021-10-30 11:53:14	
14	2021-10-31 00:11:34	MBS	2021-10-31 00:11:35	2021-10-31 00:16:44	2021-10-31 00:16:44	No
65	2021-10-31 06:49:53	MBS	2021-10-31 06:49:54	2021-10-31 06:55:50	2021-10-31 06:55:50	No
		MBS	2021-10-31 06:49:54	2021-10-31 06:55:48	2021-10-31 06:55:48	
67	2021-10-27 09:38:01	MBS	2021-10-27 09:38:02	2021-10-27 09:43:54	2021-10-27 09:43:54	No
78	2021-10-26 06:06:39	MBS	2021-10-26 06:06:40	2021-10-26 06:10:06	2021-10-26 06:10:06	No
78	2021-10-27 06:14:15	MBS	2021-10-27 06:14:16	2021-10-27 06:20:07	2021-10-27 06:20:07	No
93	2021-10-26 16:28:32	MBS	2021-10-26 16:28:33	2021-10-26 16:40:36	2021-10-26 18:11:00	Yes
		MBS	2021-10-26 16:28:33	2021-10-26 16:40:33	2021-10-26 18:11:00	
93	2021-10-26 21:10:06	AVB	2021-10-26 21:10:07	2021-10-26 21:16:13	2021-10-26 21:16:13	No
		AVB	2021-10-26 21:10:07	2021-10-26 21:16:10	2021-10-26 21:16:10	
		AVB	2021-10-26 21:10:07	2021-10-26 21:16:08	2021-10-26 21:16:08	
93	2021-10-26 23:26:43	MBS	2021-10-26 23:26:43	2021-10-26 23:31:00	2021-10-26 23:31:00	No
93	2021-10-27 22:13:19	MBS	2021-10-27 22:13:20	2021-10-27 22:21:09	2021-10-27 23:37:46	Yes

2021 Week 44: 29 Alarming Events in total

Pipeline	Alarming Event Start Time	Type	Alarm Received Time	Alarm Assessed Time	Alarm Cleared Time	Shutdown Required
01	2021-11-06 06:33:40	MBS	2021-11-06 06:33:41	2021-11-06 07:22:41	2021-11-06 07:23:54	Yes
		MBS	2021-11-06 06:36:41	2021-11-06 07:22:39	2021-11-06 07:23:54	
02	2021-11-04 10:45:41	MBS	2021-11-04 10:45:41	2021-11-04 10:48:06	2021-11-04 11:00:00	Yes
02	2021-11-04 11:22:12	MBS	2021-11-04 11:22:12	2021-11-04 11:29:09	2021-11-04 11:29:09	No
03	2021-11-01 07:38:28	MBS	2021-11-01 07:38:28	2021-11-01 07:43:16	2021-11-01 07:43:16	No
		MBS	2021-11-01 07:38:28	2021-11-01 07:43:18	2021-11-01 07:43:18	
		MBS	2021-11-01 07:41:58	2021-11-01 07:43:19	2021-11-01 07:43:19	
14	2021-11-01 07:37:13	MBS	2021-11-01 07:37:13	2021-11-01 07:42:24	2021-11-01 07:42:24	No
61	2021-11-06 10:03:10	MBS	2021-11-06 10:03:10	2021-11-06 10:06:43	2021-11-06 10:14:22	Yes
		MBS	2021-11-06 10:03:10	2021-11-06 10:05:58	2021-11-06 10:14:22	
		MBS	2021-11-06 10:03:10	2021-11-06 10:06:02	2021-11-06 10:14:22	
65	2021-11-04 18:51:24	MBS	2021-11-04 18:51:25	2021-11-04 18:55:39	2021-11-04 18:55:39	No
		MBS	2021-11-04 18:51:25	2021-11-04 18:55:37	2021-11-04 18:55:37	
78	2021-11-07 09:36:35	MBS	2021-11-07 09:36:36	2021-11-07 09:43:58	2021-11-07 09:43:58	No
		MBS	2021-11-07 09:42:06	2021-11-07 09:44:23	2021-11-07 09:44:23	
93	2021-11-02 19:39:16	MBS	2021-11-02 19:39:17	2021-11-02 19:42:39	2021-11-02 19:42:39	No
		MBS	2021-11-02 19:40:46	2021-11-02 19:42:42	2021-11-02 19:42:42	
93	2021-11-02 20:03:46	MBS	2021-11-02 20:03:47	2021-11-02 20:09:18	2021-11-02 20:09:18	No
		MBS	2021-11-02 20:03:47	2021-11-02 20:09:15	2021-11-02 20:09:15	
93	2021-11-03 01:06:26	MBS	2021-11-03 01:06:27	2021-11-03 02:07:30	2021-11-03 02:08:46	Yes
		MBS	2021-11-03 01:14:57	2021-11-03 02:07:32	2021-11-03 02:08:46	

