Enbridge Semi-Annual Report November 23, 2017 to May 22, 2018

DJ# 90-5-1-1-10099

July 18, 2018

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

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Glossary

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

AIPR	Alternate Interim Pressure Restrictions
ALD	Alternative Leak Detection
ALJ	Administrative Law Judge
APE	Area of Potential Effect
APP	Agricultural Protection Plan
ART	Alarm Response Team
ATC	American Transmission Company
AUV	Autonomous Underwater Vehicle
BIWP	Biota Investigation Work Plan
CCO	Control Centre Operations
CD	Consent Decree
CF	Crack Field
CGR	Corrosion Growth Rate
CP	Cathodic Protection
CRO	Control Room Operator
CRWP	Coating Repair Work Plan
DOJ	Department of Justice
DQA	Data Quality Assessment
DQR	Data Quality Review
EA	Engineering Assessment
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FEA	Finite Element Analysis
FEIS	Final Environmental Impact Statement
FMP	Fen Management Plan
FR	Future Report
FRE	Features Requiring Excavation
GW	Girth Weld
HCA	High Consequence Area
HDD	Horizontal Directional Drill
ICP	Integrated Contingency Plan
ICS	Incident Command System
IL	Illinois
ILI	In-Line Inspection
IN	Indiana
ITP	Independent Third Party
IVP	Intelligent Valve Placement
LDA	Leak Detection Analyst
MBS	Mass Balance System
MI	Michigan
MN	Minnesota
MDA	Minnesota Department of Agriculture
MDEQ	Michigan Department of Environmental Quality

MDNR	Minnesota Department of Natural Resources
MFL	Magnetic Flux Leakage
MOP	Maximum Operating Pressure
MP	Milepost
MPUC	Minnesota Public Utilities Commission
NA	Not Applicable
ND	North Dakota
NDDH	North Dakota Department of Health
NDE	Non-destructive Examination
NDGF	North Dakota Game and Fish
NDPSC	North Dakota Public Service Commission
NDSWC	North Dakota State Water Commission
NHPA	National Historic Preservation Act
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historical Properties
NWT	Nominal Wall Thickness
NY	New York
OD	Outside Diameter
OSRO	Oil Spill Response Organization
OMM	Operations & Maintenance Manual
PHMSA	Pipeline Hazardous Materials Safety Administration
PI	Pipeline Integrity
PN	Priority Notification
PPR	Point Pressure Restriction
POD	Probability of Detection
PR	Pressure Restriction
PRCI	Pipeline Research Council International
RCA	Root Cause Analysis
RDS	Rupture Detection System
ROA	Record of Alarms
ROV	Remote Operated Vehicle
ROW	Right of Way
RPR	Rupture Pressure Ratio
SAR	Semi-Annual Report
SCADA	Supervisory Control and Data Acquisition
SCC	Stress Crack Corrosion
SHPO	State Historic Preservation Office
SML	Subject Matter Lead
SMYS	Specified Minimum Yield Strength
SOA	Summary of Alarms
SRB	Sulfate Reducing Bacteria
STA	Senior Technical Advisor
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
WI	Wisconsin

WCMP	Wisconsin Coastal Management Program
WDNR	Wisconsin Department of Natural Resources
WLOA	Weekly List of Alarms
WMA	Wildlife Management Area
WQC	Water Quality Certification
WWI	Wisconsin Wetland Inventory

Introduction

Enbridge[1] submits this second Semi-Annual Report (also referred to herein as "SAR" or "Report") in electronic and hard copy form in accordance with Section IX, Reporting Requirements, of the Consent Decree entered in United States v. Enbridge Energy, Limited Partnership, et al., Civ. No. 1:16-cv-00914 (referred to herein as "Consent Decree," "Decree," or "CD"). Specifically, this second SAR is submitted in accordance with Paragraph 143, which requires Enbridge to submit a SAR documenting Enbridge's compliance with the Consent Decree for the second reporting period dated November 23, 2017 to May 22, 2018 no later than six months after the submittal of the first SAR. Enbridge's first SAR was submitted on January 18, 2018, and this SAR is timely submitted within six months of that date (i.e., by July 18, 2018). As per Paragraph 150 of the Consent Decree, this second 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 second 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 second reporting period. This Report is organized by Paragraph and Subparagraph number of the Consent Decree. This SAR addresses on a paragraph-by-paragraph basis each injunctive requirement of the Consent Decree that became due during the second reporting period or for which reporting is required.

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

Enbridge is compliant with the Consent Decree requirements unless otherwise stated in the applicable section of the second 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 further information on Enbridge's compliance with the Consent Decree, and/or include documents that are required to be submitted to the United States under Section IX. The Table of Contents identifies each of these appendices.

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.

[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.

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

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

Enbridge has been vigorously pursuing all avenues to complete the replacement of Line 3 as quickly as possible. During the second reporting period, as in the first SAR reporting period, Enbridge has been pursuing a coordinated effort to obtain a Certificate of Need and Route Permit from the Minnesota Public Utilities Commission ("MPUC"), both of which are required before certain other state and federal approvals may be obtained. Enbridge initiated its effort to obtain the MPUC approvals in 2015 and since that time the MPUC has held, and Enbridge has participated in, numerous public hearings, consultations, and other regulatory proceedings at that agency. MPUC proceedings were prolonged in large measure by opposition to the Line 3 replacement project from certain environmental interest groups and others, but on June 28, 2018 (outside the reporting period covered by this SAR) the MPUC voted to grant a Certificate of Need and a Route Permit. The route authorized by the MPUC follows Enbridge's preferred route with a deviation at its southern end that avoids culturally sensitive sites in the Big Sandy Area and traverses the Fond du Lac Reservation. Should the Fond du Lac tribe not consent to the route deviation crossing its reservation by August 31, 2018 then Enbridge may proceed with the replacement of Line 3 along an alternative MPUC-authorized route that bypasses the Reservation. The status of primary permits and approvals for Line 3 Replacement are noted in Table 1 below:

Table 1: Permits/Approvals Required for Line 3 Replacement

Unit of Government	Type of Application	Reason Required	Permit Status
U.S. Army Corps of Engineers ("USACE") – St. Paul District	Section 404/10 Individual Permit	Authorizes discharge of dredged and fill material into waters of the United States, including wetlands, and crossing of navigable waters of the United States; USACE has engaged Tribes through its regulatory process	MN: Application Submitted WI: Received
USACE – Omaha District	Section 404/10 Nationwide Permit	Authorizes discharge of dredged and fill material into waters of the United States, including wetlands, and crossing of navigable waters of the United States	Application Submitted; Decision Pending Completion of Section 106 Process
USACE – St. Paul District	Section 408 Authorization	Authorizes crossing of USACE civil works projects	Authorization Request Submitted; Decision Pending Environmental Review

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Table 1: Permits/Approvals Required for Line 3 Replacement			
Unit of Government	**Type of Application**	**Reason Required**	**Permit Status**
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 / ND: Consultation Ongoing WI: Clearance Received
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 Ongoing[1] ND: Consultation Complete WI: Consultation Complete
	Bald Eagle Nest Disturbance Permit	Allows for disturbance of a known bald eagle nest in proximity to construction activities	ND: Application Submitted MN: To Be Filed Following Completion of MPUC Proceeding[1]
Minnesota Public Utilities Commission ("MPUC")	Certificate of Need	Determines need for the pipeline, including questions of size, type and timing	Application Granted; awaiting written decision and certificate to authorize construction
	Route Permit	Authorizes construction of the pipeline along a specific route, subject to certain conditions	Application Granted; awaiting written decision and certificate to authorize construction
Minnesota Department of Natural Resources ("MDNR")	License to Cross Public Waters	50-year license that allows for crossing of public waters with proposed utility	To Be Filed Following Completion of MPUC Proceeding[1]
	Work in Public Waters Permit	Authorizes in-water activities in public waters located on private lands	To Be Filed Following Completion of MPUC Proceeding[1]

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Table 1: Permits/Approvals Required for Line 3 Replacement			
Unit of Government	**Type of Application**	**Reason Required**	**Permit Status**
	License to Cross Public Lands	50-year license that allows for crossing of public lands with proposed utility	To Be Filed Following Completion of MPUC Proceeding[1]
	Long-term Lease – Access Roads	Authorizes use of MDNR-managed access roads during construction and/or operation	To Be Filed Following Completion of MPUC Proceeding[1]
	Endangered Species Permit	Outlines plans for avoidance, minimization, and mitigation of take of state-listed flora species and authorizes take of individuals	To Be Filed Following Completion of MPUC Proceeding[1]
	Gully 30 Calcareous Fen Management Plan ("FMP") Authorization	Outlines the construction, restoration, and monitoring	To Be Filed Following Completion of MPUC Proceeding[1]
	Individual Groundwater Appropriation Permit – Pipeline and Facilities	Authorizes withdrawal of groundwater associated with dewatering of excavations	To Be Filed Following Completion of MPUC Proceeding[1]
	Individual Surface Water Appropriation Permit – Pipeline	Authorizes withdrawal and use of water from surface sources to support horizontal directional drills ("HDDs"), hydrostatic testing, and dust suppression	To Be Filed Following Completion of MPUC Proceeding[1]
	Individual Surface Water Appropriation Permit at Gully 30 Calcareous Fen – Pipeline	Authorizes withdrawal of groundwater associated with dewatering of excavations at the Gully 30 Calcareous Fen in accordance with the FMP	To Be Filed Following Completion of MPUC Proceeding[1]

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Table 1: Permits/Approvals Required for Line 3 Replacement			
Unit of Government	**Type of Application**	**Reason Required**	**Permit Status**
Minnesota Pollution Control Agency ("MPCA")	Section 401 Water Quality Certification ("WQC") and Antidegradation Assessment	Section 401 WQC required to issue the USACE Section 404/10 Permit; antidegradation assessment supports the Industrial Hydrostatic Test Discharge and Construction Stormwater Permitting processes	To Be Filed Following Completion of MPUC Proceeding[1]
	Clearbrook Terminal Air Quality Permit – Capped Emissions Permit	Authorizes construction and operation at the modified Clearbrook Terminal	To Be Filed Following Completion of MPUC Proceeding[1]
	National Pollutant Discharge Elimination System ("NPDES") Industrial Hydrostatic Discharge Permit	Authorizes discharge of water from hydrostatic testing activities	To Be Filed Following Completion of MPUC Proceeding[1]
	NPDES Construction Stormwater General Permit – Pipeline and Facilities	Authorizes ground disturbance with approved protection measures to manage soil erosion and stormwater discharge on construction site; and removal of water that may accumulate in pipeline trench	To Be Filed Following Completion of MPUC Proceeding[1]
Minnesota Department of Agriculture ("MDA")	Agricultural Protection Plan ("APP")	Establishes measures for agricultural protection	Consultation Ongoing
Minnesota Department of Transportation ("MnDOT")	Road Crossing Permits	Authorizes crossings of state jurisdictional roadways	Submitted; To Be Processed by MnDOT Following Completion of MPUC Proceeding[1]
	Temporary access/entrance	Authorizes access to private lands during construction from state	Pending Submission and Receipt of Crossing Permits

Table 1: Permits/Approvals Required for Line 3 Replacement			
Unit of Government	**Type of Application**	**Reason Required**	**Permit Status**
Red Lake, Two Rivers, and Middle-Snake Watershed Districts	Watershed District Permits	Authorizes crossing of legal drains and ditches within watershed	To Be Filed Following Completion of MPUC Proceeding[1]
Mississippi Headwaters Board	Compatibility Evaluation	Submittal ensures project crossings align with Minnesota Statutes 116C.57 subd.2c	Consultation Ongoing
Minnesota Department of Drinking Water Supply Management Areas ("DWSMAs")	Notification of crossing of DWSMAs	To ensure appropriate protective measures are implemented	Consultation Ongoing
North Dakota State Water Commission ("NDSWC")	Sovereign Lands Permit	Authorizes crossing of state Sovereign Lands and navigable waters	Application Submitted
	Temporary Water Permit / Water Withdrawal Permit	Coverage under a temporary water permit authorizes water use for HDDs, hydrostatic testing, and dust suppression	To Be Filed[1]
North Dakota Department of Health ("NDDH")	Section 401 WQC	Section 401 WQC required to issue the USACE Section 404/10 Permit	Application Submitted
	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	Application Submitted
Pembina County	Pembina County Floodplain Permit	Authorizes crossing of Pembina County floodplains	Received

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Table 1: Permits/Approvals Required for Line 3 Replacement			
Unit of Government	**Type of Application**	**Reason Required**	**Permit Status**
North Dakota Game and Fish ("NDGF")	Duncklee Wildlife Management Area ("WMA") Consultation	Consult with NDGF to identify special seeding or restoration measures on WMA	Consultations Ongoing
Wisconsin Department of Natural Resources ("WDNR")	Chapter 30 Wetland Individual Permit / NR 103 Wetland Permit / WQC	Authorizes impacts to wetlands and waterbodies; Section 401 WQC required to issue the USACE Section 404/10 Permit	Received
	Protected Species Consultation and Incidental Take Permit	Outlines plans for avoidance, minimization, and mitigation of take of state-listed flora and fauna species and authorizes take of individual flora species	Received
	Superior Terminal Air Permit	Authorizes construction and operation at the modified Superior Terminal	Received
Wisconsin Coastal Management Program ("WCMP")	Consistency Review	Authorizes activities within the Coastal Management Zone	Received
City of Superior	Land Disturbing Permit – Pipeline and Superior Terminal	Authorizes ground disturbance with approved protection measures to manage soil erosion and stormwater discharge on construction site	Received
	Post-Construction Stormwater Management – Pipeline	To establish long-term, post construction runoff management requirements	Received

TABLE NOTES:

[1] *Submission of this permit application, completion of the consultation, or processing of the permit application by the agency has necessarily been delayed pending receipt of the MPUC Certificate of Need and Route Permit decision approving the replacement of Line 3 and identifying an approved routing in Minnesota on the basis of which further approvals can be sought. Enbridge will provide permitting and other agencies with information as expeditiously as practicable with a goal of procuring all remaining approvals and completing consultations following the finalization of the Line 3 replacement route.*

Permitting:

Minnesota: Enbridge is awaiting the issuance of approvals necessary to replace Original US Line 3 in Minnesota. A number of local, county, state, and federal permits and approvals are required before the replacement of the approximate 340.4-mile segment of Line 3 in Minnesota can proceed. As shown in Table 1 above, many of these are dependent on the actions of the MPUC, which as noted above voted to issue a Certificate of Need and Route Permit for the Line 3 replacement.

Enbridge filed its applications for a Certificate of Need and Route Permit with the MPUC on April 24, 2015. Information filed by Enbridge and parties to those proceedings can be found at MPUC docket nos. 14-916 (for the Certificate of Need) and 15-137 (for the Route Permit).[2] The MPUC's procedure to process Certificate of Need and Route Permit applications consists of: (i) a determination of the adequacy of the Environmental Impact Statement prepared by the Minnesota Department of Commerce to assess the potential direct, indirect, and cumulative impacts that may result from the replacement of Line 3 in Minnesota; and (ii) a merits proceeding to assess the need for the proposed replacement pipeline and the most appropriate routing for the pipeline.

In connection with the environmental review, on May 1, 2018, the MPUC issued a decision finding that the Environmental Impact Statement for the Line 3 replacement project prepared by the Minnesota Department of Commerce was "adequate" under Minnesota law and thus will be considered by the MPUC in its forthcoming decision on the merits of the pipeline project and its routing. On May 21, 2018, several project opponents filed petitions with the MPUC seeking reconsideration of that adequacy decision by the MPUC. Those requests for reconsideration were denied by the MPUC's written decision dated July 3, 2018, which is outside of the reporting period covered by this SAR.

In connection with the merits review, on April 23, 2018, the Administrative Law Judge ("ALJ") assigned to the MPUC proceeding submitted a report to the MPUC containing proposed findings of fact, conclusions of law and a recommendation concerning the Certificate of Need and Route Permit applications. The ALJ's Report found that there is a need for the project, but only if Enbridge replaces Line 3 along the existing right-of-way for the Original US Line 3, rather than along the different routing preferred by Enbridge. While Enbridge agrees with the conclusion on need for the replacement, Enbridge disputed the route recommendation in May 9, 2018 exceptions to the ALJ's report. Other parties also filed exceptions raising a variety of issues with the ALJ report.

In its exceptions, Enbridge explained that the route proposed by the ALJ will cross the reservations of two Native American tribes, one of which (i.e., the Leech Lake Reservation) has made clear that it will not entertain a replacement pipeline constructed within the boundaries of its tribal lands. Enbridge's preferred route respects their wishes and represents the least impact on Tribes and their cultural resources. It also avoids a National Forest, high population areas, drinking water supplies, and other environmentally sensitive areas. Further, the routing approved by the ALJ would require closure of the existing pipeline for long periods and create other constructability issues.

While not within the period covered by this SAR, Enbridge will here describe important recent events bearing on the permitting of the replacement of Line 3 in Minnesota. The MPUC met on June 18, 19, 26, 27, and 28 to allow parties an opportunity to make final arguments and respond to MPUC questions regarding the potential approval of the pipeline project. An oral decision was issued by the MPUC on June 28 granting the Certificate of Need and a Route Permit. MPUC chose the Enbridge preferred route with a small deviation that would traverse the Fond du Lac Reservation if, within 60 days of the oral decision, Enbridge and that Tribe can successfully negotiate the

[2] The docket filings are available on the MPUC's website at https://www.edockets.state.mn.us/EFiling/edockets/searchDocuments.do?method=showeDocketsSearch&searchType=new.

terms of an easement allowing the replacement line to traverse the Reservation. Should the Fond du Lac tribe not consent to the route deviation crossing its reservation by August 31, 2018 then Enbridge may proceed with permitting an alternative MPUC-authorized route that bypasses the Reservation. Both of these route deviations were analyzed by the Final Environmental Impact Statement, which was deemed by the MPUC to adequately consider environmental impacts resulting from the Line 3 replacement in accordance with Minnesota law. A written decision will follow within 60 days of the oral decision. Enbridge anticipates that (following the disposition of any reconsideration petitions filed by project opponents) the MPUC and other Federal, State, and local agencies could issue an authorization to construct the replacement Line 3 in Q4 2018, which would allow construction to commence in Q1 2019.

North Dakota: On May 7, 2014, Enbridge received approval to replace Line 3 in North Dakota from the North Dakota Public Service Commission ("NDPSC"). In that year, Enbridge replaced an approximate 15-mile segment of Original Line 3 that extends from the U.S.-Canada border to the first U.S. mainline valve. Enbridge plans to replace the remaining 12.3-mile segment of Line 3 in North Dakota as soon as practicable and, for logistical reasons, in coordination with the much longer portion of Line 3 in Minnesota. In order to proceed with that replacement, Enbridge will be required to file the necessary notifications with the NDPSC, informing the NDPSC that Enbridge intends to proceed with construction under the PSC's certification process. Additional North Dakota Permits must still be obtained, as timing for North Dakota has been planned for replacement simultaneous to the Minnesota segment. Enbridge plans to seek the remaining North Dakota permits as expeditiously as possible so that it can move forward to replace the small remaining portion of Line 3 in North Dakota, as noted in coordination with replacement of the Minnesota section of Line 3.

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

Construction Plans:

Table 2 below identifies key dates regarding Enbridge's plans to construct the Line 3 replacement. As shown in the table and as indicated above, construction of the portion of the Line 3 replacement in the State of Wisconsin has already been completed and was placed into service on May 25, 2018. Construction of the remaining replacement segments in North Dakota and Minnesota will commence following the receipt of the permits described in Table 1 above that are required for construction. Enbridge expects that construction will last about twelve months and that the entire Line 3 replacement pipeline in the United States therefore could be in service approximately twelve months after the receipt of approvals.

Pipe procurement is nearly complete, with only a very small amount of pipe left to be manufactured. The unmanufactured pipe is currently under production in Canada. Eighty-five percent of the replacement pipe is already located in the United States with the remaining 15% of pipe either stockpiled in Canada or in the process of being manufactured. The manufacturing of the pipe will be complete in Q4 2018.

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

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

22.b [Line 3 Deactivation]

Deactivation work is planned to commence once the Line 3 Replacement is mechanically complete, and the final clean-out and decommissioning of Original US Line 3 will be complete within one year thereafter, in accordance with Subparagraph 22.b.

On May 22, 2018 the Wisconsin portion of Line 3 (i.e., Segment 18) underwent line purge in preparation for the tie-ins and line fill of the replacement portion. Outside the reporting period for this SAR, and specifically between May 24–26, tie-ins of Segment 18 were successfully completed and line fill occurred shortly thereafter. The deactivated Line 3 segment that was replaced by Segment 18 was then cleaned.

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

Enbridge has limited the operating pressure of all Line 3 segments in accordance with MOP values specified at https://www.epa.gov/enbridge-spill-michigan/enbridge-revised-maximum-operating-pressure-values. Enbridge has not increased operating pressures above the specified MOP values; therefore, hydrostatic pressure tests were neither required to be conducted nor needed to be provided to the US Environmental Protection Agency ("EPA") with associated procedures and results. Enbridge has not exceeded the MOP values submitted to the EPA.

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

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

The In-Line Inspection ("ILI") of all portions of Original US Line 3 is scheduled on an annual basis, using the most appropriate tools for detecting, charactering, and sizing Crack Features, Corrosion Features, and Geometric Features. The ILI schedule, and the identification, excavation and mitigation or repairs of all Features Requiring Excavation ("FREs") are described in detail in this SAR under Subsection VII.D: In-Line Inspection Based Spill Prevention Program.

Enbridge conducted quarterly cleaning and biocide treatment of Original US Line 3 in 2018. During the current reporting period, Enbridge conducted quarterly biocide treatments on the Original US Line 3 as set forth in the table below. In April 2018, as per the ITP's request, Enbridge also submitted the Biocide Treatment Plan, Treatment Effectiveness Summary, and 2018 Q1 Biocide Injection Report per the request of the ITP in April 2018.

Table 3: Original US Line 3 Biocide Treatments

Segment	Type of Tool Run	Completion Date (MM/DD/YYYY)
Gretna to Clearbrook	Biocide treatment	3/14/2018
Clearbrook to Superior	Biocide treatment	3/16/2018

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

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

23 [Line 10 Replacement Evaluation]

Following the submittal of the report entitled, "Evaluation of Replacement of Portions of Line 10 within the United States" to the EPA on September 20, 2017 (referred to herein as "September 20 Line 10 Report"), Enbridge determined that the Line 10 corrosion feature counts used in the charts and analysis in that report were higher than those that actually exist in the Line due to some features being duplicated. Specifically, the feature count provided in the September 20 Line 10 Report included both cluster and cluster-child corrosion features as reported to Enbridge by the 2015 Gemini corrosion ILI. A cluster-child is a metal loss anomaly that is part of a cluster and should not have been separately counted. Specifically, the September 20 Line 10 Report stated that there were 6,448 corrosion features, while in fact the actual number of such features was 3,345. This double-counting of some of the corrosion features led to the inflated feature count issue, which came to Enbridge's attention in early December 2017, after the reporting period for the first SAR ended on November 22, 2017.

Enbridge provided EPA and the ITP with notification of the double-counting issue on January 10, 2018, just prior to submitting the first SAR on January 18, 2018. Enbridge corrected the feature counts by removing the duplicate features. The corrected corrosion feature numbers are reflected in the Revised Line 10 Report that Enbridge submitted to EPA and the ITP on April 16, 2018 (referred to herein as the "April 16 Revised Line 10 Report").

The April 16 Revised Line 10 Report, also reflects updated information that came to Enbridge's attention after the close of the first SAR reporting period. Specifically, and separate from the double-counting issue described above, in June 2017, the Enbridge initiated an MOP verification project on Line 10. Information gathered during the course of the MOP verification project came to the attention of the Enbridge Pipeline Integrity ("PI") team that prepared the September 20 Line 10 Report in late January 2018, after the first SAR was submitted. This updated information was related to Line 10 pipe grade, wall thickness, pipe diameter, and MOP for certain portions of Line 10. Based on this updated information, the Enbridge PI team was able to recalculate Line 10 feature depth, safety factors and rupture pressure ratios. The recalculated data is reflected in the April 16 Revised Line 10 Report submitted by Enbridge. All of the changes that resulted from the updated information were non-material and did not impact the conclusion of the September 20 Line 10 Report that the US segments would not warrant a further pipe replacement consideration.

Additional details regarding the data developed by the MOP verification project and the recalculations based on that data are provided in the cover letter submitted by Enbridge with the April 16 Revised Line 10 Report, as well as in Enbridge's response to the ITP's Preliminary Findings issued on April 16, 2018. As reported in the cover letter and in Enbridge's response to the ITP's Preliminary Findings, the revised data reflected in the April 16 Revised Line 10 Report does not change Enbridge's core conclusion that Line 10 in the United States does not warrant replacement and can continue to be operated safely with the rehabilitation programs currently in place.

Enbridge believes that its original Line 10 Report and the April 16 Revised Line 10 Report are fully compliant with the requirement in Paragraph 23 of the Decree that Enbridge submit a report evaluating replacement of the US portion of Line 10, including the segment of that pipeline that crosses the Niagara River. Enbridge's Reports consist of such an evaluation undertaken consistent with Enbridge's integrity procedures governing repair versus replacement evaluations. As required by Paragraph 23, the Reports discuss the number, density and severity of crack and corrosion features found on the US portion of Line 10 and compare these to the section of Line 10 to be replaced in Canada. Outside the reporting period for this SAR, Enbridge is continuing to discuss its evaluation of the replacement of the portion of Line 10 within the United States with the ITP.

Section C – Hydrostatic Pressure Testing

No hydrostatic pressure tests were conducted on any Lakehead System Pipeline during this reporting period (i.e., between November 23, 2017 and May 22, 2018). Therefore, the requirements specified in Paragraphs 24, 25, and 26 were not triggered and are not applicable to this SAR.

Details of the hydrostatic pressure test conducted in June 2017 on the portion of Line 5 that spans the Straits of Mackinac were provided in the first SAR dated January 18, 2018.

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.

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

Enbridge conducted thirty-three (33) ILIs of twenty segments of nine pipelines in the Lakehead System using appropriate ILI tools for the features of interest.

A complete list of ILIs conducted during the reporting period for this SAR is provided in the table below.

Table 4: ILI Runs Completed During November 23, 2017 to May 22, 2018

Tool Run ID	Line	Segment	Tool Technology	Pull Date	Tool Type
4395	02	CR-DR	MFL and Geometry	2/7/2018	Corrosion, Geometry
4396	02	DR-PW	MFL and Geometry	1/19/2018	Corrosion, Geometry
3831	03	CR-PW	UT Crack Detection	4/6/2018	Crack
2351	04	DN-VG	UT Crack and UT Metal Loss	2/7/2018	Corrosion, Crack
2346	04	DR-FW	UT Crack and UT Metal Loss	2/27/2018	Corrosion, Crack
4466	04	FW-WR	UT Crack and UT Metal Loss	12/12/2017	Corrosion, Crack
6013[1]	04	GF-DN	UT Crack and UT Metal Loss	12/8/2017	Corrosion, Crack
2358	04	PL-CR	UT Crack and UT Metal Loss	2/20/2018	Corrosion, Crack
2323	04	VG-PL	UT Crack and UT Metal Loss	2/14/2018	Corrosion, Crack
2689	04	WR-PW	Geometry	2/6/2018	Geometry
2381	04	WR-PW	UT Crack and UT Metal Loss	3/14/2018	Corrosion, Crack
6089	05	ENO-EMA	MFL and Geometry	4/17/2018	Corrosion, Geometry
6087	05	ENO-EMA	Geometry	4/7/2018	Geometry
4449	05	ENO-EMA	Circumferential Crack Detection	4/10/2018	Crack
2371	05	ENO-EMA	MFL	3/20/2018	Corrosion
6016	05	ENO-EMA	Geometry	3/20/2018	Geometry
4406	05	MA-BC	Circumferential MFL	1/12/2018	Corrosion
4464[2]	05	MA-BC	Circumferential Crack Detection	5/17/2018	Crack
4213	05	PE-IR	Geometry	2/22/2018	Geometry
6088	05	WNO-WMA	Geometry	4/7/2018	Geometry
6017	05	WNO-WMA	Geometry	3/20/2018	Geometry
4450	05	WNO-WMA	Circumferential Crack Detection	4/11/2018	Crack
2370	05	WNO-WMA	MFL	3/21/2018	Corrosion
6090	05	WNO-WMA	MFL and Geometry	4/18/2018	Corrosion, Geometry
4443	6A	AM-GT	Ultrasonic Metal Loss	12/2/2017	Corrosion

Table 4: ILI Runs Completed During November 23, 2017 to May 22, 2018					
Tool Run ID	**Line**	**Segment**	**Tool Technology**	**Pull Date**	**Tool Type**
4334	6A	AM-GT	MFL and Geometry	1/8/2018	Corrosion, Geometry
4109[3]	10	ENR-UT	MFL and Geometry	5/17/2018	Corrosion, Geometry
2411	10	WNR-EB	UT Crack Detection	5/15/2018	Crack
4105	10	WNR-EB	MFL and Geometry	5/15/2018	Corrosion, Geometry
2459	64	GL-GT	MFL and Geometry	1/24/2018	Corrosion, Geometry
2369[4]	67	GF-CR	MFL and Geometry	4/5/2018	Corrosion, Geometry
4489	78	SK-RW	Ultrasonic Metal Loss	1/12/2018	Corrosion
4490	78	SK-RW	MFL and Geometry	1/10/2018	Corrosion, Geometry

TABLE NOTES:

[1] *Run ID 6013 is a rerun of a failed tool run (Run ID 4467) which had a pull date of November 22, 2017, and its failure notification was received on November 24, 2017.*

[2] *Run ID 4464 vendor notification of degraded inspection data was received on May 25, 2018 (three days after this Semi-Annual Report reporting period). The tool failure will be included in the next SAR and the rerun (Tool Run ID 6099) has been scheduled to meet the inspection deadline.*

[3] *Run ID 4109 vendor notification of degraded inspection data was received on May 23, 2018 (one day after this Semi-Annual Report reporting period). The tool failure will be included in the next Semi- Annual Report and the rerun (Tool Run ID 6095) has been scheduled to meet the inspection deadline.*

[4] *Run ID 2369 is a Dual-Tool (Corrosion and Geometry) run. The run was a partial success / failure: Corrosion inspection was accepted, and a rerun will be required for Geometry only. Vendor notification of degraded inspection data was received on April 12, 2018. The tool failure will be included in the next SAR and the Geometry rerun (Tool Run ID 6091) has been scheduled to meet the inspection deadline.*

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

28.c [Incomplete or Invalid ILI]

Enbridge's contracts with vendors that are retained to conduct ILIs on the Lakehead System reference the ILI Reporting Profile Standard (the current version of this document is titled "In-Line Inspection Minimum Reporting Profile Standard Requirements," published on January 31, 2018), which requires vendors to submit Data Quality Assessments ("DQA") according to the deadlines specified in the Consent Decree. Prior to the Effective Date of the Consent Decree, all approved ILI vendors were sent the ILI Reporting Profile Standard, which was published on February 1, 2017 to contain the Consent Decree reporting requirements. This document is made part of the

vendors' overall contracts with Enbridge. In addition to the ILI Reporting Profile Standard, 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 individually contracted through Enbridge's contract Work Order Process. Prior to the Effective Date of the Consent Decree, all existing, renewed, and new 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.

Notifications from vendors concerning two failed/partially failed ILI tool runs were received by Enbridge during this reporting period, as summarized in the following Table 5. The vendor followed proper protocol as specified in Enbridge's ILI Reporting Profile Standard by promptly notifying Enbridge of the failed/partially failed ILI tool runs. Enbridge followed and will follow all necessary steps to complete a valid ILI within the timeframes specified in Paragraphs 65 and 66 of the Consent Decree. Paragraph 31 of this SAR includes detailed information about the incomplete or invalid ILI tool runs.

Table 5: 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
4467	04	GF-DN	NDT UCM	3/9/2018	11/22/2017	11/24/2017	6013	12/8/2017
2369	67	GF-CR	GE MFL4	4/18/2019	4/5/2018	4/12/2018	6091	6/6/2018

TABLE NOTE:

ILI run failure notifications received after May 22, 2018 will be reported with more detail in the next SAR.

ILI run degraded inspection notification (Run ID 4109) was received on May 23, 2018. Tool failed due to one faulty corrosion sensor arm, and more detailed failure analysis is underway. The ILI tool rerun has been scheduled to meet the re-inspection interval requirements as explained in the table notes of Table 4 listed above.

ILI run degraded inspection notification (Run ID 4464) was received on May 25, 2018. Tool failed due to liftoff at pipe girth welds, and more detailed failure analysis is underway. The ILI tool rerun has been scheduled to meet the re-inspection interval requirements as explained in the table notes of Table 4 listed above.

29 [12-Month ILI Schedule]

The following table (Table 6) includes each ILI tool run that is scheduled to be initiated on any pipeline during the period from May 23, 2018 to May 22, 2019 (i.e., the 12-month period after the reporting period covered by this SAR).

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

Per the ILI Stipulation, Enbridge has been working with ILI vendors to develop and test a new crack ILI tool to detect Line 2 cracking features, with a particular focus of the crack features on or adjacent to the pipeline's long seam weld.

An ILI with the new crack inspection tool is scheduled for the Line 2 Gretna-to-Clearbrook segment in early Q2 of 2019 to validate that the new ILI crack tool technology will be able to accurately and reliably detect the cracking features on Line 2, as agreed in the ILI Stipulation. As per the stipulation, Enbridge will submit a report to the EPA and ITP summarizing the performance of the tool run and whether it is acceptable to detect the Line 2 cracking features.

Table 6: 12-Month Lakehead ILI Schedule (May 23, 2018 – May 22, 2019)

Run ID	Line	Segment	Tool Technology	Threat Monitored	Required Completion Date[1]
2454	01	CR-PW	MFL and Geometry	Corrosion, Geometry	8/17/2018
4045	01	CR-PW	Ultrasonic Metal Loss	Corrosion	9/25/2018
4405	01	CR-PW	Ultrasonic Crack Detection	Crack	2/25/2019
4502	01	GF-CR	GeoPig	Geometry	7/18/2019
4508	02	GF-CR	Ultrasonic Crack Detection	Crack	9/15/2020[2]
3830	03	CR-PW	Circumferential MFL	Corrosion	8/20/2018
3829	03	CR-PW	MFL and Geometry	Corrosion, Geometry	8/20/2018
3826	03	GF-CR	Circumferential MFL	Corrosion	6/7/2019
4447	03	GF-CR	MFL and Geometry	Corrosion, Geometry	11/14/2018
3827	03	GF-CR	Ultrasonic Crack Detection	Crack	11/14/2018
4536	05	ENO-EMA	Circumferential Crack Detection	Crack	4/10/2019
4532	05	ENO-EMA	MFL	Corrosion	3/20/2019
4534	05	ENO-EMA	GeoPig	Geometry	3/20/2019
6099	05	MA-BC	Circumferential Crack Detection	Crack	12/31/2018
2724	05	PE-IR	Circumferential Crack Detection	Crack	10/15/2019
4538	05	PE-IR	GeoPig	Geometry	2/22/2023
4543	05	WNO-WMA	Circumferential Crack Detection	Crack	4/11/2019
4541	05	WNO-WMA	GeoPig	Geometry	3/20/2019
4539	05	WNO-WMA	MFL	Corrosion	3/20/2019
4452	6A	AM-GT	Circumferential Crack Detection	Crack	12/31/2018
4804	6A	AM-GT	Ultrasonic Crack Detection	Crack	5/18/2020
2305	6A	PE-AM	Circumferential Crack Detection	Crack	12/31/2018

Table 6: 12-Month Lakehead ILI Schedule (May 23, 2018 – May 22, 2019)					
Run ID	**Line**	**Segment**	**Tool Technology**	**Threat Monitored**	**Required Completion Date[1]**
4805	6A	PE-AM	Ultrasonic Metal Loss	Corrosion	4/22/2019
4107	10	EB-ENR	MFL and Geometry	Corrosion, Geometry	9/4/2018
4555	10	EB-ENR	Ultrasonic Wall Measurement	Corrosion	4/15/2019
6095	10	ENR-UT	MFL and Geometry	Corrosion, Geometry	8/20/2018
4473	10	ENR-UT	Ultrasonic Metal Loss	Corrosion	8/20/2018
4611	61	PE-FN	GeoPig	Geometry	3/18/2019
6091	67	GF-CR	GeoPig	Geometry	4/18/2019
4614	67	GF-CR	Ultrasonic Crack Detection	Crack	6/19/2018
4487	78	GT-SK	MFL and Geometry	Corrosion, Geometry	10/10/2018

TABLE NOTE:

[1] ILI tools will be scheduled/run prior to the Required Completion Date. The Required Completion Dates comply with all applicable laws and regulations in addition to the Consent Decree requirements.

[2] Line 2 crack ILI deadline is calculated based off 2015 Hydrostatic Testing, as stipulated in the "Stipulation and Agreement Regarding Assessment and Payment of Stipulated Penalties Relating to Timeliness of Certain In-Line Inspection".

Within the Lakehead system, Line 62 was idled (i.e., is inactive and not in operation having been purged) by Enbridge on March 30, 2017, prior to the Effective Date of the Consent Decree. Since the date that Line 62 was idled, Line 62 has remained out of service and does not transport any petroleum products.