Pipeline	Alarming Event Start Time	Type	Alarm Received Time	Alarm Assessed Time	Alarm Cleared Time	Shutdown Required
93	2021-11-03 04:10:32	MBS	2021-11-03 04:10:32	2021-11-03 04:13:56	2021-11-03 04:13:56	No
		MBS	2021-11-03 04:11:32	2021-11-03 04:14:09	2021-11-03 04:14:09	
		MBS	2021-11-03 04:11:32	2021-11-03 04:14:06	2021-11-03 04:14:06	
		MBS	2021-11-03 04:14:02	2021-11-03 04:15:48	2021-11-03 04:15:48	
		MBS	2021-11-03 04:20:32	2021-11-03 04:23:41	2021-11-03 04:23:41	
93	2021-11-03 04:59:04	MBS	2021-11-03 04:59:04	2021-11-03 05:01:37	2021-11-03 05:01:37	No
		MBS	2021-11-03 04:59:04	2021-11-03 05:01:40	2021-11-03 05:01:40	
		MBS	2021-11-03 04:59:04	2021-11-03 05:01:39	2021-11-03 05:01:39	
93	2021-11-03 08:21:12	MBS	2021-11-03 08:21:13	2021-11-03 08:28:17	2021-11-03 08:28:17	No
93	2021-11-03 09:15:13	MBS	2021-11-03 09:15:14	2021-11-03 09:23:10	2021-11-03 09:23:10	No
93	2021-11-03 15:38:59	MBS	2021-11-03 15:38:59	2021-11-03 15:44:55	2021-11-03 15:44:55	No
93	2021-11-03 16:28:01	MBS	2021-11-03 16:28:01	2021-11-03 16:35:36	2021-11-03 16:35:36	No
		MBS	2021-11-03 16:28:31	2021-11-03 16:35:34	2021-11-03 16:35:34	
93	2021-11-03 17:52:32	MBS	2021-11-03 17:52:33	2021-11-03 18:01:12	2021-11-03 18:01:12	No
		MBS	2021-11-03 17:52:33	2021-11-03 18:01:14	2021-11-03 18:01:14	
		MBS	2021-11-03 18:00:05	2021-11-03 18:03:25	2021-11-03 18:03:25	
		MBS	2021-11-03 18:00:34	2021-11-03 18:03:23	2021-11-03 18:03:23	
93	2021-11-03 18:01:34	AVB	2021-11-03 18:01:34	2021-11-03 18:04:34	2021-11-03 18:04:34	No
93	2021-11-03 23:50:19	MBS	2021-11-03 23:50:19	2021-11-03 23:56:36	2021-11-03 23:56:36	No
93	2021-11-04 05:45:31	MBS	2021-11-04 05:45:32	2021-11-04 05:52:12	2021-11-04 05:52:12	No
93	2021-11-04 06:04:01	MBS	2021-11-04 06:04:02	2021-11-04 06:10:57	2021-11-04 06:10:57	No

Pipeline	Alarming Event Start Time	Type	Alarm Received Time	Alarm Assessed Time	Alarm Cleared Time	Shutdown Required
93	2021-11-04 12:42:47	MBS	2021-11-04 12:42:48	2021-11-04 19:07:13	2021-11-04 19:49:00	Yes
		MBS	2021-11-04 12:45:19	2021-11-04 19:07:14	2021-11-04 19:49:00	
		MBS	2021-11-04 13:09:18	2021-11-04 19:07:16	2021-11-04 19:49:00	
		MBS	2021-11-04 13:12:48	2021-11-04 19:07:17	2021-11-04 19:49:00	
		MBS	2021-11-04 13:27:18	2021-11-04 19:07:20	2021-11-04 19:49:00	
		MBS	2021-11-04 14:48:50	2021-11-04 19:07:30	2021-11-04 19:49:00	
93	2021-11-04 19:00:28	MBS	2021-11-04 19:00:29	2021-11-04 19:07:35	2021-11-04 19:07:35	No
93	2021-11-04 19:59:10	MBS	2021-11-04 19:59:11	2021-11-04 20:07:24	2021-11-04 21:19:00	Yes
		MBS	2021-11-04 19:59:41	2021-11-04 20:07:26	2021-11-04 21:19:00	
		MBS	2021-11-04 20:00:41	2021-11-04 20:07:27	2021-11-04 21:19:00	
		MBS	2021-11-04 20:01:41	2021-11-04 20:07:29	2021-11-04 21:19:00	
		MBS	2021-11-04 20:02:11	2021-11-04 20:07:31	2021-11-04 21:19:00	
		MBS	2021-11-04 20:09:43	2021-11-04 20:12:17	2021-11-04 21:19:00	
93	2021-11-04 22:51:21	MBS	2021-11-04 22:51:22	2021-11-04 22:54:48	2021-11-04 22:54:48	No
		MBS	2021-11-04 23:24:24	2021-11-04 23:29:37	2021-11-04 23:29:37	
		MBS	2021-11-04 23:29:54	2021-11-04 23:36:00	2021-11-04 23:36:00	
		MBS	2021-11-04 23:31:23	2021-11-04 23:36:01	2021-11-04 23:36:01	
93	2021-11-05 01:01:28	AVB	2021-11-05 01:01:28	2021-11-05 01:08:11	2021-11-05 01:08:11	No
93	2021-11-05 07:46:19	MBS	2021-11-05 07:46:20	2021-11-05 07:51:29	2021-11-05 07:51:29	No
93	2021-11-06 10:58:29	MBS	2021-11-06 10:58:30	2021-11-06 11:01:59	2021-11-06 11:01:59	No

2021 Week 45: 8 Alarming Events in total

Pipeline	Alarming Event Start Time	Type	Alarm Received Time	Alarm Assessed Time	Alarm Cleared Time	Shutdown Required
04	2021-11-13 07:09:21	MBS	2021-11-13 07:09:23	2021-11-13 07:15:11	2021-11-13 07:15:11	No
05	2021-11-11 08:46:11	MBS	2021-11-11 08:46:12	2021-11-11 08:50:18	2021-11-11 08:50:18	No
		MBS	2021-11-11 08:46:42	2021-11-11 08:50:12	2021-11-11 08:50:12	
		MBS	2021-11-11 08:46:42	2021-11-11 08:50:14	2021-11-11 08:50:14	
06A	2021-11-08 08:04:31	MBS	2021-11-08 08:04:31	2021-11-08 08:09:30	2021-11-08 08:09:30	No
		MBS	2021-11-08 08:04:31	2021-11-08 08:09:27	2021-11-08 08:09:27	
10	2021-11-09 22:52:50	MBS	2021-11-09 22:52:50	2021-11-10 11:14:45	2021-11-10 11:37:00	Yes
10	2021-11-13 22:48:42	AVB	2021-11-13 22:48:43	2021-11-13 22:54:11	2021-11-13 22:54:11	No
65	2021-11-13 01:13:20	MBS	2021-11-13 01:13:21	2021-11-13 01:16:18	2021-11-13 01:16:18	No
93	2021-11-08 10:55:46	MBS	2021-11-08 10:55:47	2021-11-08 10:59:55	2021-11-08 10:59:55	No
93	2021-11-09 09:39:54	MBS	2021-11-09 09:39:55	2021-11-09 09:44:34	2021-11-09 09:44:34	No
		MBS	2021-11-09 09:39:55	2021-11-09 09:44:30	2021-11-09 09:44:30	
		MBS	2021-11-09 09:39:55	2021-11-09 09:44:32	2021-11-09 09:44:32	

2021 Week 46: 11 Alarming Events in total

Pipeline	Alarming Event Start Time	Type	Alarm Received Time	Alarm Assessed Time	Alarm Cleared Time	Shutdown Required
01	2021-11-18 10:24:49	MBS	2021-11-18 10:24:49	2021-11-18 10:29:04	2021-11-18 10:29:04	No
02	2021-11-15 12:54:44	MBS	2021-11-15 12:54:45	2021-11-15 13:02:40	2021-11-15 13:02:40	No
04	2021-11-17 16:44:54	MBS MBS	2021-11-17 16:44:55 2021-11-17 16:45:25	2021-11-17 16:53:03 2021-11-17 16:53:05	2021-11-17 16:53:03 2021-11-17 16:53:05	No
06A	2021-11-17 08:41:32	MBS MBS MBS	2021-11-17 08:41:32 2021-11-17 08:41:32 2021-11-17 08:41:32	2021-11-17 08:44:51 2021-11-17 08:44:50 2021-11-17 08:44:54	2021-11-17 08:44:51 2021-11-17 08:44:50 2021-11-17 08:44:54	No
93	2021-11-15 15:25:26	MBS MBS	2021-11-15 15:25:26 2021-11-15 15:30:27	2021-11-15 15:33:30 2021-11-15 15:33:44	2021-11-15 15:33:30 2021-11-15 15:33:44	No
93	2021-11-16 03:51:46	MBS	2021-11-16 03:51:46	2021-11-16 03:59:09	2021-11-16 03:59:09	No
93	2021-11-16 05:07:17	MBS	2021-11-16 05:07:18	2021-11-16 05:14:11	2021-11-16 05:14:11	No
93	2021-11-17 04:01:47	AVB	2021-11-17 04:01:47	2021-11-17 04:06:39	2021-11-17 04:06:39	No
93	2021-11-20 00:29:39	MBS MBS MBS	2021-11-20 00:29:40 2021-11-20 00:29:40 2021-11-20 00:30:39	2021-11-20 00:37:24 2021-11-20 00:37:26 2021-11-20 00:37:27	2021-11-20 00:37:24 2021-11-20 00:37:26 2021-11-20 00:37:27	No
93	2021-11-20 01:01:38	AVB	2021-11-20 01:01:39	2021-11-20 01:04:04	2021-11-20 01:04:04	No
93	2021-11-20 01:42:40	MBS MBS MBS	2021-11-20 01:42:41 2021-11-20 01:44:11 2021-11-20 01:45:11	2021-11-20 01:47:49 2021-11-20 01:47:51 2021-11-20 01:47:53	2021-11-20 01:47:49 2021-11-20 01:47:51 2021-11-20 01:47:53	No

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
Instrumentation Failure	10 days	Communication Interruption	Restored Communications
Instrumentation Failure	10 days	Power Outage	Restored Power
Scheduled Maintenance or Repairs	4 days	Field Maintenance	Finished the Maintenance


Table 4c: Instrumentation Outage Report

Pipeline	Station	Outage Start	Outage End	Root Cause
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None to report.