As Enbridge previously informed the ITP, before Line 62 was idled, the pipeline was cleaned, purged, had corrosion inhibitor applied, and was injected with nitrogen. Line 62, as idled, is being properly monitored with pressure monitoring, cathodic protection ("CP"), and right-of-way ("ROW") patrol. Because Line 62 remains idled and filled with nitrogen, no ILIs have been scheduled for Line 62 during the period covered by this SAR. Performing ILIs on an idled line is not practicable because there is no oil to push the tool along. Enbridge and EPA have discussed the fact that Line 62 is idle and that ILIs do not need to be run on that line while it remains out of operation.

Changes to Previous 12-Month ILI Schedule (November 23, 2017 to November 22, 2018)

The following table outlines changes to Tool Runs associated with the previous 12-month Lakehead ILI schedule (November 23, 2017 to November 22, 2018).

Table 7: Changes to Previous 12-Month ILI Schedule (November 23, 2017 to November 22, 2018)						
Original Run ID	**Revised Run ID**	**Line**	**Segment Name**	**Technology**	**Threat Monitored**	**Schedule Revision Comments**
2309	N/A	04	CS-DR	Geometry	Geometry	Will be rescheduled after May 22, 2019 and a new tool Run ID will be created. The rescheduled run will meet the inspection deadline.
4467	6013	04	GF-DN	UT Crack and UT Metal Loss	Corrosion, Crack	Failed run from November 2017, rerun (Run ID 6013), pull date of December 8, 2017.
N/A	6087	05	ENO-EMA	Geometry	Geometry	Added inspection after Line 5 Straits of Mackinac third party anchor strike in April 2018.
N/A	6089	05	ENO-EMA	MFL and Geometry	Corrosion, Geometry	Added inspection after Line 5 Straits of Mackinac third party anchor strike in April 2018.
4464	6099	05	MA-BC	UCc	Crack	Failed run from May 2018, rerun has been scheduled to meet the inspection deadline.
N/A	6088	05	WNO-WMA	Geometry	Geometry	Added inspection after Line 5 Straits of Mackinac third party anchor strike in April 2018.
N/A	6090	05	WNO-WMA	MFL and Geometry	Corrosion, Geometry	Added inspection after Line 5 Straits of Mackinac third party anchor strike in April 2018.
4109	6095	10	ENR-UT	GEMINI	Corrosion, Geometry	Failed run from May 2018, rerun has been scheduled to meet the inspection deadline.
2369	6091	67	GF-CR	Geometry	Geometry	Rerun when the Geometry portion of tool run (Run ID 2369) failed while the Corrosion data of the tool run (Run ID 2369) was accepted.
4469	4490	78	SK-RW	MFL and Geometry	Corrosion, Geometry	Run ID was revised from 4469 to 4490. Tool (Run ID 4490) pull date of January 10, 2018.

30 [ILI Schedule Modification]

The original 12-month ILI Schedule (November 23, 2017 – November 22, 2018) for Lakehead System Pipelines was set forth in Table 6 of Paragraph 29 of the first SAR (*see* page 17 of 275). ILIs have been performed by Enbridge, as shown in Table 4 above, which is included in Enbridge's response to Subparagraphs 28.a-b. During this time period there were two failed / partially failed ILI runs that required a re-run, as discussed in

Subparagraph 28.c of this SAR. The reruns of those ILIs have been described in Subparagraph 28.c, and the modifications are summarized in Table 7 above.

31 [ILI Compliance with Tool Specifications]

Enbridge reviewed vendor-provided Data Quality Assessment ("DQA") reports for each ILI performed, and compared the reports against vendor tool specifications and other relevant information. Two ILIs did not meet vendor specifications during the current reporting period. The tables provided immediately below provide: (1) a summary of ILIs that did not meet ILI Vendor specifications for data quality; and (2) a detailed listing of each invalid ILI, including the reason it was deemed invalid and actions taken to prevent recurrence.

Table 8: Incomplete or Invalid ILIs and Rerun Dates[1]

Tool Run ID	Line	Segment	Tool	Inspection Deadline	Pull Date	Date of DQA Notification	Rerun Tool Run ID	Rerun Date
4467[2]	04	GF-DN	NDT UCM	3/9/2018	11/22/2017	11/24/2017	6013	12/8/2017
2369[3]	67	GF-CR	GE MFL4	4/18/2019	4/5/2018	4/12/2018	6091	6/6/2018

TABLE NOTE:

[1] ILI Tool failure notification(s) received after the reporting period for this SAR will be included in the next SAR.

[2] The tool pull date was November 22, 2017, and the tool failure notification was received on November 24, 2017. Further details regarding the tool failure are provided in the tables below. The tool rerun date is provided above and was scheduled to meet the re-inspection interval requirements.

[3] The Dual-Tool (Corrosion and Geometry) was a partial failure. The Corrosion inspection data was accepted and analyzed, and rerun is required for Geometry only. The Geometry rerun has been scheduled to meet the re-inspection interval requirements, and Enbridge will provide information regarding the Geometry rerun in next SAR.

Details of each deviation that occurred within the reporting period of this SAR are provided in the following tables.

Table 9: Tool Run 4467

Category	Description
Line Number	04
Segment Start Trap	Gretna
Segment End Trap	Donaldson
Tool Technology	Ultrasonic Crack and Wall Measurement
Tool Run Launch Date	November 21, 2017
Tool Run Receipt Date	November 22, 2017
Tool Pull Date	November 22, 2017

Table 9: Tool Run 4467	
Category	**Description**
Date of DQA Notification	November 24, 2017
Description of DQA Issue	Loss of connection to front end modules and successive restart attempts, in addition to file server communication issues.
Cause of Issue	Electronics issues
Corrective Action	Re-run
Tool Rerun Required?	Yes
Tool Re-Run Date	December 8, 2017

Table 10: Tool Run 2369	
Category	**Description**
Line Number	67
Segment Start Trap	Gretna
Segment End Trap	Clearbrook
Tool Technology	Geometry and magnetic corrosion
Tool Run Launch Date	April 3, 2018
Tool Run Receipt Date	April 4, 2018
Tool Pull Date	April 5, 2018
Date of DQA Notification	Initial notification on April 12, 2018. April 26, 2018, vendor provided all necessary detail required by the Enbridge Subject Matter Lead (“SML”) to determine the run acceptance of the corrosion inspection and the requirement of a re-run of the geometry inspection.
Description of DQA Issue	Four (4) adjacent caliper arms provided intermittent data throughout the run.
Cause of Issue	Failure analysis underway
Corrective Action	Re-run for the geometry portion only.
Tool Rerun Required?	Yes (Geometry ONLY)

Table 10: Tool Run 2369	
Category	**Description**
Tool Re-Run Date	June 6, 2018

(II) Review of ILI Data

32.a-c [Initial ILI Reports for Crack (120 days), Corrosion (90 days) and Geometric (60 days) Features]

The following table lists valid ILI tool runs for which the Initial ILI Reports were received between November 23, 2017 and May 22, 2018. Tool speed and tool performance were indicated in all reports listed.

Table 11: Valid In-line Inspection Runs with Reports Received							
Tool Run ID	**Line**	**Segment**	**Tool**	**Report Type**	**Report Due Date**	**Report Received Date**	**Report Received On Time?**
4395	02	CR-DR	GEMINI	Corrosion	5/8/2018	5/7/2018	TRUE
4395	02	CR-DR	GEMINI	Geometry	4/9/2018	4/6/2018	TRUE
4396	02	DR-PW	GEMINI	Corrosion	4/19/2018	4/18/2018	TRUE
4396	02	DR-PW	GEMINI	Geometry	3/20/2018	3/20/2018	TRUE
4494	02	GF-CR	GEMINI	Corrosion	2/1/2018	2/1/2018	TRUE
4494	02	GF-CR	GEMINI	Geometry	1/2/2018	12/29/2017	TRUE
3711	03	GF-CR	UCMp	Corrosion	2/12/2018	2/12/2018	TRUE
3711	03	GF-CR	UCMp	Crack	3/14/2018	3/12/2018	TRUE
2254	04	CR-CS	DuDi UCM	Crack	2/15/2018	2/15/2018	TRUE
2254	04	CR-CS	DuDi UCM	Corrosion	1/16/2018	1/16/2018	TRUE
4465	04	CS-DR	DuDi UCM	Corrosion	1/18/2018	1/17/2018	TRUE
4465	04	CS-DR	DuDi UCM	Crack	2/20/2018	2/16/2018	TRUE
2351	04	DN-VG	DuDi UCM	Corrosion	5/8/2018	5/8/2018	TRUE
4466	04	FW-WR	DuDi UCM	Corrosion	3/12/2018	3/8/2018	TRUE
4466	04	FW-WR	DuDi UCM	Crack	4/11/2018	4/11/2018	TRUE
6013	04	GF-DN	DuDi UCM	Crack	4/9/2018	3/22/2018	TRUE
6013	04	GF-DN	DuDi UCM	Corrosion	3/8/2018	2/20/2018	TRUE
2358	04	PL-CR	DuDi UCM	Corrosion	5/21/2018	5/18/2018	TRUE

Table 11: Valid In-line Inspection Runs with Reports Received							
Tool Run ID	**Line**	**Segment**	**Tool**	**Report Type**	**Report Due Date**	**Report Received Date**	**Report Received On Time?**
2323	04	VG-PL	DuDi UCM	Corrosion	5/15/2018	5/15/2018	TRUE
2689	04	WR-PW	GeoPig	Geometry	4/9/2018	4/6/2018	TRUE
2162	05	BC-RW	CD+2	Crack	12/6/2017	12/6/2017	TRUE
4468	05	BC-RW	UCc	Crack	3/2/2018	3/2/2018	TRUE
6016	05	ENO-EMA	GeoPig	Geometry	5/21/2018	5/17/2018	TRUE
6087	05	ENO-EMA	GeoPig	Geometry	6/6/2018	4/23/2018	TRUE
4356	05	IR-NO	UCc	Crack	2/12/2018	2/8/2018	TRUE
4406	05	MA-BC	AFD	Corrosion	4/12/2018	4/12/2018	TRUE
4213	05	PE-IR	GeoPig	Geometry	4/24/2018	4/23/2018	TRUE
6017	05	WNO-WMA	GeoPig	Geometry	5/21/2018	5/17/2018	TRUE
6088	05	WNO-WMA	GeoPig	Geometry	6/6/2018	4/23/2018	TRUE
4334	6A	AM-GT	GEMINI	Corrosion	4/9/2018	4/6/2018	TRUE
4334	6A	AM-GT	GEMINI	Geometry	3/9/2018	3/9/2018	TRUE
4443	6A	AM-GT	UMP	Corrosion	3/2/2018	3/2/2018	TRUE
3809	6A	PE-AM	DUO CD	Crack	2/5/2018	2/2/2018	TRUE
4182	6A	PE-AM	GEMINI	Corrosion	12/28/2017	12/28/2017	TRUE
4438	10	EB-ENR	UC	Crack	1/18/2018	1/18/2018	TRUE
3645	10	ENR-UT	UCh	Crack	11/24/2017	11/24/2017	TRUE
2459	64	GL-GT	GEMINI	Corrosion	4/24/2018	4/23/2018	TRUE
2459	64	GL-GT	GEMINI	Geometry	3/26/2018	3/23/2018	TRUE
4490	78	SK-RW	MFL4	Corrosion	4/10/2018	4/9/2018	TRUE
4489	78	SK-RW	UMP	Corrosion	4/12/2018	4/11/2018	TRUE
4490	78	SK-RW	MFL4	Geometry	3/12/2018	3/8/2018	TRUE

TABLE NOTE:

The unsuccessful ILI runs that required reruns , or partial reruns (for combo tool only) as discussed in Paragraph 31 of this SAR, have no report and are therefore not included in this table.

33 [Priority Features]

33.a [Immediate Priority Feature Notification Requirements]

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

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

33.b [Priority Feature Definition]

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

1. Features that the ILI Vendor may consider to be an immediate threat to the integrity of the pipeline.
2. Dent or geometric features greater than or equal to 5 percent of the outside diameter (“OD”) of the pipe.
3. Metal loss features with peak depth greater than or equal to 75 percent of the nominal wall thickness of the pipe.
4. Metal loss features forecasted to reach a maximum depth of greater than or equal to 75 percent of nominal wall thickness with 365 calendar days.
5. Metal loss features with an effective area RPR ≤ 0.85
6. Unmatched metal loss features with a depth greater than 50 percent of the nominal wall thickness or actual wall thickness.
7. Crack features that meet or exceed the saturation limit of the crack detection tool.
8. Crack features greater than or equal to 2.5 mm/0.098 inch detected on the internal and external pipe surface at the same location.
9. Priority notification criteria specifically identified in a project work order.

The current version of the In-Line Inspection Reporting Profile Standard is titled “In-Line Inspection Minimum Reporting Requirements,” as updated in January 2018).

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. To the best of Enbridge knowledge, no vendor failed to report Priority Features during the reporting period of this SAR.

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

The following table (Table 12) identifies Priority Features for which Enbridge received notification from vendors during this reporting period. Each listed feature is then discussed in greater detail immediately below the table. All priority features identified within this reporting period were reviewed timely and repair / mitigation actions were taken if required.

Table 12: Priority Features

Run ID	Line	Segment	Technology	Number of Features	Date Priority Notification Received	Date Priority Notification Reviewed	Date of Discovery / Date Features Added to Dig List	Pressure Restriction Required?	Date Pressure Restriction Imposed	Repair / Mitigation Deadline	Date of Repair / Mitigation
4396	02	DR-PW	GEMINI	1	03/01/2018	03/01/2018	NA	NA	NA	NA	Previously Repaired
4494	02	GF-CR	MFL and Geometry	1	12/15/2017	12/15/2017	NA	NA	NA	NA	Previously Repaired
3711	03	GF-CR	UCMp	1	2/1/2018	2/1/2018	2/6/2018	N	NA	3/6/2018	2/26/2018
4468	05	BC-RW	UCc	3	2/8/2018	2/8/2018	2/12/2018	N	NA	2/12/2019	Multiple (see below)
4356	05	IR-NO	UCc	5	1/22/2018	1/24/2018	1/24/2018	Y	1/24/2018	Multiple (see below)	Multiple (see below)
4356	05	IR-NO	UCc	1	1/24/2018	1/25/2018	1/25/2018	N	NA	4/25/2018	3/4/2018
4356	05	IR-NO	UCc	1	1/25/2018	1/27/2018	1/29/2018	Y	1/31/2018	2/13/2018	2/1/2018

Line 2 DR-PW GEMINI (Run ID 4396)

Girth Weld ("GW") 108610: One Priority Notification ("PN") was received on 3/1/2018, and feature was reviewed on 3/1/2018. It was determined that mitigation (excavation and Point Pressure Restriction ("PPR")) was not required because the feature was previously repaired.

Line 2 GF-CR MFL and Geometry (GEMINI) (Run ID 4494)

GW 58550: One PN was received on 12/15/2017, and feature was reviewed on 12/15/2017. It was determined that mitigation (excavation and RP) was not required because the feature was previously repaired.

Line 3 GF-CR UCMp (Run ID 3711)

GW 44240: One PN was received on 2/1/2018. The feature was reviewed on 2/1/2018 and determined that mitigation (excavation only) was required. Mitigation activities were completed on 2/26/2018.

Line 5 BC-RW UCc (Run ID 4468)

Three PN features were received on 2/8/2018 for features on multiple pipe joints:

GW 12040: Feature was reviewed and determined that mitigation (excavation only) was required. Mitigation activities were completed on 4/21/2018.

GW 28640: Feature was reviewed and determined that mitigation (excavation only) was required. Mitigation activities have a deadline of 2/12/2019.

GW 103520: Feature was reviewed and determined that mitigation (excavation only) was required. Mitigation activities have a deadline of 2/12/2019.

Line 5 IR-NO UCc (Run ID 4356)

Five PN features were received on 1/22/2018 for features on multiple pipe joints:

GW 17740: Feature was reviewed and determined that mitigation (excavation and Pressure Restriction ("PR")) was required. Mitigation activities were completed on 2/3/2018. Point Pressure Restriction (PPR = 385 psi) was imposed on 1/24/2018 and removed on 2/21/2018.

GW 17980: Feature was reviewed and determined that mitigation (excavation only) was required. Mitigation activities were completed on 2/5/2018.

GW 47150: Feature was reviewed and determined that mitigation (excavation only) was required. Mitigation activities were completed on 2/21/2018.

GW 221030: Feature was reviewed and determined that mitigation (excavation only) was required. Mitigation activities were completed on 2/21/2018.

GW 236570: Feature was reviewed and determined that mitigation (excavation only) was required. Mitigation activities were completed on 3/2/2018.

One PN feature was received on 1/24/2018 for a feature on GW 68880:

Feature was reviewed and determined that mitigation (excavation only) was required. Mitigation activities were completed on 3/4/2018.

One PN feature was received on 1/25/2018 for a feature on GW 216420:

Feature was reviewed and determined that mitigation (excavation and PR) was required. Mitigation activities were completed on 2/1/2018. A PPR equal to 504 psi was imposed on 1/31/2018 and removed on 1/31/2018. The PPR was removed once the mitigation was completed on the feature requiring the pressure restriction.

34 [Data Quality Review]

Data quality reviews were completed within the timeframes required by the Consent Decree. ILI reports that did not meet Enbridge's quality standards are described below.

34.a [Preliminary Review of Initial ILI Report]

There were forty-five (45) Initial ILI reports reviewed between November 23, 2017 and May 22, 2018. The preliminary review of the Initial ILI reports received before April 22, 2018 was completed within the 30 day timeframe provided under the Consent Decree. Data concerns were identified with six (6) Initial ILI reports. Details regarding these concerns appear below.

The following table illustrates the Data Quality Review ("DQR") timeline versus requirements in Subparagraph 34.a of the Consent Decree.

Table 13: Preliminary Review of Initial ILI Reports[1]									
Tool Run ID	**Line**	**Segment**	**Tool**	**Report Received Date**	**Report Type**	**Date Preliminary Review Required[1]**	**Date Preliminary Review Completed**	**Review Completed on Time?**	**Data Quality Concerns?**
4395	02	CR-DR	GEMINI	4/6/2018	Geometry	5/7/2018	5/3/2018	Yes	No
4395	02	CR-DR	GEMINI	5/7/2018	Corrosion	6/6/2018	FR	FR	FR
4396	02	DR-PW	GEMINI	3/20/2018	Geometry	4/19/2018	4/18/2018	Yes	No
4396	02	DR-PW	GEMINI	4/18/2018	Corrosion	5/18/2018	5/16/2018	Yes	No
4494	02	GF-CR	GEMINI	12/29/2017	Geometry	1/29/2018	1/18/2018	Yes	No
4494	02	GF-CR	GEMINI	2/1/2018	Corrosion	3/5/2018	3/1/2018	Yes	No
3712	03	CR-PW	USWM+	11/18/2017	Corrosion	12/18/2017	12/18/2017	Yes	Yes
3711	03	GF-CR	UCMp	2/12/2018	Corrosion	3/14/2018	3/14/2018	Yes	No
3711	03	GF-CR	UCMp	3/12/2018	Crack	4/11/2018	4/11/2018	Yes	No
2254	04	CR-CS	DuDi UCM	1/16/2018	Corrosion	2/15/2018	2/14/2018	Yes	Yes
2254	04	CR-CS	DuDi UCM	2/15/2018	Crack	3/19/2018	3/19/2018	Yes	No
4465	04	CS-DR	DuDi UCM	1/17/2018	Corrosion	2/16/2018	2/15/2018	Yes	Yes
4465	04	CS-DR	DuDi UCM	2/16/2018	Crack	3/19/2018	3/19/2018	Yes	No
2351	04	DN-VG	DuDi UCM	5/8/2018	Corrosion	6/7/2018	FR	FR	FR
4466	04	FW-WR	DuDi UCM	3/8/2018	Corrosion	4/9/2018	03/22/2018	Yes	No
4466	04	FW-WR	DuDi UCM	4/11/2018	Crack	5/11/2018	5/3/2018	Yes	No
6013	04	GF-DN	DuDi UCM	2/20/2018	Corrosion	3/22/2018	3/22/2018	Yes	No
6013	04	GF-DN	DuDi UCM	3/22/2018	Crack	4/23/2018	4/23/2018	Yes	No
2358	04	PL-CR	DuDi UCM	5/18/2018	Corrosion	6/18/2018	FR	FR	FR

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Table 13: Preliminary Review of Initial ILI Reports[1]									
Tool Run ID	**Line**	**Segment**	**Tool**	**Report Received Date**	**Report Type**	**Date Preliminary Review Required[1]**	**Date Preliminary Review Completed**	**Review Completed on Time?**	**Data Quality Concerns?**
2323	04	VG-PL	DuDi UCM	5/15/2018	Corrosion	6/14/2018	FR	FR	FR
2689	04	WR-PW	GeoPig	4/6/2018	Geometry	5/7/2018	5/3/2018	Yes	No
2162	05	BC-RW	CD+2	12/6/2017	Crack	1/5/2018	1/5/2017	Yes	No
2215	05	BC-RW	GEMINI	11/22/2017	Corrosion	12/22/2017	12/18/2017	Yes	No
4468	05	BC-RW	UCc	3/2/2018	Crack	4/2/2018	4/2/2018	Yes	No
6016	05	ENO-EMA	GeoPig	5/17/2018	Geometry	6/18/2018	FR	FR	FR
6087	05	ENO-EMA	GeoPig	4/23/2018	Geometry	5/23/2018	FR	FR	FR
4356	05	IR-NO	UCc	2/8/2018	Crack	3/12/2018	3/12/2018	Yes	No
4406	05	MA-BC	AFD	4/12/2018	Corrosion	5/14/2018	5/14/2018	Yes	Yes
2140	05	PE-IR	AFD	11/21/2017	Corrosion	12/21/2017	12/21/2017	Yes	No
2150	05	PE-IR	CD+2	11/16/2017	Crack	12/18/2017	12/14/2017	Yes	No
4213	05	PE-IR	GeoPig	4/23/2018	Geometry	5/23/2018	FR[2]	FR[2]	FR[2]
6017	05	WNO-WMA	GeoPig	5/17/2018	Geometry	6/18/2018	FR	FR	FR
6088	05	WNO-WMA	GeoPig	4/23/2018	Geometry	5/23/2018	FR	FR	FR
4334	6A	AM-GT	GEMINI	3/9/2018	Geometry	4/9/2018	4/9/2018	Yes	No
4334	6A	AM-GT	GEMINI	4/6/2018	Corrosion	5/7/2018	5/6/2018	Yes	Yes
4443	6A	AM-GT	UMP	3/2/2018	Corrosion	4/2/2018	4/2/2018	Yes	Yes
3809	6A	PE-AM	DUO CD	2/2/2018	Crack	3/5/2018	3/5/2018	Yes	No

Table 13: Preliminary Review of Initial ILI Reports[1]									
Tool Run ID	**Line**	**Segment**	**Tool**	**Report Received Date**	**Report Type**	**Date Preliminary Review Required[1]**	**Date Preliminary Review Completed**	**Review Completed on Time?**	**Data Quality Concerns?**
4182	6A	PE-AM	GEMINI	12/28/2017	Corrosion	1/29/2018	1/29/2018	Yes	No
4438	10	EB-ENR	UC	1/18/2018	Crack	2/20/2018	2/16/2018	Yes	No
3645	10	ENR-UT	UCh	11/24/2017	Crack	12/26/2017	12/21/2017	Yes	No
2459	64	GL-GT	GEMINI	3/23/2018	Geometry	4/23/2018	4/23/2018	Yes	No
2459	64	GL-GT	GEMINI	4/23/2018	Corrosion	5/23/2018	FR	FR	FR
4489	78	SK-RW	UMP	4/11/2018	Corrosion	5/11/2018	5/11/2018	Yes	No
4490	78	SK-RW	MFL4	3/8/2018	Geometry	4/9/2018	4/9/2018	Yes	No
4490	78	SK-RW	MFL4	4/9/2018	Corrosion	5/9/2018	5/9/2018	Yes	No

TABLE NOTE:

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

[2] *The Preliminary Review of Line 5 PE-IR Geopig Initial ILI Report was completed on May 23, 2018 (one day after this SAR reporting period), and the ILI data issue identified in the review is included in this SAR and more detail is included in the paragraph below.*

ILI data issues encountered when performing the preliminary reviews of the Initial ILI Reports are listed in the table above and are analyzed and summarized below:

Line 3 CR-PW USWM+ (Tool Run ID 3712)

Reported relative distances for the most severe point of some cluster features were incorrect. This re-issue did not change depth or Rupture Pressure Ratios ("RPRs") of any of the features; nor was there any impact on threat integration. Enbridge requested the vendor to re-issue the report to meet Enbridge Reporting Profile Standard data quality and consistency requirements, and the report was re-issued (ILI Report Issue 1.1) on 1/22/2018.

Line 4 CR-CS UCM Corrosion (Tool Run ID 2254) and Line 4 CS-DR UCM Corrosion (Tool Run ID 4465)

Both Line 4 corrosion reports had feature orientation reporting problems identified in the Initial ILI Report (Issue 1) which were resolved with the vendor, and corrected in the re-issued reports (Issue 2). ILI Report Issue 2 was reviewed without any other issues or concerns within 30 days of the receipt of the Initial ILI Report (Issue 1).

Line 5 MA-BC AFD Corrosion (Tool Run ID 4406)

Data degradation (minor circumferential data loss) occurred from 422664.56 ft. to 422698.20 ft. which corresponds to GW 110010 and GW 110020. Data wasn't reported on these two joints in the 2018 AFD inspection due to a tool issue. Several shallow features (Depths < 17% Nominal Wall Thickness ("NWT"), RPR > 1.18) were reported on these two joints from the 2012 and 2017 MFL. Based on the results of the above three inspections which showed no significant corrosion, no action is required for the 33.64ft of degraded data.

Line 5 PE-IR Geopig (Tool Run ID 4213)

The data indicated that there was one failed arm on the caliper tool. There are 68 caliper arms on this tool. One missing arm represents a width of 2.8" (circumference of pipe is 94.25"). No deformation ever reported by a caliper tool on Line 5 PE-IR has had a width less than or equal to 2.8" (70.62mm). The narrowest width of a dent reported by any caliper tool on Line 5 PE-IR is 3.976" (101mm) and thus at least one adjacent arm to the failed arm would detect the dent. Additionally, a successful 2017 Geopig was completed on this segment and a dig program was issued. PI contacted the vendor to identify where the failed arm was located on the topside of the pipe. Note that the review was completed on May 23, 2018, which is outside the SAR reporting period.

Line 6A AM-GT GEMINI Corrosion (Tool Run ID 4334)

The Line 6A AM-GT 2018 GEMINI MFL ILI data report was re-issued because Enbridge identified during the DQR process that Metal Loss features meeting the ILI tool detection and reporting threshold were unboxed and unreported by the ILI Vendor.

Enbridge's review of the Line 6A AM-GT 2018 GEMINI MFL ILI data identified some Metal Loss features that meet the tool detection and reporting threshold but were not reported (unboxed) by the ILI Vendor. On April 30, 2018, Enbridge initiated a request to have the ILI Vendor review and confirm Metal Loss features identified as unboxed. Upon the ILI Vendor's confirmation that some the identified Metal Loss features requested for review by Enbridge were unreported in the ILI data listing, Enbridge requested further discussion with the ILI Vendor.

On May 3, 2018, Enbridge and the ILI Vendor formally agreed that the ILI Vendor would perform a Root Cause Analysis ("RCA"), document corrective actions and re-analyze the ILI data on the entire length of Line 6A AM-GT after which the ILI Vendor will re-issue the Line 6A AM-GT 2018 GEMINI MFL ILI data (Issue 2).

ILI data for the Line 6A AM-GT 2018 GEMINI MFL ILI run (Issue 1) was assessed within the Consent Decree deadlines/timelines and excavations were issued to the field within the required timelines.

The vendor was asked to submit the RCA, corrective action identification and re-analysis of the Line 6A AM-GT 2018 GEMINI MFL ILI data (Issue 2). The Issue 2 final report was received and accepted by Enbridge on June 1, 2018.

Enbridge's DQR for the re-issued Line 6A AM-GT 2018 GEMINI MFL ILI data (Issue 2) and the issuance of excavation will be completed within 180 days (7/7/2018) from when the ILI tool was pulled from the pipeline (1/8/2018) as stipulated by the CD (Subparagraph 34.d). Assessment of ILI data for the Line 6A AM-GT 2018 GEMINI MFL ILI run (Issue 2) is currently ongoing and expected to be completed within the stipulated Consent Decree deadline/timeline of July 7, 2018.

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

The Line 6A AM-GT 2017 NDT UMP ILI data report was re-issued because Enbridge identified during the DQR process that Metal Loss features meeting the ILI tool detection and reporting threshold were unboxed and unreported by the ILI Vendor.

Enbridge's DQR of the Line 6A AM-GT 2017 NDT UMP ILI data identified some Metal Loss features that meet the tool detection and reporting threshold but were not reported (unboxed) by the ILI Vendor. On March 29, 2018, Enbridge initiated a request to have the ILI Vendor review and confirm Metal Loss features identified as unboxed. Upon the ILI Vendor's confirmation that some the identified Metal Loss features requested for review by Enbridge were unreported in the ILI data listing, Enbridge requested further discussion with the ILI Vendor.

On April 18, 2018, Enbridge formally requested that the ILI Vendor perform an RCA document corrective actions, and re-analyze the ILI data on the entire length of L6A AM-GT, as well as re-issue the Line 6A AM-GT 2017 NDT UMP ILI data.

ILI data for the Line 6A AM-GT 2017 NDT UMP ILI run (Issue 1) was assessed within the Consent Decree deadlines/timelines and excavations issued to the field as required.

The RCA, corrective action identification, and re-analysis of the Line 6A AM-GT 2017 NDT UMP ILI data is now complete with the final ILI data report was approved on 4/25/2018.

Enbridge's DQR for the re-issued Line 6A AM-GT 2017 NDT UMP ILI data (Issue 2) was completed within 180 days (5/31/2018) from when the ILI tool was pulled from the pipeline as stipulated by the Consent Decree (Subparagraph 34.d). Assessment of ILI data for the Line 6A AM-GT 2017 NDT UMP ILI run (Issue 2) is now complete and excavation issued within the Consent Decree deadline of 4/29/2018.

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 according to the Lakehead System Integrity Remediation process. Table 17 in Paragraph 37 of this SAR identifies the timelines when FREs were identified and placed onto the Dig List during this SAR reporting period.

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34.c [Resolution of Identified Data Quality Concerns]

For ILI runs with Data Quality Concerns that were identified during Enbridge's preliminary review of the Initial ILI Report, Enbridge completed the evaluations necessary to resolve all of the identified data quality concerns as expeditiously as practicable, as summarized in Table 14. ILI data issue details of the listed programs of Line 3 CR-PW USWM+, Line 4 CR-CS UCM Corrosion, Line 4 CS-DR Corrosion, Line 5 MA-BC AFD, Line 6A AM-GT GEMINI Corrosion and UMP are discussed above in response to Subparagraph 34.a.

Table 14: Report with Data Quality Concerns

Tool Run ID	Line	Segment	Tool	Initial Report Received Date	Date Preliminary Review Required	Date Preliminary Review Completed	Data Quality Concerns?
3712	03	CR-PW	USWM+	11/18/2017	12/18/2017	12/18/2017	Yes
2254	04	CR-CS	UCM Corrosion	1/16/2018	2/15/2018	2/14/2018	Yes
4465	04	CS-DR	UCM Corrosion	1/17/2018	2/16/2018	2/15/2018	Yes
4406	05	MA-BC	AFD	4/12/2018	5/14/2018	5/14/2018	Yes
4334	6A	AM-GT	GEMINI Corrosion	4/6/2018	5/7/2018	5/6/2018	Yes
4443	6A	AM-GT	UMP	3/2/2018	4/2/2018	4/2/2018	Yes

34.d [ILI Data Quality Evaluation Timelines]

Enbridge procedures provide for analysts to complete all data quality evaluations of ILI data within 180 Days after the ILI tool is removed from the pipeline at the conclusion of any ILI investigation. During the reporting period of this SAR, all data was reviewed in a timely manner as provided by applicable procedures. As outlined in the below table, 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).

Table 15: Data Quality Evaluation Timelines[1]

Tool Run ID	Line	Segment	Tool	Pull Date	Report Type	Deadline to Complete All ILI Data Quality Evaluations	Quality Evaluations Completed Within 180 Days?
4395	02	CR-DR	GEMINI	2/7/2018	Geometry	8/6/2018	FR[2]
4395	02	CR-DR	GEMINI	2/7/2018	Corrosion	8/6/2018	FR
4396	02	DR-PW	GEMINI	1/19/2018	Geometry	7/18/2018	FR

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Table 15: Data Quality Evaluation Timelines[1]							
Tool Run ID	**Line**	**Segment**	**Tool**	**Pull Date**	**Report Type**	**Deadline to Complete All ILI Data Quality Evaluations**	**Quality Evaluations Completed Within 180 Days?**
4396	02	DR-PW	GEMINI	1/19/2018	Corrosion	7/18/2018	FR
4494	02	GF-CR	GEMINI	11/3/2017	Geometry	5/2/2018	Yes
4494	02	GF-CR	GEMINI	11/3/2017	Corrosion	5/2/2018	Yes
3712	03	CR-PW	USWM+	8/21/2017	Corrosion	2/20/2018	Yes
3711	03	GF-CR	UCMp	11/14/2017	Crack	5/14/2018	Yes
3711	03	GF-CR	UCMp	11/14/2017	Corrosion	5/14/2018	Yes
2254	04	CR-CS	DuDi UCM	10/18/2017	Corrosion	4/16/2018	Yes
2254	04	CR-CS	DuDi UCM	10/18/2017	Crack	4/16/2018	Yes
4465	04	CS-DR	DuDi UCM	10/20/2017	Crack	4/18/2018	Yes
4465	04	CS-DR	DuDi UCM	10/20/2017	Corrosion	4/18/2018	Yes
2351	04	DN-VG	DuDi UCM	2/7/2018	Corrosion	8/6/2018	FR
4466	04	FW-WR	DuDi UCM	12/12/2017	Corrosion	6/11/2018	FR
4466	04	FW-WR	DuDi UCM	12/12/2017	Crack	6/11/2018	FR
6013	04	GF-DN	DuDi UCM	12/8/2017	Corrosion	6/6/2018	FR
6013	04	GF-DN	DuDi UCM	12/8/2017	Crack	6/6/2018	FR
2358	04	PL-CR	DuDi UCM	2/20/2018	Corrosion	8/20/2018	FR
2323	04	VG-PL	DuDi UCM	2/14/2018	Corrosion	8/13/2018	FR
2689	04	WR-PW	GeoPig	2/6/2018	Geometry	8/6/2018	FR
2162	05	BC-RW	CD+2	8/8/2017	Crack	2/5/2018	Yes
2215	05	BC-RW	GEMINI	8/24/2017	Corrosion	2/20/2018	Yes
4468	05	BC-RW	UCc	11/2/2017	Crack	5/1/2018	Yes
6016	05	ENO-EMA	GeoPig	3/20/2018	Geometry	9/17/2018	FR
6087	05	ENO-EMA	GeoPig	4/7/2018	Geometry	10/4/2018	FR
4356	05	IR-NO	UCc	10/13/2017	Crack	4/11/2018	Yes
4406	05	MA-BC	AFD	1/12/2018	Corrosion	7/11/2018	FR
3662	05	PE-IR	USWM+	7/12/2017	Corrosion (Issue 2)	1/8/2018	Yes
2140	05	PE-IR	AFD	8/23/2017	Corrosion	2/20/2018	Yes

Table 15: Data Quality Evaluation Timelines[1]							
Tool Run ID	**Line**	**Segment**	**Tool**	**Pull Date**	**Report Type**	**Deadline to Complete All ILI Data Quality Evaluations**	**Quality Evaluations Completed Within 180 Days?**
2150	05	PE-IR	CD+2	7/19/2017	Crack	1/16/2018	Yes
4213	05	PE-IR	GeoPig	2/22/2018	Geometry	8/21/2018	FR
6017	05	WNO-WMA	GeoPig	3/20/2018	Geometry	9/17/2018	FR
6088	05	WNO-WMA	GeoPig	4/7/2018	Geometry	10/4/2018	FR
4334	6A	AM-GT	GEMINI	1/8/2018	Corrosion	7/9/2018	FR
4334	6A	AM-GT	GEMINI	1/8/2018	Geometry	7/9/2018	FR
4443	6A	AM-GT	UMP	12/2/2017	Corrosion	5/31/2018	FR
3809	6A	PE-AM	DUO CD	10/6/2017	Crack	4/4/2018	Yes
4182	6A	PE-AM	GEMINI	9/29/2017	Corrosion	3/28/2018	Yes
4438	10	EB-ENR	UC	9/20/2017	Crack	3/19/2018	Yes
3645	10	ENR-UT	UCh	7/27/2017	Crack	1/23/2018	Yes
2459	64	GL-GT	GEMINI	1/24/2018	Geometry	7/23/2018	FR
2459	64	GL-GT	GEMINI	1/24/2018	Corrosion	7/23/2018	FR
4489	78	SK-RW	UMP	1/12/2018	Corrosion	7/11/2018	FR
4490	78	SK-RW	MFL4	1/10/2018	Geometry	7/9/2018	FR
4490	78	SK-RW	MFL4	1/10/2018	Corrosion	7/9/2018	FR

TABLE NOTE

[1] Runs with reports received on or before November 22, 2017 and ILI Data Quality Review performed after November 22, 2017 are included.