Appendix 3 – PHMSA Reports from Lakehead Discharges [146] and Update on Discharges from Lakehead System Pipelines [147]

Reporting Period: May 23, 2021 to November 22, 2021

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: 1/31/2023	
 Pipeline and Hazardous Materials Safety Administration	Original Report Date:	09/01/2021	
	No.	20210247 - 36108 <small>(DOT Use Only)</small>	
ACCIDENT REPORT - HAZARDOUS LIQUID PIPELINE SYSTEMS			
A federal agency may not conduct or sponsor, and a person is not required to respond to, nor shall a person be subject to a penalty for failure to comply with a collection of information subject to the requirements of the Paperwork Reduction Act unless that collection of information displays a current valid OMB Control Number. The OMB Control Number for this information collection is 2137-0047. All responses to the collection of information are mandatory. Send comments regarding this burden or any other aspect of this collection of information, including suggestions for reducing the burden to: Information Collection Clearance Officer, PHMSA, Office of Pipeline Safety (PHP-30) 1200 New Jersey Avenue, SE, Washington, D.C. 20590.			
INSTRUCTIONS			
<i>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.</i>			
PART A - KEY REPORT INFORMATION			
Report Type: <i>(select all that apply)</i>	Original:	Supplemental:	Final:
	Yes	Yes	Yes
Last Revision Date:	12/09/2021		
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:	08/02/2021 15:05		
5. Location of Accident:			
Latitude / Longitude	[REDACTED]		
6. National Response Center Report Number (if applicable):	1312603		
7. Local time (24-hr clock) and date of initial telephonic report to the National Response Center (if applicable):	08/03/2021 08:05		
8. Commodity released: <i>(select only one, based on predominant volume released)</i>	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):	1.00		
10. Estimated volume of intentional and/or controlled release/blowdown (Barrels):			
11. Estimated volume of commodity recovered (Barrels):	1.00		
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)			
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:	08/02/2021 15:12
14b. Local time pipeline/facility restarted:	08/02/2021 19:00
- 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":	08/02/2021 15:05
18b. Local time Operator resources arrived on site:	08/02/2021 15:05
PART B - ADDITIONAL LOCATION INFORMATION	
1. Was the origin of the Accident onshore?	Yes
<i>If Yes, Complete Questions (2-12)</i>	
<i>If No, Complete Questions (13-15)</i>	
- If Onshore:	
2. State:	Indiana
3. Zip Code:	46319
4. City	Griffith
5. County or Parish	Lake
6. Operator-designated location:	Milepost/Valve Station
Specify:	GT
7. Pipeline/Facility name:	Griffith Terminal
8. Segment name/ID:	Transfer Line 1
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):	Underground
Specify:	Under soil
- If Other, Describe:	
Depth-of-Cover (in):	60
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 Terminal/Tank Farm Equipment and Piping
- If Onshore Breakout Tank or Storage Vessel, Including Attached Appurtenances, specify:	
3. Item involved in Accident:	Flange
- 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:	2012
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:	Connection Failure
- 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: (<i>Select one or both</i>)	
- 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?	Yes
7. Did the released commodity reach or occur in one or more High Consequence Area (HCA)?	Yes
7a. If Yes, specify HCA type(s): (<i>Select all that apply</i>)	
- 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:	Yes
Was this HCA identified in the "could affect" determination for this Accident site in the Operator's Integrity Management Program?	Yes
- 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	Yes
Was this HCA identified in the "could affect" determination for this Accident site in the Operator's Integrity Management Program?	Yes
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	
8b. Estimated cost of commodity lost	
8c. Estimated cost of Operator's property damage & repairs	
8d. Estimated cost of Operator's emergency response	
8e. Estimated cost of Operator's environmental remediation	
8f. Estimated other costs	
Describe:	
8g. Estimated total costs (sum of above) – effective 12-2012, changed to "Total estimated property damage (sum of above)"	
PART E - ADDITIONAL OPERATING INFORMATION	
1. Estimated pressure at the point and time of the Accident (psig):	150.00
2. Maximum Operating Pressure (MOP) at the point and time of the Accident (psig):	275.00
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?	No
6d. Did SCADA-based information (such as alarm(s), alert(s), event(s), and/or volume calculations) assist with the confirmation of the Accident?	No
7. Was a CPM leak detection system in place on the pipeline or facility involved in the Accident?	No
- If Yes:	
7a. Was it operating at the time of the Accident?	
7b. Was it fully functional at the time of the Accident?	
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?	
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?	
8. How was the Accident initially identified for the Operator?	Local Operating Personnel, including contractors
- 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:	Operator employee
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?	Yes, specify investigation result(s): (select all that apply)
- 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)	
- 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	Yes
- Investigation identified no controller issues	Yes
- 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	
<i>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).</i>	
Apparent Cause:	G6 - Equipment Failure
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: <i>(select all that apply)</i>	
- 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: <i>(select all that apply)</i>	
- Field examination	
- Determined by metallurgical analysis	
- Other:	
- If Other, Describe:	
4. Was the failed item buried under the ground?	
- If Yes :	
<input type="checkbox"/> 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 <i>(select all that apply):</i> -	
- 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 <i>(select all that apply):</i> -	
- Field examination	
- Determined by metallurgical analysis	
- Other:	
- If Other, Describe:	
9. Location of corrosion <i>(select all that apply):</i> -	
- 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: <i>(select all that apply)</i>	
- 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 or Weld.	
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: <i>(select all that apply)</i> -	
- 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: <i>(select all that apply)</i> -	
- 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 <i>(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):</i>	
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: <i>(select all that apply)</i>	
- 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: <i>(select all that apply)</i>	

- 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: (<i>select all that apply</i>):	
- 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:	Non-threaded Connection Failure
- If Malfunction of Control/Relief Equipment:	
1. Specify: <i>(select all that apply)</i> -	
- 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:	Gasket
- 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: <i>(select all that apply)</i>	
- 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	Yes
- If Other, Describe:	Relaxed Flange
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 <i>(select all that apply):</i> -	
- 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:	
- If Miscellaneous:	
1. Describe:	
- If Unknown:	
2. Specify:	
PART H - NARRATIVE DESCRIPTION OF THE ACCIDENT	
<p>On August 2, 2021 at approximately 3:05 PM CDT operations personnel completing routine rounds found oil on the ground in Manifold 202 at Griffith Terminal near Transfer Line 1. The section of pipe was isolated and crews were called on site to begin clean up and excavation of the affected area. Once excavation was complete the source of the leak was determined to be a flanged connection on Transfer Line 1. The gasket was replaced and the flange was retorqued. Due to a rain event during the night, the excavation area filled with water. An additional contracting crew needed to be called in for dewatering purposes therefore increasing the operator cost of the release. The NRC was notified once it was determined that costs would exceed the \$50,000 reporting threshold due to additional clean up. The NRC was notified on August 3, 2021 at 8:05 AM CDT (Report #1312603). A 48-hour update was made to the NRC on August 4, 2021 at 12:08 PM CDT (Report #1312766).</p> <p>The bolts were removed from the flange connection and were sent for a third-party analysis and field investigation was completed. The cause of the release was determined to be due to a relaxed flange. Due to the area being excavated and repacked several times over the years for other work in the manifold area, the flange relaxed over time. This caused the gasket to eventually develop a weep which leaked into the surrounding soil until it was discovered by operations when it reached the surface. Approximately 70 cubic yards of contaminated soil was removed from the release site.</p>	
PART I - PREPARER AND AUTHORIZED SIGNATURE	
Preparer's Name	
Preparer's Title	
Preparer's Telephone Number	
Preparer's E-mail Address	
Preparer's Facsimile Number	
Authorized Signer Name	
Authorized Signer Title	
Authorized Signer Telephone Number	
Authorized Signer Email	
Date	12/09/2021