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

34.e [Discrepancies between Two Successive ILI Runs]

Potential data quality concerns that specifically related to the most previous assessment of the line segment were identified during Enbridge's preliminary review for the initial ILI Reports identified in Table 16 below. A significant severity discrepancy is defined in the Consent Decree as: if at least 60% of the population of reported features are either (A) more severe than previously reported and more severe than predicted by the most recent assessment of anticipated feature growth, or (B) less severe than previously reported. A significant density discrepancy is defined in the Consent Decree as follows: if the number of reported features is at least 20% greater or 20% less than the number of features previously reported.

Table 16: Discrepancies between Two Successive ILI Runs							
Tool Run ID	**Line**	**Segment**	**Tool**	**Report Type**	**Severity discrepancy?**	**Density discrepancy?**	**Type of features Requiring Excavation Discrepancy?**
4395	02	CR-DR	GEMINI	Geometry	N	Y	NA
4396	02	DR-PW	GEMINI	Geometry	N	Y	NA
4494	02	GF-CR	GEMINI	Corrosion	N	Y	NA
4494	02	GF-CR	GEMINI	Geometry	N	Y	NA
3711	03	GF-CR	NDT UCMp	Crack	N	Y	NA
2254	04	CR-CS	UCM	Crack	N	Y	NA
4466	04	FW-WR	UCM	Crack	N	Y	NA
6013	04	GF-DN	UCM	Crack	N	Y	NA
4344	6A	AM-GT	GEMINI	Corrosion	N	Y	NA
4443	6A	AM-GT	UMP	Corrosion	N	Y	NA
4182	6A	PE-AM	GEMINI	Corrosion	N	Y	NA

Line 2 CR-DR Gemini Geometry (Run ID 4395)

The subject Line 2 report contained a discrepancy between data provided in the previous report related to a greater than 20% decrease in reported feature density. All non-matching features were reviewed in detail and no required actions identified. The results of the assessment are summarized in the Geometric ILI Summary Document.

Line 2 DR-PW Gemini Geometry (Run ID 4396)

The subject Line 2 report contained a discrepancy between data provided in the previous report related to a greater than 20% decrease in reported feature density. All non-matching features were reviewed in detail and no required actions were identified to address the discrepancy. The results of the assessment, and additional mitigations, are summarized in the Geometric ILI Summary Document.

Line 2 GF-CR Gemini Corrosion (Run ID 4494)

The subject Line 2 report contained a discrepancy between data provided in the previous report related to a greater than 20% decrease in reported feature density. This was an increase of 35% in the density of features >=10%. Preliminary analysis of the 2017 ILI data demonstrated that the tool is expected to have performed according to the specifications. To further investigate the discrepancy one dig was issued for excavation to confirm the sizing of a previously excavated and recoated feature. The results of the assessment are summarized in the Corrosion Program Summary Document.

Line 2 GF-CR Gemini Geometry (Run ID 4494)

The subject Line 2 report contained a discrepancy between data provided in the previous report related to a greater than 20% increase in reported feature density. An investigation into the discrepancy was completed and no required actions were identified to address the discrepancy. The results of the assessment, and additional mitigations, are summarized in the Geometric ILI Summary Document.

Line 3 GF-CR NDT UCMp Crack (Run ID 3711)

The subject Line 3 report contained a discrepancy between data provided in the previous report related to a greater than 20% decrease in reported feature density. An investigation identified that the discrepancy was due to two primary reasons: (i) a 12-mile new replacement section was installed downstream of GF station (i.e., removing 12 miles of previously-reported pipeline from service, and (ii) an improved probability of detection ("POD") for Crack Features ("CF") over prior crack tool technology. The improved POD has been achieved through continuous improvement efforts supported by both the vendor and Enbridge, leveraging the results of previous digs on the Enbridge mainline system.

Line 4 CR-CS NDT UCMUT Crack (Run ID 2254), Line 4 FW-WR NDT UCMUT Crack (Run ID 4466), and Line 4 CR-CS NDT UCMUT Crack (Run ID 6013)

The three subject Line 4 reports contained a density discrepancy between data provided in the previous ILI Report. The discrepancy noted was related to a greater than 20% reduction in the density of reported features, primarily a reduction in reporting of low level features. An investigation was completed and identified that the density discrepancy is due the change in analysis methodology by the ILI vendor as a result of continuous improvement efforts made jointly with Enbridge.

Improvements in inspection tool configuration and processing algorithms were achieved through the process of calibrating analysis to the results of previous digs to increase the precision and accuracy of the inline inspection results. The increased precision resulted in a high number of low level features that had previously been reported, to fall below the 1.0 mm depth reporting threshold. The lengths of some individual features were further below the minimum (POD) stated in the performance specification of 25 mm.
Another example of a continuous improvement is that the recent inspection tool was configured with online parameters to adapt to varying liquid product properties in the pipeline throughout the inspection to further improve performance.

Line 6A AM-GT 2018 BH GEMINI MFL4 Corrosion (Run ID 4344)

The subject Line 6A report contained a discrepancy between data provided in the previous report related to a greater than 20% increase in reported feature density, due to a significant increase in low level corrosion (primarily between 10% and 20% depth). Investigation into the causes of the discrepancy indicate that the increase in reported features is due to two primary reasons; improvements in inline inspection tool specifications and general growth of low level corrosion features now meeting reporting thresholds.

The technology used for the 2018 inspection takes advantage of increased resolution (more sensors), improved pinhole detection and overall improved performance specifications. The technology provides for increased accuracy and precision in detection and reporting, and the result was an increase in the overall number of features reported.

The vast majority of the increased number of reported features are low level corrosion, less than 20%. Due to anticipated general corrosion growth, a number of new features now meet the 10% reporting criteria threshold. Review of the data has further confirmed that there is not a severity discrepancy identified to be associated with the density discrepancy.

Line 6A AM-GT 2017 NDT UMP Corrosion (Run ID 4443)

The subject Line 6A report contained a discrepancy between data provided in the previous report related to a greater than 20% increase in reported feature density, due to a significant increase in low level corrosion (primarily between 10% and 20% depth). Investigation into the causes of the discrepancy indicate that the increase in reported features is due to two primary reasons; differences between the technologies provided by two ILI vendors and the associated tool specifications and software algorithms, and general growth of low level corrosion features now meeting reporting thresholds.

As discussed in Paragraph 34a, some data quality review issues were identified and addressed with the ILI vendor. The density discrepancy resulting in the final re-issued report primarily consists of low level corrosion between 10% and 20%. This is not unexpected, due to both the anticipated general corrosion growth, i.e. a number of new features now meet the 10% reporting criteria threshold, and the specified tool tolerances for the inline inspection tool technologies. Review of the data has further confirmed that there is not a severity discrepancy identified to be associated with the density discrepancy.

Line 6A PE-AM 2017 BH GEMINI MFL Corrosion (Run ID 4182)

The subject Line 6A report contained a discrepancy between data provided in the previous report related to a greater than 20% increase in reported feature density, due to a significant increase in low level corrosion (primarily between 10% and 20% depth). Investigation into the causes of the discrepancy indicate that the increase in reported features is due to two primary reasons; differences between the technologies provided by two ILI vendors and the associated tool specifications and software algorithms, and general growth of low level corrosion features now meeting reporting thresholds.
This is not unexpected, due to both the anticipated general corrosion growth, i.e. a number of new features now meet the 10% reporting criteria threshold, and the specified tool tolerances for the inline inspection tool technologies. Review of the data has further confirmed that there is not a severity discrepancy identified to be associated with the density discrepancy.

34.f-g [Investigative Digs]

No investigative digs were required during this reporting period.

(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 a FRE in accordance with the Lakehead System Integrity Remediation process. The records of these evaluations were recorded in the Assessment Sheets for each ILI tool run and were referenced in the Compliance Registry Forms.

36 [Feature Requiring Excavation Definition]

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

- 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.
- 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.
- Enbridge considers other unique characteristics of a feature using the criteria set forth in Subsection VII.D.(V) of the Consent Decree. These methods are outlined in the procedure, PI-37 Fitness for Service Calculations and the Lakehead System Integrity Remediation process. The records of these methods being applied are in the Assessment Sheets for each ILI tool run and were referenced in the Compliance Registry Forms database.

With respect to Geometric features, Enbridge considers other unique characteristics of the feature using the criteria set forth in Subsection VII.D.(V) of the Consent Decree. This method is outlined in the procedure, PI-37 Fitness for Service Calculations. The records of this criteria being applied are in the Assessment Sheets for each ILI tool run and were referenced in the Compliance Registry Forms.

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

Following each successful Consent Decree ILI tool run, Enbridge identified all Crack, Corrosion, and Geometric features detected by the ILI tool runs that are FREs in accordance with the Lakehead System Integrity Remediation process. 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.

Enbridge identified all FREs based on their Predicted Burst Pressure and their Remaining Life, and added these features 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.

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

The non-compliance issue that the three dent features were placed onto the dig list for Line 6A Adams to Griffith AM-GT GEMINI CAL program (Tool Run ID 4334) four days later than the Consent Decree timelines is addressed in Paragraph 145.

Table 17 below identifies the FREs that were discovered during the reporting period of this SAR. Priority notifications are excluded from these tables as they are included in Paragraph 33 of this SAR. ILI tool runs that did not discover any FREs are excluded from this table. Details on the process to identify FREs are included within the ILI Assessment Sheets.

Table 17: Deadlines for Placing Features Requiring Excavation on the Dig List

Tool Run ID	Line	Seg-ment	Tool	Threat Type	Pull Date	Burst Pressure Calculation Date	Remaining Life Calculation Date	Other Features Identified Date	Number of Features Identified	Date All Features Added to Dig List	Within 180 Days of Tool Pull Date?	Within 5 Days of Calculations?
4396	02	DR - PW	GEMINIC AL	Interacting	1/19/2018	NA	NA	4/18/2018	2	4/18/2018	Yes	Yes
4494	02	GF - CR	GEMINIC AL	Dent	11/3/2017	NA	NA	1/18/2018	1	1/18/2018	Yes	Yes
4494	02	GF - CR	GEMINI MFL	Corrosion	11/3/2017	3/1/2018	3/1/2018	3/1/2018	5	3/1/2018	Yes	Yes
3712	03	CR - PW	USWM+	Corrosion	8/21/2017	12/26/2017	12/26/2017	12/26/2017	1	12/26/2017	Yes	Yes
3712	03	CR - PW	USWM+	Interacting	8/21/2017	NA	NA	12/26/2017	3	12/26/2017	Yes	Yes
3711	03	GF - CR	UCMPUT CD	Crack	11/14/2017	4/11/2018	4/11/2018	4/16/2018	5	4/16/2018	Yes	Yes
3711	03	GF - CR	UCMPUT WM	Corrosion	11/14/2017	3/14/2018	3/14/2018	3/19/2018	4	3/19/2018	Yes	Yes
2254	04	CR - CS	UCMUT WM	Interacting	10/18/2017	NA	NA	2/15/2018	2	2/15/2018	Yes	Yes
4465	04	CS - DR	UCMUTC D	Crack	10/20/2017	3/19/2018	3/19/2018	3/21/2018	15	3/21/2018	Yes	Yes
4466	04	FW - WR	UCMUT WM	Corrosion	12/12/2017	3/22/2018	3/22/2018	3/22/2018	1	3/22/2018	Yes	Yes
4466	04	FW - WR	UCMUTC D	Crack	12/12/2017	5/3/2018	5/3/2018	5/8/2018	5	5/8/2018	Yes	Yes

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Table 17: Deadlines for Placing Features Requiring Excavation on the Dig List												
Tool Run ID	**Line**	**Seg-ment**	**Tool**	**Threat Type**	**Pull Date**	**Burst Pressure Calculation Date**	**Remaining Life Calculation Date**	**Other Features Identified Date**	**Number of Features Identified**	**Date All Features Added to Dig List**	**Within 180 Days of Tool Pull Date?**	**Within 5 Days of Calculations?**
6013	04	GF - DN	UCMUTWM	Corrosion	12/8/2017	3/22/2018	3/22/2018	3/22/2018	4	3/22/2018	Yes	Yes
6013	04	GF - DN	UCMUTCD	Crack	12/8/2017	4/23/2018	4/23/2018	4/23/2018	1	4/23/2018	Yes	Yes
2215	05	BC - RW	GEMINI MFL	Corrosion	8/24/2017	12/18/2017	12/18/2017	12/18/2017	10	12/18/2017	Yes	Yes
4468	05	BC - RW	UCC	Crack	11/2/2017	4/26/2018	4/26/2018	5/1/2018	1	5/1/2018	Yes	Yes
4356	05	IR - NO	UCC	Crack	10/13/2017	4/6/2018	4/6/2018	3/13/2018	2	4/10/2018	Yes	Yes
4406	05	MA - BC	AFD	Corrosion	1/12/2018	5/14/2018	5/14/2018	5/17/2018	6	5/17/2018	Yes	Yes
2150	05	PE - IR	CD+	Crack	7/19/2017	12/14/2017	12/14/2017	12/14/2017	5	12/14/2017	Yes	Yes
2150	05	PE - IR	CD+	Interacting	7/19/2017	NA	NA	12/14/2017	9	12/14/2017	Yes	Yes
2140	05	PE - IR	AFD	Corrosion	8/23/2017	12/21/2017	12/21/2017	12/26/2017	11	12/26/2017	Yes	Yes
2140	05	PE - IR	AFD	Interacting	8/23/2017	NA	NA	12/26/2017	1	12/26/2017	Yes	Yes
4443	06A	AM - GT	UMP	Corrosion	12/2/2017	4/2/2018	4/2/2018	4/9/2018	57	4/9/2018	Yes	Yes
4334	06A	AM - GT	GEMINI MFL	Corrosion	1/8/2018	5/6/2018	5/6/2018	5/11/2018	19	5/11/2018	Yes	Yes
4334	06A	AM - GT	GEMINI MFL	Interacting	1/8/2018	NA	NA	5/11/2018	1	5/11/2018	Yes	Yes
4334	06A	AM - GT	GEMINICAL	Interacting	1/8/2018	NA	NA	4/16/2018	24	4/16/2018	Yes	Yes
4334	06A	AM - GT	GEMINICAL	Dent	1/8/2018	NA	NA	4/20/2018	3	4/20/2018	Yes	Yes

Table 17: Deadlines for Placing Features Requiring Excavation on the Dig List												
Tool Run ID	**Line**	**Seg-ment**	**Tool**	**Threat Type**	**Pull Date**	**Burst Pressure Calculation Date**	**Remaining Life Calculation Date**	**Other Features Identified Date**	**Number of Features Identified**	**Date All Features Added to Dig List**	**Within 180 Days of Tool Pull Date?**	**Within 5 Days of Calculations?**
4182	06A	PE - AM	GEMINI MFL	Corrosion	9/29/2017	1/29/2018	1/29/2018	2/5/2018	45	2/5/2018	Yes	Yes
3809	06A	PE - AM	DUOCD	Crack	10/6/2017	3/5/2018	3/5/2018	3/9/2018	41	3/9/2018	Yes	Yes

38 [Dig List Actions]

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

38.a [Excavation and Repair Deadlines]

For each FRE placed on the Dig List, Enbridge established excavation and repair deadlines that accounted for the level of threat posed by the feature and that complied with the dig criteria deadlines specified in 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. This requirement is outlined in the Lakehead System Integrity Remediation process and deadlines can be found in the approved PI Listing for each ILI tool run.

38.b [Establish Pressure Restrictions if Required]

Enbridge's Lakehead System Integrity Remediation process and procedure PI-04 (Impose, Revise and Remove Pressure Restrictions) outline how any PRs required for FREs are established pursuant to Subsection VII.D.(V) of the Consent Decree.

In any case that a 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 "PPR values" requirements were satisfied by limiting the discharge pressure at the nearest upstream pump station to a level that assured compliance with the PPR value at the location of the feature.

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

The process to adhere to the requirements of Paragraph 39 is documented in Enbridge Operations & Maintenance Manuals ("OMMs") Book 3 sections B3_05-01-01 through B3_05-03-08.

The process to adhere to the requirement in Subparagraph 39.a is documented in the Lakehead System Integrity Remediation process.

During the reporting period of this SAR, Enbridge followed its OMMs to field assess all crack and geometry features, and all corrosion features greater than 10%. Ten percent (10%) is the general corrosion ILI tool detection threshold.

Enbridge followed the Lakehead System Integrity Remediation process to excavate and repair or mitigate all identified FREs on the pipeline that were the subject of the ILI, in accordance with Subsection VII.D.(V) of the Consent Decree.

During excavations for FRE 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 the approved Non-destructive examination ("NDE") reports are 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.b were not applicable for this SAR.

During this SAR reporting period, the FREs repaired and planned for repair are listed in Table 18 below.

Table 18: FREs Repaired and Planned for Repair

Dig ID	Line	Segment	Girth Weld	Tool Run ID	Date of Repair / Mitigation	Crack Features	Corrosion Features	Axial Grooving Features	Dent Features	Interacting Features
23779	02	DR - PW	13270	4396	4/20/2018					1
23782	02	DR - PW	42810	4396	4/21/2018					1
23120	02	GF - CR	20820	4494	FR				1	
23274	02	GF - CR	11030	4494	FR		1			
23275	02	GF - CR	62790	4494	FR		2			
23276	02	GF - CR	66850	4494	FR		1			
23280	02	GF - CR	177030	4494	FR		1			
23086	03	CR - PW	141430	3712	2/22/2018					1
23087	03	CR - PW	159230	3712	2/9/2018		1			
23088	03	CR - PW	239920	3712	1/26/2018					1
23089	03	CR - PW	249650	3712	FR					1
23402	03	GF - CR	42500	3711	6/8/2018		1			
23403	03	GF - CR	49840	3711	FR		1			
23404	03	GF - CR	129350	3711	FR		1			
23405	03	GF - CR	130610	3711	FR		1			
23769	03	GF - CR	60750	3711	FR	1				
23770	03	GF - CR	64890	3711	FR	1				
23771	03	GF - CR	153060	3711	FR	1				
23772	03	GF - CR	156870	3711	FR	1				
23773	03	GF - CR	158200	3711	FR	1				
23254	04	CR - CS	32820	2254	FR					1
23255	04	CR - CS	39160	2254	FR					1
23491	04	CS - DR	27690	4465	FR	3				
23492	04	CS - DR	27990	4465	FR	1				
23493	04	CS - DR	28050	4465	FR	1				
23494	04	CS - DR	28060	4465	FR	1				
23495	04	CS - DR	28070	4465	FR	1				
23496	04	CS - DR	28120	4465	FR	2				
23497	04	CS - DR	28220	4465	FR	1				
23498	04	CS - DR	28950	4465	FR	1				
23499	04	CS - DR	30540	4465	FR	1				

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Table 18: FREs Repaired and Planned for Repair										
Dig ID	Line	Segment	Girth Weld	Tool Run ID	Date of Repair / Mitigation	Crack Fea-tures	Cor-rosion Features	Axial Groo-ving Features	Dent Fea-tures	Inter-acting Features
23500	04	CS - DR	30770	4465	FR	1				
23501	04	CS - DR	30790	4465	FR	1				
23502	04	CS - DR	32380	4465	FR	1				
23510	04	FW - WR	25700	4466	FR		1			
23897	04	FW - WR	16340	4466	FR	1				
23898	04	FW - WR	19250	4466	FR	1				
23899	04	FW - WR	26600	4466	FR	1				
23901	04	FW - WR	28430	4466	FR	1				
23902	04	FW - WR	29000	4466	FR	1				
23505	04	GF - DN	48150	6013	FR		1			
23507	04	GF - DN	54670	6013	FR		1			
23508	04	GF - DN	54690	6013	FR		1			
23509	04	GF - DN	54970	6013	FR		1			
23852	04	GF - DN	47390	6013	FR	1				
22956	05	BC - RW	56680	2215	12/11/2017					1
23045	05	BC - RW	10	2215	FR		1			
23046	05	BC - RW	610	2215	FR		1			
23047	05	BC - RW	4070	2215	FR		1			
23048	05	BC - RW	9500	2215	5/18/2018		1			
23049	05	BC - RW	13220	2215	FR		1			
23050	05	BC - RW	22170	2215	5/22/2018		1			
23051	05	BC - RW	26290	2215	FR		1			
23053	05	BC - RW	37600	2215	5/17/2018		1			
23054	05	BC - RW	56740	2215	6/1/2018		1			
23055	05	BC - RW	63420	2215	FR		1			
23873	05	BC - RW	12760	4468	FR	1				
23727	05	IR - NO	30650	4356	FR	1				
23728	05	IR - NO	65420	4356	FR	1				
23979	05	MA - BC	10010	4406	FR		1			
23980	05	MA - BC	33700	4406	FR		2			
23981	05	MA - BC	91290	4406	FR		1			
23982	05	MA - BC	95630	4406	FR		1			
23983	05	MA - BC	138790	4406	FR		1			
22847	05	PE - IR	20160	3662	12/2/2017		1			

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Table 18: FREs Repaired and Planned for Repair										
Dig ID	Line	Segment	Girth Weld	Tool Run ID	Date of Repair / Mitigation	Crack Features	Corrosion Features	Axial Grooving Features	Dent Features	Interacting Features
22849	05	PE - IR	183400	3662	2/19/2018					1
22850	05	PE - IR	184460	3662	3/15/2018		1			
22851	05	PE - IR	201490	3662	12/9/2017		1			
22852	05	PE - IR	201610	3662	12/4/2017					1
22853	05	PE - IR	207190	3662	12/19/2017		1			
22854	05	PE - IR	242570	3662	3/2/2018		1			
23017	05	PE - IR	114300	2150	5/19/2018	1				
23018	05	PE - IR	127420	2150	FR	1				2
23019	05	PE - IR	152550	2150	FR					2
23020	05	PE - IR	154730	2150	2/23/2018	1				
23021	05	PE - IR	182420	2150	3/6/2018	1				
23022	05	PE - IR	183220	2150	2/23/2018	1				
23023	05	PE - IR	184520	2150	3/8/2018	1				1
23025	05	PE - IR	190460	2150	3/3/2018	1				
23026	05	PE - IR	195900	2150	5/22/2018	2				
23076	05	PE - IR	12910	2140	5/19/2018			1		
23077	05	PE - IR	20520	2140	FR			1		
23078	05	PE - IR	33020	2140	FR			1		
23079	05	PE - IR	81930	2140	FR			1		
23080	05	PE - IR	116480	2140	FR			2		
23081	05	PE - IR	116930	2140	FR			1		
23082	05	PE - IR	148130	2140	FR			1		
23083	05	PE - IR	167940	2140	1/22/2018					1
23084	05	PE - IR	230050	2140	FR			2		
23085	05	PE - IR	245260	2140	FR			1		
23672	6A	AM - GT	8370	4443	FR		1			
23673	6A	AM - GT	20580	4443	FR		1			
23674	6A	AM - GT	37040	4443	FR		1			
23675	6A	AM - GT	72020	4443	5/22/2018		1			
23676	6A	AM - GT	77030	4443	FR		1			
23677	6A	AM - GT	89180	4443	FR		1			
23678	6A	AM - GT	99630	4443	FR		1			
23679	6A	AM - GT	100680	4443	FR		1			
23680	6A	AM - GT	106240	4443	FR		1			

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Table 18: FREs Repaired and Planned for Repair										
Dig ID	Line	Segment	Girth Weld	Tool Run ID	Date of Repair / Mitigation	Crack Features	Corrosion Features	Axial Grooving Features	Dent Features	Interacting Features
23681	6A	AM - GT	109420	4443	FR		1			
23682	6A	AM - GT	111040	4443	FR		1			
23683	6A	AM - GT	112090	4443	FR		1			
23684	6A	AM - GT	123180	4443	FR		2			
23685	6A	AM - GT	130890	4443	FR		1			
23686	6A	AM - GT	136750	4443	FR		1			
23687	6A	AM - GT	140880	4443	FR		1			
23688	6A	AM - GT	147990	4443	FR		1			
23689	6A	AM - GT	148420	4443	FR		1			
23690	6A	AM - GT	151570	4443	FR		1			
23691	6A	AM - GT	153530	4443	FR		1			
23692	6A	AM - GT	157490	4443	FR		1			
23693	6A	AM - GT	162900	4443	FR		1			
23694	6A	AM - GT	163690	4443	FR		1			
23695	6A	AM - GT	165800	4443	FR		1			
23696	6A	AM - GT	178150	4443	FR		1			
23697	6A	AM - GT	198680	4443	FR		1			
23698	6A	AM - GT	201190	4443	FR		1			
23699	6A	AM - GT	206940	4443	FR		1			
23700	6A	AM - GT	207050	4443	FR		1			
23701	6A	AM - GT	241040	4443	FR		1			
23702	6A	AM - GT	243240	4443	FR		1			
23703	6A	AM - GT	255130	4443	FR		1			
23704	6A	AM - GT	257720	4443	FR		1			
23705	6A	AM - GT	261430	4443	FR		1			
23706	6A	AM - GT	273260	4443	FR		1			
23707	6A	AM - GT	273330	4443	FR		1			
23708	6A	AM - GT	274200	4443	FR		1			
23709	6A	AM - GT	274947	4443	FR		1			
23710	6A	AM - GT	277560	4443	FR		1			
23711	6A	AM - GT	279270	4443	FR		1			
23712	6A	AM - GT	279280	4443	FR		1			
23713	6A	AM - GT	286210	4443	FR		1			
23714	6A	AM - GT	286240	4443	FR		1			

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Table 18: FREs Repaired and Planned for Repair										
Dig ID	Line	Segment	Girth Weld	Tool Run ID	Date of Repair / Mitigation	Crack Fea-tures	Cor-rosion Features	Axial Groo-ving Features	Dent Fea-tures	Inter-acting Features
23715	6A	AM - GT	286560	4443	FR		1			
23716	6A	AM - GT	288040	4443	FR		1			
23717	6A	AM - GT	288150	4443	FR		1			
23718	6A	AM - GT	288710	4443	FR		1			
23719	6A	AM - GT	289390	4443	FR		1			
23720	6A	AM - GT	295160	4443	FR		1			
23721	6A	AM - GT	298130	4443	FR		1			
23722	6A	AM - GT	299220	4443	FR		1			
23723	6A	AM - GT	299890	4443	FR		1			
23724	6A	AM - GT	304370	4443	FR		2			
23725	6A	AM - GT	334010	4443	FR		1			
23726	6A	AM - GT	334200	4443	FR		1			
23733	6A	AM - GT	45720	4334	4/28/2018					1
23734	6A	AM - GT	55320	4334	5/9/2018					1
23735	6A	AM - GT	56710	4334	5/14/2018					1
23736	6A	AM - GT	58480	4334	5/8/2018					1
23737	6A	AM - GT	59370	4334	5/16/2018					1
23739	6A	AM - GT	60490	4334	5/10/2018					1
23740	6A	AM - GT	64190	4334	5/18/2018					1
23741	6A	AM - GT	67200	4334	5/10/2018					1
23742	6A	AM - GT	71970	4334	5/15/2018					1
23743	6A	AM - GT	73960	4334	5/10/2018					1
23744	6A	AM - GT	75150	4334	5/11/2018					1
23745	6A	AM - GT	76370	4334	5/14/2018					1
23747	6A	AM - GT	79540	4334	5/18/2018					1
23748	6A	AM - GT	80160	4334	5/16/2018					1
23749	6A	AM - GT	84610	4334	5/17/2018					1
23750	6A	AM - GT	86310	4334	5/12/2018					1
23751	6A	AM - GT	86980	4334	5/12/2018					1
23752	6A	AM - GT	96410	4334	5/8/2018					1
23753	6A	AM - GT	114370	4334	5/5/2018					1
23754	6A	AM - GT	116150	4334	5/8/2018					1
23756	6A	AM - GT	131060	4334	5/8/2018					1
23761	6A	AM - GT	218320	4334	5/16/2018					1

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Table 18: FREs Repaired and Planned for Repair										
Dig ID	Line	Segment	Girth Weld	Tool Run ID	Date of Repair / Mitigation	Crack Features	Corrosion Features	Axial Grooving Features	Dent Features	Interacting Features
23762	6A	AM - GT	222770	4334	4/24/2018					1
23766	6A	AM - GT	294900	4334	5/3/2018					1
23844	6A	AM - GT	57390	4334	FR				1	
23845	6A	AM - GT	86020	4334	FR				1	
23846	6A	AM - GT	115870	4334	FR				1	
23931	6A	AM - GT	79740	4334	FR		1			
23932	6A	AM - GT	81970	4334	FR		1			
23933	6A	AM - GT	83110	4334	FR		1			
23934	6A	AM - GT	112360	4334	FR		1			
23935	6A	AM - GT	129350	4334	FR		1			
23936	6A	AM - GT	129910	4334	FR		2			
23937	6A	AM - GT	191340	4334	FR		1			
23938	6A	AM - GT	203070	4334	FR		1			
23939	6A	AM - GT	255160	4334	FR		1			
23940	6A	AM - GT	255760	4334	FR		1			
23941	6A	AM - GT	256490	4334	FR		1			
23942	6A	AM - GT	257370	4334	FR		1			
23943	6A	AM - GT	268130	4334	FR		1			
23944	6A	AM - GT	288420	4334	FR					1
23945	6A	AM - GT	290170	4334	FR		1			
23946	6A	AM - GT	300010	4334	FR		1			
23947	6A	AM - GT	300310	4334	FR		1			
23948	6A	AM - GT	303870	4334	FR		1			
23949	6A	AM - GT	305530	4334	FR		1			
23174	6A	PE - AM	530	4182	FR		1			
23175	6A	PE - AM	1050	4182	FR		1			
23176	6A	PE - AM	20060	4182	FR		1			
23178	6A	PE - AM	24530	4182	FR		1			
23179	6A	PE - AM	45350	4182	FR		1			
23180	6A	PE - AM	63000	4182	3/3/2018		1			
23181	6A	PE - AM	63410	4182	2/22/2018		1			
23182	6A	PE - AM	95470	4182	FR		1			
23183	6A	PE - AM	109130	4182	FR		1			
23184	6A	PE - AM	117210	4182	FR		1			

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Table 18: FREs Repaired and Planned for Repair										
Dig ID	Line	Segment	Girth Weld	Tool Run ID	Date of Repair / Mitigation	Crack Features	Corrosion Features	Axial Grooving Features	Dent Features	Interacting Features
23185	6A	PE - AM	135390	4182	2/24/2018		1			
23186	6A	PE - AM	142960	4182	FR		1			
23187	6A	PE - AM	148400	4182	FR		2			
23188	6A	PE - AM	155370	4182	FR		1			
23189	6A	PE - AM	157390	4182	FR		1			
23190	6A	PE - AM	165720	4182	FR		1			
23191	6A	PE - AM	178590	4182	FR		1			
23192	6A	PE - AM	186710	4182	FR		1			
23195	6A	PE - AM	216510	4182	FR		1			
23196	6A	PE - AM	218410	4182	FR		1			
23197	6A	PE - AM	221970	4182	FR		1			
23198	6A	PE - AM	223520	4182	FR		1			
23199	6A	PE - AM	226760	4182	FR		1			
23200	6A	PE - AM	226790	4182	FR		1			
23201	6A	PE - AM	227710	4182	FR		1			
23202	6A	PE - AM	230360	4182	FR		1			
23203	6A	PE - AM	233390	4182	2/28/2018		1			
23204	6A	PE - AM	235290	4182	FR		1			
23205	6A	PE - AM	236100	4182	FR		1			
23206	6A	PE - AM	237970	4182	FR		1			
23207	6A	PE - AM	240960	4182	FR		1			
23208	6A	PE - AM	244040	4182	FR		1			
23209	6A	PE - AM	244050	4182	FR		1			
23210	6A	PE - AM	244490	4182	FR		1			
23211	6A	PE - AM	249090	4182	FR		1			
23212	6A	PE - AM	250760	4182	FR		1			
23213	6A	PE - AM	252450	4182	FR		1			
23214	6A	PE - AM	253910	4182	FR		1			
23215	6A	PE - AM	255750	4182	FR		1			
23216	6A	PE - AM	257200	4182	FR		1			
23218	6A	PE - AM	271270	4182	FR		1			
23219	6A	PE - AM	297940	4182	FR		1			
23220	6A	PE - AM	298790	4182	FR		1			
23221	6A	PE - AM	301610	4182	FR		1			

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Table 18: FREs Repaired and Planned for Repair										
Dig ID	Line	Segment	Girth Weld	Tool Run ID	Date of Repair / Mitigation	Crack Features	Corrosion Features	Axial Grooving Features	Dent Features	Interacting Features
23309	6A	PE - AM	1810	3809	FR	1				
23311	6A	PE - AM	7250	3809	FR	2				
23312	6A	PE - AM	13370	3809	FR	1				
23313	6A	PE - AM	14060	3809	FR	1				
23314	6A	PE - AM	14750	3809	FR	1				
23315	6A	PE - AM	32610	3809	FR	1				
23316	6A	PE - AM	64390	3809	FR	1				
23317	6A	PE - AM	64440	3809	FR	1				
23318	6A	PE - AM	64650	3809	FR	1				
23319	6A	PE - AM	65160	3809	FR	1				
23320	6A	PE - AM	65300	3809	FR	1				
23321	6A	PE - AM	65830	3809	FR	1				
23322	6A	PE - AM	68870	3809	FR	1				
23323	6A	PE - AM	91150	3809	FR	1				
23324	6A	PE - AM	102240	3809	FR	1				
23325	6A	PE - AM	104330	3809	FR	1				
23327	6A	PE - AM	105780	3809	FR	1				
23330	6A	PE - AM	148440	3809	FR	1				
23333	6A	PE - AM	154650	3809	FR	1				
23334	6A	PE - AM	164110	3809	FR	1				
23335	6A	PE - AM	167090	3809	FR	1				
23336	6A	PE - AM	169660	3809	FR	1				
23337	6A	PE - AM	170290	3809	FR	2				
23338	6A	PE - AM	173380	3809	FR	1				
23339	6A	PE - AM	173450	3809	FR	1				
23340	6A	PE - AM	173540	3809	FR	1				
23341	6A	PE - AM	173790	3809	FR	1				
23342	6A	PE - AM	174300	3809	FR	1				
23343	6A	PE - AM	193860	3809	FR	1				
23344	6A	PE - AM	194100	3809	FR	1				
23345	6A	PE - AM	216150	3809	FR	1				
23346	6A	PE - AM	219110	3809	FR	1				
23347	6A	PE - AM	219830	3809	FR	1				
23350	6A	PE - AM	257870	3809	FR	1				

Table 18: FREs Repaired and Planned for Repair										
Dig ID	**Line**	**Segment**	**Girth Weld**	**Tool Run ID**	**Date of Repair / Mitigation**	**Crack Features**	**Corrosion Features**	**Axial Grooving Features**	**Dent Features**	**Interacting Features**
23351	6A	PE - AM	262700	3809	FR	1				
23352	6A	PE - AM	283440	3809	FR	1				
23353	6A	PE - AM	295120	3809	FR	1				
23354	6A	PE - AM	299650	3809	FR	1				
23355	6A	PE - AM	322910	3809	FR	1				
Totals						79	157	11	4	41

40 [Field Data Comparison to ILI Data]

The process to adhere to the requirements of Paragraph 40 and Subparagraphs 40.a, 40.b, 40.c, is documented in the Lakehead System Integrity Remediation process. Complete ILI programs with the associated Consent Decree digs completed within the reporting period for this SAR are listed in the table below.

Within 30 days after completing excavation of all features requiring excavation identified on a pipeline based on Initial ILI Report, Enbridge completed the required analysis of the field data obtained during all excavations for all Consent Decree Digs.

Table 19: ILI Programs with Feature Requiring Excavation Repaired/Mitigated					
Tool Run ID	**Line**	**Segment**	**Tool**	**Report Type**	**Last NDE Report Approved Date**
4396	02	DR-PW	GEMINI	Geometry	5/14/2018
4493	02	GF-CR	GEMINI	Geometry	12/21/2017
2215	05	BC-RW	GEMINI	Geometry	1/12/2018
3662	05	PE-IR	USWM+	Corrosion	5/3/2018

After completing the field investigations of the FREs in May 2018, Enbridge has started the analysis of the field investigations of Line 2 DR-PW (Tool Run 4396) Geometry program, and more detail will be included in the next SAR.

Within 30 days after completing the field investigations of the FREs in December 2017, Enbridge completed the analysis of the field investigations of Line 2 GF-CR (Tool Run 4493) Geometry program, the ILI tool performance was validated, and no further action was required regarding the excavation program.

Within 30 days after completing the field investigations of the FREs in January 2018, Enbridge completed the analysis of the field investigations of Line 5 BC-RW (Tool Run 2215) Geometry program, the ILI tool performance was validated, and no further action was required regarding the excavation program.

After completing the field investigations of the FREs in May 2018, Enbridge has started the analysis of the field investigations of Line 5 PE-IR (Tool Run 3662) Corrosion program, and more detail will be included in the next SAR.