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: 1/31/2023	
 <p>U.S. Department of Transportation Pipeline and Hazardous Materials Safety Administration</p>	Original Report Date:	09/07/2021	
	No.	20210253 - 36070 <small>(DOT Use Only)</small>	
ACCIDENT REPORT - HAZARDOUS LIQUID PIPELINE SYSTEMS			
<p>A federal agency may not conduct or sponsor, and a person is not required to respond to, nor shall a person be subject to a penalty for failure to comply with a collection of information subject to the requirements of the Paperwork Reduction Act unless that collection of information displays a current valid OMB Control Number. The OMB Control Number for this information collection is 2137-0047. All responses to the collection of information are mandatory. Send comments regarding this burden or any other aspect of this collection of information, including suggestions for reducing the burden to: Information Collection Clearance Officer, PHMSA, Office of Pipeline Safety (PHP-30) 1200 New Jersey Avenue, SE, Washington, D.C. 20590.</p>			
INSTRUCTIONS			
<p><i>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.</i></p>			
PART A - KEY REPORT INFORMATION			
Report Type: <i>(select all that apply)</i>	Original:	Supplemental:	Final:
	Yes	Yes	Yes
Last Revision Date:	12/02/2021		
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:	08/09/2021 10:38		
5. Location of Accident:			
Latitude / Longitude			
6. National Response Center Report Number (if applicable):	1313243		
7. Local time (24-hr clock) and date of initial telephonic report to the National Response Center (if applicable):	08/09/2021 19:24		
8. Commodity released: <i>(select only one, based on predominant volume released)</i>	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):	1.00		
10. Estimated volume of intentional and/or controlled release/blowdown (Barrels):			
11. Estimated volume of commodity recovered (Barrels):	1.00		
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:	08/09/2021 11:47
14b. Local time pipeline/facility restarted:	08/11/2021 11:19
- 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":	08/09/2021 18:19
18b. Local time Operator resources arrived on site:	08/09/2021 12:00
PART B - ADDITIONAL LOCATION INFORMATION	
1. Was the origin of the Accident onshore?	Yes
<i>If Yes, Complete Questions (2-12)</i>	
<i>If No, Complete Questions (13-15)</i>	
- If Onshore:	
2. State:	Minnesota
3. Zip Code:	55736
4. City	Wawina
5. County or Parish	Itasca
6. Operator-designated location:	Milepost/Valve Station
Specify:	1032
7. Pipeline/Facility name:	Line 1
8. Segment name/ID:	MP 1032
9. Was Accident on Federal land, other than the Outer Continental Shelf (OCS)?	No
10. Location of Accident:	Pipeline Right-of-way
11. Area of Accident (as found):	Underground
Specify:	Under soil
- If Other, Describe:	
Depth-of-Cover (in):	6
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 Pipeline, Including Valve Sites
- If Onshore Breakout Tank or Storage Vessel, Including Attached Appurtenances, specify:	
3. Item involved in Accident:	Weld, including heat-affected zone
- If Pipe, specify:	
3a. Nominal diameter of pipe (in):	18
3b. Wall thickness (in):	.281

3c. SMYS (Specified Minimum Yield Strength) of pipe (psi):	46,000
3d. Pipe specification:	X46
3e. Pipe Seam , specify:	Longitudinal ERW - Low Frequency
- If Other, Describe:	
3f. Pipe manufacturer:	Unknown
3g. Year of manufacture:	1950
3h. Pipeline coating type at point of Accident, specify:	Cold Applied Tape
- If Other, Describe:	
- If Weld, including heat-affected zone, specify. If Pipe Girth Weld, 3a through 3h above are required:	Pipe Girth Weld
- 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:	1950
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: <i>(Select one or both)</i>	
- 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): <i>(Select all that apply)</i>	
- 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	
8b. Estimated cost of commodity lost	
8c. Estimated cost of Operator's property damage & repairs	
8d. Estimated cost of Operator's emergency response	
8e. Estimated cost of Operator's environmental remediation	
8f. Estimated other costs	
Describe:	
8g. Estimated total costs (sum of above) – effective 12-2012, changed to "Total estimated property damage (sum of above)"	
PART E - ADDITIONAL OPERATING INFORMATION	
1. Estimated pressure at the point and time of the Accident (psig):	234.00
2. Maximum Operating Pressure (MOP) at the point and time of the Accident (psig):	823.00
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?	Yes
- 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:	Automatic
5b. Type of downstream valve used to initially isolate release source:	Automatic
5c. Length of segment isolated between valves (ft):	97,944
5d. Is the pipeline configured to accommodate internal inspection tools?	Yes
- 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?	No
- 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?	No
6d. Did SCADA-based information (such as alarm(s), alert(s), event(s), and/or volume calculations) assist with the confirmation of the Accident?	No
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?	Local Operating Personnel, including contractors
- 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:	Contractor working for the Operator
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?	Yes, specify investigation result(s): (select all that apply)
- 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)	
- 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	Yes
- Investigation identified no controller issues	Yes
- 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	
<i>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).</i>	
Apparent Cause:	G5 - Material Failure of Pipe or Weld
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: <i>(select all that apply)</i>	
- 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: <i>(select all that apply)</i>	
- Field examination	
- Determined by metallurgical analysis	
- Other:	
- If Other, Describe:	
4. Was the failed item buried under the ground?	
- If Yes :	
<input type="checkbox"/> 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 <i>(select all that apply):</i> -	
- 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 <i>(select all that apply):</i> -	
- Field examination	
- Determined by metallurgical analysis	
- Other:	
- If Other, Describe:	
9. Location of corrosion <i>(select all that apply):</i> -	
- 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: <i>(select all that apply)</i>	
- 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 or Weld.	
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: <i>(select all that apply)</i> -	
- 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: <i>(select all that apply)</i> -	
- 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 <i>(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):</i>	
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:	Construction-, Installation-, or Fabrication-related
1. The sub-cause shown above is based on the following: <i>(select all that apply)</i>	
- Field Examination	
- Determined by Metallurgical Analysis	Yes
- 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: <i>(select all that apply)</i>	