41 [ILI Electronic Records]

Appendix B to the Lakehead System Integrity Program Logistics Exception process includes a table summarizing the electronic record repositories to meet the 14 criteria listed in Paragraph 41. These were uploaded to OneSource as per Subparagraph 78.a.

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

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

(IV) Predicted Burst Pressure/Fitness for Service

42 [Predicted Burst Pressure]

Enbridge calculated the Predicted Burst Pressure of all Crack and Corrosion features identified by ILI tools, in accordance with the requirements of Subsection VII.D.(IV) of the Consent Decree. These requirements are reflected in the Lakehead System Integrity Remediation process.

43 [Predicted Burst Pressure Definition]

The Lakehead System Integrity Remediation process defines the Predicted Burst Pressure of a feature as the lowest pressure area in the pipeline at the location of the feature that is predicted to result in failure of the feature.

Enbridge calculated the Predicted Burst Pressure of features in accordance with the inputs and procedures in Appendix B of the Consent Decree, which is consistent with procedures outlined in the Lakehead System Integrity Remediation process.

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

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

The following table summarizes the timelines for completing initial Predicted Burst Pressure calculations and initial Remaining Life calculations for all Crack or Corrosion features identified in reports that were received prior to April 22, 2018. Refer to Table 11 for a list of all valid ILI runs with reports received within the reporting period.

Table 20: Initial Predicted Burst Pressure and Initial Remaining Life Calculations

Tool Run ID	Line	Segment	Tool	Report Type	Pull Date	Date Preliminary Review Completed	Data Quality Concerns?	Calculation Deadline (1)	Calculation Deadline (2)	Burst Pressure Calculation Date	Remaining Life Calculation Date
4494	02	GF-CR	GEMINI	Corrosion	11/3/2017	3/1/2018	N	4/26/2018	4/27/2018	3/1/2018	3/1/2018
3712	03	CR-PW	USWM+	Corrosion	8/21/2017	12/18/2017	Y	2/12/2018	2/12/2018	12/26/2017	12/26/2017
3711	03	GF-CR	UCMp	Corrosion	11/14/2017	3/14/2018	N	5/9/2018	5/8/2018	3/14/2018	3/14/2018
3711	03	GF-CR	UCMp	Crack	11/14/2017	4/11/2018	N	6/6/2018	5/8/2018	4/11/2018	4/11/2018
2254	04	CR-CS	DuDi UCM	Crack	10/18/2017	3/19/2018	N	5/14/2018	4/11/2018	3/19/2018	3/19/2018
2254	04	CR-CS	DuDi UCM	Corrosion	10/18/2017	2/14/2018	Y	4/11/2018	4/11/2018	2/15/2018	2/15/2018
4465	04	CS-DR	DuDi UCM	Corrosion	10/20/2017	2/15/2018	Y	4/11/2018	4/13/2018	2/15/2018	2/15/2018
4465	04	CS-DR	DuDi UCM	Crack	10/20/2017	3/19/2018	N	5/14/2018	4/13/2018	3/19/2018	3/19/2018
4466	04	FW-WR	DuDi UCM	Corrosion	12/12/2017	3/22/2018	N	5/17/2018	6/5/2018	3/22/2018	3/22/2018
4466	04	FW-WR	DuDi UCM	Crack	12/12/2017	5/3/2018	N	6/28/2018	6/5/2018	5/3/2018	5/3/2018
6013	04	GF-DN	DuDi UCM	Crack	12/8/2017	4/23/2018	N	6/18/2018	6/1/2018	4/23/2018	4/23/2018
6013	04	GF-DN	DuDi UCM	Corrosion	12/8/2017	3/22/2018	N	5/17/2018	6/1/2018	3/22/2018	3/22/2018
2162	05	BC-RW	CD+2	Crack	8/8/2017	1/5/2018	N	3/2/2018	1/30/2018	1/10/2018	1/10/2018
4468	05	BC-RW	UCc	Crack	11/2/2017	4/2/2018	N	5/29/2018	4/26/2018	4/26/2018	4/26/2018
2215	05	BC-RW	GEMINI	Corrosion	8/24/2017	12/18/2017	N	2/12/2018	2/15/2018	12/18/2017	12/18/2017

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Table 20: Initial Predicted Burst Pressure and Initial Remaining Life Calculations											
Tool Run ID	**Line**	**Segment**	**Tool**	**Report Type**	**Pull Date**	**Date Preliminary Review Completed**	**Data Quality Concerns?**	**Calculation Deadline (1)**	**Calculation Deadline (2)**	**Burst Pressure Calculation Date**	**Remaining Life Calculation Date**
4356	05	IR-NO	UCc	Crack	10/13/2017	3/12/2018	N	5/7/2018	4/6/2018	4/6/2018	4/6/2018
4406	05	MA-BC	AFD	Corrosion	1/12/2018	5/14/2018	Y	7/9/2018	7/6/2018	5/14/2018	5/14/2018
2150	05	PE-IR	CD+2	Crack	7/19/2017	12/14/2017	N	2/8/2018	1/10/2018	12/14/2017	12/14/2017
2140	05	PE-IR	AFD	Corrosion	8/23/2017	12/21/2017	N	2/15/2018	2/14/2018	12/21/2017	12/21/2017
4443	6A	AM-GT	UMP	Corrosion	12/2/2017	4/2/2018	Y	5/29/2018	5/29/2018	4/2/2018	4/2/2018
4334	6A	AM-GT	GEMINI	Corrosion	1/8/2018	5/6/2018	Y	7/2/2018	7/2/2018	5/6/2018	5/6/2018
4182	6A	PE-AM	GEMINI	Corrosion	9/29/2017	1/29/2018	N	3/26/2018	3/23/2018	1/29/2018	1/29/2018
3809	6A	PE-AM	DUO CD	Crack	10/6/2017	3/5/2018	N	4/30/2018	3/30/2018	3/5/2018	3/5/2018
4438	10	EB-ENR	UC	Crack	9/20/2017	2/16/2018	N	4/13/2018	3/14/2018	2/16/2018	2/16/2018
3645	10	ENR-UT	UCh	Crack	7/27/2017	12/21/2017	N	2/15/2018	1/18/2018	12/21/2017	12/21/2017
4490	78	SK-RW	MFL4	Corrosion	1/10/2018	5/9/2018	N	7/5/2018	7/5/2018	5/9/2018	5/9/2018
4489	78	SK-RW	UMP	Corrosion	1/12/2018	5/11/2018	N	7/6/2018	7/6/2018	5/11/2018	5/11/2018

As shown in the Table above, all calculations were completed no later than the earlier of either: (1) eight weeks after completing data quality review with respect to the feature and/or pipeline section where the feature is located; or (2) 175 Days after the ILI tool was removed from the pipeline at the conclusion of the ILI run.

45 [Retention of Electronic Records]

As outlined in the Lakehead System Integrity Remediation process, Enbridge procedures require that the company maintain electronic records documenting all Predicted Burst Pressure calculations, and all Remaining Life calculations, including inputs and dates the calculations were completed with respect to particular features, until five years after termination of the Consent Decree.

(V) Dig Selection Criteria

46 [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 21 below.

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 also 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 also repaired or mitigated the features based on an analysis of field measurement values for feature length and depth or other field observations, despite being placed on the Dig List based on an analysis of ILI-reported values for feature length and depth.

During this reporting period, Enbridge followed the Lakehead System Integrity Remediation process, which meets requirements set out in Paragraph 46 of the Consent Decree.

The feature repair and mitigation of the Priority Notification features are reported in Subparagraphs 33.c-d and therefore are not included in the table below.

Table 21: Identified Digs

Dig ID	Line	Seg-ment	Girth Weld	Tool Run ID	Technology	Date of Discovery / Feature Added to Dig List	Repair / Mitigation Deadline	Date of Repair / Mitigation
23779	02	DR - PW	13270	4396	MFL and Geometry	4/18/2018	5/18/2018	4/20/2018
23782	02	DR - PW	42810	4396	MFL and Geometry	4/18/2018	10/15/2018	4/21/2018

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Table 21: Identified Digs								
Dig ID	**Line**	**Seg-ment**	**Girth Weld**	**Tool Run ID**	**Technology**	**Date of Discovery / Feature Added to Dig List**	**Repair / Mitigation Deadline**	**Date of Repair / Mitigation**
23120	02	GF - CR	20820	4494	MFL and Geometry	1/18/2018	1/18/2019	FR
23274	02	GF - CR	11030	4494	MFL and Geometry	3/1/2018	3/1/2019	FR
23275	02	GF - CR	62790	4494	MFL and Geometry	3/1/2018	3/1/2019	FR
23276	02	GF - CR	66850	4494	MFL and Geometry	3/1/2018	3/1/2019	FR
23280	02	GF - CR	177030	4494	MFL and Geometry	3/1/2018	3/1/2019	FR
23086	03	CR - PW	141430	3712	UT Metal Loss	12/26/2017	12/26/2018	2/22/2018
23087	03	CR - PW	159230	3712	UT Metal Loss	12/26/2017	6/25/2018	2/9/2018
23088	03	CR - PW	239920	3712	UT Metal Loss	12/26/2017	6/25/2018	1/26/2018
23089	03	CR - PW	249650	3712	UT Metal Loss	12/26/2017	12/26/2018	FR
23402	03	GF - CR	42500	3711	UT Metal Loss and UT Crack	3/19/2018	9/17/2018	6/8/2018
23403	03	GF - CR	49840	3711	UT Metal Loss and UT Crack	3/19/2018	3/19/2019	FR
23404	03	GF - CR	129350	3711	UT Metal Loss and UT Crack	3/19/2018	9/17/2018	FR
23405	03	GF - CR	130610	3711	UT Metal Loss and UT Crack	3/19/2018	9/17/2018	FR

Table 21: Identified Digs								
Dig ID	**Line**	**Seg-ment**	**Girth Weld**	**Tool Run ID**	**Technology**	**Date of Discovery / Feature Added to Dig List**	**Repair / Mitigation Deadline**	**Date of Repair / Mitigation**
23769	03	GF - CR	60750	3711	UT Metal Loss and UT Crack	4/16/2018	4/16/2019	FR
23770	03	GF - CR	64890	3711	UT Metal Loss and UT Crack	4/16/2018	4/16/2019	FR
23771	03	GF - CR	153060	3711	UT Metal Loss and UT Crack	4/16/2018	4/16/2019	FR
23772	03	GF - CR	156870	3711	UT Metal Loss and UT Crack	4/16/2018	4/16/2019	FR
23773	03	GF - CR	158200	3711	UT Metal Loss and UT Crack	4/16/2018	4/16/2019	FR
23254	04	CR - CS	32820	2254	UT Metal Loss and UT Crack	2/15/2018	2/15/2019	FR
23255	04	CR - CS	39160	2254	UT Metal Loss and UT Crack	2/15/2018	2/15/2019	FR
23491	04	CS - DR	27690	4465	UT Metal Loss and UT Crack	3/21/2018	3/21/2019	FR
23492	04	CS - DR	27990	4465	UT Metal Loss and UT Crack	3/21/2018	3/21/2019	FR
23493	04	CS - DR	28050	4465	UT Metal Loss and UT Crack	3/21/2018	3/21/2019	FR

Table 21: Identified Digs								
Dig ID	**Line**	**Seg-ment**	**Girth Weld**	**Tool Run ID**	**Technology**	**Date of Discovery / Feature Added to Dig List**	**Repair / Mitigation Deadline**	**Date of Repair / Mitigation**
23494	04	CS - DR	28060	4465	UT Metal Loss and UT Crack	3/21/2018	3/21/2019	FR
23495	04	CS - DR	28070	4465	UT Metal Loss and UT Crack	3/21/2018	3/21/2019	FR
23496	04	CS - DR	28120	4465	UT Metal Loss and UT Crack	3/21/2018	3/21/2019	FR
23497	04	CS - DR	28220	4465	UT Metal Loss and UT Crack	3/21/2018	3/21/2019	FR
23498	04	CS - DR	28950	4465	UT Metal Loss and UT Crack	3/21/2018	3/21/2019	FR
23499	04	CS - DR	30540	4465	UT Metal Loss and UT Crack	3/21/2018	3/21/2019	FR
23500	04	CS - DR	30770	4465	UT Metal Loss and UT Crack	3/21/2018	3/21/2019	FR
23501	04	CS - DR	30790	4465	UT Metal Loss and UT Crack	3/21/2018	3/21/2019	FR
23502	04	CS - DR	32380	4465	UT Metal Loss and UT Crack	3/21/2018	3/21/2019	FR
23510	04	FW - WR	25700	4466	UT Metal Loss and UT Crack	3/22/2018	3/22/2019	FR

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Table 21: Identified Digs								
Dig ID	**Line**	**Seg-ment**	**Girth Weld**	**Tool Run ID**	**Technology**	**Date of Discovery / Feature Added to Dig List**	**Repair / Mitigation Deadline**	**Date of Repair / Mitigation**
23897	04	FW - WR	16340	4466	UT Metal Loss and UT Crack	5/8/2018	5/8/2019	FR
23898	04	FW - WR	19250	4466	UT Metal Loss and UT Crack	5/8/2018	5/8/2019	FR
23899	04	FW - WR	26600	4466	UT Metal Loss and UT Crack	5/8/2018	5/8/2019	FR
23901	04	FW - WR	28430	4466	UT Metal Loss and UT Crack	5/8/2018	5/8/2019	FR
23902	04	FW - WR	29000	4466	UT Metal Loss and UT Crack	5/8/2018	5/8/2019	FR
23505	04	GF - DN	48150	6013	UT Metal Loss and UT Crack	3/22/2018	3/22/2019	FR
23507	04	GF - DN	54670	6013	UT Metal Loss and UT Crack	3/22/2018	3/22/2019	FR
23508	04	GF - DN	54690	6013	UT Metal Loss and UT Crack	3/22/2018	3/22/2019	FR
23509	04	GF - DN	54970	6013	UT Metal Loss and UT Crack	3/22/2018	3/22/2019	FR
23852	04	GF - DN	47390	6013	UT Metal Loss and UT Crack	4/23/2018	4/18/2019	FR
22956	05	BC - RW	56680	2215	MFL and Geometry	11/15/2017	1/16/2018	12/11/2017

Table 21: Identified Digs								
Dig ID	**Line**	**Seg-ment**	**Girth Weld**	**Tool Run ID**	**Technology**	**Date of Discovery / Feature Added to Dig List**	**Repair / Mitigation Deadline**	**Date of Repair / Mitigation**
23045	05	BC - RW	10	2215	MFL and Geometry	12/18/2017	12/13/2018	FR
23046	05	BC - RW	610	2215	MFL and Geometry	12/18/2017	6/18/2018	FR
23047	05	BC - RW	4070	2215	MFL and Geometry	12/18/2017	12/18/2018	FR
23048	05	BC - RW	9500	2215	MFL and Geometry	12/18/2017	6/18/2018	5/18/2018
23049	05	BC - RW	13220	2215	MFL and Geometry	12/18/2017	6/18/2018	FR
23050	05	BC - RW	22170	2215	MFL and Geometry	12/18/2017	6/18/2018	5/22/2018
23051	05	BC - RW	26290	2215	MFL and Geometry	12/18/2017	12/18/2018	FR
23053	05	BC - RW	37600	2215	MFL and Geometry	12/18/2017	6/18/2018	5/17/2018
23054	05	BC - RW	56740	2215	MFL and Geometry	12/18/2017	6/18/2018	6/1/2018
23055	05	BC - RW	63420	2215	MFL and Geometry	12/18/2017	12/18/2018	FR
23873	05	BC - RW	12760	4468	Circ. Crack	5/1/2018	10/29/2018	FR
23727	05	IR - NO	30650	4356	Circ. Crack	4/10/2018	4/10/2019	FR
23728	05	IR - NO	65420	4356	Circ. Crack	4/10/2018	10/9/2018	FR
23979	05	MA - BC	10010	4406	Circ. MFL	5/17/2018	5/17/2019	FR
23980	05	MA - BC	33700	4406	Circ. MFL	5/17/2018	5/17/2019	FR
23981	05	MA - BC	91290	4406	Circ. MFL	5/17/2018	5/17/2019	FR

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Table 21: Identified Digs								
Dig ID	**Line**	**Seg-ment**	**Girth Weld**	**Tool Run ID**	**Technology**	**Date of Discovery / Feature Added to Dig List**	**Repair / Mitigation Deadline**	**Date of Repair / Mitigation**
23982	05	MA - BC	95630	4406	Circ. MFL	5/17/2018	11/13/2018	FR
23983	05	MA - BC	138790	4406	Circ. MFL	5/17/2018	5/17/2019	FR
22847	05	PE - IR	20160	3662	UT Metal Loss	10/27/2017	10/29/2018	12/2/2017
22849	05	PE - IR	183400	3662	UT Metal Loss	10/27/2017	10/29/2018	2/19/2018
22850	05	PE - IR	184460	3662	UT Metal Loss	10/27/2017	10/29/2018	3/15/2018
22851	05	PE - IR	201490	3662	UT Metal Loss	10/27/2017	10/29/2018	12/9/2017
22852	05	PE - IR	201610	3662	UT Metal Loss	10/27/2017	10/29/2018	12/4/2017
22853	05	PE - IR	207190	3662	UT Metal Loss	10/27/2017	10/29/2018	12/19/2017
22854	05	PE - IR	242570	3662	UT Metal Loss	10/27/2017	4/25/2018	3/2/2018
23017	05	PE - IR	114300	2150	UT Crack Detection	12/14/2017	6/12/2018	5/19/2018
23018	05	PE - IR	127420	2150	UT Crack Detection	12/14/2017	6/12/2018	FR
23019	05	PE - IR	152550	2150	UT Crack Detection	12/14/2017	12/14/2018	FR
23020	05	PE - IR	154730	2150	UT Crack Detection	12/14/2017	6/12/2018	2/23/2018
23021	05	PE - IR	182420	2150	UT Crack Detection	12/14/2017	12/14/2018	3/6/2018
23022	05	PE - IR	183220	2150	UT Crack Detection	12/14/2017	12/14/2018	2/23/2018

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Table 21: Identified Digs								
Dig ID	**Line**	**Seg-ment**	**Girth Weld**	**Tool Run ID**	**Technology**	**Date of Discovery / Feature Added to Dig List**	**Repair / Mitigation Deadline**	**Date of Repair / Mitigation**
23023	05	PE - IR	184520	2150	UT Crack Detection	12/14/2017	12/14/2018	3/8/2018
23025	05	PE - IR	190460	2150	UT Crack Detection	12/14/2017	12/14/2018	3/3/2018
23026	05	PE - IR	195900	2150	UT Crack Detection	12/14/2017	6/12/2018	5/22/2018
23076	05	PE - IR	12910	2140	Circ. MFL	12/26/2017	6/25/2018	5/19/2018
23077	05	PE - IR	20520	2140	Circ. MFL	12/26/2017	12/26/2018	FR
23078	05	PE - IR	33020	2140	Circ. MFL	12/26/2017	12/26/2018	FR
23079	05	PE - IR	81930	2140	Circ. MFL	12/26/2017	6/25/2018	FR
23080	05	PE - IR	116480	2140	Circ. MFL	12/26/2017	6/25/2018	FR
23081	05	PE - IR	116930	2140	Circ. MFL	12/26/2017	6/25/2018	FR
23082	05	PE - IR	148130	2140	Circ. MFL	12/26/2017	6/25/2018	FR
23083	05	PE - IR	167940	2140	Circ. MFL	12/26/2017	2/26/2018	1/22/2018
23084	05	PE - IR	230050	2140	Circ. MFL	12/26/2017	6/25/2018	FR
23085	05	PE - IR	245260	2140	Circ. MFL	12/26/2017	6/25/2018	FR
23672	6A	AM - GT	8370	4443	UT Metal Loss	4/9/2018	4/9/2019	FR
23673	6A	AM - GT	20580	4443	UT Metal Loss	4/9/2018	4/9/2019	FR
23674	6A	AM - GT	37040	4443	UT Metal Loss	4/9/2018	4/9/2019	FR
23675	6A	AM - GT	72020	4443	UT Metal Loss	4/9/2018	4/9/2019	5/22/2018
23676	6A	AM - GT	77030	4443	UT Metal Loss	4/9/2018	4/9/2019	FR

Table 21: Identified Digs								
Dig ID	**Line**	**Seg-ment**	**Girth Weld**	**Tool Run ID**	**Technology**	**Date of Discovery / Feature Added to Dig List**	**Repair / Mitigation Deadline**	**Date of Repair / Mitigation**
23677	6A	AM - GT	89180	4443	UT Metal Loss	4/9/2018	4/9/2019	FR
23678	6A	AM - GT	99630	4443	UT Metal Loss	4/9/2018	4/9/2019	FR
23679	6A	AM - GT	100680	4443	UT Metal Loss	4/9/2018	4/9/2019	FR
23680	6A	AM - GT	106240	4443	UT Metal Loss	4/9/2018	4/9/2019	FR
23681	6A	AM - GT	109420	4443	UT Metal Loss	4/9/2018	4/9/2019	FR
23682	6A	AM - GT	111040	4443	UT Metal Loss	4/9/2018	4/9/2019	FR
23683	6A	AM - GT	112090	4443	UT Metal Loss	4/9/2018	4/9/2019	FR
23684	6A	AM - GT	123180	4443	UT Metal Loss	4/9/2018	4/9/2019	FR
23685	6A	AM - GT	130890	4443	UT Metal Loss	4/9/2018	4/9/2019	FR
23686	6A	AM - GT	136750	4443	UT Metal Loss	4/9/2018	4/9/2019	FR
23687	6A	AM - GT	140880	4443	UT Metal Loss	4/9/2018	4/9/2019	FR
23688	6A	AM - GT	147990	4443	UT Metal Loss	4/9/2018	4/9/2019	FR
23689	6A	AM - GT	148420	4443	UT Metal Loss	4/9/2018	4/9/2019	FR
23690	6A	AM - GT	151570	4443	UT Metal Loss	4/9/2018	4/9/2019	FR

Table 21: Identified Digs								
Dig ID	**Line**	**Seg-ment**	**Girth Weld**	**Tool Run ID**	**Technology**	**Date of Discovery / Feature Added to Dig List**	**Repair / Mitigation Deadline**	**Date of Repair / Mitigation**
23691	6A	AM - GT	153530	4443	UT Metal Loss	4/9/2018	10/9/2018	FR
23692	6A	AM - GT	157490	4443	UT Metal Loss	4/9/2018	4/9/2019	FR
23693	6A	AM - GT	162900	4443	UT Metal Loss	4/9/2018	4/9/2019	FR
23694	6A	AM - GT	163690	4443	UT Metal Loss	4/9/2018	4/9/2019	FR
23695	6A	AM - GT	165800	4443	UT Metal Loss	4/9/2018	4/9/2019	FR
23696	6A	AM - GT	178150	4443	UT Metal Loss	4/9/2018	4/9/2019	FR
23697	6A	AM - GT	198680	4443	UT Metal Loss	4/9/2018	10/9/2018	FR
23698	6A	AM - GT	201190	4443	UT Metal Loss	4/9/2018	4/9/2019	FR
23699	6A	AM - GT	206940	4443	UT Metal Loss	4/9/2018	4/9/2019	FR
23700	6A	AM - GT	207050	4443	UT Metal Loss	4/9/2018	4/9/2019	FR
23701	6A	AM - GT	241040	4443	UT Metal Loss	4/9/2018	4/9/2019	FR
23702	6A	AM - GT	243240	4443	UT Metal Loss	4/9/2018	4/9/2019	FR
23703	6A	AM - GT	255130	4443	UT Metal Loss	4/9/2018	4/9/2019	FR
23704	6A	AM - GT	257720	4443	UT Metal Loss	4/9/2018	10/9/2018	FR

Table 21: Identified Digs								
Dig ID	**Line**	**Seg-ment**	**Girth Weld**	**Tool Run ID**	**Technology**	**Date of Discovery / Feature Added to Dig List**	**Repair / Mitigation Deadline**	**Date of Repair / Mitigation**
23705	6A	AM - GT	261430	4443	UT Metal Loss	4/9/2018	10/9/2018	FR
23706	6A	AM - GT	273260	4443	UT Metal Loss	4/9/2018	10/9/2018	FR
23707	6A	AM - GT	273330	4443	UT Metal Loss	4/9/2018	10/9/2018	FR
23708	6A	AM - GT	274200	4443	UT Metal Loss	4/9/2018	10/9/2018	FR
23709	6A	AM - GT	274947	4443	UT Metal Loss	4/9/2018	4/9/2019	FR
23710	6A	AM - GT	277560	4443	UT Metal Loss	4/9/2018	10/9/2018	FR
23711	6A	AM - GT	279270	4443	UT Metal Loss	4/9/2018	10/9/2018	FR
23712	6A	AM - GT	279280	4443	UT Metal Loss	4/9/2018	10/9/2018	FR
23713	6A	AM - GT	286210	4443	UT Metal Loss	4/9/2018	4/9/2019	FR
23714	6A	AM - GT	286240	4443	UT Metal Loss	4/9/2018	4/9/2019	FR
23715	6A	AM - GT	286560	4443	UT Metal Loss	4/9/2018	4/9/2019	FR
23716	6A	AM - GT	288040	4443	UT Metal Loss	4/9/2018	10/9/2018	FR
23717	6A	AM - GT	288150	4443	UT Metal Loss	4/9/2018	4/9/2019	FR
23718	6A	AM - GT	288710	4443	UT Metal Loss	4/9/2018	4/9/2019	FR

Table 21: Identified Digs								
Dig ID	**Line**	**Seg-ment**	**Girth Weld**	**Tool Run ID**	**Technology**	**Date of Discovery / Feature Added to Dig List**	**Repair / Mitigation Deadline**	**Date of Repair / Mitigation**
23719	6A	AM - GT	289390	4443	UT Metal Loss	4/9/2018	4/9/2019	FR
23720	6A	AM - GT	295160	4443	UT Metal Loss	4/9/2018	4/9/2019	FR
23721	6A	AM - GT	298130	4443	UT Metal Loss	4/9/2018	10/9/2018	FR
23722	6A	AM - GT	299220	4443	UT Metal Loss	4/9/2018	4/9/2019	FR
23723	6A	AM - GT	299890	4443	UT Metal Loss	4/9/2018	4/9/2019	FR
23724	6A	AM - GT	304370	4443	UT Metal Loss	4/9/2018	4/9/2019	FR
23725	6A	AM - GT	334010	4443	UT Metal Loss	4/9/2018	10/9/2018	FR
23726	6A	AM - GT	334200	4443	UT Metal Loss	4/9/2018	10/9/2018	FR
23733	6A	AM - GT	45720	4334	MFL and Geometry	4/16/2018	10/15/2018	4/28/2018
23734	6A	AM - GT	55320	4334	MFL and Geometry	4/16/2018	6/15/2018	5/9/2018
23735	6A	AM - GT	56710	4334	MFL and Geometry	4/16/2018	10/15/2018	5/14/2018
23736	6A	AM - GT	58480	4334	MFL and Geometry	4/16/2018	10/15/2018	5/8/2018
23737	6A	AM - GT	59370	4334	MFL and Geometry	4/16/2018	4/16/2019	5/16/2018
23739	6A	AM - GT	60490	4334	MFL and Geometry	4/16/2018	10/15/2018	5/10/2018

Table 21: Identified Digs								
Dig ID	**Line**	**Seg-ment**	**Girth Weld**	**Tool Run ID**	**Technology**	**Date of Discovery / Feature Added to Dig List**	**Repair / Mitigation Deadline**	**Date of Repair / Mitigation**
23740	6A	AM - GT	64190	4334	MFL and Geometry	4/16/2018	10/15/2018	5/18/2018
23741	6A	AM - GT	67200	4334	MFL and Geometry	4/16/2018	10/15/2018	5/10/2018
23742	6A	AM - GT	71970	4334	MFL and Geometry	4/16/2018	10/15/2018	5/15/2018
23743	6A	AM - GT	73960	4334	MFL and Geometry	4/16/2018	10/15/2018	5/10/2018
23744	6A	AM - GT	75150	4334	MFL and Geometry	4/16/2018	10/15/2018	5/11/2018
23745	6A	AM - GT	76370	4334	MFL and Geometry	4/16/2018	10/15/2018	5/14/2018
23747	6A	AM - GT	79540	4334	MFL and Geometry	4/16/2018	10/15/2018	5/18/2018
23748	6A	AM - GT	80160	4334	MFL and Geometry	4/16/2018	10/15/2018	5/16/2018
23749	6A	AM - GT	84610	4334	MFL and Geometry	4/16/2018	10/15/2018	5/17/2018
23750	6A	AM - GT	86310	4334	MFL and Geometry	4/16/2018	10/15/2018	5/12/2018
23751	6A	AM - GT	86980	4334	MFL and Geometry	4/16/2018	10/15/2018	5/12/2018
23752	6A	AM - GT	96410	4334	MFL and Geometry	4/16/2018	10/15/2018	5/8/2018
23753	6A	AM - GT	114370	4334	MFL and Geometry	4/16/2018	10/15/2018	5/5/2018
23754	6A	AM - GT	116150	4334	MFL and Geometry	4/16/2018	10/15/2018	5/8/2018

Table 21: Identified Digs								
Dig ID	**Line**	**Seg-ment**	**Girth Weld**	**Tool Run ID**	**Technology**	**Date of Discovery / Feature Added to Dig List**	**Repair / Mitigation Deadline**	**Date of Repair / Mitigation**
23756	6A	AM - GT	131060	4334	MFL and Geometry	4/16/2018	10/15/2018	5/8/2018
23761	6A	AM - GT	218320	4334	MFL and Geometry	4/16/2018	6/15/2018	5/16/2018
23762	6A	AM - GT	222770	4334	MFL and Geometry	4/16/2018	6/15/2018	4/24/2018
23766	6A	AM - GT	294900	4334	MFL and Geometry	4/16/2018	6/15/2018	5/3/2018
23844	6A	AM - GT	57390	4334	MFL and Geometry	4/20/2018	4/17/2019	FR
23845	6A	AM - GT	86020	4334	MFL and Geometry	4/20/2018	4/17/2019	FR
23846	6A	AM - GT	115870	4334	MFL and Geometry	4/20/2018	4/17/2019	FR
23931	6A	AM - GT	79740	4334	MFL and Geometry	5/11/2018	5/13/2019	FR
23932	6A	AM - GT	81970	4334	MFL and Geometry	5/11/2018	5/13/2019	FR
23933	6A	AM - GT	83110	4334	MFL and Geometry	5/11/2018	5/13/2019	FR
23934	6A	AM - GT	112360	4334	MFL and Geometry	5/11/2018	5/13/2019	FR
23935	6A	AM - GT	129350	4334	MFL and Geometry	5/11/2018	5/13/2019	FR
23936	6A	AM - GT	129910	4334	MFL and Geometry	5/11/2018	5/13/2019	FR
23937	6A	AM - GT	191340	4334	MFL and Geometry	5/11/2018	11/7/2018	FR

Table 21: Identified Digs								
Dig ID	**Line**	**Seg-ment**	**Girth Weld**	**Tool Run ID**	**Technology**	**Date of Discovery / Feature Added to Dig List**	**Repair / Mitigation Deadline**	**Date of Repair / Mitigation**
23938	6A	AM - GT	203070	4334	MFL and Geometry	5/11/2018	11/7/2018	FR
23939	6A	AM - GT	255160	4334	MFL and Geometry	5/11/2018	11/7/2018	FR
23940	6A	AM - GT	255760	4334	MFL and Geometry	5/11/2018	11/7/2018	FR
23941	6A	AM - GT	256490	4334	MFL and Geometry	5/11/2018	11/7/2018	FR
23942	6A	AM - GT	257370	4334	MFL and Geometry	5/11/2018	11/7/2018	FR
23943	6A	AM - GT	268130	4334	MFL and Geometry	5/11/2018	11/7/2018	FR
23944	6A	AM - GT	288420	4334	MFL and Geometry	5/11/2018	5/13/2019	FR
23945	6A	AM - GT	290170	4334	MFL and Geometry	5/11/2018	11/7/2018	FR
23946	6A	AM - GT	300010	4334	MFL and Geometry	5/11/2018	11/7/2018	FR
23947	6A	AM - GT	300310	4334	MFL and Geometry	5/11/2018	11/7/2018	FR
23948	6A	AM - GT	303870	4334	MFL and Geometry	5/11/2018	11/7/2018	FR
23949	6A	AM - GT	305530	4334	MFL and Geometry	5/11/2018	11/7/2018	FR
23174	6A	PE - AM	530	4182	MFL and Geometry	2/5/2018	2/5/2019	FR
23175	6A	PE - AM	1050	4182	MFL and Geometry	2/5/2018	2/5/2019	FR

Table 21: Identified Digs								
Dig ID	**Line**	**Seg-ment**	**Girth Weld**	**Tool Run ID**	**Technology**	**Date of Discovery / Feature Added to Dig List**	**Repair / Mitigation Deadline**	**Date of Repair / Mitigation**
23176	6A	PE - AM	20060	4182	MFL and Geometry	2/5/2018	2/5/2019	FR
23178	6A	PE - AM	24530	4182	MFL and Geometry	2/5/2018	2/5/2019	FR
23179	6A	PE - AM	45350	4182	MFL and Geometry	2/5/2018	2/5/2019	FR
23180	6A	PE - AM	63000	4182	MFL and Geometry	2/5/2018	2/5/2019	3/3/2018
23181	6A	PE - AM	63410	4182	MFL and Geometry	2/5/2018	2/5/2019	2/22/2018
23182	6A	PE - AM	95470	4182	MFL and Geometry	2/5/2018	2/5/2019	FR
23183	6A	PE - AM	109130	4182	MFL and Geometry	2/5/2018	2/5/2019	FR
23184	6A	PE - AM	117210	4182	MFL and Geometry	2/5/2018	2/5/2019	FR
23185	6A	PE - AM	135390	4182	MFL and Geometry	2/5/2018	2/5/2019	2/24/2018
23186	6A	PE - AM	142960	4182	MFL and Geometry	2/5/2018	8/6/2018	FR
23187	6A	PE - AM	148400	4182	MFL and Geometry	2/5/2018	2/5/2019	FR
23188	6A	PE - AM	155370	4182	MFL and Geometry	2/5/2018	2/5/2019	FR
23189	6A	PE - AM	157390	4182	MFL and Geometry	2/5/2018	2/5/2019	FR
23190	6A	PE - AM	165720	4182	MFL and Geometry	2/5/2018	2/5/2019	FR

Table 21: Identified Digs								
Dig ID	**Line**	**Seg-ment**	**Girth Weld**	**Tool Run ID**	**Technology**	**Date of Discovery / Feature Added to Dig List**	**Repair / Mitigation Deadline**	**Date of Repair / Mitigation**
23191	6A	PE - AM	178590	4182	MFL and Geometry	2/5/2018	2/5/2019	FR
23192	6A	PE - AM	186710	4182	MFL and Geometry	2/5/2018	2/5/2019	FR
23195	6A	PE - AM	216510	4182	MFL and Geometry	2/5/2018	2/5/2019	FR
23196	6A	PE - AM	218410	4182	MFL and Geometry	2/5/2018	2/5/2019	FR
23197	6A	PE - AM	221970	4182	MFL and Geometry	2/5/2018	2/5/2019	FR
23198	6A	PE - AM	223520	4182	MFL and Geometry	2/5/2018	2/5/2019	FR
23199	6A	PE - AM	226760	4182	MFL and Geometry	2/5/2018	2/5/2019	FR
23200	6A	PE - AM	226790	4182	MFL and Geometry	2/5/2018	2/5/2019	FR
23201	6A	PE - AM	227710	4182	MFL and Geometry	2/5/2018	2/5/2019	FR
23202	6A	PE - AM	230360	4182	MFL and Geometry	2/5/2018	2/5/2019	FR
23203	6A	PE - AM	233390	4182	MFL and Geometry	2/5/2018	2/5/2019	2/28/2018
23204	6A	PE - AM	235290	4182	MFL and Geometry	2/5/2018	2/5/2019	FR
23205	6A	PE - AM	236100	4182	MFL and Geometry	2/5/2018	2/5/2019	FR
23206	6A	PE - AM	237970	4182	MFL and Geometry	2/5/2018	2/5/2019	FR

Table 21: Identified Digs								
Dig ID	**Line**	**Seg-ment**	**Girth Weld**	**Tool Run ID**	**Technology**	**Date of Discovery / Feature Added to Dig List**	**Repair / Mitigation Deadline**	**Date of Repair / Mitigation**
23207	6A	PE - AM	240960	4182	MFL and Geometry	2/5/2018	2/5/2019	FR
23208	6A	PE - AM	244040	4182	MFL and Geometry	2/5/2018	2/5/2019	FR
23209	6A	PE - AM	244050	4182	MFL and Geometry	2/5/2018	2/5/2019	FR
23210	6A	PE - AM	244490	4182	MFL and Geometry	2/5/2018	2/5/2019	FR
23211	6A	PE - AM	249090	4182	MFL and Geometry	2/5/2018	2/5/2019	FR
23212	6A	PE - AM	250760	4182	MFL and Geometry	2/5/2018	2/5/2019	FR
23213	6A	PE - AM	252450	4182	MFL and Geometry	2/5/2018	2/5/2019	FR
23214	6A	PE - AM	253910	4182	MFL and Geometry	2/5/2018	2/5/2019	FR
23215	6A	PE - AM	255750	4182	MFL and Geometry	2/5/2018	2/5/2019	FR
23216	6A	PE - AM	257200	4182	MFL and Geometry	2/5/2018	2/5/2019	FR
23218	6A	PE - AM	271270	4182	MFL and Geometry	2/5/2018	2/5/2019	FR
23219	6A	PE - AM	297940	4182	MFL and Geometry	2/5/2018	2/5/2019	FR
23220	6A	PE - AM	298790	4182	MFL and Geometry	2/5/2018	2/5/2019	FR
23221	6A	PE - AM	301610	4182	MFL and Geometry	2/5/2018	2/5/2019	FR
23309	6A	PE - AM	1810	3809	Crack	3/9/2018	9/5/2018	FR

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Table 21: Identified Digs								
Dig ID	**Line**	**Seg-ment**	**Girth Weld**	**Tool Run ID**	**Technology**	**Date of Discovery / Feature Added to Dig List**	**Repair / Mitigation Deadline**	**Date of Repair / Mitigation**
23311	6A	PE - AM	7250	3809	Crack	3/9/2018	9/5/2018	FR
23312	6A	PE - AM	13370	3809	Crack	3/9/2018	9/5/2018	FR
23313	6A	PE - AM	14060	3809	Crack	3/9/2018	9/5/2018	FR
23314	6A	PE - AM	14750	3809	Crack	3/9/2018	9/5/2018	FR
23315	6A	PE - AM	32610	3809	Crack	3/9/2018	9/5/2018	FR
23316	6A	PE - AM	64390	3809	Crack	3/9/2018	9/5/2018	FR
23317	6A	PE - AM	64440	3809	Crack	3/9/2018	9/5/2018	FR
23318	6A	PE - AM	64650	3809	Crack	3/9/2018	9/5/2018	FR
23319	6A	PE - AM	65160	3809	Crack	3/9/2018	9/5/2018	FR
23320	6A	PE - AM	65300	3809	Crack	3/9/2018	9/5/2018	FR
23321	6A	PE - AM	65830	3809	Crack	3/9/2018	9/5/2018	FR
23322	6A	PE - AM	68870	3809	Crack	3/9/2018	9/5/2018	FR
23323	6A	PE - AM	91150	3809	Crack	3/9/2018	9/5/2018	FR
23324	6A	PE - AM	102240	3809	Crack	3/9/2018	9/5/2018	FR
23325	6A	PE - AM	104330	3809	Crack	3/9/2018	9/5/2018	FR
23327	6A	PE - AM	105780	3809	Crack	3/9/2018	3/4/2019	FR
23330	6A	PE - AM	148440	3809	Crack	3/9/2018	9/5/2018	FR
23333	6A	PE - AM	154650	3809	Crack	3/9/2018	9/5/2018	FR
23334	6A	PE - AM	164110	3809	Crack	3/9/2018	9/5/2018	FR
23335	6A	PE - AM	167090	3809	Crack	3/9/2018	9/5/2018	FR
23336	6A	PE - AM	169660	3809	Crack	3/9/2018	9/5/2018	FR
23337	6A	PE - AM	170290	3809	Crack	3/9/2018	9/5/2018	FR
23338	6A	PE - AM	173380	3809	Crack	3/9/2018	9/5/2018	FR

Table 21: Identified Digs								
Dig ID	**Line**	**Seg-ment**	**Girth Weld**	**Tool Run ID**	**Technology**	**Date of Discovery / Feature Added to Dig List**	**Repair / Mitigation Deadline**	**Date of Repair / Mitigation**
23339	6A	PE - AM	173450	3809	Crack	3/9/2018	9/5/2018	FR
23340	6A	PE - AM	173540	3809	Crack	3/9/2018	9/5/2018	FR
23341	6A	PE - AM	173790	3809	Crack	3/9/2018	9/5/2018	FR
23342	6A	PE - AM	174300	3809	Crack	3/9/2018	9/5/2018	FR
23343	6A	PE - AM	193860	3809	Crack	3/9/2018	9/5/2018	FR
23344	6A	PE - AM	194100	3809	Crack	3/9/2018	9/5/2018	FR
23345	6A	PE - AM	216150	3809	Crack	3/9/2018	9/5/2018	FR
23346	6A	PE - AM	219110	3809	Crack	3/9/2018	9/5/2018	FR
23347	6A	PE - AM	219830	3809	Crack	3/9/2018	9/5/2018	FR
23350	6A	PE - AM	257870	3809	Crack	3/9/2018	9/5/2018	FR
23351	6A	PE - AM	262700	3809	Crack	3/9/2018	9/5/2018	FR
23352	6A	PE - AM	283440	3809	Crack	3/9/2018	9/5/2018	FR
23353	6A	PE - AM	295120	3809	Crack	3/9/2018	9/5/2018	FR
23354	6A	PE - AM	299650	3809	Crack	3/9/2018	9/5/2018	FR
23355	6A	PE - AM	322910	3809	Crack	3/9/2018	9/5/2018	FR

TABLE NOTES:

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

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

The Priority Notification features for which Enbridge imposed PPRs are reported in Subparagraphs 33.c-d and are therefore not included in the table below.

Eight corrosion PPRs for Line 6A AM-GT joints with Upstream Girth Weld numbers of 81970, 83110, 112360, 129350, 129910, 300010, 300310, and 303870 were imposed by one day later than the requirements prescribed in the Consent Decree. This non-compliance issue is addressed in Paragraph 145.

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Table 22: 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 Imposition Date**	**Repair / Mitigation Date**	**PPR Removal Date[1]**
28017	02	DR-PW	13270	4/18/2018	5/18/2018	NA	4/20/2018	4/20/2018
28018	02	DR-PW	42810	4/18/2018	10/15/2018	NA	4/21/2018	4/20/2018
27100	03	CR-PW	239920	12/26/2017	6/25/2018	12/28/2017	1/26/2018	FR
27954	04	FW-WR	25700	3/22/2018	3/22/2019	3/23/2018	FR	FR
27955	04	GF-DN	48150	3/22/2018	3/22/2019	3/23/2018	FR	FR
27050	05	BC-RW	56680	11/15/2017	1/16/2018	11/17/2017	12/11/2017	12/11/2017
27060	05	BC-RW	610	12/18/2017	6/18/2018	12/19/2017	FR	FR
27061	05	BC-RW	9500	12/18/2017	6/18/2018	12/19/2017	5/18/2018	FR
27062	05	BC-RW	13220	12/18/2017	6/18/2018	12/19/2017	FR	FR
27063	05	BC-RW	22170	12/18/2017	6/18/2018	12/19/2017	5/22/2018	FR
27064	05	BC-RW	26290	12/18/2017	12/18/2018	12/19/2017	FR	FR
27065	05	BC-RW	37600	12/18/2017	6/18/2018	12/19/2017	5/17/2018	FR
27066	05	BC-RW	56740	12/18/2017	6/18/2018	12/19/2017	FR	FR
27067	05	BC-RW	63420	12/18/2017	12/18/2018	12/19/2017	FR	FR
28067	05	BC-RW	12760	5/1/2018	10/29/2018	5/2/2018	FR	FR
27978	05	IR-NO	65420	4/10/2018	10/9/2018	4/11/2018	FR	FR
27022	05	PE-IR	20160	10/27/2017	10/29/2018	10/30/2017	12/2/2017	3/6/2018
27024	05	PE-IR	242570	10/27/2017	4/25/2018	10/30/2017	3/2/2018	FR
27056	05	PE-IR	114300	12/14/2017	6/12/2018	12/18/2017	5/19/2018	FR
27057	05	PE-IR	127420	12/14/2017	6/12/2018	12/18/2017	FR	FR
27058	05	PE-IR	154730	12/14/2017	6/12/2018	12/18/2017	2/23/2018	FR
27059	05	PE-IR	195900	12/14/2017	6/12/2018	12/18/2017	5/22/2018	FR
27097	05	PE-IR	81930	12/26/2017	6/25/2018	12/27/2017	FR	FR
27098	05	PE-IR	116930	12/26/2017	6/25/2018	12/27/2017	FR	FR
27099	05	PE-IR	230050	12/26/2017	6/25/2018	12/27/2017	FR	FR
27956	6A	AM-GT	72020	4/9/2018	4/9/2019	4/10/2018	5/22/2018	FR

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Table 22: 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 Imposition Date**	**Repair / Mitigation Date**	**PPR Removal Date[1]**
27957	6A	AM-GT	89180	4/9/2018	4/9/2019	4/10/2018	FR	FR
27958	6A	AM-GT	99630	4/9/2018	4/9/2019	4/10/2018	FR	FR
27959	6A	AM-GT	100680	4/9/2018	4/9/2019	4/10/2018	FR	FR
27960	6A	AM-GT	111040	4/9/2018	4/9/2019	4/10/2018	FR	FR
27961	6A	AM-GT	130890	4/9/2018	4/9/2019	4/10/2018	FR	FR
27962	6A	AM-GT	151570	4/9/2018	4/9/2019	4/10/2018	FR	FR
27963	6A	AM-GT	153530	4/9/2018	10/9/2018	4/10/2018	FR	FR
27964	6A	AM-GT	157490	4/9/2018	4/9/2019	4/10/2018	FR	FR
27965	6A	AM-GT	163690	4/9/2018	4/9/2019	4/10/2018	FR	FR
27966	6A	AM-GT	165800	4/9/2018	4/9/2019	4/10/2018	FR	FR
27967	6A	AM-GT	198680	4/9/2018	10/9/2018	4/10/2018	FR	FR
27968	6A	AM-GT	257720	4/9/2018	10/9/2018	4/10/2018	FR	FR
27969	6A	AM-GT	261430	4/9/2018	10/9/2018	4/10/2018	FR	FR
27970	6A	AM-GT	273260	4/9/2018	10/9/2018	4/10/2018	FR	FR
27971	6A	AM-GT	273330	4/9/2018	10/9/2018	4/10/2018	FR	FR
27972	6A	AM-GT	274200	4/9/2018	10/9/2018	4/10/2018	FR	FR
27973	6A	AM-GT	277560	4/9/2018	10/9/2018	4/10/2018	FR	FR
27974	6A	AM-GT	279270	4/9/2018	10/9/2018	4/10/2018	FR	FR
27975	6A	AM-GT	279280	4/9/2018	10/9/2018	4/10/2018	FR	FR
27976	6A	AM-GT	288040	4/9/2018	10/9/2018	4/10/2018	FR	FR
27981	6A	AM-GT	45720	4/16/2018	10/15/2018	4/18/2018	4/28/2018	4/27/2018
27982	6A	AM-GT	56710	4/16/2018	10/15/2018	4/18/2018	5/14/2018	5/6/2018
27983	6A	AM-GT	64190	4/16/2018	10/15/2018	4/18/2018	5/18/2018	5/9/2018
27984	6A	AM-GT	67200	4/16/2018	10/15/2018	4/18/2018	5/10/2018	5/9/2018
27985	6A	AM-GT	71970	4/16/2018	10/15/2018	4/18/2018	5/15/2018	5/9/2018
27986	6A	AM-GT	73960	4/16/2018	10/15/2018	4/18/2018	5/10/2018	5/11/2018

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Table 22: 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 Imposition Date**	**Repair / Mitigation Date**	**PPR Removal Date[1]**
27987	6A	AM-GT	75150	4/16/2018	10/15/2018	4/18/2018	5/11/2018	5/11/2018
27988	6A	AM-GT	76370	4/16/2018	10/15/2018	4/18/2018	5/14/2018	5/11/2018
27989	6A	AM-GT	79540	4/16/2018	10/15/2018	4/18/2018	5/18/2018	5/17/2018
27990	6A	AM-GT	80160	4/16/2018	10/15/2018	4/18/2018	5/16/2018	5/17/2018
27991	6A	AM-GT	84610	4/16/2018	10/15/2018	4/18/2018	5/17/2018	5/17/2018
27992	6A	AM-GT	86310	4/16/2018	10/15/2018	4/18/2018	5/12/2018	5/11/2018
27993	6A	AM-GT	86980	4/16/2018	10/15/2018	4/18/2018	5/12/2018	5/11/2018
27994	6A	AM-GT	96410	4/16/2018	10/15/2018	4/18/2018	5/8/2018	5/5/2018
27995	6A	AM-GT	114370	4/16/2018	10/15/2018	4/18/2018	5/5/2018	5/5/2018
27996	6A	AM-GT	116150	4/16/2018	10/15/2018	4/18/2018	5/8/2018	5/6/2018
27997	6A	AM-GT	131060	4/16/2018	10/15/2018	4/18/2018	5/8/2018	5/9/2018
27998	6A	AM-GT	222770	4/16/2018	6/15/2018	4/18/2018	4/24/2018	4/25/2018
27999	6A	AM-GT	55320	4/16/2018	6/15/2018	4/18/2018	5/9/2018	5/5/2018
28000	6A	AM-GT	59370	4/16/2018	4/16/2019	4/18/2018	5/16/2018	5/6/2018
28001	6A	AM-GT	294900	4/16/2018	6/15/2018	4/18/2018	5/3/2018	5/2/2018
28002	6A	AM-GT	58480	4/16/2018	10/15/2018	4/18/2018	5/8/2018	5/5/2018
28004	6A	AM-GT	60490	4/16/2018	10/15/2018	4/18/2018	5/10/2018	5/9/2018
28005	6A	AM-GT	60500	4/16/2018	10/15/2018	4/18/2018	5/10/2018	5/9/2018
28013	6A	AM-GT	218320	4/16/2018	6/15/2018	4/18/2018	5/16/2018	4/28/2018
28088	6A	AM-GT	81970	5/11/2018	5/13/2019	5/15/2018	FR	FR
28089	6A	AM-GT	83110	5/11/2018	5/13/2019	5/15/2018	FR	FR
28090	6A	AM-GT	112360	5/11/2018	5/13/2019	5/15/2018	FR	FR
28091	6A	AM-GT	129350	5/11/2018	5/13/2019	5/15/2018	FR	FR
28092	6A	AM-GT	129910	5/11/2018	5/13/2019	5/15/2018	FR	FR
28093	6A	AM-GT	300010	5/11/2018	11/7/2018	5/15/2018	FR	FR
28094	6A	AM-GT	300310	5/11/2018	11/7/2018	5/15/2018	FR	FR

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Table 22: 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 Imposition Date**	**Repair / Mitigation Date**	**PPR Removal Date[1]**
28095	6A	AM-GT	303870	5/11/2018	11/7/2018	5/15/2018	FR	FR
27828	6A	PE-AM	24530	2/5/2018	2/5/2019	2/7/2018	FR	FR
27829	6A	PE-AM	63000	2/5/2018	2/5/2019	2/7/2018	3/3/2018	FR
27830	6A	PE-AM	117210	2/5/2018	2/5/2019	2/7/2018	FR	FR
27831	6A	PE-AM	135390	2/5/2018	2/5/2019	2/7/2018	2/24/2018	FR
27832	6A	PE-AM	142960	2/5/2018	8/6/2018	2/7/2018	FR	FR
27833	6A	PE-AM	148400	2/5/2018	2/5/2019	2/7/2018	FR	FR
27834	6A	PE-AM	216510	2/5/2018	2/5/2019	2/7/2018	FR	FR
27835	6A	PE-AM	223520	2/5/2018	2/5/2019	2/7/2018	FR	FR
27836	6A	PE-AM	226760	2/5/2018	2/5/2019	2/7/2018	FR	FR
27837	6A	PE-AM	226790	2/5/2018	2/5/2019	2/7/2018	FR	FR
27838	6A	PE-AM	230360	2/5/2018	2/5/2019	2/7/2018	FR	FR
27839	6A	PE-AM	233390	2/5/2018	2/5/2019	2/7/2018	2/28/2018	FR
27840	6A	PE-AM	236100	2/5/2018	2/5/2019	2/7/2018	FR	FR
27841	6A	PE-AM	271270	2/5/2018	2/5/2019	2/7/2018	FR	FR
27916	6A	PE-AM	1810	3/9/2018	9/5/2018	3/12/2018	FR	FR
27917	6A	PE-AM	7250	3/9/2018	9/5/2018	3/12/2018	FR	FR
27918	6A	PE-AM	13370	3/9/2018	9/5/2018	3/12/2018	FR	FR
27919	6A	PE-AM	14060	3/9/2018	9/5/2018	3/12/2018	FR	FR
27920	6A	PE-AM	14750	3/9/2018	9/5/2018	3/12/2018	FR	FR
27921	6A	PE-AM	32610	3/9/2018	9/5/2018	3/12/2018	FR	FR
27922	6A	PE-AM	64390	3/9/2018	9/5/2018	3/12/2018	FR	FR
27923	6A	PE-AM	64440	3/9/2018	9/5/2018	3/12/2018	FR	FR
27924	6A	PE-AM	64650	3/9/2018	9/5/2018	3/12/2018	FR	FR
27925	6A	PE-AM	65160	3/9/2018	9/5/2018	3/12/2018	FR	FR
27926	6A	PE-AM	65300	3/9/2018	9/5/2018	3/12/2018	FR	FR

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Table 22: 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 Imposition Date**	**Repair / Mitigation Date**	**PPR Removal Date[1]**
27927	6A	PE-AM	65830	3/9/2018	9/5/2018	3/12/2018	FR	FR
27928	6A	PE-AM	68870	3/9/2018	9/5/2018	3/12/2018	FR	FR
27929	6A	PE-AM	91150	3/9/2018	9/5/2018	3/12/2018	FR	FR
27930	6A	PE-AM	102240	3/9/2018	9/5/2018	3/12/2018	FR	FR
27931	6A	PE-AM	104330	3/9/2018	9/5/2018	3/12/2018	FR	FR
27932	6A	PE-AM	148440	3/9/2018	9/5/2018	3/12/2018	FR	FR
27933	6A	PE-AM	154650	3/9/2018	9/5/2018	3/12/2018	FR	FR
27934	6A	PE-AM	164110	3/9/2018	9/5/2018	3/12/2018	FR	FR
27935	6A	PE-AM	167090	3/9/2018	9/5/2018	3/12/2018	FR	FR
27936	6A	PE-AM	169660	3/9/2018	9/5/2018	3/12/2018	FR	FR
27937	6A	PE-AM	170290	3/9/2018	9/5/2018	3/12/2018	FR	FR
27938	6A	PE-AM	173380	3/9/2018	9/5/2018	3/12/2018	FR	FR
27939	6A	PE-AM	173450	3/9/2018	9/5/2018	3/12/2018	FR	FR
27940	6A	PE-AM	173540	3/9/2018	9/5/2018	3/12/2018	FR	FR
27941	6A	PE-AM	173790	3/9/2018	9/5/2018	3/12/2018	FR	FR
27942	6A	PE-AM	174300	3/9/2018	9/5/2018	3/12/2018	FR	FR
27943	6A	PE-AM	193860	3/9/2018	9/5/2018	3/12/2018	FR	FR
27944	6A	PE-AM	194100	3/9/2018	9/5/2018	3/12/2018	FR	FR
27945	6A	PE-AM	216150	3/9/2018	9/5/2018	3/12/2018	FR	FR
27946	6A	PE-AM	219110	3/9/2018	9/5/2018	3/12/2018	FR	FR
27947	6A	PE-AM	219830	3/9/2018	9/5/2018	3/12/2018	FR	FR
27948	6A	PE-AM	257870	3/9/2018	9/5/2018	3/12/2018	FR	FR
27949	6A	PE-AM	262700	3/9/2018	9/5/2018	3/12/2018	FR	FR
27950	6A	PE-AM	283440	3/9/2018	9/5/2018	3/12/2018	FR	FR
27951	6A	PE-AM	295120	3/9/2018	9/5/2018	3/12/2018	FR	FR
27952	6A	PE-AM	299650	3/9/2018	9/5/2018	3/12/2018	FR	FR

Table 22: 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 Imposition Date**	**Repair / Mitigation Date**	**PPR Removal Date[1]**
27953	6A	PE-AM	322910	3/9/2018	9/5/2018	3/12/2018	FR	FR

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.

46.e [Alternate Plans and Alternate Pressure Restrictions]

Enbridge implemented two alternate plans which implemented interim alternate pressure during the reporting period of this SAR.

46.f [Saturated Signal Crack Feature]

Neither of the alternate plans that implemented an interim alternate pressure restriction were for saturated signal crack features that present a rupture threat. None of the features had ILI-measured length equal to or longer than the leak-rupture boundary as determined in accordance PR-218-05404. For purposes of this Consent Decree, the leak-rupture boundary equals two times the value of the variable "c" as determined in equation numbers 9 and 10 at p. 25 of PR-218-05404 (May 2011).

46.g [Alternate Plans and Pressure Restrictions]

Enbridge has complied with the requirements of Subparagraph 46.g as described below. During the period covered by this SAR, Enbridge implemented two Alternate Interim Pressure Restrictions (“AIPRs”) as authorized by Subparagraph 46.d. The details of the two AIPRs implemented are summarized in Tables 22.1 and 22.2. Enbridge notified EPA in writing of each AIPR within the time specified in Subparagraph 46.g.(2). As set forth in Tables 22.1 and 22.2, the written notifications provided the information required in Subparagraphs 46.g(2).a-d. The written notification provided to EPA included a copy of the Engineering Assessment prepared as provided in Subparagraph 46.g(1) and Subparagraph 46.g(2).d, demonstrating that Enbridge will achieve a level of safety for all FREs covered by the Alternate Plan or by the alternate pressure restriction requirements that is greater than or equal to the safety factor intended to be achieved through compliance with the requirements of this Subsection VII.D.(V) applicable to such feature or features.

Enbridge also provided the Line 5 Alternate Pressure Restriction reports to the State of Michigan.

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46.h [Alternate Plans and Temporary Pressure Restrictions]

Subparagraph 46.h appears to apply to "Alternate Plans" implemented under Subparagraph 46.c. The two AIPRs implemented during the period covered by this SAR were implemented under Subparagraph 46.d. The details of the AIPRRs implemented are described in Tables 22-1 and 22-2 below.

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

Both of the AIPRs implemented complied with applicable laws and regulations.

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

Enbridge implemented each proposed AIPR as described in the written notifications submitted to EPA pursuant to Subparagraph 46.g(2) and has proceeded accordingly.

46.k [Documentation Maintenance]

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

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

Enbridge implemented two alternate pressure restrictions during the reporting period of this SAR. Details of each alternative pressure restriction are shown in Tables 23-1 and 23-2 below.

Table 23: Alternate Plans and Alternate Pressure Restrictions	
46.e. Alternate Plan or Alternate Pressure Restrictions submitted from effective date to the end of this SAR reporting period:	2 of maximum 40
46.e. Cumulative Excavations of Joints	2 of maximum 200
46.e. Maximum number of contiguous joints	1 of maximum 10

Table 23-1: Alternate Interim Pressure Restriction Details Line 5 BC-RW GW 56680	
Alternate Plan Line	5
Alternate Plan Tool Run	BC-RW 2017-08 BH GEMINI CAL
Alternate Plan Joint	56680
46.l. (iv) Date Engineering Assessment was Completed	November 17, 2017
46.l.(vii) Alternate Pressure Restriction Implementation Date	November 17, 2017
46.l.(iv) Alternate Pressure Restriction Reporting/Notification Date	November 27, 2017

Notification was within 10 days of EA completion	Yes
Alternate Interim Pressure Restriction (psi)	487
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	No
46.c.(3) Alternate Plan submitted for 46.c.(1)(2)	No
46.d.(i) Significantly Impair Operability	Yes
46.d.(ii) Significant Adverse Effect on Pipeline Integrity	No

46.l(i) Alternate Plan and Alternate Pressure Restriction Detailed Description:

Enbridge completed a Line 5 BC-RW 2017-08 BH GEMINI CAL run on August 24, 2017. The tool reported a dent interacting with an area of metal loss meeting in a High Consequence Area ("HCA") in Tuscola County, Michigan.

Enbridge became aware of this interacting feature on November 15, 2017.
On November 17, within 2 days of the determination of the feature in question, Enbridge determined that the interim pressure restriction prescribed by Table 5 and Subparagraph 59.b of the Consent Decree would significantly impact or impair the operability of Line 5, and could result in shutdown of the line.
On November 17, 2017, Enbridge completed the Engineering Assessment that was submitted to EPA on November 27, 2017, to assess alternatives to possible shutdown of Line 5, and that Engineering Assessment concluded that the feature in question is a smooth dent with non-interacting corrosion at the shoulder. Enbridge subjected the feature to a more refined analysis known as "finite element analysis" ("FEA"). The FEA determined that the metal loss features in question are not interacting with the dent and, from a structural reliability perspective, the dent is not an imminent threat to the pipeline.

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

The completed Engineering Assessment demonstrates that the ILI findings of 8 to 13% metal losses and the 3% deep bottom side dent do not interact when examined for potential stress/strain interaction. This means that the fitness for purpose assessment for each ILI reported feature can be performed independently.
The Engineering Assessment, with the detailed FEA, concluded that the safety of the line will not be enhanced by treating the dent feature and nearby metal loss as interacting features. From a safety perspective, the metal loss can be individually assessed under Consent Decree Paragraphs 50, 51 and 52 and from a safety point of view would not require excavation or protection through a PPR. Similarly, the bottom side dent can be individually assessed through Consent Decree Paragraphs 55, 56 and 57 and would not require excavation or protection through a PPR.

46.l(iv) detailed description of the analysis comparing the level of safety achieved by each such Alternate Plan and/or the alternate interim pressure restriction with the level of safety that would be achieved through compliance with the requirements of Subsection VII.D.(V)

It is not possible to compare the level of safety for the features covered by the alternate pressure restriction requirements to the level of safety achieved through compliance with the requirements of Subparagraph 59.b if applied to such feature or features, since it is likely that the application of the requirements of Subparagraph 59.b could impair operation of the line or make the line inoperable. However, for the above reasons, the Line can continue to be operated safely at a pressure somewhat higher than that otherwise dictated by Subparagraph 59.b, albeit a lower pressure than had been in place prior to November 17.

46.l.(vi) description of activities undertaken by Enbridge during the reporting period to implement Alternate Plan and alternate interim pressure restriction

As a result of the conclusions in the Engineering Assessment, Enbridge, consistent with Paragraph 46 of the Consent Decree, elected to impose an alternate pressure restriction of 487 psi (50% specified minimum yield

strength ("SMYS")), as noted above. Enbridge also issued a dig package and completed the excavation on this joint (GW 56680) on December 11, 2017 and removed the Alternate PPR on December 11, 2017.

Table 23-2: Alternate Interim Pressure Restriction Line 3 CR-PW GW 239920	
Alternate Plan Line	3
Alternate Plan Tool Run	CR-PW 2017-08 GE WM+
Alternate Plan Joint	239920
46.l. (iv) Date Engineering Assessment was Completed	December 26, 2017
46.l.(vii) Alternate Pressure Restriction Implementation Date	December 26, 2017
46.l.(iv) Alternate Pressure Restriction Reporting/Notification Date	January 5, 2018
Notification was within 10 days of EA completion	Yes
Alternate Interim Pressure Restriction (psi)	322
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	No
46.c.(3) Alternate Plan submitted for 46.c.(1)(2)	No
46.d.(i) Significantly Impair Operability	Yes
46.d.(ii) Significant Adverse Effect on Pipeline Integrity	No
46.l(i) Alternate Plan and Alternate Pressure Restriction Detailed Description: Enbridge completed a Line 3 CR-PW Ultrasonic Wall Measurement (USWM+) In-line Inspection on August 21, 2017. The tool reported two metal loss features that were found to be interacting with a dent (not in an HCA) through threat integration. Enbridge determined that these features were interacting on December 26, 2017. On December 26, Enbridge confirmed that the interim pressure restriction prescribed by Table 5 and Subparagraph 59.b of the Consent Decree would significantly impact or impair the operability of Line 3, and could result in shutdown of the line. Enbridge completed the Engineering Assessment to assess alternatives to possible shutdown of Line 3 on December 26, 2017,, and completed the Supplemental EA on January 5, 2018. The Engineering Assessment concluded that the feature in question is a smooth dent with incidental corrosion, and a more refined analysis known as FEA determined that the adverse effect of the dent does not affect the burst pressure of the metal loss features in question from a structural reliability perspective, the dent is currently safe.	
46.l.(iii) Basis for selection of the Alternate Plan and Alternate interim pressure restriction and alternate timetables On December 26, Enbridge requested Operations to impose a PPR of 322 psi (37.5% SMYS) to be implemented no later than December 28 on affected portion of Line 3.	
46.l. (iv) detailed description of the analysis comparing the level of safety achieved by each such Alternate Plan and/or the alternate interim pressure restriction with the level of safety that would be achieved through compliance with the requirements of Subsection VII.D.(V) The PPR corresponds to the lowest operating pressure at location when considering all safety margins required to control pressure. By way of comparison, Subparagraph 59.b of the Decree, if applied, would impose an operating	

pressure limit not to exceed 80% of the highest actual operating pressure at the location of the feature over the last 60 Days, which in this case would be approximately 213 psi (24.8% SMYS). Based on the FEA analysis, the metal loss is predicted to fail at 679 psi (79% SMYS). The Consent Decree achieves a safety factor of 1.25 through 80% of 60 day high. The intent of the 80% of 60 day high is to re-establish a 1.25 safety factor on a potential sub-critical flaw defined as a flaw that has a failure pressure just below the recently highest pressure achieved. In contrast, the imposed restriction of 322 psi achieves a safety factor of 2.4 over the predicted failure pressure estimated through FEA, much larger than the safety factor of 1.39 applied to corrosion features.

46.l.(vi) description of activities undertaken by Enbridge during the reporting period to implement Alternate Plan and alternate interim pressure restriction

Enbridge, consistent with Paragraph 46 of the Decree, elected to impose an alternate PR of 322 psi (37.5% SMYS), as described above. Enbridge also expedited the excavation. Enbridge issued a dig package, and applied for the required permits from the State and local permitting authorities beginning on December 20, 2017. Enbridge completed the mitigation of the subject feature on January 26, 2018.

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

Enbridge has set schedules for the excavation and repair or mitigation of each Crack feature that meets one (or more) of the Dig Selection Criteria set forth in Table 1 of the Consent Decree, in accordance with the timeframes specified in column 2 of Table 1, and the PR requirements specified in column 3 of Table 1. The following tables summarize the segments containing each Crack feature that meets the above criteria.

Enbridge also issued dig packages to excavate and repair or mitigate Crack features that intersected or interacted with Corrosion features, dents, or other Geometric features, and established appropriate pressure restrictions for such interacting features, as provided in Table 5 and Paragraph 59 of the Consent Decree. For more information about these interacting features, see Paragraph 59 in this SAR. These features are not included in Tables 23 and 24.

Table 24: Crack Features Requiring Excavation

Dig ID	Line	Segment	Girth Weld	Date of Discovery / Feature Added to Dig List	Repair / Mitigation Deadline	Date of Repair / Mitigation
23769	03	GF - CR	60750	4/16/2018	4/16/2019	FR
23770	03	GF - CR	64890	4/16/2018	4/16/2019	FR
23771	03	GF - CR	153060	4/16/2018	4/16/2019	FR
23772	03	GF - CR	156870	4/16/2018	4/16/2019	FR
23773	03	GF - CR	158200	4/16/2018	4/16/2019	FR
23491	04	CS - DR	27690	3/21/2018	3/21/2019	FR
23492	04	CS - DR	27990	3/21/2018	3/21/2019	FR
23493	04	CS - DR	28050	3/21/2018	3/21/2019	FR
23494	04	CS - DR	28060	3/21/2018	3/21/2019	FR
23495	04	CS - DR	28070	3/21/2018	3/21/2019	FR

Table 24: Crack Features Requiring Excavation						
Dig ID	**Line**	**Segment**	**Girth Weld**	**Date of Discovery / Feature Added to Dig List**	**Repair / Mitigation Deadline**	**Date of Repair / Mitigation**
23496	04	CS - DR	28120	3/21/2018	3/21/2019	FR
23497	04	CS - DR	28220	3/21/2018	3/21/2019	FR
23498	04	CS - DR	28950	3/21/2018	3/21/2019	FR
23499	04	CS - DR	30540	3/21/2018	3/21/2019	FR
23500	04	CS - DR	30770	3/21/2018	3/21/2019	FR
23501	04	CS - DR	30790	3/21/2018	3/21/2019	FR
23502	04	CS - DR	32380	3/21/2018	3/21/2019	FR
23897	04	FW - WR	16340	5/8/2018	5/8/2019	FR
23898	04	FW - WR	19250	5/8/2018	5/8/2019	FR
23899	04	FW - WR	26600	5/8/2018	5/8/2019	FR
23901	04	FW - WR	28430	5/8/2018	5/8/2019	FR
23902	04	FW - WR	29000	5/8/2018	5/8/2019	FR
23852	04	GF - DN	47390	4/23/2018	4/18/2019	FR
23873	05	BC - RW	12760	5/1/2018	10/29/2018	FR
23727	05	IR - NO	30650	4/10/2018	4/10/2019	FR
23728	05	IR - NO	65420	4/10/2018	10/9/2018	FR
23017	05	PE - IR	114300	12/14/2017	6/12/2018	5/19/2018
23018	05	PE - IR	127420	12/14/2017	6/12/2018	FR
23020	05	PE - IR	154730	12/14/2017	6/12/2018	2/23/2018
23021	05	PE - IR	182420	12/14/2017	12/14/2018	3/6/2018
23022	05	PE - IR	183220	12/14/2017	12/14/2018	2/23/2018
23025	05	PE - IR	190460	12/14/2017	12/14/2018	3/3/2018
23026	05	PE - IR	195900	12/14/2017	6/12/2018	5/22/2018
23309	6A	PE - AM	1810	3/9/2018	9/5/2018	FR
23311	6A	PE - AM	7250	3/9/2018	9/5/2018	FR
23312	6A	PE - AM	13370	3/9/2018	9/5/2018	FR
23313	6A	PE - AM	14060	3/9/2018	9/5/2018	FR
23314	6A	PE - AM	14750	3/9/2018	9/5/2018	FR
23315	6A	PE - AM	32610	3/9/2018	9/5/2018	FR

Table 24: Crack Features Requiring Excavation						
Dig ID	**Line**	**Segment**	**Girth Weld**	**Date of Discovery / Feature Added to Dig List**	**Repair / Mitigation Deadline**	**Date of Repair / Mitigation**
23316	6A	PE - AM	64390	3/9/2018	9/5/2018	FR
23317	6A	PE - AM	64440	3/9/2018	9/5/2018	FR
23318	6A	PE - AM	64650	3/9/2018	9/5/2018	FR
23319	6A	PE - AM	65160	3/9/2018	9/5/2018	FR
23320	6A	PE - AM	65300	3/9/2018	9/5/2018	FR
23321	6A	PE - AM	65830	3/9/2018	9/5/2018	FR
23322	6A	PE - AM	68870	3/9/2018	9/5/2018	FR
23323	6A	PE - AM	91150	3/9/2018	9/5/2018	FR
23324	6A	PE - AM	102240	3/9/2018	9/5/2018	FR
23325	6A	PE - AM	104330	3/9/2018	9/5/2018	FR
23327	6A	PE - AM	105780	3/9/2018	3/4/2019	FR
23330	6A	PE - AM	148440	3/9/2018	9/5/2018	FR
23333	6A	PE - AM	154650	3/9/2018	9/5/2018	FR
23334	6A	PE - AM	164110	3/9/2018	9/5/2018	FR
23335	6A	PE - AM	167090	3/9/2018	9/5/2018	FR
23336	6A	PE - AM	169660	3/9/2018	9/5/2018	FR
23337	6A	PE - AM	170290	3/9/2018	9/5/2018	FR
23338	6A	PE - AM	173380	3/9/2018	9/5/2018	FR
23339	6A	PE - AM	173450	3/9/2018	9/5/2018	FR
23340	6A	PE - AM	173540	3/9/2018	9/5/2018	FR
23341	6A	PE - AM	173790	3/9/2018	9/5/2018	FR
23342	6A	PE - AM	174300	3/9/2018	9/5/2018	FR
23343	6A	PE - AM	193860	3/9/2018	9/5/2018	FR
23344	6A	PE - AM	194100	3/9/2018	9/5/2018	FR
23345	6A	PE - AM	216150	3/9/2018	9/5/2018	FR
23346	6A	PE - AM	219110	3/9/2018	9/5/2018	FR
23347	6A	PE - AM	219830	3/9/2018	9/5/2018	FR
23350	6A	PE - AM	257870	3/9/2018	9/5/2018	FR
23351	6A	PE - AM	262700	3/9/2018	9/5/2018	FR

Table 24: Crack Features Requiring Excavation						
Dig ID	**Line**	**Segment**	**Girth Weld**	**Date of Discovery / Feature Added to Dig List**	**Repair / Mitigation Deadline**	**Date of Repair / Mitigation**
23352	6A	PE - AM	283440	3/9/2018	9/5/2018	FR
23353	6A	PE - AM	295120	3/9/2018	9/5/2018	FR
23354	6A	PE - AM	299650	3/9/2018	9/5/2018	FR
23355	6A	PE - AM	322910	3/9/2018	9/5/2018	FR

As per the Lakehead System Integrity Program Logistics Exception process, Enbridge established PRs within the timeframes identified in Table 1 and specified in Paragraph 47 of the Consent Decree.