- Fatigue or Vibration-related	
Specify:	
- If Other, Describe:	
- Mechanical Stress:	
- Other	Yes
- If Other, Describe:	Unknown
- 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: <i>(select all that apply)</i> :	
- Dent	
- Gouge	
- Pipe Bend	
- Arc Burn	
- Crack	
- Lack of Fusion	
- Lamination	
- Buckle	
- Wrinkle	
- Misalignment	
- Burnt Steel	
- Other:	Yes
- If Other, Describe:	Burn-through defect containing slag
5. Has one or more internal inspection tool collected data at the point of the Accident?	Yes
5a. If Yes, for each tool used, select type of internal inspection tool and indicate most recent year run:	
- Magnetic Flux Leakage	Yes
Most recent year run:	2018
- Ultrasonic	Yes
Most recent year run:	2018
- Geometry	Yes
Most recent year run:	2018
- Caliper	Yes
Most recent year run:	2018
- Crack	Yes
Most recent year run:	2018
- 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?	Yes
- If Yes:	
Most recent year tested:	1974
Test pressure (psig):	1,136.00
7. Has one or more Direct Assessment been conducted on the pipeline segment?	Yes, but the point of the Accident was not identified as a dig site
- 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:	2021
8. Has one or more non-destructive examination(s) been conducted at the point of the Accident since January 1, 2002?	No
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: <i>(select all that apply)</i> -	
- 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: <i>(select all that apply)</i>	
- 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 <i>(select all that apply):</i> -	
- 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:	
- If Miscellaneous:	
1. Describe:	
- If Unknown:	
2. Specify:	
PART H - NARRATIVE DESCRIPTION OF THE ACCIDENT	
<p>On August 9, 2021 at approximately 10:38 AM CDT, an environmental contractor performing work along the right of way noticed a suspicious area with dead vegetation near Line 1 at MP 1032. Enbridge operations personnel were notified at 11:26 AM CDT and dispatched pipeline maintenance personnel to investigate the area. The Edmonton Control Center was contacted and all lines in the right of way were shut down at 11:47 AM CDT. Pipeline maintenance personnel arrived onsite at 12:00 PM CDT and confirmed dead vegetation and a hydrocarbon smell. There was no free product or gas alarms present so additional resources were dispatched to begin excavating the area. At 6:19 PM CDT, NDE discovered a pinhole on the girth weld at MP 1032. Further excavation found approximately 1 barrel of crude had been released from Line 1. All other lines in the area were restarted and cleanup began on the release. A call to the NRC was made on August 9, 2021 at 7:10 PM CDT but Enbridge personnel was placed on hold until 7:24 PM CDT which is the timestamp shown on the NRC report (Report #1313243). The 48-hour NRC notification was made on August 11, 2021 at 1:32 PM CDT (Report #1313400).</p> <p>A Plidco sleeve was installed and Line 1 was restarted on August 11, 2021 at 11:19 AM CDT. Approximately 105 cubic yards of contaminated soil was removed from the release site. A cutout was performed on August 30. The metallurgical analysis identified a throughwall girth weld manufacturing anomaly associated with a burn-through from original construction as the cause of the release. Supporting evidence for this conclusion includes the morphology of the leak path, the absence of a root bead, the presence of weld slag along the leak path, and the absence for any other mechanism.</p>	
PART I - PREPARER AND AUTHORIZED SIGNATURE	
Preparer's Name	
Preparer's Title	
Preparer's Telephone Number	
Preparer's E-mail Address	
Preparer's Facsimile Number	
Authorized Signer Name	
Authorized Signer Title	
Authorized Signer Telephone Number	
Authorized Signer Email	
Date	12/02/2021