The following table lists the pressure restrictions imposed due to these criteria as applicable to this SAR.

Table 25: Crack Feature Pressure Restrictions									
PR ID	**Line**	**Segment**	**Girth Weld**	**Date of Discovery**	**Repair / Mitigation Deadline (specified in Tables 1 to 5 of the Consent Decree)**	**PPR Set (psi)**	**PPR Imposition Date**	**Repair / Mitigation Date**	**PPR Removal Date[1]**
28067	05	BC-RW	12760	5/1/2018	10/29/2018	687	5/2/2018	FR	FR[2]
27978	05	IR-NO	65420	4/10/2018	10/9/2018	657	4/11/2018	FR	FR
27056	05	PE-IR	114300	12/14/2017	6/12/2018	616	12/18/2017	5/19/2018	FR
27057	05	PE - IR	127420	12/14/2017	6/12/2018	839	12/18/2017	FR	FR
27058	05	PE-IR	154730	12/14/2017	6/12/2018	654	12/18/2017	2/23/2018	FR
27059	05	PE-IR	195900	12/14/2017	6/12/2018	660	12/18/2017	5/22/2018	FR
27916	6A	PE-AM	1810	3/9/2018	9/5/2018	823	3/12/2018	FR	FR
27917	6A	PE-AM	7250	3/9/2018	9/5/2018	805	3/12/2018	FR	FR
27918	6A	PE-AM	13370	3/9/2018	9/5/2018	671	3/12/2018	FR	FR
27919	6A	PE-AM	14060	3/9/2018	9/5/2018	654	3/12/2018	FR	FR
27920	6A	PE-AM	14750	3/9/2018	9/5/2018	663	3/12/2018	FR	FR
27921	6A	PE-AM	32610	3/9/2018	9/5/2018	618	3/12/2018	FR	FR
27922	6A	PE-AM	64390	3/9/2018	9/5/2018	605	3/12/2018	FR	FR

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Table 25: Crack Feature Pressure Restrictions									
PR ID	**Line**	**Segment**	**Girth Weld**	**Date of Discovery**	**Repair / Mitigation Deadline (specified in Tables 1 to 5 of the Consent Decree)**	**PPR Set (psi)**	**PPR Imposition Date**	**Repair / Mitigation Date**	**PPR Removal Date[1]**
27923	6A	PE-AM	64440	3/9/2018	9/5/2018	617	3/12/2018	FR	FR
27924	6A	PE-AM	64650	3/9/2018	9/5/2018	602	3/12/2018	FR	FR
27925	6A	PE-AM	65160	3/9/2018	9/5/2018	615	3/12/2018	FR	FR
27926	6A	PE-AM	65300	3/9/2018	9/5/2018	614	3/12/2018	FR	FR
27927	6A	PE-AM	65830	3/9/2018	9/5/2018	617	3/12/2018	FR	FR
27928	6A	PE-AM	68870	3/9/2018	9/5/2018	590	3/12/2018	FR	FR
27929	6A	PE-AM	91150	3/9/2018	9/5/2018	581	3/12/2018	FR	FR
27930	6A	PE-AM	102240	3/9/2018	9/5/2018	557	3/12/2018	FR	FR
27931	6A	PE-AM	104330	3/9/2018	9/5/2018	576	3/12/2018	FR	FR
27932	6A	PE-AM	148440	3/9/2018	9/5/2018	595	3/12/2018	FR	FR
27933	6A	PE-AM	154650	3/9/2018	9/5/2018	598	3/12/2018	FR	FR
27934	6A	PE-AM	164110	3/9/2018	9/5/2018	613	3/12/2018	FR	FR
27935	6A	PE-AM	167090	3/9/2018	9/5/2018	616	3/12/2018	FR	FR
27936	6A	PE-AM	169660	3/9/2018	9/5/2018	618	3/12/2018	FR	FR
27937	6A	PE-AM	170290	3/9/2018	9/5/2018	568	3/12/2018	FR	FR
27938	6A	PE-AM	173380	3/9/2018	9/5/2018	609	3/12/2018	FR	FR
27939	6A	PE-AM	173450	3/9/2018	9/5/2018	582	3/12/2018	FR	FR
27940	6A	PE-AM	173540	3/9/2018	9/5/2018	588	3/12/2018	FR	FR
27941	6A	PE-AM	173790	3/9/2018	9/5/2018	602	3/12/2018	FR	FR
27942	6A	PE-AM	174300	3/9/2018	9/5/2018	605	3/12/2018	FR	FR
27943	6A	PE-AM	193860	3/9/2018	9/5/2018	578	3/12/2018	FR	FR
27944	6A	PE-AM	194100	3/9/2018	9/5/2018	597	3/12/2018	FR	FR
27945	6A	PE-AM	216150	3/9/2018	9/5/2018	605	3/12/2018	FR	FR
27946	6A	PE-AM	219110	3/9/2018	9/5/2018	614	3/12/2018	FR	FR
27947	6A	PE-AM	219830	3/9/2018	9/5/2018	618	3/12/2018	FR	FR
27948	6A	PE-AM	257870	3/9/2018	9/5/2018	600	3/12/2018	FR	FR

Table 25: Crack Feature Pressure Restrictions									
PR ID	**Line**	**Segment**	**Girth Weld**	**Date of Discovery**	**Repair / Mitigation Deadline (specified in Tables 1 to 5 of the Consent Decree)**	**PPR Set (psi)**	**PPR Imposition Date**	**Repair / Mitigation Date**	**PPR Removal Date[1]**
27949	6A	PE-AM	262700	3/9/2018	9/5/2018	609	3/12/2018	FR	FR
27950	6A	PE-AM	283440	3/9/2018	9/5/2018	600	3/12/2018	FR	FR
27951	6A	PE-AM	295120	3/9/2018	9/5/2018	614	3/12/2018	FR	FR
27952	6A	PE-AM	299650	3/9/2018	9/5/2018	607	3/12/2018	FR	FR
27953	6A	PE-AM	322910	3/9/2018	9/5/2018	616	3/12/2018	FR	FR

TABLE NOTES:

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

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

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, as outlined in the Lakehead System Integrity Remediation process.

49 [Dig Timeline Extensions]

During this reporting period, Enbridge did not extend any dig deadline from 180 days to 365 days. As a result, Subparagraphs 49.b through 49.e are not applicable.

Consistent with Paragraph 144, Enbridge here reports that it now anticipates a possible need to extend deadlines in the future. As discussed in the face to face meeting with the ITP/EPA in April 2018, the Enbridge PI team received a request from the project execution team on May 16, 2018 to extend seven (7) Line 6A Superior to Adams (PE-AM) integrity dig deadlines from September 2018 to March 2019 in order to reduce adverse environmental impacts by allowing digs to occur in the winter. These seven digs with Upstream Girth Weld number of 64390, 64440, 64650, 65160, 65300, 65830, and 68870 are all located in a Chittamo, Wisconsin wetland, which is mapped in the Wisconsin Wetland Inventory ("WWI"). Access to these digs will require a waterway crossing. Winter construction in a less saturated wetland may be advantageous since the wetland ground disturbance will be reduced in the winter timeframe. PI is currently evaluating the deadline extension request and will provide an update in the next SAR if the digs have mitigation deadlines extended for these environmental impact reasons.

Another anticipated difficulty is that the target feature for one dig on the Line 6A Adams to Griffith (AM-GT) with Upstream Girth Weld number of 256490 segment is that it is located under an inter-state toll highway. The excavation is likely to be of extraordinary scope and complexity and may not be possible to execute within the Consent Decree timelines. Enbridge is in the process of investigating this issue further, and will communicate with the ITP and EPA once the results of its investigation are available. Additional information will be provided in the next SAR.

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 following table summarizes the segments containing each Corrosion feature that meets the above criteria.

Table 26: Corrosion Features Requiring Excavation

Dig ID	Line	Segment	Girth Weld	Date of Discovery / Feature Added to Dig List	Repair / Mitigation Deadline	Date of Repair / Mitigation
23274	02	GF - CR	11030	3/1/2018	3/1/2019	FR
23275	02	GF - CR	62790	3/1/2018	3/1/2019	FR
23276	02	GF - CR	66850	3/1/2018	3/1/2019	FR
23280	02	GF - CR	177030	3/1/2018	3/1/2019	FR
23087	03	CR - PW	159230	12/26/2017	6/25/2018	2/9/2018
23402	03	GF - CR	42500	3/19/2018	9/17/2018	6/8/2018
23403	03	GF - CR	49840	3/19/2018	3/19/2019	FR
23404	03	GF - CR	129350	3/19/2018	9/17/2018	FR
23405	03	GF - CR	130610	3/19/2018	9/17/2018	FR
23510	04	FW - WR	25700	3/22/2018	3/22/2019	FR
23505	04	GF - DN	48150	3/22/2018	3/22/2019	FR
23507	04	GF - DN	54670	3/22/2018	3/22/2019	FR
23508	04	GF - DN	54690	3/22/2018	3/22/2019	FR
23509	04	GF - DN	54970	3/22/2018	3/22/2019	FR
23045	05	BC - RW	10	12/18/2017	12/13/2018	FR
23046	05	BC - RW	610	12/18/2017	6/18/2018	FR
23047	05	BC - RW	4070	12/18/2017	12/18/2018	FR
23048	05	BC - RW	9500	12/18/2017	6/18/2018	5/18/2018

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Table 26: Corrosion Features Requiring Excavation						
Dig ID	**Line**	**Segment**	**Girth Weld**	**Date of Discovery / Feature Added to Dig List**	**Repair / Mitigation Deadline**	**Date of Repair / Mitigation**
23049	05	BC - RW	13220	12/18/2017	6/18/2018	FR
23050	05	BC - RW	22170	12/18/2017	6/18/2018	5/22/2018
23051	05	BC - RW	26290	12/18/2017	12/18/2018	FR
23053	05	BC - RW	37600	12/18/2017	6/18/2018	5/17/2018
23054	05	BC - RW	56740	12/18/2017	6/18/2018	6/1/2018
23055	05	BC - RW	63420	12/18/2017	12/18/2018	FR
23979	05	MA - BC	10010	5/17/2018	5/17/2019	FR
23980	05	MA - BC	33700	5/17/2018	5/17/2019	FR
23981	05	MA - BC	91290	5/17/2018	5/17/2019	FR
23982	05	MA - BC	95630	5/17/2018	11/13/2018	FR
23983	05	MA - BC	138790	5/17/2018	5/17/2019	FR
22847	05	PE - IR	20160	10/27/2017	10/29/2018	12/2/2017
22850	05	PE - IR	184460	10/27/2017	10/29/2018	3/15/2018
22851	05	PE - IR	201490	10/27/2017	10/29/2018	12/9/2017
22853	05	PE - IR	207190	10/27/2017	10/29/2018	12/19/2017
22854	05	PE - IR	242570	10/27/2017	4/25/2018	3/2/2018
23672	6A	AM - GT	8370	4/9/2018	4/9/2019	FR
23673	6A	AM - GT	20580	4/9/2018	4/9/2019	FR
23674	6A	AM - GT	37040	4/9/2018	4/9/2019	FR
23675	6A	AM - GT	72020	4/9/2018	4/9/2019	5/22/2018
23676	6A	AM - GT	77030	4/9/2018	4/9/2019	FR
23677	6A	AM - GT	89180	4/9/2018	4/9/2019	FR
23678	6A	AM - GT	99630	4/9/2018	4/9/2019	FR
23679	6A	AM - GT	100680	4/9/2018	4/9/2019	FR
23680	6A	AM - GT	106240	4/9/2018	4/9/2019	FR
23681	6A	AM - GT	109420	4/9/2018	4/9/2019	FR
23682	6A	AM - GT	111040	4/9/2018	4/9/2019	FR
23683	6A	AM - GT	112090	4/9/2018	4/9/2019	FR
23684	6A	AM - GT	123180	4/9/2018	4/9/2019	FR

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Table 26: Corrosion Features Requiring Excavation						
Dig ID	**Line**	**Segment**	**Girth Weld**	**Date of Discovery / Feature Added to Dig List**	**Repair / Mitigation Deadline**	**Date of Repair / Mitigation**
23685	6A	AM - GT	130890	4/9/2018	4/9/2019	FR
23686	6A	AM - GT	136750	4/9/2018	4/9/2019	FR
23687	6A	AM - GT	140880	4/9/2018	4/9/2019	FR
23688	6A	AM - GT	147990	4/9/2018	4/9/2019	FR
23689	6A	AM - GT	148420	4/9/2018	4/9/2019	FR
23690	6A	AM - GT	151570	4/9/2018	4/9/2019	FR
23691	6A	AM - GT	153530	4/9/2018	10/9/2018	FR
23692	6A	AM - GT	157490	4/9/2018	4/9/2019	FR
23693	6A	AM - GT	162900	4/9/2018	4/9/2019	FR
23694	6A	AM - GT	163690	4/9/2018	4/9/2019	FR
23695	6A	AM - GT	165800	4/9/2018	4/9/2019	FR
23696	6A	AM - GT	178150	4/9/2018	4/9/2019	FR
23697	6A	AM - GT	198680	4/9/2018	10/9/2018	FR
23698	6A	AM - GT	201190	4/9/2018	4/9/2019	FR
23699	6A	AM - GT	206940	4/9/2018	4/9/2019	FR
23700	6A	AM - GT	207050	4/9/2018	4/9/2019	FR
23701	6A	AM - GT	241040	4/9/2018	4/9/2019	FR
23702	6A	AM - GT	243240	4/9/2018	4/9/2019	FR
23703	6A	AM - GT	255130	4/9/2018	4/9/2019	FR
23704	6A	AM - GT	257720	4/9/2018	10/9/2018	FR
23705	6A	AM - GT	261430	4/9/2018	10/9/2018	FR
23706	6A	AM - GT	273260	4/9/2018	10/9/2018	FR
23707	6A	AM - GT	273330	4/9/2018	10/9/2018	FR
23708	6A	AM - GT	274200	4/9/2018	10/9/2018	FR
23709	6A	AM - GT	274947	4/9/2018	4/9/2019	FR
23710	6A	AM - GT	277560	4/9/2018	10/9/2018	FR
23711	6A	AM - GT	279270	4/9/2018	10/9/2018	FR
23712	6A	AM - GT	279280	4/9/2018	10/9/2018	FR
23713	6A	AM - GT	286210	4/9/2018	4/9/2019	FR

Table 26: Corrosion Features Requiring Excavation						
Dig ID	**Line**	**Segment**	**Girth Weld**	**Date of Discovery / Feature Added to Dig List**	**Repair / Mitigation Deadline**	**Date of Repair / Mitigation**
23714	6A	AM - GT	286240	4/9/2018	4/9/2019	FR
23715	6A	AM - GT	286560	4/9/2018	4/9/2019	FR
23716	6A	AM - GT	288040	4/9/2018	10/9/2018	FR
23717	6A	AM - GT	288150	4/9/2018	4/9/2019	FR
23718	6A	AM - GT	288710	4/9/2018	4/9/2019	FR
23719	6A	AM - GT	289390	4/9/2018	4/9/2019	FR
23720	6A	AM - GT	295160	4/9/2018	4/9/2019	FR
23721	6A	AM - GT	298130	4/9/2018	10/9/2018	FR
23722	6A	AM - GT	299220	4/9/2018	4/9/2019	FR
23723	6A	AM - GT	299890	4/9/2018	4/9/2019	FR
23724	6A	AM - GT	304370	4/9/2018	4/9/2019	FR
23725	6A	AM - GT	334010	4/9/2018	10/9/2018	FR
23726	6A	AM - GT	334200	4/9/2018	10/9/2018	FR
23931	6A	AM - GT	79740	5/11/2018	5/13/2019	FR
23932	6A	AM - GT	81970	5/11/2018	5/13/2019	FR
23933	6A	AM - GT	83110	5/11/2018	5/13/2019	FR
23934	6A	AM - GT	112360	5/11/2018	5/13/2019	FR
23935	6A	AM - GT	129350	5/11/2018	5/13/2019	FR
23936	6A	AM - GT	129910	5/11/2018	5/13/2019	FR
23937	6A	AM - GT	191340	5/11/2018	11/7/2018	FR
23938	6A	AM - GT	203070	5/11/2018	11/7/2018	FR
23939	6A	AM - GT	255160	5/11/2018	11/7/2018	FR
23940	6A	AM - GT	255760	5/11/2018	11/7/2018	FR
23941	6A	AM - GT	256490	5/11/2018	11/7/2018	FR
23942	6A	AM - GT	257370	5/11/2018	11/7/2018	FR
23943	6A	AM - GT	268130	5/11/2018	11/7/2018	FR
23945	6A	AM - GT	290170	5/11/2018	11/7/2018	FR
23946	6A	AM - GT	300010	5/11/2018	11/7/2018	FR
23947	6A	AM - GT	300310	5/11/2018	11/7/2018	FR

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Table 26: Corrosion Features Requiring Excavation						
Dig ID	**Line**	**Segment**	**Girth Weld**	**Date of Discovery / Feature Added to Dig List**	**Repair / Mitigation Deadline**	**Date of Repair / Mitigation**
23948	6A	AM - GT	303870	5/11/2018	11/7/2018	FR
23949	6A	AM - GT	305530	5/11/2018	11/7/2018	FR
23174	6A	PE - AM	530	2/5/2018	2/5/2019	FR
23175	6A	PE - AM	1050	2/5/2018	2/5/2019	FR
23176	6A	PE - AM	20060	2/5/2018	2/5/2019	FR
23178	6A	PE - AM	24530	2/5/2018	2/5/2019	FR
23179	6A	PE - AM	45350	2/5/2018	2/5/2019	FR
23180	6A	PE - AM	63000	2/5/2018	2/5/2019	3/3/2018
23181	6A	PE - AM	63410	2/5/2018	2/5/2019	2/22/2018
23182	6A	PE - AM	95470	2/5/2018	2/5/2019	FR
23183	6A	PE - AM	109130	2/5/2018	2/5/2019	FR
23184	6A	PE - AM	117210	2/5/2018	2/5/2019	FR
23185	6A	PE - AM	135390	2/5/2018	2/5/2019	2/24/2018
23186	6A	PE - AM	142960	2/5/2018	8/6/2018	FR
23187	6A	PE - AM	148400	2/5/2018	2/5/2019	FR
23188	6A	PE - AM	155370	2/5/2018	2/5/2019	FR
23189	6A	PE - AM	157390	2/5/2018	2/5/2019	FR
23190	6A	PE - AM	165720	2/5/2018	2/5/2019	FR
23191	6A	PE - AM	178590	2/5/2018	2/5/2019	FR
23192	6A	PE - AM	186710	2/5/2018	2/5/2019	FR
23195	6A	PE - AM	216510	2/5/2018	2/5/2019	FR
23196	6A	PE - AM	218410	2/5/2018	2/5/2019	FR
23197	6A	PE - AM	221970	2/5/2018	2/5/2019	FR
23198	6A	PE - AM	223520	2/5/2018	2/5/2019	FR
23199	6A	PE - AM	226760	2/5/2018	2/5/2019	FR
23200	6A	PE - AM	226790	2/5/2018	2/5/2019	FR
23201	6A	PE - AM	227710	2/5/2018	2/5/2019	FR
23202	6A	PE - AM	230360	2/5/2018	2/5/2019	FR
23203	6A	PE - AM	233390	2/5/2018	2/5/2019	2/28/2018

Table 26: Corrosion Features Requiring Excavation						
Dig ID	**Line**	**Segment**	**Girth Weld**	**Date of Discovery / Feature Added to Dig List**	**Repair / Mitigation Deadline**	**Date of Repair / Mitigation**
23204	6A	PE - AM	235290	2/5/2018	2/5/2019	FR
23205	6A	PE - AM	236100	2/5/2018	2/5/2019	FR
23206	6A	PE - AM	237970	2/5/2018	2/5/2019	FR
23207	6A	PE - AM	240960	2/5/2018	2/5/2019	FR
23208	6A	PE - AM	244040	2/5/2018	2/5/2019	FR
23209	6A	PE - AM	244050	2/5/2018	2/5/2019	FR
23210	6A	PE - AM	244490	2/5/2018	2/5/2019	FR
23211	6A	PE - AM	249090	2/5/2018	2/5/2019	FR
23212	6A	PE - AM	250760	2/5/2018	2/5/2019	FR
23213	6A	PE - AM	252450	2/5/2018	2/5/2019	FR
23214	6A	PE - AM	253910	2/5/2018	2/5/2019	FR
23215	6A	PE - AM	255750	2/5/2018	2/5/2019	FR
23216	6A	PE - AM	257200	2/5/2018	2/5/2019	FR
23218	6A	PE - AM	271270	2/5/2018	2/5/2019	FR
23219	6A	PE - AM	297940	2/5/2018	2/5/2019	FR
23220	6A	PE - AM	298790	2/5/2018	2/5/2019	FR
23221	6A	PE - AM	301610	2/5/2018	2/5/2019	FR

TABLE NOTES:

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

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

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, as outlined in the Lakehead System Integrity Remediation process.

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52 [Corrosion Feature Pressure Restrictions]

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

The following table 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 weekend or United States Federal holiday, the imposition deadlines was moved to the following business day in accordance with Definition (m) of the Consent Decree..

Table 27: Corrosion Feature Pressure Restrictions

PR ID	Line	Seg-ment	Girth Weld	Date of Discovery	Repair / Mitigation Deadline (specified in Tables 1 to 5 of the Consent Decree)	PPR Set (psi)	PPR Imposition Date	Repair / Mitigation Date	PPR Removal Date[1]
27954	04	FW-WR	25700	3/22/2018	3/22/2019	602	3/23/2018	FR	FR
27955	04	GF-DN	48150	3/22/2018	3/22/2019	630	3/23/2018	FR	FR
27060	05	BC-RW	610	12/18/2017	6/18/2018	770	12/19/2017	FR	FR
27061	05	BC-RW	9500	12/18/2017	6/18/2018	646	12/19/2017	5/18/2018	FR
27062	05	BC-RW	13220	12/18/2017	6/18/2018	731	12/19/2017	FR	FR
27063	05	BC-RW	22170	12/18/2017	6/18/2018	770	12/19/2017	5/22/2018	FR
27064	05	BC-RW	26290	12/18/2017	12/18/2018	680	12/19/2017	FR	FR
27065	05	BC-RW	37600	12/18/2017	6/18/2018	701	12/19/2017	5/17/2018	FR
27066	05	BC-RW	56740	12/18/2017	6/18/2018	701	12/19/2017	6/1/2018	FR
27067	05	BC-RW	63420	12/18/2017	12/18/2018	617	12/19/2017	FR	FR
27022	05	PE-IR	20160	10/27/2017	10/29/2018	834	10/30/2017	12/2/2017	3/6/2018
27024	05	PE-IR	242570	10/27/2017	4/25/2018	696	10/30/2017	3/2/2018	FR
27956	6A	AM-GT	72020	4/9/2018	4/9/2019	599	4/10/2018	5/22/2018	FR
27957	6A	AM-GT	89180	4/9/2018	4/9/2019	599	4/10/2018	FR	FR
27958	6A	AM-GT	99630	4/9/2018	4/9/2019	596	4/10/2018	FR	FR
27959	6A	AM-GT	100680	4/9/2018	4/9/2019	601	4/10/2018	FR	FR

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Table 27: Corrosion Feature Pressure Restrictions									
PR ID	**Line**	**Seg-ment**	**Girth Weld**	**Date of Discovery**	**Repair / Mitigation Deadline (specified in Tables 1 to 5 of the Consent Decree)**	**PPR Set (psi)**	**PPR Imposition Date**	**Repair / Mitigation Date**	**PPR Removal Date[1]**
27960	6A	AM-GT	111040	4/9/2018	4/9/2019	614	4/10/2018	FR	FR
27961	6A	AM-GT	130890	4/9/2018	4/9/2019	610	4/10/2018	FR	FR
27962	6A	AM-GT	151570	4/9/2018	4/9/2019	614	4/10/2018	FR	FR
27963	6A	AM-GT	153530	4/9/2018	10/9/2018	595	4/10/2018	FR	FR
27964	6A	AM-GT	157490	4/9/2018	4/9/2019	596	4/10/2018	FR	FR
27965	6A	AM-GT	163690	4/9/2018	4/9/2019	605	4/10/2018	FR	FR
27966	6A	AM-GT	165800	4/9/2018	4/9/2019	588	4/10/2018	FR	FR
27967	6A	AM-GT	198680	4/9/2018	10/9/2018	614	4/10/2018	FR	FR
27968	6A	AM-GT	257720	4/9/2018	10/9/2018	601	4/10/2018	FR	FR
27969	6A	AM-GT	261430	4/9/2018	10/9/2018	607	4/10/2018	FR	FR
27970	6A	AM-GT	273260	4/9/2018	10/9/2018	610	4/10/2018	FR	FR
27971	6A	AM-GT	273330	4/9/2018	10/9/2018	602	4/10/2018	FR	FR
27972	6A	AM-GT	274200	4/9/2018	10/9/2018	617	4/10/2018	FR	FR
27973	6A	AM-GT	277560	4/9/2018	10/9/2018	614	4/10/2018	FR	FR
27974	6A	AM-GT	279270	4/9/2018	10/9/2018	583	4/10/2018	FR	FR
27975	6A	AM-GT	279280	4/9/2018	10/9/2018	588	4/10/2018	FR	FR
27976	6A	AM-GT	288040	4/9/2018	10/9/2018	612	4/10/2018	FR	FR
28088	6A	AM-GT	81970	5/11/2018	5/13/2019	610	5/15/2018	FR	FR
28089	6A	AM-GT	83110	5/11/2018	5/13/2019	611	5/15/2018	FR	FR
28090	6A	AM-GT	112360	5/11/2018	5/13/2019	610	5/15/2018	FR	FR
28091	6A	AM-GT	129350	5/11/2018	5/13/2019	614	5/15/2018	FR	FR
28092	6A	AM-GT	129910	5/11/2018	5/13/2019	609	5/15/2018	FR	FR

Table 27: Corrosion Feature Pressure Restrictions									
PR ID	**Line**	**Seg-ment**	**Girth Weld**	**Date of Discovery**	**Repair / Mitigation Deadline (specified in Tables 1 to 5 of the Consent Decree)**	**PPR Set (psi)**	**PPR Imposition Date**	**Repair / Mitigation Date**	**PPR Removal Date[1]**
28093	6A	AM-GT	300010	5/11/2018	11/7/2018	584	5/15/2018	FR	FR
28094	6A	AM-GT	300310	5/11/2018	11/7/2018	607	5/15/2018	FR	FR
28095	6A	AM-GT	303870	5/11/2018	11/7/2018	576	5/15/2018	FR	FR
27828	6A	PE-AM	24530	2/5/2018	2/5/2019	604	2/7/2018	FR	FR
27829	6A	PE-AM	63000	2/5/2018	2/5/2019	615	2/7/2018	3/3/2018	FR
27830	6A	PE-AM	117210	2/5/2018	2/5/2019	596	2/7/2018	FR	FR
27831	6A	PE-AM	135390	2/5/2018	2/5/2019	616	2/7/2018	2/24/2018	FR
27832	6A	PE-AM	142960	2/5/2018	8/6/2018	595	2/7/2018	FR	FR
27833	6A	PE-AM	148400	2/5/2018	2/5/2019	614	2/7/2018	FR	FR
27834	6A	PE-AM	216510	2/5/2018	2/5/2019	615	2/7/2018	FR	FR
27835	6A	PE-AM	223520	2/5/2018	2/5/2019	616	2/7/2018	FR	FR
27836	6A	PE-AM	226760	2/5/2018	2/5/2019	609	2/7/2018	FR	FR
27837	6A	PE-AM	226790	2/5/2018	2/5/2019	609	2/7/2018	FR	FR
27838	6A	PE-AM	230360	2/5/2018	2/5/2019	609	2/7/2018	FR	FR
27839	6A	PE-AM	233390	2/5/2018	2/5/2019	599	2/7/2018	2/28/2018	6/5/2018
27840	6A	PE-AM	236100	2/5/2018	2/5/2019	606	2/7/2018	FR	FR
27841	6A	PE-AM	271270	2/5/2018	2/5/2019	603	2/7/2018	FR	FR

TABLE NOTES:

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

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

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

During this reporting period, Axial Slotting, Axial Grooving and Selective Seam Corrosion, and Weld Anomaly A/B FREs were identified, as listed in the table below.

Table 28: Dig Selection Criteria 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**
23076	05	PE - IR	12910	12/26/2017	6/25/2018	5/19/2018
23077	05	PE - IR	20520	12/26/2017	12/26/2018	FR
23078	05	PE - IR	33020	12/26/2017	12/26/2018	FR
23079	05	PE - IR	81930	12/26/2017	6/25/2018	FR
23080	05	PE - IR	116480	12/26/2017	6/25/2018	FR
23081	05	PE - IR	116930	12/26/2017	6/25/2018	FR
23082	05	PE - IR	148130	12/26/2017	6/25/2018	FR
23084	05	PE - IR	230050	12/26/2017	6/25/2018	FR
23085	05	PE - IR	245260	12/26/2017	6/25/2018	FR

TABLE NOTES:

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

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

During this reporting period, PRs required as a result of Axial Slotting, Axial Grooving, Selective Seam Corrosion features and Seam Weld anomaly A/B features were imposed, as identified in Table 28 below, in accordance with Table 3 of the Consent Decree.

Table 29: Axial Slotting, Axial Grooving and Selective Seam Corrosion, and Weld Anomaly A/B Feature Pressure Restrictions									
PR ID	**Line**	**Segment**	**Girth Weld**	**Date of Discovery**	**Repair / Mitigation Deadline (specified in Tables 1 to 5 of the Consent Decree)**	**PPR Set (psi)**	**PPR Imposition Date**	**Repair / Mitigation Date**	**PPR Removal Date[1]**
27097	05	PE-IR	81930	12/26/2017	6/25/2018	694	12/27/2017	FR[2]	FR
27098	05	PE-IR	116930	12/26/2017	6/25/2018	677	12/27/2017	FR	FR
27099	05	PE-IR	230050	12/26/2017	6/25/2018	654	12/27/2017	FR	FR

TABLE NOTES:

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

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

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

As outlined in the Lakehead System Remediation Exceptions process and documented in the ILI Assessment Sheets, Enbridge will excavate and repair or mitigate each dent that met one or more of the Dig Selection Criteria set forth in Table 4 of the Consent Decree, and establish pressure restrictions for identified interacting dents as provided in Paragraph 57. Enbridge will meet with 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 for features not located within an HCA.

56 [Dent Mitigation Timelines]

As outlined in the Lakehead System Remediation Exceptions process and documented in the ILI Assessment Sheets, Enbridge procedures provide that Enbridge will determine the deadline of a dent feature repair or mitigation as the shortest deadline. The same process provides that Enbridge will establish the lowest operating pressure at the location of the feature that was subject to more than one pressure restriction.

As discussed in Paragraph 37, three Line 6A dents were placed on the Dig List 4 days late. Their repair/mitigation deadlines, however, were determined to be the 365 days after the date by when they should have been discovered (April 17, 2018). Enbridge expects to complete repair/mitigation of these features in a timely manner.

Table 30: Dent Mitigation Timelines

Dig ID	Line	Segment	Girth Weld	Date of Discovery / Feature Added to Dig List	Repair / Mitigation Deadline	Date of Repair / Mitigation
23120	02	GF – CR	20820	1/18/2018	1/18/2019	FR[1]
23844	6A	AM – GT	57390	4/20/2018	4/17/2019	FR
23845	6A	AM – GT	86020	4/20/2018	4/17/2019	FR
23846	6A	AM – GT	115870	4/20/2018	4/17/2019	FR

TABLE NOTES:

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

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57 [Dent Feature Pressure Restrictions]

There were no dent features requiring PRs during the reporting period of this SAR.

As outlined in the Lakehead System Remediation Exceptions process and documented in the ILI Assessment Sheets, Enbridge procedures provide that Enbridge will establish PRs for interacting dents within the timeframes identified in Paragraph 57 of the Consent Decree:

a) Within 2 days after determining that any dent feature had a depth greater than 6 percent of nominal pipeline diameter (i.e. whether the dent was located on the top or bottom of the pipeline), Enbridge limited the operating pressure at the location of the dent to not more than 80 percent of the highest actual operating pressure at that location during the last 60 days.
b) After identifying any dent features located on the top of the pipeline that had a depth that was greater than or equal to 3 percent of the nominal diameter of the pipeline; in the case of a pipeline with a nominal diameter greater than or equal to 12 inches, or 0.250 inches; in the case of any pipeline with a nominal diameter less than 12 inches; Enbridge limited the operating pressure at the location of the feature to not more than 80 percent of the highest actual operating pressure at that location during the last 60 days if the feature was not repaired or mitigated within the applicable timeframe specified in Table 4 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. Enbridge excavated and repaired all such intersecting/interacting features that met the dig selection criteria set forth in Table 5 of the Consent Decree, within the applicable timeframes identified in columns 2 and 3 of Table 5. Enbridge also established PRs as provided in Table 5 and Paragraph 59 of the Consent Decree. For more information, see Paragraph 59 of this SAR.

The following table lists the intersecting/interacting features that were identified for excavation.

Table 31: Interacting Features Requiring Excavation

Dig ID	Line	Seg-ment	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
23779	02	DR - PW	13270	GEMINI-CAL	3/20/2018	3/26/2018	4/18/2018	5/18/2018	2018 GEMINI MFL	4/20/2018
23782	02	DR - PW	42810	GEMINI-CAL	3/20/2018	3/26/2018	4/18/2018	10/15/2018	2018 GEMINI MFL	4/21/2018
23086	03	CR - PW	141430	USWM+	11/18/2017	11/20/2017	12/26/2017	12/26/2018	2015 DuoCD	2/22/2018

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Table 31: Interacting Features Requiring Excavation										
Dig ID	Line	Seg-ment	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
23088	03	CR - PW	239920	USWM+	11/18/2017	11/20/2017	12/26/2017	6/25/2018	2015 GEMINI CAL	1/26/2018
23089	03	CR - PW	249650	USWM+	11/18/2017	11/20/2017	12/26/2017	12/26/2018	2015 DuoCD	FR
23254	04	CR - CS	32820	UCMUTWM	1/16/2018	1/16/2018	2/15/2018	2/15/2019	2013 NDT UCMUTCD	FR
23255	04	CR - CS	39160	UCMUTWM	1/16/2018	1/16/2018	2/15/2018	2/15/2019	2013 NDT UCMUTCD	FR
22956	05	BC - RW	56680	GEMINI-CAL	10/23/2017	10/27/2017	11/15/2017	1/16/2018	2017 GEMINI MFL	12/11/2017
22849	05	PE - IR	183400	USWM+	9/29/2017	10/4/2017	10/27/2017	10/29/2018	2014 CD+	2/19/2018
22852	05	PE - IR	201610	USWM+	9/29/2017	10/4/2017	10/27/2017	10/29/2018	2014 CD+	12/4/2017
23019	05	PE - IR	152550	CD+2	11/16/2017	11/16/2017	12/14/2017	12/14/2018	2017 USWM+	FR
23023	05	PE - IR	184520	CD+2	11/16/2017	11/16/2017	12/14/2017	12/14/2018	2017 USWM+	3/8/2018
23083	05	PE - IR	167940	AFD	11/21/2017	11/22/2017	12/26/2017	2/26/2018	2017 AFD	1/22/2018
23733	6A	AM - GT	45720	GEMINI-CAL	3/9/2018	3/9/2018	4/16/2018	10/15/2018	2018 BH GEMINI MFL	4/28/2018
23734	6A	AM - GT	55320	GEMINI-CAL	3/9/2018	3/9/2018	4/16/2018	6/15/2018	2018 BH GEMINI MFL	5/9/2018
23735	6A	AM - GT	56710	GEMINI-CAL	3/9/2018	3/9/2018	4/16/2018	10/15/2018	2018 BH GEMINI MFL	5/14/2018

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Table 31: Interacting Features Requiring Excavation										
Dig ID	Line	Seg-ment	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
23736	6A	AM - GT	58480	GEMINI-CAL	3/9/2018	3/9/2018	4/16/2018	10/15/2018	2018 BH GEMINI MFL	5/8/2018
23737	6A	AM - GT	59370	GEMINI-CAL	3/9/2018	3/9/2018	4/16/2018	4/16/2019	2018 BH GEMINI MFL	5/16/2018
23739	6A	AM - GT	60490	GEMINI-CAL	3/9/2018	3/9/2018	4/16/2018	10/15/2018	2018 BH GEMINI MFL	5/10/2018
23740	6A	AM - GT	64190	GEMINI-CAL	3/9/2018	3/9/2018	4/16/2018	10/15/2018	2018 BH GEMINI MFL	5/18/2018
23741	6A	AM - GT	67200	GEMINI-CAL	3/9/2018	3/9/2018	4/16/2018	10/15/2018	2018 BH GEMINI MFL	5/10/2018
23742	6A	AM - GT	71970	GEMINI-CAL	3/9/2018	3/9/2018	4/16/2018	10/15/2018	2018 BH GEMINI MFL	5/15/2018
23743	6A	AM - GT	73960	GEMINI-CAL	3/9/2018	3/9/2018	4/16/2018	10/15/2018	2018 BH GEMINI MFL	5/10/2018
23744	6A	AM - GT	75150	GEMINI-CAL	3/9/2018	3/9/2018	4/16/2018	10/15/2018	2018 BH GEMINI MFL	5/11/2018
23745	6A	AM - GT	76370	GEMINI-CAL	3/9/2018	3/9/2018	4/16/2018	10/15/2018	2018 BH GEMINI MFL	5/14/2018
23747	6A	AM - GT	79540	GEMINI-CAL	3/9/2018	3/9/2018	4/16/2018	10/15/2018	2018 BH GEMINI MFL	5/18/2018
23748	6A	AM - GT	80160	GEMINI-CAL	3/9/2018	3/9/2018	4/16/2018	10/15/2018	2018 BH GEMINI MFL	5/16/2018
23749	6A	AM - GT	84610	GEMINI-CAL	3/9/2018	3/9/2018	4/16/2018	10/15/2018	2018 BH GEMINI MFL	5/17/2018

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Table 31: Interacting Features Requiring Excavation										
Dig ID	**Line**	**Seg-ment**	**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**
23750	6A	AM - GT	86310	GEMINI-CAL	3/9/2018	3/9/2018	4/16/2018	10/15/2018	2018 BH GEMINI MFL	5/12/2018
23751	6A	AM - GT	86980	GEMINI-CAL	3/9/2018	3/9/2018	4/16/2018	10/15/2018	2018 BH GEMINI MFL	5/12/2018
23752	6A	AM - GT	96410	GEMINI-CAL	3/9/2018	3/9/2018	4/16/2018	10/15/2018	2018 BH GEMINI MFL	5/8/2018
23753	6A	AM - GT	114370	GEMINI-CAL	3/9/2018	3/9/2018	4/16/2018	10/15/2018	2018 BH GEMINI MFL	5/5/2018
23754	6A	AM - GT	116150	GEMINI-CAL	3/9/2018	3/9/2018	4/16/2018	10/15/2018	2018 BH GEMINI MFL	5/8/2018
23756	6A	AM - GT	131060	GEMINI-CAL	3/9/2018	3/9/2018	4/16/2018	10/15/2018	2018 BH GEMINI MFL	5/8/2018
23761	6A	AM - GT	218320	GEMINI-CAL	3/9/2018	3/9/2018	4/16/2018	6/15/2018	2018 BH GEMINI MFL	5/16/2018
23762	6A	AM - GT	222770	GEMINI-CAL	3/9/2018	3/9/2018	4/16/2018	6/15/2018	2018 BH GEMINI MFL	4/24/2018
23766	6A	AM - GT	294900	GEMINI-CAL	3/9/2018	3/9/2018	4/16/2018	6/15/2018	2018 BH GEMINI MFL	5/3/2018
23944	6A	AM - GT	288420	GEMINI-MFL	4/6/2018	4/9/2018	5/11/2018	5/13/2019	2017 DUO CD	FR

TABLE NOTES:

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

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59 [Pressure Restrictions for Interacting Features]

Except as described in the discussion of Paragraph 46 above, Enbridge established the PRs within the timeframes identified in Table 5 and specified in Subparagraphs 59.a and 59.b of the Consent Decree for each interacting feature identified during the period of this SAR. 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. Within two days after determining that any dent had an indication of cracking, metal loss or a stress riser, Enbridge limited operating pressure at the location of such feature to not more 80 percent of the highest actual operating pressure at the location of the feature over the last 60 days.