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: 1/31/2023	
 <p>U.S. Department of Transportation Pipeline and Hazardous Materials Safety Administration</p>	Original Report Date:	11/16/2021	
	No.	20210323 - 36002 <small>(DOT Use Only)</small>	
ACCIDENT REPORT - HAZARDOUS LIQUID PIPELINE SYSTEMS			
<p>A federal agency may not conduct or sponsor, and a person is not required to respond to, nor shall a person be subject to a penalty for failure to comply with a collection of information subject to the requirements of the Paperwork Reduction Act unless that collection of information displays a current valid OMB Control Number. The OMB Control Number for this information collection is 2137-0047. All responses to the collection of information are mandatory. Send comments regarding this burden or any other aspect of this collection of information, including suggestions for reducing the burden to: Information Collection Clearance Officer, PHMSA, Office of Pipeline Safety (PHP-30) 1200 New Jersey Avenue, SE, Washington, D.C. 20590.</p>			
INSTRUCTIONS			
<p><i>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.</i></p>			
PART A - KEY REPORT INFORMATION			
Report Type: <i>(select all that apply)</i>	Original: Yes	Supplemental:	Final: Yes
Last Revision Date:			
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: 10/18/2021 10:38			
5. Location of Accident:			
Latitude / Longitude: [REDACTED]			
6. National Response Center Report Number (if applicable): 1319752			
7. Local time (24-hr clock) and date of initial telephonic report to the National Response Center (if applicable): 10/18/2021 11:44			
8. Commodity released: <i>(select only one, based on predominant volume released)</i> 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): 4.00			
10. Estimated volume of intentional and/or controlled release/blowdown (Barrels):			
11. Estimated volume of commodity recovered (Barrels): 4.00			
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:	10/18/2021 10:38
14b. Local time pipeline/facility restarted:	10/18/2021 23:25
- 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":	10/18/2021 10:38
18b. Local time Operator resources arrived on site:	10/18/2021 10:38
PART B - ADDITIONAL LOCATION INFORMATION	
1. Was the origin of the Accident onshore?	Yes
<i>If Yes, Complete Questions (2-12)</i>	
<i>If No, Complete Questions (13-15)</i>	
- If Onshore:	
2. State:	Minnesota
3. Zip Code:	56760
4. City	Viking
5. County or Parish	Marshall
6. Operator-designated location:	Milepost/Valve Station
Specify:	VK
7. Pipeline/Facility name:	Viking Station
8. Segment name/ID:	Line 4 Flange
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):	Underground
Specify:	Under soil
- If Other, Describe:	
Depth-of-Cover (in):	48
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:	Flange
- 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:	1974
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:	Connection Failure
- 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: (<i>Select one or both</i>)	
- 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): (<i>Select all that apply</i>)	
- 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	
8b. Estimated cost of commodity lost	
8c. Estimated cost of Operator's property damage & repairs	
8d. Estimated cost of Operator's emergency response	
8e. Estimated cost of Operator's environmental remediation	
8f. Estimated other costs	
Describe:	
8g. Estimated total costs (sum of above) – effective 12-2012, changed to "Total estimated property damage (sum of above)"	
PART E - ADDITIONAL OPERATING INFORMATION	
1. Estimated pressure at the point and time of the Accident (psig):	638.00
2. Maximum Operating Pressure (MOP) at the point and time of the Accident (psig):	960.00
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?	No
6d. Did SCADA-based information (such as alarm(s), alert(s), event(s), and/or volume calculations) assist with the confirmation of the Accident?	No
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?	Local Operating Personnel, including contractors
- 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:	Operator employee
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)	Lack of Control Center involvement
- 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	
<i>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).</i>	
Apparent Cause:	G6 - Equipment Failure
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: <i>(select all that apply)</i>	
- 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: <i>(select all that apply)</i>	
- Field examination	
- Determined by metallurgical analysis	
- Other:	
- If Other, Describe:	
4. Was the failed item buried under the ground?	
- If Yes :	
<input type="checkbox"/> 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 <i>(select all that apply):</i> -	
- 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 <i>(select all that apply):</i> -	
- Field examination	
- Determined by metallurgical analysis	
- Other:	
- If Other, Describe:	
9. Location of corrosion <i>(select all that apply):</i> -	
- 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: <i>(select all that apply)</i>	
- 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 or Weld.	
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: <i>(select all that apply)</i> -	
- 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: <i>(select all that apply)</i> -	
- 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 <i>(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):</i>	
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: <i>(select all that apply)</i>	
- 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: <i>(select all that apply)</i>	

- 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: (<i>select all that apply</i>):	
- 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:	Non-threaded Connection Failure
- If Malfunction of Control/Relief Equipment:	
1. Specify: <i>(select all that apply)</i> -	
- 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:	Gasket
- 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: <i>(select all that apply)</i>	
- 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	Yes
- If Other, Describe:	Original vintage gasket, degradation from years of service
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 <i>(select all that apply):</i> -	
- 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:	
- If Miscellaneous:	
1. Describe:	
- If Unknown:	
2. Specify:	
PART H - NARRATIVE DESCRIPTION OF THE ACCIDENT	
<p>On October 18, 2021 at approximately 10:38 AM CDT, a technician performing maintenance activities at the Viking Station discovered crude oil on the ground at the base of Line 4 discharge valve (4SDV1). The Edmonton Control Center was immediately notified, and the line was shut down. Operations began investigating the cause of the release but the source could not be identified at the time until the entire area around the valve could be excavated. Additional equipment and resources were called in to assist in excavation to determine the source of the release and clean-up of the area. The NRC was notified on October 18, 2021 at 11:44 AM CDT (NRC# 1319752). Excavation and clean up proceeded until the source of the release was identified as a bad gasket at a flange fitting upstream of the station discharge valve. Approximately 4 barrels of crude oil was released onto the site. A 48-hour update to the NRC was made on October 20, 2021 at 10:51 AM CDT (NRC# 1319933).</p> <p>The cause of the release was determined to be due to normal wear and tear of the gasket from years of service. The gasket was replaced and approximately 950 yards of contaminated soil was removed from the release site and disposed of at an approved landfill.</p>	
PART I - PREPARER AND AUTHORIZED SIGNATURE	
Preparer's Name	
Preparer's Title	
Preparer's Telephone Number	
Preparer's E-mail Address	
Preparer's Facsimile Number	
Authorized Signer Name	
Authorized Signer Title	
Authorized Signer Telephone Number	
Authorized Signer Email	
Date	11/16/2021