Table 32: Interacting Features Pressure Restrictions

PR ID	Line	Seg-ment	Girth Weld	Date of Discovery	Repair / Mitigation Deadline (specified in Tables 1 to 5 of the Consent Decree)	PPR Set (psi)	PPR Imposition Date	Repair / Mitigation Date	PPR Removal Date[1]
28017	02	DR-PW	13270	4/18/2018	5/18/2018	418	NA	4/20/2018	4/20/2018
28018	02	DR-PW	42810	4/18/2018	10/15/2018	299	NA	4/21/2018	4/20/2018
27100	03	CR-PW	239920	12/26/2017	6/25/2018	322	12/28/2017	1/26/2018	FR
27050	05	BC-RW	56680	11/15/2017	1/16/2018	694	11/17/2017	12/11/2017	12/11/2017
27981	6A	AM-GT	45720	4/16/2018	10/15/2018	331	4/18/2018	4/28/2018	4/27/2018
27982	6A	AM-GT	56710	4/16/2018	10/15/2018	273	4/18/2018	5/14/2018	5/6/2018
27983	6A	AM-GT	64190	4/16/2018	10/15/2018	339	4/18/2018	5/18/2018	5/9/2018
27984	6A	AM-GT	67200	4/16/2018	10/15/2018	320	4/18/2018	5/10/2018	5/9/2018
27985	6A	AM-GT	71970	4/16/2018	10/15/2018	301	4/18/2018	5/15/2018	5/9/2018
27986	6A	AM-GT	73960	4/16/2018	10/15/2018	296	4/18/2018	5/10/2018	5/11/2018
27987	6A	AM-GT	75150	4/16/2018	10/15/2018	289	4/18/2018	5/11/2018	5/11/2018
27988	6A	AM-GT	76370	4/16/2018	10/15/2018	280	4/18/2018	5/14/2018	5/11/2018

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Table 32: Interacting Features Pressure Restrictions									
PR ID	Line	Seg-ment	Girth Weld	Date of Discovery	Repair / Mitigation Deadline (specified in Tables 1 to 5 of the Consent Decree)	PPR Set (psi)	PPR Imposition Date	Repair / Mitigation Date	PPR Removal Date[1]
27989	6A	AM-GT	79540	4/16/2018	10/15/2018	269	4/18/2018	5/18/2018	5/17/2018
27990	6A	AM-GT	80160	4/16/2018	10/15/2018	266	4/18/2018	5/16/2018	5/17/2018
27991	6A	AM-GT	84610	4/16/2018	10/15/2018	265	4/18/2018	5/17/2018	5/17/2018
27992	6A	AM-GT	86310	4/16/2018	10/15/2018	259	4/18/2018	5/12/2018	5/11/2018
27993	6A	AM-GT	86980	4/16/2018	10/15/2018	256	4/18/2018	5/12/2018	5/11/2018
27994	6A	AM-GT	96410	4/16/2018	10/15/2018	291	4/18/2018	5/8/2018	5/5/2018
27995	6A	AM-GT	114370	4/16/2018	10/15/2018	351	4/18/2018	5/5/2018	5/5/2018
27996	6A	AM-GT	116150	4/16/2018	10/15/2018	340	4/18/2018	5/8/2018	5/6/2018
27997	6A	AM-GT	131060	4/16/2018	10/15/2018	282	4/18/2018	5/8/2018	5/9/2018
27998	6A	AM-GT	222770	4/16/2018	6/15/2018	206	4/18/2018	4/24/2018	4/25/2018
27999	6A	AM-GT	55320	4/16/2018	6/15/2018	279	4/18/2018	5/9/2018	5/5/2018
28000	6A	AM-GT	59370	4/16/2018	4/16/2019	273	4/18/2018	5/16/2018	5/6/2018
28001	6A	AM-GT	294900	4/16/2018	6/15/2018	310	4/18/2018	5/3/2018	5/2/2018
28002	6A	AM-GT	58480	4/16/2018	10/15/2018	274	4/18/2018	5/8/2018	5/5/2018
28004	6A	AM-GT	60490	4/16/2018	10/15/2018	352	4/18/2018	5/10/2018	5/9/2018
28005	6A	AM-GT	60500	4/16/2018	10/15/2018	352	4/18/2018	5/10/2018	5/9/2018
28013	6A	AM-GT	218320	4/16/2018	6/15/2018	253	4/18/2018	5/16/2018	4/28/2018

TABLE NOTES:

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

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

(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. Paragraph 44 of the Consent Decree discusses how all calculations are completed within the required timeframes. The following table summarizes the remaining life calculations completed during this reporting period.

Table 33: Remaining Life Calculations

Tool Run ID	Line	Segment	Tool	Report Type	Remaining Life Calculation Completion Date
4494	02	GF-CR	GEMINI	Corrosion	3/1/2018
3711	03	GF-CR	UCMp	Corrosion	3/14/2018
3711	03	GF-CR	UCMp	Crack	4/11/2018
2254	04	CR-CS	DuDi UCM	Corrosion	2/15/2018
2254	04	CR-CS	DuDi UCM	Crack	3/19/2018
4465	04	CS-DR	DuDi UCM	Corrosion	2/15/2018
4465	04	CS-DR	DuDi UCM	Crack	3/19/2018
4466	04	FW-WR	DuDi UCM	Corrosion	3/22/2018
4466	04	FW-WR	DuDi UCM	Crack	5/3/2018
6013	04	GF-DN	DuDi UCM	Corrosion	3/22/2018
6013	04	GF-DN	DuDi UCM	Crack	4/23/2018
2215	05	BC-RW	GEMINI	Corrosion	12/18/2017
4468	05	BC-RW	UCc	Crack	4/26/2018
2162	05	BC-RW	CD+2	Crack	1/10/2018
4356	05	IR-NO	UCc	Crack	4/6/2018
4406	05	MA-BC	AFD	Corrosion	5/14/2018
2150	05	PE-IR	CD+2	Crack	12/14/2017

Table 33: Remaining Life Calculations					
Tool Run ID	**Line**	**Segment**	**Tool**	**Report Type**	**Remaining Life Calculation Completion Date**
2140	05	PE-IR	AFD	Corrosion	12/21/2017
4334	6A	AM-GT	GEMINI	Corrosion	5/6/2018
4443	6A	AM-GT	UMP	Corrosion	4/2/2018
4182	6A	PE-AM	GEMINI	Corrosion	1/29/2018
3809	6A	PE-AM	DUO CD	Crack	3/5/2018
4438	10	EB-ENR	UC	Crack	2/16/2018
3645	10	ENR-UT	UCh	Crack	12/21/2017
4490	78	SK-RW	MFL4	Corrosion	5/9/2018
4489	78	SK-RW	UMP	Corrosion	5/11/2018

61 [Remaining Life Clarifications]

There are no injunctive measures associated with this Paragraph.

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

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

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 immediate 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 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") growth model, and determined the remaining life with the model yielding the fastest projected growth rate and the shortest Remaining Life as documented in the Lakehead System Integrity Remediation process Table 2, Step 7.2.

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

Paragraph 44 of the Consent Decree discusses how all calculations are completed within the required timeframes. The following table summarizes the remaining life calculations completed during this reporting period.

Table 34: Crack Feature Remaining Life Calculations					
Tool Run ID	**Line**	**Segment**	**Tool**	**Report Type**	**Remaining Life Calculation Completion Date**
3711	03	GF-CR	UCMp	Crack	4/11/2018
2254	04	CR-CS	DuDi UCM	Crack	3/19/2018
4465	04	CS-DR	DuDi UCM	Crack	3/19/2018
4466	04	FW-WR	DuDi UCM	Crack	5/3/2018
6013	04	GF-DN	DuDi UCM	Crack	4/23/2018
4468	05	BC-RW	UCc	Crack	4/26/2018
2162	05	BC-RW	CD+2	Crack	1/10/2018
4356	05	IR-NO	UCc	Crack	4/6/2018
2150	05	PE-IR	CD+2	Crack	12/14/2017
3809	6A	PE-AM	DUO CD	Crack	3/5/2018
4438	10	EB-ENR	UC	Crack	2/16/2018
3645	10	ENR-UT	UCh	Crack	12/21/2017

64 [Corrosion Growth Rate]

Enbridge used a Corrosion Growth Rate ("CGR") based on back-to-back corrosion runs (if available), or a historical CGR estimate for newly constructed pipeline or pipeline segment with no less than 0.005 inch per year. The application of a CGR based on back-to-back corrosion runs, or a historical CGR estimate for newly constructed pipeline or pipeline segment with no less than 0.005 inch per year, is illustrated in more detail in the ILI Assessment sheets.

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

Other than crack inspections for Line 2, all crack and corrosion ILIs required as of the end of the reporting period for this SAR that date under Paragraphs 65 of the Consent Decree have been completed. Crack inspections for Line 2 are governed by the Stipulation filed with the Court on May 2, 2018. Under the Stipulation, no crack inspections on Line 2 are due until 2020.

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

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

Annual ILIs have been scheduled for Line 3 in 2018 until the Original US Line 3 is taken out of service; Line 3 ILI schedules are included in Paragraphs 28-29.

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]

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

Protection from Currents, Ice, Spans

The Dual Pipelines are continuously buried near the shoreline areas, which eliminates the potential for impairment of the integrity of the Dual Pipelines caused by ice. Enbridge operates and maintains the Dual Pipelines to ensure that currents or ice do not impair the integrity of either pipeline.

Independent studies completed by Dynamic Risk Assessment Systems, Inc. (final report published on State of Michigan website at https://mipetroleumpipelines.com/document/alternatives-analysis-straits-pipeline-final-report) have confirmed that there is no risk to the Dual Pipelines from ice on the deeper portions of the pipelines and the burial medium protects the pipelines from ice in the shallow portions. Burial conditions are further confirmed through periodic visual inspections, e.g. Remote Operated Vehicle ((“ROV”) / Autonomous Underwater Vehicle (“AUV”)) surveys.

The results of the 2016 visual inspection were reported in the first SAR. In accordance with Enbridge's span management program, and the requirements of the Consent Decree, Enbridge will complete another visual inspection using the ROV/AUV technology in the third SAR reporting period prior to the July 31, 2018 deadline as required by Subparagraph 68.f.

Enbridge operates and maintains the Dual Pipelines to ensure the pipelines are well-supported in areas where the pipeline is suspended above the lake bed (“spans”) in compliance with the conditions of the 1953 “Easement” with the State of Michigan and to eliminate potential impairment of the integrity of the Dual Pipelines caused by currents. Enbridge currently performs underwater inspections of the Dual Pipelines every two years to assure that span lengths meet required standards and conditions, with the next inspection scheduled prior to July 31, 2018, as described above. The 2016 anchor installation program was intended to provide continued compliance with the 75' maximum span criteria included in the easement based on the results of previous underwater inspections.

Additional anchor installations are planned. The current anchor installation program includes the now-completed (after the close of the reporting period for this SAR) installation of an additional 19 anchors that both the Michigan Department of Environmental Quality (“MDEQ”) and the USACE have authorized for installation as per Enbridge's request. An additional 51 anchors are planned to be installed as per an agreement between EPA and Enbridge set forth in a proposed modification to the Decree that has not yet been filed with the Court. Those additional anchors will planned to be installed in 2019 once the USACE permitting process, which contemplates an

individual permit rather than a nationwide permit, has been completed. The planned installation schedule falls beyond the second SAR reporting period ending May 23, 2018. However, Enbridge's planning and preparation activities, including the preparation of permit applications, were ongoing through the current reporting period. This is further discussed below in Subparagraph 68.b.

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. This is accomplished through a variety of strategies including:

- In addition to the burial of the Dual Pipelines in water less than 65 feet deep, "DO NOT ANCHOR" signage is located on the north side of the Straits of Mackinac to warn vessels of the existence of infrastructure under the lake.
- Enbridge Operations Department maintains a relationship with the US Coast Guard ("USCG") at Sault Ste. Marie and attends meetings to support public outreach and other discussions. Enbridge also attends Northern Michigan Area planning meetings that are facilitated by the USCG and the EPA as a stakeholder.
- In addition to the requirements in Paragraph 68, Enbridge continues to conduct annual ILIs on the Dual Pipelines including Geometry ILIs, in compliance with the federal Protecting our Infrastructure of Pipelines and Enhancing Safety Act of 2016 (a.k.a., Pipes Act).. These inspections would identify mechanical damage such as anchor damage to the integrity of the pipelines.
- On November 27, 2017, Enbridge implemented an additional risk mitigation measure focused on spill consequence reduction. A procedure has been developed as per an agreement with the State of Michigan, to monitor, report and shutdown operations of the Straits crossings during sustained adverse weather conditions, where wave heights near the crossing exceed eight feet. During this reporting period, operations were suspended only once on December 5, 2017 due to wave height. Processes to notify State of Michigan authorities of any times where Enbridge is required to shut down the line as a result of any wave height exceedances are also in place. Additional focused activity related to mitigating risk of vessel anchor damage has been ongoing throughout this reporting period in accordance with the November 27, 2017 agreement between the State of Michigan and Enbridge ("November 2017 Agreement"). The November 2017 Agreement sets out a plan to improve coordination between Enbridge and the State of Michigan for the operation and maintenance of the Dual Pipelines located in Michigan, including across the Straits, while also providing enhanced transparency to the citizens of Michigan.

Although outside the reporting period for this SAR, Enbridge notes that on June 28, 2018, Enbridge submitted to the State of Michigan a report on options to mitigate the risk of a vessel's anchor puncturing, dragging or otherwise damaging Enbridge's Dual Pipelines across the Straits. In the report, Enbridge assessed the following strategies:

1. Measures to enhance shipping communication and warning technologies; and,
2. The use of protective barriers to further protect the Dual Pipelines from any risks posed by a vessel anchor coming in direct contact with the Dual Pipelines.

Enbridge, with the support of third-party expert consultants, worked closely with the State of Michigan to complete this assessment. The report has been posted on Enbridge's website and a copy was submitted as a matter of information to the EPA on June 29, 2018. Enbridge will continue to keep the ITP/EPA informed of next steps in connection with the implementation of any new anchor strike mitigation measures. The report will be further discussed in the next SAR.

April 2018 Third Party Anchor Strike

On April 1, 2018, the Dual Pipelines sustained damage as a result of what Enbridge believes to be from a vessel anchor strike. The anchor strike resulted in damage to the American Transmission Company's ("ATC") submarine power transmission cables, and that incident was reported by ATC to the USCG. Enbridge was also notified of the ATC cable damage on April 3, 2018. As a precautionary measure Enbridge shut down Line 5 for a period of time noted below. Since the time of notification of the incident, Enbridge has supported the USCG investigation, and has taken steps to ensure the ongoing safe operation of the Dual Pipelines. Enbridge has also provided regular updates to stakeholders (including PHMSA, EPA and Michigan state agencies) regarding Enbridge's response to the anchor strike incident. While the investigation is ongoing, a summary of the actions taken by Enbridge in response to the event is as follows:

- April 3 - Precautionary shutdown was completed, as well as a review of established leak detection systems data from the experimental geophone that was installed on one of the crossings. Leak detection systems confirmed no abnormal conditions. The experimental geophone data identified an acoustic anomaly that corresponded with the timing of the potential vessel anchor strike.
- April 4 - A pressure hold test was conducted to confirm pipeline containment, as well as a gauge plate internal inspection to identify any major damage resulting from the anchor strike. The gauge plate results showed no indication of major damage.
- April 7 - A high resolution ILI was conducted to confirm pipeline condition. The results, received on April 9 and April 10, indicated the presence of three new dents:
    - 3.9% OD dent (depth of 0.779", length of 23.40") on the East Crossing.
    - 3.5% OD dent (depth of 0.705", length of 14.14") and a 2.1% OD dent (depth of 0.411", length of 10.03") on the West Crossing.
    - Enbridge conducted a FEA to calculate the burst pressure of these dents. That FEA conservatively assumed that various sizes of crack and gouges were located in the apexes of the dents, even though it was not known at the time whether gouging or cracking was present in any of the dents. This FEA modeling produced a minimum burst pressure above 1100psig when using upper bound crack depth defined based on the reported strain field. Incorporating a safety factor of 1.25 to this burst pressure resulted in the calculation of a pressure well above the maximum operating pressure of the Line (600psig), thereby confirming the integrity of the Dual Pipelines.
- April 13 - As a precautionary measure, a PPR was implemented to restrict operating pressures on the Dual Pipelines. The PPRs imposed were the recent high operating pressures that had been achieved since the time of the incident.
- April 17 and April 18 - An additional magnetic flux leakage ("MFL") ILI was conducted to further characterize damage on East Pipeline and West Pipeline, respectively. The results identified the location of the previously reported dents on April 9 and 10, and confirmed no reportable metal loss anomalies within tool reporting thresholds were associated with the three dents.
- April 17 - A ROV inspection (with a high resolution camera) was conducted on both the East and West lines (visual assessment of the areas identified by the Geometry tool). The area covered by the visual assessment included looking upstream and downstream of the areas of interest for approximately 20 feet on both pipelines. The findings concluded:
    - There was no evidence of a leak on either pipeline;
    - There was a clear view of scraping of the lake bottom leading up to the pipelines;
    - There was no apparent debris near the pipelines;
    - The ROV video provided visual confirmation that both pipelines were impacted;
    - There was evidence of the three dents, one on the East leg and two on the West leg, reported by inline inspection, and resulting coating damage; and
    - No signs of damage to the nearest screw anchor on the West Pipeline were observed.

- April 18 - PureHM's SmartBall leak detection inspection was conducted on both the East and West lines, for which no anomalous conditions were reported.
- April 23 to May 20 - Diving operations were completed on both the East and West Pipelines to conduct the following activities:
    - Visual inspections to confirm damage and locations;
    - Remove coating and clean surface to inspect for rub marks or gouging;
    - Remove observed light gouging occurring in each of the three dents;
    - Conduct NDE to record measurements of dent shape, remaining wall thickness and to confirm that there is no cracking present within the areas of deformation;
    - All activities were completed successfully, further confirming the integrity of the Dual Pipelines and their continued safe operation;
  - These activities constituted completion of short-term repairs (i.e. removal of any surficial damage); however, upon consultation with the Pipeline and Hazardous Materials Safety Administration ("PHMSA"), it was agreed that long-term repairs, including the installation of a composite wrap, would be completed to restore strength of the pipeline to its original capacity. Additionally, it was agreed that Enbridge would apply an additional precautionary PPR of 380 psig until such time that the permanent repair was completed.
  - While the Dual Pipelines continue to operate safely, the permanent repairs are planned to be conducted in July 2018, outside the reporting period for this SAR, pending receipt of all required permits.

68.b [Screw Anchor Support]

As reported in the first SAR, Enbridge and EPA filed with the Court the "First Modification" to the Consent Decree on June 1, 2017. The First Modification revised the deadline for installing screw anchors to account for the data/information generated as a result of the 2016 visual inspection. The First Modification states that Enbridge has until October 1, 2018, to install screw anchors on uncovered portions of the Dual Pipelines that: (1) are located in water deeper than 65 feet; and (2) are not subject to requirements applicable to portions of the Dual Pipelines where the pipe is suspended above the lakebed without supports for more than 75 feet.

Visual underwater inspections are planned to be performed prior to July 31, 2018, to re-confirm that the Dual Pipelines located within 65-feet of water or less are continuously covered on the floor of the Straits.

Enbridge reported the results of the 2016 anchor installation program in the first SAR, confirming that the distance between screw anchor supports on the Dual Pipelines complies with the 75-foot maximum span length criteria set forth in the Easement issued by the State of Michigan.

As a preventative measure to minimize the potential for the unsupported spans on the Dual Pipelines to exceed the 75-foot maximum span length criteria, Enbridge and EPA agreed to criteria for the installation of additional screw anchor supports. The scope, schedule, and associated procedures for the installation of those additional screw anchor supports is described in the 2018 Screw Anchor Work Plan that was submitted to EPA on May 17, 2018, and approved by the EPA on May 22, 2018.

Some of the work described in the 2018 Screw Anchor Work Plan was originally planned to be completed in 2017, but was postponed due to permitting delays and to allow for such work to be completed at the same time as the planned installation of additional screw anchors in 2018. As a result, a total of 70 anchors had been planned for installation in 2018. While the forthcoming installation of the screw anchors falls outside the reporting period of this SAR, many planning and preparatory activities have been ongoing throughout the period leading up to May 23, 2018, including the following: contracting, mobilization of equipment, preparation of work plans and submission to EPA, and the submission of applications to obtain all necessary permits from federal and state agencies.

Within the reporting period of this SAR, Enbridge received federal and state permits required for the installation of 19 screw anchors. The USACE's approval to install the remaining 51 anchors, however, remains pending. In accordance with Paragraph 175 of the Consent Decree, Enbridge notified EPA on May 22, 2018 and June 1, 2018 that the USACE's issuance of permits required to install the 51 screw anchors may be delayed, thereby potentially constituting a force majeure event. Enbridge's notification to EPA was submitted as a result of the USACE informing Enbridge on May 17 that it has "determined that the project does not qualify for nationwide permit authorization, and we will review it under our standard permit process." The USACE's view – that an individual permit is required to conduct certain screw anchor installation activities and that the work cannot proceed pursuant to Nationwide Permit 12 – has since been confirmed by the USACE to Enbridge. The timing of the issuance of the USACE's individual permit remains uncertain; Enbridge expects that it will not receive a permit to allow for the 51 screw anchors to be installed by the October 1, 2018, deadline that is specified under the Consent Decree and the First Modification.

68.c [Periodic Visual Inspections]

Enbridge's compliance with Subparagraph 68.c was previously reported in Enbridge's first SAR. Enbridge will report the status of the 2018 visual inspection, to be conducted in July 2018, in the third SAR.

68.d [Underwater Inspection Repairs]

Enbridge's compliance with Subparagraph 68.d was reported in Enbridge's first SAR. Enbridge will review the results of the planned 2018 underwater visual inspection to identify any areas where the Dual Pipelines may not be adequately covered or supported. Should any such areas be identified following the forthcoming underwater visual inspection, Enbridge will undertake any necessary repairs or mitigation. Such future actions, if any, will be reported in the third SAR.

68.e [Screw Anchor Report]

Enbridge's compliance with Subparagraph 68.e was reported in the first SAR. Enbridge will comply with the report requirements under Subparagraph 68.e if repairs are needed to resolve coverage or support issues that may be identified as a result of the forthcoming 2018 underwater visual inspection. Such future actions, if any, will be reported in the third SAR.

A summary report specific to the 19 screw anchors installed in 2018, pursuant to the Screw Anchor Work Plan, will be submitted to EPA within 60 days of completion of the installation of those screw anchors and will be discussed in the third SAR.

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

Enbridge plans to complete another underwater visual inspection of each of the Dual Pipelines on or before July 31, 2018. Following that inspection, Enbridge will complete any necessary repairs in accordance with Subparagraph 68.d, and will prepare and submit any required reports in accordance with Subparagraph 68.e.

69.a [Biota Investigation]

On August 14, 2017, Enbridge initiated implementation of the biota investigation work in accordance with the schedule set out in the Biota Investigation Work Plan ("BIWP"), as described in Subparagraph 69.b and approved by the EPA on June 13, 2017. The BIWP identified the necessary steps for Enbridge to further study the impact

of biota and mussels on the Dual Pipelines. This work included review of the potential for the biota to create a corrosive environment and the potential impact of the weight of the biomass on the pipelines.

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

69.b [Biota Investigation Work Plan]

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

69.c [Biota Work Plan Implementation]

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

The final Biota Investigation report concluded the following:

- Assessment 1: The accumulation of mussels and/or other biota are not causing coating deterioration or other harmful effects to the Dual Pipelines.
- Assessment 2: The accumulation of mussels and/or other biota are not creating a corrosive environment by, among other things, fostering the growth of anaerobic sulfate reducing bacteria ("SRB") that may cause metal loss.
- Assessment 3: Mussels and other biota are not introducing features that may threaten the integrity of either of the Dual Pipelines due to the weight of such biomass or the pressure caused by current or ice movement around such biomass in areas where the pipelines are suspended above the floor of the Straits.

Accordingly, because the final Biota Investigation report concludes that mussels and other biota have not impaired the Dual Pipelines, Enbridge is not required under Subparagraph 68.c to supplement the final Biota Investigation report with a proposed work plan. On May 31, 2018, Enbridge provided responses to subsequent ITP information requests related to the Biota Investigation issued on May 3, 2018. A copy of the final Biota Inspection report was provided to the State of Michigan on April 6, 2018.

Enbridge executed the coating repairs specified in Coating Repair Work Plan ("CRWP") and completed 7 repairs in the 2017 construction season. One coating repair remained outstanding following closure of the 2017 field program, and Enbridge plans to complete that repair in July 2018. On December 15, 2017, Enbridge submitted an interim report to the EPA regarding the status of the CRWP and Enbridge will submit a final report to the EPA 60 days after the completion of the outstanding repair. Enbridge also provided a copy of the CRWP Interim report to the State of Michigan on December 15, 2017.

In addition, as a matter of information and not related to any provision of the Consent Decree, Enbridge submitted to the State of Michigan an Anchor Inspection Workplan ("AIWP") Interim Report on January 16, 2018 pursuant to Enbridge's AIWP required by the State of Michigan. That AIWP Interim Report advised the State of the status of Enbridge's inspection for coating damage, and repair of coating damage, at areas on the Dual Pipelines where screw anchors have been installed. A copy of this Interim Report was provided to EPA on March 2, 2018.

In addition, also as a matter of information and not related to any provision of the Consent Decree, Enbridge submitted to the State of Michigan on June 29, 2018 a report entitled "Evaluation of Technologies to Assess the condition of pipe coating on Line 5." This report, prepared in coordination with third party experts and the State of Michigan, was prepared pursuant to the November 27, 2017 Agreement between Enbridge and the State of Michigan. The report, which has been posted on Enbridge's website and a copy of which was provided to EPA on

June 29, 2018, concluded that the only one of the studied technologies for assessing coating damage is Cathodic Protection Close Interval Survey (CP CIS), which Enbridge plans to implement in 2018.

70 [In-Line Inspections of the Dual Pipelines]

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

71 [Investigation and Repair of Axially-aligned Features]

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

72 [Pipeline Movement Investigation]

Enbridge's compliance with Paragraph 72 was previously reported in the first SAR. Enbridge considers this requirement to be complete; however, Enbridge will provide relevant updates, if any, in future SARs.

73 [Quarterly Inspections Using Acoustic Leak Detection Tool]

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

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

Table 35: Acoustic Leak Detection

Segment	Quarter	Leak Detection Tool Run Date
Dual Pipelines (West and East)	Q1	3/21/2018
Dual Pipelines (West and East)	Q2	4/18/2018

Section F – Data Integration

74 [Feature Integration Database]

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

75 [Integrity Management Personnel Access to Feature Integration Database]

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

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

76 [Successive ILI Data Sets]

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

77 [Update of OneSource Database]

Enbridge's compliance with this Paragraph is explained in Enbridge's first SAR, and Enbridge's compliance with Paragraph 77 has not changed since the submission of the first SAR. Enbridge completed all field investigations of the Consent Decree excavations related to the particular ILI Tool Runs and uploaded NDE reports into OneSource within 60 days after the field investigation report was quality reviewed and approved by Enbridge.

Table 36: OneSource NDE Updates

Tool Run ID	Line	Segment	Tool	Report Type	Last NDE Report Approved Date	OneSource Load Date
4396	02	DR-PW	GEMINI	Geometry	5/14/2018	5/29/2018
4493	02	GF-CR	GEMINI	Geometry	12/21/2017	1/2/2018
2215	05	BC-RW	GEMINI	Geometry	1/12/2018	1/18/2018
3662	05	PE-IR	USWM+	Corrosion	5/3/18	5/14/2018

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

78.a [OneSource ILI Updates]

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

Table 37: OneSource ILI Updates

Tool Run ID	Line	Segment	Tool	Report Type	Report Received Date	OneSource Load Date
4395	02	CR - DR	GEMINIMFL	Corrosion	5/7/2018	5/9/2018
4395	02	CR - DR	GEMINICAL	Geometry	4/6/2018	4/9/2018
4396	02	DR - PW	GEMINICAL	Geometry	3/20/2018	3/26/2018
4396	02	DR - PW	GEMINIMFL	Corrosion	4/18/2018	4/23/2018
4494	02	GF - CR	GEMINICAL	Geometry	12/29/2017	12/29/2017
4494	02	GF - CR	GEMINIMFL	Corrosion	2/1/2018	2/5/2018
3711	03	GF - CR	UCMPUTWM	Corrosion	2/12/2018	2/13/2018
3711	03	GF - CR	UCMPUTCD	Crack	3/12/2018	3/13/2018
2254	04	CR - CS	UCMUTWM	Corrosion	1/16/2018	1/16/2018
2254	04	CR - CS	UCMUTCD	Crack	2/15/2018	2/15/2018
4465	04	CS - DR	UCMUTWM	Corrosion	1/17/2018	1/17/2018
4465	04	CS - DR	UCMUTCD	Crack	2/16/2018	2/17/2018
2351	04	DN - VG	UCMUTWM	Corrosion	5/8/2018	5/8/2018
4466	04	FW - WR	UCMUTCD	Crack	4/11/2018	4/12/2018
4466	04	FW - WR	UCMUTWM	Corrosion	3/8/2018	3/9/2018
6013	04	GF - DN	UCMUTWM	Corrosion	2/20/2018	2/21/2018
6013	04	GF - DN	UCMUTCD	Crack	3/22/2018	3/22/2018
2358	04	PL - CR	UCMUTWM	Corrosion	5/18/2018	5/22/2018
2323	04	VG - PL	UCMUTWM	Corrosion	5/15/2018	5/15/2018
2689	04	WR - PW	GEOPIG	Geometry	4/6/2018	4/10/2018
4468	05	BC - RW	UCC	Crack	3/2/2018	3/6/2018
2162	05	BC - RW	CD+	Crack	12/6/2017	12/12/2017
6016	05	ENO - EMA	GEOPIG	Geometry	5/17/2018	5/22/2018
6087	05	ENO - EMA	GEOPIG	Geometry	4/23/2018	4/25/2018

Table 37: OneSource ILI Updates						
Tool Run ID	**Line**	**Segment**	**Tool**	**Report Type**	**Report Received Date**	**OneSource Load Date**
4356	05	IR - NO	UCC	Crack	2/8/2018	2/9/2018
4406	05	MA - BC	AFD	Corrosion	4/12/2018	4/16/2018
4213	05	PE - IR	GEOPIG	Geometry	4/23/2018	4/26/2018
6017	05	WNO - WMA	GEOPIG	Geometry	5/17/2018	5/22/2018
6088	05	WNO - WMA	GEOPIG	Geometry	4/23/2018	4/25/2018
4443	6A	AM - GT	UMP	Corrosion	3/2/2018	3/6/2018
4334	6A	AM - GT	GEMINICAL	Geometry	3/9/2018	3/9/2018
4334	6A	AM - GT	GEMINIMFL	Corrosion	4/6/2018	4/9/2018
3809	6A	PE - AM	DUOCD	Crack	2/2/2018	2/5/2018
4182	6A	PE - AM	GEMINIMFL	Corrosion	12/28/2017	12/29/2017
4438	10	EB - ENR	UC	Crack	1/18/2018	1/24/2018
3645	10	ENR - UT	UCH	Crack	11/24/2017	11/27/2017
2459	64	GL - GT	GEMINIMFL	Corrosion	4/23/2018	4/25/2018
2459	64	GL - GT	GEMINICAL	Geometry	3/23/2018	3/26/2018
4489	78	SK - RW	UMP	Corrosion	4/11/2018	4/13/2018
4490	78	SK - RW	MFL4MFL	Corrosion	4/9/2018	4/13/2018
4490	78	SK - RW	MFL4CAL	Geometry	3/8/2018	3/13/2018

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. The following table summarizes the reviews completed during this reporting period.

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Table 38: Interacting Feature Reviews						
Tool Run ID	**Line**	**Segment**	**Tool**	**Report Type**	**Pull Date**	**Interacting Feature Review**
4395	02	CR-DR	GEMINI	Geometry	2/7/2018	5/3/2018
4396	02	DR-PW	GEMINI	Geometry	1/19/2018	4/18/2018
4494	02	GF-CR	GEMINI	Corrosion	11/3/2017	3/1/2018
4494	02	GF-CR	GEMINI	Geometry	11/3/2017	1/18/2018
3712	03	CR-PW	USWM+	Corrosion	8/21/2017	12/26/2017
3711	03	GF-CR	UCMp	Crack	11/14/2017	4/11/2018
3711	03	GF-CR	UCMp	Corrosion	11/14/2017	3/14/2018
2254	04	CR-CS	DuDi UCM	Corrosion	10/18/2017	2/15/2018
2254	04	CR-CS	DuDi UCM	Crack	10/18/2017	3/19/2018
4465	04	CS-DR	DuDi UCM	Corrosion	10/20/2017	2/15/2018
4465	04	CS-DR	DuDi UCM	Crack	10/20/2017	3/19/2018
4466	04	FW-WR	DuDi UCM	Corrosion	12/12/2017	3/22/2018
4466	04	FW-WR	DuDi UCM	Crack	12/12/2017	5/3/2018
6013	04	GF-DN	DuDi UCM	Corrosion	12/8/2017	3/22/2018
6013	04	GF-DN	DuDi UCM	Crack	12/8/2017	4/23/2018
2689	04	WR-PW	GeoPig	Geometry	2/6/2018	5/3/2018
2215	05	BC-RW	GEMINI	Corrosion	8/24/2017	12/18/2017
4468	05	BC-RW	UCc	Crack	11/2/2017	4/2/2018
4356	05	IR-NO	UCc	Crack	10/13/2017	3/12/2018
4406	05	MA-BC	AFD	Corrosion	1/12/2018	5/14/2018
2150	05	PE-IR	CD+2	Crack	7/19/2017	12/14/2017
2140	05	PE-IR	AFD	Corrosion	8/23/2017	12/21/2017
4334	6A	AM-GT	GEMINI	Geometry	1/8/2018	4/9/2018
4443	6A	AM-GT	UMP	Corrosion	12/2/2017	4/2/2018
4334	6A	AM-GT	GEMINI	Corrosion	1/8/2018	5/6/2018
3809	6A	PE-AM	DUO CD	Crack	10/6/2017	3/5/2018
4182	6A	PE-AM	GEMINI	Corrosion	9/29/2017	1/29/2018
4438	10	EB-ENR	UC	Crack	9/20/2017	2/16/2018
3645	10	ENR-UT	UCh	Crack	7/27/2017	12/22/2017

Table 38: Interacting Feature Reviews						
Tool Run ID	**Line**	**Segment**	**Tool**	**Report Type**	**Pull Date**	**Interacting Feature Review**
2459	64	GL-GT	GEMINI	Geometry	1/24/2018	4/23/2018
4490	78	SK-RW	MFL4	Corrosion	1/10/2018	5/9/2018
4489	78	SK-RW	UMP	Corrosion	1/12/2018	5/11/2018
4490	78	SK-RW	MFL4	Geometry	1/10/2018	4/9/2018

Section G – Leak Detection and Control Room Operations

(I) Assessment of Alternative Leak Detection Technologies

79-80 [Create and Submit ALD Report]

On November 30, 2017, the ITP provided its compliance verification report regarding the first SAR, concluding that Enbridge was in compliance with the requirements specified under Section VII.G.I of the Consent Decree concerning an Assessment of Alternative Leak Detection Technologies. Enbridge considers this to be complete and no further reporting is required for this SAR.

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

81-83 [Create and Submit ALD Mackinac Report]

On February 19, 2018, the ITP published its review and evaluation of the Report on Feasibility of Installing an Alternative Leak Detection System at the Straits of Mackinac ("ALD Straits Report"). The ITP concluded that Enbridge's conclusions in the ALD Straits Report are indicative of the application of best engineering judgment related to the technologies evaluated as they existed at the time of the report. The ITP concluded in its review and evaluation that Enbridge's ALD Straits Report complies with Paragraphs 81-83.

On March 6, 2018, the ITP released an amendment to its February 19, 2018 review and evaluation of the ALD Straits Report, which provided clarification regarding the definition of abnormal operating conditions, sensitivity values, and the Pipeline Research Council International ("PRCI") document. This amendment did not change the ITP's original conclusion that Enbridge's ALD Straits Report complied with Paragraphs 81-83.

Further, as a matter of information, Stipulation D of the Line 5 November 2017 Agreement with the State of Michigan requires Enbridge to conduct an evaluation of additional underwater technologies to enhance leak detection. In accordance with that requirement, Enbridge conducted a review of other technologies that were not assessed in the ALD Straits Report to determine whether such other technologies would provide a viable additional benefit over and above the technologies that are already in place on Line 5, or those that Enbridge plans to implement in accordance with the Consent Decree requirements. Enbridge collaborated with the State of Michigan to develop the framework for the assessment, including the identification of the additional technologies that are to be assessed in that report. Enbridge completed the evaluation of these additional technologies and on June 28, 2018 submitted to the State a report entitled "Evaluation of identified underwater technologies to

enhance leak detection of the Dual Line 5 Pipelines." That report concluded that none of the evaluated additional technologies were suitable for use in the Straits. This report was posted on Enbridge's website and a copy was supplied to EPA on June 29, 2018. The report will be further discussed in Enbridge's third SAR.

Enbridge considers the requirements under Paragraphs 81-83 to be complete and no further reporting is required for this SAR.

(III) Requirements for New Lakehead Pipelines and Replacement Segments

84 [Applicability]

In order to ensure compliance with Section VII.G.III of the Consent Decree, Enbridge applies the definitions of New Lakehead Pipelines and Replacement Segments that are specified in Paragraph 84.

Enbridge has not implemented any new Replacement Segments or New Lakehead Pipelines, as those terms are defined under Subparagraphs 84.a and 84.b, during this reporting period. The requirements of these Subparagraphs are thus not applicable during this reporting period.

85 [Installation of Flowmeters]

As indicated above, Enbridge has not implemented any Replacement Segments or New Lakehead Pipelines during this reporting period; therefore, the requirements set forth under Paragraph 85 concerning the installation of flowmeters on new Replacement Segments and New Lakehead Pipelines were not triggered during this reporting period. In order to ensure compliance with Paragraph 85, the requirements specified under Paragraph 85 have been incorporated into Enbridge's mainline leak detection equipment standard, which requires that flowmeters be installed for all New Lakehead Pipelines and Replacement Segments.

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

As indicated above, Enbridge has not implemented any Replacement Segments or New Lakehead Pipelines during this reporting period; therefore, the requirements set forth under Paragraph 86 concerning the installation of flowmeters on Replacement Segments and New Lakehead Pipelines that utilize in-line batch interface tools were not triggered during this reporting period. In order to ensure compliance with Paragraph 86, the requirements specified under Paragraph 86 have been incorporated into Enbridge's mainline leak detection equipment standard, which requires that flowmeters be installed for all New Lakehead Pipelines and Replacement Segments that utilize in-line batch interface tools.

87 [Installation of Other Instrumentation]

As indicated above, Enbridge has not implemented any Replacement Segments or New Lakehead Pipelines during this reporting period; therefore, the requirements set forth under Paragraph 87 concerning the installation of other instrumentation on Replacement Segments and New Lakehead Pipelines were not triggered during this reporting period. In order to ensure compliance with Paragraph 87, the requirements specified under Paragraph 87 have been incorporated into Enbridge's mainline leak detection equipment standard, which requires that other instrumentation (i.e., pressure transducer/transmitter and temperature transducer/transmitter) be installed for all New Lakehead Pipelines or Replacement Segments.

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

As indicated above, Enbridge has not implemented any Replacement Segments or New Lakehead Pipelines during this reporting period; therefore, the requirements specified in Paragraph 88 concerning the design of meter-to-meter MBS Segments were not triggered during this reporting period.

89 [Leak Detection Sensitivity Requirements]

Enbridge has fully complied with this Paragraph by designing the New US Line 3, once constructed following the receipt of necessary approvals and permits, to meet or exceed the defined MBS leak detection sensitivity targets. Enbridge will provide a further update on its compliance with the Line 3-related requirements specified under Subparagraph 89.a once all necessary approvals and permits have been received and construction of the New US Line 3 is complete; the status of Line 3 approvals and permits is discussed in response to Paragraph 22 above. Also, no other Lakehead projects have been designed or constructed for this period; thus, the requirements specified in Subparagraph 89.b for Other Lakehead Projects were not triggered during this reporting period.

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

As indicated above, Enbridge has not implemented any Replacement Segments or New Lakehead Pipelines during this reporting period; therefore, the requirements specified under Paragraph 90 concerning demonstrating compliance with leak detection sensitivity design and construction requirements have not been triggered. Once Enbridge's New US Line 3 is constructed and commissioned, Enbridge will demonstrate that the MBS leak detection system will comply with Subparagraphs 90.a (Plan for testing the MBS leak detection system to detect leaks and ruptures), 90.b (Test Plan details), 90.c (Proposed Plan and schedule if the testing fails), and 89.a (Leak Detection Sensitivity Requirements).

91 [Establishment and Optimization of Alarm Thresholds]

As indicated above, Enbridge has not implemented any Replacement Segments or New Lakehead Pipelines during this reporting period. Enbridge has undertaken pre-construction design activities associated with the New US Line 3. Enbridge will undertake the appropriate steps defined in this Paragraph upon initial line fill of the New US Line 3, as well as upon initial line fill of any other New Lakehead Pipelines or Replacement Segments.

(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 provided under Paragraph 93. Enbridge's continuous and uninterrupted leak detection capability is achieved through a number of measures including architectural, logical, and procedural controls. Since the Effective Date of the Consent Decree, leak detection alarm thresholds for steady state operations have been met and continue to meet the minimum alarm thresholds set forth in the table at Paragraph 91.

93 [Temporary Suspension of MBS Leak Detection Capabilities]

Enbridge continues to track the three categories of temporary MBS suspension that are specified in Subparagraphs 93.a-c. Ultrasonic flowmeter maintenance and flowmeter outage workflows are followed 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 Appendix 3 for a list of occurrences of each type of instrumentation outages 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 its 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 (b). Enbridge continuously operates the ALD method until the flowmeter outage is resolved and the MBS segments are restored to operation.

96 [Reporting of MBS Outages]

Enbridge restores leak detection capability as soon as practicable following any outage in an MBS segment. This is achieved by implementing Enbridge procedures and operating tools to track and manage planned and unplanned flow meter outage and in-line tool runs resulting in temporary loss or suspension of leak detection on the affected segment.

One MBS leak detection system outage event occurred during this reporting period. Specifically, on May 15, 2018, an unintended loss of control occurred on the Line 67 Supervisory Control and Data Acquisition ("SCADA") servers, which resulted in the outage of the MBS leak detection system for approximately one hour and forty minutes. As per Control Centre Operations ("CCO") procedure, a shutdown was initiated by utilizing field operations during the communication outage. Once control was restored, the remainder of Line 67 was shutdown utilizing the SCADA system.

The details related to this outage are as follows: (1) the day and hour when the outage began was May 15, 2018 at 08:05 MST; (2) the day and hour when the MBS outage was resolved, including when communications were restored, was on May 15, 2018 at 09:41 MST; (3) the reason for the MBS outage was due to loss of communication between the SCADA and Leak Detection systems (note that ALD was not possible due to the SCADA system failure); and (4) to resolve the outage, Enbridge executed operational procedures for manual shut down of pumps by field personnel, and the local control systems automated implementation of safe pressure limits.

With respect to the outage event described above, leak detection capability was restored within the time periods specified in the table in Paragraph 97. Accordingly, the reporting requirement specified under Paragraph 96 is inapplicable to this outage.

97 [Reporting Requirements]

Refer to Appendix 3 for a table identifying the number of occurrences by type where MBS was temporarily suspended, none of which exceeded the duration thresholds specified in the table provided under Paragraph 97. In all events that Enbridge temporarily lost or suspended MBS leak detection capability, all instrumentation outages were put back into service within the prescribed time period for restoring MBS segment to operation, as specified in Paragraph 97. Accordingly, the reporting requirements specified under Paragraph 96 were inapplicable during this reporting period.

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) during any occurrence of an unplanned shutdown during the in-line tool run. The tolling period applied by Enbridge begins when the pipeline is shutdown, 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 unscheduled shutdowns that occurred during the ILI tool bypass for this reporting period.

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

The only remotely-controlled valve that was excavated during this reporting period was on Line 4 at Nushka Lake. The work involved partial excavation of a valve and excavation of the mainline pipeline on one side of the valve. Even though the valve was not required to be fully excavated to perform the necessary maintenance work, Enbridge voluntarily decided to excavate both sides of the valve to install a new upstream and a new downstream pressure transmitter as well as a new skin temperature transmitter. This work was undertaken by Enbridge even though Enbridge and the ITP have interpreted Paragraph 99 to not require the installation of such instrumentation when a remotely-controlled valve is only partially excavated.

Before the instrumentation on the Line 4 valve can be installed, Enbridge is required to obtain a new permit from the U.S. Forest Service, Chippewa National Forest, which will authorize Enbridge to extend the valve site fence line to provide the necessary real estate to allow for the installation of the additional instrumentation. Enbridge submitted its application on February 26, 2018 and that application remains pending. Enbridge expects to receive the required permit in time to allow for the installation of the instrumentation in Q4 2018.

100 [Requirements for Valve Excavation]

Enbridge has revised its procedures to recognize that the instrumentation identified in Paragraph 99 need not be installed if the circumstances specified under Paragraph 100, concerning emergency excavations and “functionally identical” instrumentation, are present relative to the excavation of a remotely-controlled valve.

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 of the Consent Decree. Enbridge considers this to be complete and no further reporting is required for this SAR.

102 [Rupture Detection System Alarm]

Enbridge continuously operates its Rupture Detection System ("RDS") at all times on all Lakehead System Pipelines during both steady-state and transient-state conditions. The RDS is complementary to and integrated with Enbridge's SCADA system and MBS Leak Detection System. The RDS is designed and operated in compliance with Enbridge's understanding of the requirements specified in Subparagraphs 102.a-b. This includes the technical implementation and integration of the RDS into the appropriate operational procedure, consistent with the Leak Detection Requirements for Control Room, specified under Section VII.G.V. of the Consent Decree.

Enbridge submitted its RDS Test Report to EPA and the ITP on August 18, 2017. The report documented the effectiveness of the RDS, and included an explanation of why the RDS would alarm in the event of an abnormally low pressure or abnormal pressure drop on both sides of a pump station, which are inclusive of and account for any increase in flow rate. The report summarized comprehensive simulated testing of the RDS using real historical data, which determined that the system is able to quickly and reliably detect all Enbridge historical rupture events. That report, together with additional information provided by Enbridge, further confirmed that the inclusion of an increase in flow rate in the RDS algorithm risks impairment to the overall alarm system by compromising the sensitivity of the RDS, and thus a flow rate factor was deployed only to those pipelines experiencing reliability issues (which do not include any Lakehead System Pipeline). Enbridge also explained that even though the Consent Decree requires only that an RDS monitor data from the SCADA system for (a) an abnormally low pressure; (b) an abnormal pressure drop *or* (c) an abnormal increase in flow rate, Enbridge's RDS in fact uses an algorithm that accounts directly for the first two factors even though an RDS that relies on any one would have been compliant. Further, Enbridge's SCADA and MBS systems monitor flow rate as well. The ITP prepared a *Review and Evaluation of the RDS Test Report* on October 23, 2017, which concluded that the Enbridge's implementation of the RDS was state-of-the-art and generally followed recommended industry practice. However, the ITP raised a question concerning the need for additional testing to account for the use of flow rate in the RDS algorithm.

While for the above reasons Enbridge believes that its RDS is compliant and that inclusion of flow rate directly in the RDS algorithm would not provide incremental value, on December 19, 2017, Enbridge responded to the ITP's question, proposing to conduct additional testing. Following concurrence with the ITP as to the scope of the additional testing to be undertaken, Enbridge proceeded to conduct that additional testing, which demonstrated that the combined systems of RDS and MBS provide effective coverage for rupture detection in each of the three alternative situations identified in the Consent Decree. The results from that testing were provided to the ITP on April 30, 2018.

After the close of the reporting period covered by this SAR, Enbridge and the ITP have continued to discuss the RDS, and following discussions that took place in late June 2018, Enbridge is further considering a response to the ITP's remaining concerns. As of the close of the current SAR reporting period, the ITP considers this to be a discussion item only, and the ITP has not made any conclusion with respect to Enbridge's compliance with Paragraph 102. Enbridge will further report on the status of this matter in the third SAR.

103 ["24-hour" Alarm]

Enbridge implemented the 24-hour volume balance alarm as part of Enbridge's SCADA system in advance of the 270 day deadline specified in Paragraph 103. The 24-hour alarm applies to all Lakehead System Pipelines and is active at all times, including during steady state and transient state operations. The 24-hour alarm was designed and is implemented in accordance with Subparagraphs 103.a-b. In accordance with Subparagraph 103.c, Enbridge will complete the required study and report the results of that study to EPA. The events described in Subparagraphs 103.d-g have not occurred, and thus the requirements under these Subparagraphs were not triggered during this reporting period.

(V) Leak Detection Requirements for Control Room

104 [Applicability]

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

105 [Alarm Response Team]

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

106 [Remote Notification of Alarm Response Team]

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

107 [Audible and Visual Alarms]

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

108 [Alarm Clearance Procedures]

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

108.a [Alarm Clearance Requirements]

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

108.b [Alarm Clearing Restrictions]

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

108.c [Confirmation of Leak Detection System Functioning]

Enbridge implemented procedures to require the LDA to analyze and determine whether the leak detection system that generated the alarm is functioning properly. This process consists of determining whether any leak alarms have been caused by data errors input into the leak detection systems, system malfunctions, or other factors that could lead to an invalid leak alarm.

108.d [Independent Alarm Investigation]

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

108.e [ART Procedures for Column Separation]

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

108.f [Electronic Records of Alarm Response]

Enbridge implemented an electronic record keeping system for managing ART response information. All ART member responses are recorded and are documented as required by this Paragraph (see Appendix 1: Lakehead Leak Alarm Report). Each record – which is created at the end of each shift by each ART member choosing from specified alarm categories that are identified on an electronic menu – includes details of the alarm event including the type of alarm, reasons for clearing the alarm, and the procedures executed by members of the ART. Review of leak alarms are required by all incoming ART members during a shift change (i.e. subsequent shift). All records of alarms are retained for a minimum of five years.

109 [Unscheduled Shutdown in Response to an Alarm]

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

109.a [Ten-Minute Rule]

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

109.b [Column Separation – Running Pipeline]

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

109.c [Column Separation – Pipeline Shutdown]

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

109.d [Confirmed Leak Rule]

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

109.e [Shutdown and Restart Record]

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

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

110.a [Weekly List of Alarms]

In accordance with Subparagraph 110.a, Enbridge prepares an electronic weekly list of alarms ("WLOA") as part of the Lakehead Leak Alarm Report. That WLOA is provided as Appendix 1. 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 1. 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 time, Enbridge has complied with the Ten-Minute Rule and other requirements in Subsection VII.G. (V) when responding to leak detection system alarms.

There are no non-compliances to report and no corrective actions 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 those non-compliances specifically listed in the SOA.

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. Enbridge is compliant with this Paragraph, and has not observed any instances where pipeline operations deviated from the requirements of this Paragraph.

112 [Reporting of Events from Paragraph 111]

Information related to all incidents during the reporting period where Enbridge received information concerning a potential leak or rupture, including the information provided with each such notice, the start and end times of each respective investigation, and the conclusion and findings of each investigation, is provided in Appendix 2 to this SAR: Lakehead System Pipeline Incident Reporting.

Section H – Spill Response and Preparedness

113 [Immediate Action to Confirmed Pipeline Leak or Rupture]

Enbridge has not had any confirmed pipeline leaks or ruptures on the Lakehead System within the reporting period of more than one barrel or of any harmful quantity that reached the waters of the United States or adjoining shorelines.

During the reporting period, three releases occurred on the Lakehead System that triggered PHMSA reporting requirements. The releases were reported to PHMSA in accordance with 49 C.F.R. § 195.50(e) not due to quantity discharged, but rather due to the fact that the initial estimated property damage, including the cost of clean-up and recovery, value of lost product, and/or damage to the property of the operator and/or others would exceed $50,000. With respect to each release, Enbridge proceeded without delay to dispatch trained personnel to the location of the rupture or leak and took action to prevent any migration of oil into waters of the United States, including shutting down the affected line.

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

114 [Required Actions]

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

115 [Agreed Exercises]

In accordance with Paragraph 115, Enbridge conducted functional activities for the Cass Lake Agreed Exercise in 2017 and will complete the field/equipment deployment portion of that Agreed Exercise in October 2018. Enbridge has also taken measures to plan both the Des Plaines and Wisconsin River Agreed Exercises, with the former scheduled to occur in September 2018 and the latter scheduled to occur in 2019. Additional information regarding each of these Agreed Exercises is provided below.

Cass Lake Agreed Exercise

Enbridge and the United States mutually agreed to a non-material second modification of the Consent Decree ("Second Modification") to modify the timing for the completion of activities associated with the Cass Lake Agreed Exercise. Specifically, the parties agreed through the Second Modification that was filed with the court on July 14, 2017 (Doc. No. 16) that the Cass Lake Agreed Exercise is to be completed by Enbridge in two parts. The Second Modification requires that, in 2017, Enbridge was to conduct a functional exercise with mobilization and deployment of Enbridge's local Incident Management Team and a functioning command post employing the Incident Command System ("ICS") in 2017. The Second Modification requires that, in 2018, Enbridge conduct a

field exercise with equipment deployment at or near Cass Lake in accordance with the requirements of Subparagraph 115.a.

Enbridge fulfilled the functional exercise requirement of the Second Modification by conducting the Cass Lake Agreed Exercise on September 26 and 27, 2017. Details about the planning and implementation of the Cass Lake Agreed Exercise can be found in the first SAR. In accordance with Subparagraph 115.i, Enbridge submitted the Draft Cass Lake Agreed Exercise After Action Report to EPA on November 23, 2017. That After Action Report set forth Enbridge's findings and conclusions regarding the functional/command portion of the Cass Lake Agreed Exercise. EPA provided comments on the After Action Report on May 17, 2018.

In accordance with the Second Modification, Enbridge is conducting a field exercise with equipment deployment at Cass Lake on October 3, 2018. The first planning meeting for this exercise was held with federal, local and tribal representatives on May 10, 2018.

Des Plaines Agreed Exercise

In accordance with Subparagraph 115.b(2), Enbridge has scheduled the Des Plaines Agreed Exercise to occur on September 27, 2018. Planning for the Des Plaines Agreed Exercise was initiated in May 2017. In November 2017, and in accordance with Subparagraphs 115.d and 115.e(2), Enbridge sent 37 planning team invitations to local, state and federal representatives (including EPA, PHMSA, Area committee and Sub-Area committee representatives, but not to Tribes as the EPA confirmed to Enbridge that there are no Tribes in this area that are required to be notified under the CD) to attend planning meetings for the Des Plaines Agreed Exercise. In accordance with Subparagraph 115.e(1), the first planning meeting was held on November 21, 2017, more than 10 months before the Des Plaines Agreed Exercise is scheduled to take place. In accordance with Subparagraph 115.e(1), Enbridge has conducted two planning meetings for the exercise. In accordance with Subparagraph 115.e(3), Enbridge coordinated with the planning participants during the initial meeting to develop the objectives, scenario, and participant list for the Des Plaines Agreed Exercise. The specific dates of the planning meetings are as follows:

- Concept and Objectives on May 16, 2017;
- Initial Planning Meeting on November 21, 2017; and
- Mid-Planning Meeting on February 28, 2018.

Based on input provided by the initial planning meeting attendees, Enbridge prepared a draft exercise plan for the Des Plaines Agreed Exercise, which included: the scope, objectives, scenario, and participant list for the exercise. In accordance with Subparagraph 115.e(4), that Draft Agreed Exercise Plan was submitted to EPA for review and approval on December 21, 2017, nine months before the scheduled Agreed Exercise. Enbridge has submitted a second draft of the Agreed Exercise Plan to EPA, which satisfies/addresses the comments received from EPA in the January 3, 2018 letter to Enbridge.

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 during this reporting period:

- Neche, ND on January 31; and
- Nekoosa, WI on May 16.

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

- Wisconsin Rapids, WI on February 21;
- Fort Atkinson, WI on March 21;
- Plainfield, IL on April 4;
- Griffith, IN on April 11;
- Clearbrook, MN on April 25; and
- Marenisco, MI on May 22.

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. Each Field Exercise included the following:

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

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

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 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.

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 to community, state and local first responders listed in Appendix C, as well as first responders located within 5 miles of the exercise scenario. The invitations provided recipients with notice of the exercise at least four weeks prior to the date in which the exercise was to be conducted. The invitation also indicated that Enbridge would provide meals to persons who attended each exercise, and that the training would be provided at no cost to the invitees, excluding travel costs. Further, in accordance with Subparagraph 116.d, on December 20, 2017, Enbridge provided EPA with notice of all the Field and Table Top exercises to be conducted in 2018.

116.e [Community Outreach Sessions]

In accordance with Subparagraph 116.e, Enbridge conducted the following Community Outreach sessions during this reporting period:

- Hallock, MN on April 24;
- Thief River Falls, MN on April 25;
- Clearbrook, MN on April 26;
- Tonawanda, NY on May 15; and
- Bessemer, MI on May 22.

For the Community Outreach sessions identified above, a total of 16,719 invitations were sent to landowners, elected officials, media, the general public, and community leaders. Each Community Outreach session was conducted in an open-house format with manned booths that provided attendees with valuable information on pipeline operations, product information, safety, preventative maintenance, integrity, emergency response, public awareness, damage prevention / right-of-way, and Enbridge's involvement in local communities. The information conveyed at each of the Community Outreach sessions also included the following:

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

117 [Control Point Plans]

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

In accordance with Subparagraph 117.c, control points for the Straits of Mackinac were submitted to EPA on May 23, 2018. The control point information submitted to date by Enbridge to EPA was provided in the electronic formats that are specified in Subparagraph 117.e.

In accordance with Subparagraph 117.d, control points for the Wisconsin River Agreed Exercise were submitted to EPA on May 23, 2018. The control point information submitted to date by Enbridge to EPA was provided in the electronic formats that are specified in Subparagraph 117.e. The location for this exercise is that of a rural community with only one feasible facility to run the exercise. Enbridge had planned to run the exercise in October 2018 to align with the facility availability and to ensure control point submission requirements in the Consent Decree could be met. As per the request of the EPA, Enbridge advanced the Exercise date to mid-September to accommodate attendance from all parties.

In accordance with Subparagraph 117.g, Enbridge provided the USCG with requested control points for Rapid and Whitefish River on April 30, 2018.

118 [Response Time]

In accordance with Paragraph 118, Enbridge will conduct a review of Enbridge and Oil Spill Response Organization (“OSRO”) personnel and equipment available to respond to an oil spill from the Lakehead System within three years after the Effective Date of the Consent Decree.

119 [Coordination with Governmental Planners]

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

119.a [Planning Meeting Participation]

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

- Buffalo Area Committee Meeting on May 4;
- Detroit Sub-Area Committee Meeting on May 2;
- Duluth/Houghton Sub-Area Committee Meetings on April 10 and April 12; and
- Sault Ste. Marie Sub-Area Committee Meeting on January 4.

To date, Enbridge has not received an invitation to become an active member of the Area or Sub-Area Committees identified in Subparagraph 119.a.

119.b [Sub-Area Activities Participation]

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

119.b(1) [Field Exercise Participation]

Since the Effective Date of the Consent Decree, Enbridge has not received an invitation from a Sub-Area Committee to attend a Field Exercise. Thus, Enbridge had no obligation under Subparagraph 119.b(1) to attend a Sub-Area Committee Field Exercise during this reporting period.

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

Since the Effective Date of the Consent Decree, Enbridge has not received an invitation from a Sub-Area Committee to attend other training events. Thus, Enbridge had no obligation under Subparagraph 119.b(1) to attend Sub-Area Committee training events during this reporting period.

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 during this reporting period to meet and discuss response planning strategies to ensure consistency with the Area Plan. Thus, Enbridge had no obligation under Subparagraph 119.d to schedule and attend a meeting with EPA, PHMSA, USCG, tribal representatives, and/or state or local authorities 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, as explained in the first SAR.

119.h [Emergency Response Equipment]

Enbridge continues to maintain, in good working order, its prepositioned emergency response equipment and materials. During this reporting period, no equipment was used or expired and thus replacement of the materials was not warranted or required. To the extent that any modifications to inventories of prepositioned equipment are made, Enbridge will provide electronic written notices of those changes on an annual basis to EPA and the listed Area and Sub-Area Committees. The first of these modification reports will be submitted to EPA and the listed Area and Sub-Area Committees in September 2018.

119.i [Inland Spill Response Guide on Website]

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

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119.j [Inland Spill Response Guide to EPA]

EPA has not requested a copy of the "Inland Spill Response Guide." Enbridge will provide EPA with an electronic copy of that document, upon any future request by EPA.

119.k [Electronic Submittal of Documents]

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

120 [Incident Command System Training]

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

120.a [Incident Command System Training Requirements]

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

- Incident Commanders, Deputy Incident Commanders or Alternative Incident Commanders of any Regional Incident Management Team in any Lakehead ICP: ICS 100B - 400 and position- specific training;
- All other personnel listed as members of any Regional Incident Management Team in any Lakehead ICP: ICS 100B - 300 and position-specific training;
- Regional Emergency Response Coordinators: ICS 100B - 400 training;
- 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; and
- Any other manager or executive who give direction to field personnel, or is responsible for making funding, personnel, or resource decisions during a spill response (if ICS 100B – 400 has not been taken): ICS 402 training.

Changes to the Incident Management Team lists due to retirements, change of employment, etc. will result in additional training being conducted for any replacement personnel.

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

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

120.c [Training Requirements and Electronic Certification Documents]

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

Section I – New Remotely Controlled Valves

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

The Consent Decree requires that Enbridge install 14 remotely-controlled valves over the term of the Decree. During 2017, Enbridge installed and commissioned the first four of these 14 valves, as described below. Enbridge obtained all permits necessary to install the remotely-controlled valves identified below from the appropriate agencies.

Table 39: Planned Valve Installation Program Overview

Year	Quantity and Line Number	Milepost Number
2017 (Complete)	4 sites, Line 5	1473, 1487, 1601, 1715
2018 (In progress)	4 sites, Line 5	1416, 1518, 1429, 1621
2019	2 sites, Line 6A 2 sites, Line 14	427, 459 412, 430
2020	2 sites, Line 6A	80, 196

The valve installations completed in 2017 were installed at the milepost ("MP") locations specified under Paragraph 122. During this reporting period, the remotely-controlled valves at MPs 1601 and 1715 were successfully commissioned, on December 11, 2017. The remotely-controlled valves installed at MPs 1473 and 1487 were reported in the first SAR.

With respect to the remotely-controlled valves that are scheduled for installation in 2018, Enbridge completed the following activities during this reporting period: material procurement, submission of permit applications, receipt of all required permits, completion of construction specifications and drawings, completion of construction contract. Construction to install the remotely-controlled valves at MPs 1416 and 1518 commenced on May 15, 2018. Enbridge expects that all four remotely-controlled valves scheduled for installation in 2018 will be complete by October 17, 2018, and will be placed into commission by December 5, 2018. Additional information relative to the installation and commissioning of the remotely-controlled valves on Line 5 at MPs 1416, 1518, 1429 and 1621 will be provided in the third SAR.

123. [Enbridge Computer Modeling for Valve Locations]

The locations for the installation of all remotely-controlled valves, including those identified in the table above, were identified by conducting an analysis using Enbridge's Intelligent Valve Placement ("IVP") methodology. The objective and guiding principle of the IVP methodology is to reduce the maximum potential release volume as much as reasonably practicable in the unlikely event of a pipeline release. To achieve this, the entire pipeline route is modeled by taking into account: the topography of the right-of-way; the elevation profile of the pipeline;

the throughput and operating pressure of the pipeline; and the location of watercourses. The IVP methodology also considers potential impacts of a pipeline release on sensitive features, or HCAs, including highly populated areas, other populated areas, reservoirs holding water intended for human consumption, commercially navigable waterways, and environmentally sensitive areas. HCAs include those that are directly affected by the pipeline and those that are affected by a transport mechanism such as overland or terrain transport, spray, and water transport.

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

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

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

124. [Valve Design and Closure]

Prior to requisition of the valves for installation in 2017, Enbridge subject matter experts examined each step of the valve closure process including initiating of command, communication of command to the remote facility, energizing of the actuator, and mechanical process to fully close and seal the valve. Considerations were made for each of these steps leading up to the start of mechanical closure, and subtracted from the total allowable command-to-sealed requirement, and the valves were specified on the Purchase Order to the manufacturer to close within that remaining time. Enbridge also specified on the Inspection and Test Plan that a valve closure timing test will be completed on at least one valve of each size to verify actuator open and close time. Enbridge inspectors were present to witness the shop closure timing test and confirmed that the valves closed within the specified time, prior to shipment and delivery. During wet commissioning of the valves at MP 1601 and 1715, timing tests were conducted and both valves fully closed and sealed within three minutes of the operator engaging the valve-closure mechanism, complying with the Consent Decree requirement.

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

- Commissioning of Valves at MP 1601 and 1715
- Finalizing of construction punch list items for MP 1601 and 1715
- Completion of 2018 material procurement activities
- Final submittal of all environmental permit application for 2018 construction activities
- Completion of construction specifications and drawings for 2018 execution plan
- Completion of construction contract for 2018 execution plan
- Receipt of all approved environmental permits for 2018 construction activities
- Start of 2018 construction activities
- Submission of all permit applications and receipt of all permits as forecasted

As a condition of the environmental permits required for the remotely-controlled valves installed in 2017 at MPs 1473, 1487, 1601, 1715 on Line 5, the Environmental Inspector assigned by Enbridge is required to prepare weekly reports monitoring Enbridge's compliance with restoration status, and provide those reports to the County. The state agency (MDEQ) responsible for issuing the permit may request (but has not requested to date) to see copies of the reports. Enbridge will continue to prepare and submit the weekly reports until the County deems the monitoring to be complete, and the state agency considers the permit condition(s) to be fulfilled.

Section J – Independent Third Party Consent Decree Compliance Verification

As reported in the first SAR dated January 18, 2018, Enbridge retained O.B. Harris, LLC as the ITP on January 11, 2017 to conduct a comprehensive verification of Enbridge's compliance with the requirements set forth in Section VII (Injunctive Measures), except for subsection VII.H (Spill Response & Preparedness) which Paragraph 125 excludes from the verification activities that are required to be performed by the ITP. Therefore, Enbridge's obligations under Paragraphs 125, 127-132.a and 134 have been satisfied. Enbridge will continue to report on required updates and/or changes to this injunctive measure in future SARs.

126. [ITP Access to Enbridge Lakehead System]

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

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

In accordance with Paragraph 132, Enbridge continues to support the ITP in providing them additional information and responding to their requests to assist the ITP in completing the tasks required by Subparagraphs 132.b, c, d and e. Enbridge considers *Task 1 – Initial Project Planning Meeting with Region 5 in Chicago* to be complete and will no longer report on compliance with Subparagraph 132.a in future SARs.

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). The first such report is due in September 2018, and is outside the reporting date for this SAR. Enbridge will provide an update on the status of the ITP's written verification report in the third SAR.

134.l [General Requirements – ITP Annual Certification]

On January 4, 2018, the ITP provided its annual certification to the United States, verifying that it complies with the General Requirements of Subparagraph 132.l.

135. [Enbridge Enforcement of the Agreement]

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

136. [ITP Replacement]

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

IX. – Reporting Requirements

144. [SAR Requirements]

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

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

In many cases, the matters listed above have been provided above in sections of the Report that relate to specific Decree requirements. Immediately below in this section is a discussion of potential impacts associated with Point Pressure Restrictions (PPRs), which may arise in a wide variety of contexts based on current Consent Decree requirements. To avoid repetitive language in this SAR, Enbridge has outlined this concern per the below PPR discussion.

Point Pressure Restrictions (PPRs)

Section D of the Consent Decree references PRs, PPRs, and limited operating pressure in a large number of paragraphs, including: 33.c.2; 38.b; 38.b.1;38.b.2; 46.b; 46.c.3; 46.d; 46.e; 46.f; 46.g.1; 46.g.2.a; 46.g.2.b; 46.g.2.c; 46.h; 46.j; 46.k; 46.l; 46.m; 47; 48; 49.c.1.a; 49.c.1.c.2; 49d; 50; 50.b; 51; 52; 52.a; 52.b; 53.b; 53.d; 54; 55; 56; 57; 57.a; 57.b; 58; 59; 59.a; and 59.b.

Operability difficulties have been encountered due to the implementation of non-safety related 80% of last 60-day high point PRs as required under the Consent Decree. In particular (and as discussed by the Parties and the ITP on June 28, 2018), brief overpressures have occurred on Line 6A when trying to swing delivery points and when trying to restart the line in different configurations. Enbridge implemented all required PRs and remediated the associated features within required timelines. Remediation of the features and removal of the PPRs after the remediation excavations, remedied the operating difficulties.

A variety of transient events can result from abnormal operating conditions that can occur over the normal course of pipeline operations. Pipelines shipping non-compressible products are particularly susceptible to these types of

transient events when operating under temporary pressure restrictions. Temporary pressure restrictions are imposed for precautionary reasons. It is therefore recognized by all operators that controls and procedures are required to maintain pressure restriction scenarios. Pressure limits and continuous pressure monitoring are the main controls. Pressure limits are set with the consideration of how these transient events may impact the operating pressures on the system, ensuring operability while also managing operating pressures during normal operation to acceptable levels accounting for both design limits and temporary pressure restrictions. However, given the variety and uniqueness of abnormal operating events, and subsequent transient pressure conditions, the exceedance of temporary pressure restrictions can occur, lasting for at most one or two seconds. These transient events may result in proactive pipeline shutdowns which can be interpreted as an operational issue in accordance with P.144. These proactive shutdowns are part of Enbridge's protection system to ensure that pressure restrictions are maintained. In addition to continuous pressure limits, continuous pressure monitoring and proactive shutdowns, additional procedural controls exist to manage and maintain pressure restrictions and including the review of abnormal transient events operational considerations before restarting the line.

Based on current Consent Decree language, Enbridge will likely need to utilize Engineering Assessments or alternate plans, as provided for under Paragraph 46. to prevent future operability issues due to PPRs. Enbridge has been reluctant to use these items due to the prescriptive maximum number of forty Engineering Assessments allowed under the term of the Consent Decree.

Due to the hydraulic complexity of pipeline system operations, it can be difficult to fully assess the impact of severe PRs for all operating configurations within the timing of the Consent Decree. As a result, Enbridge has raised this issue with EPA and the ITP. Discussions regarding the issue are ongoing.

Reports to State Agencies

In June 2018, outside the period covered by this SAR, Enbridge submitted to the State of Michigan a series of reports regarding Line 5 at the Straits of Mackinac and, in one case, Line 5 water crossings in Michigan other than at the Straits, that were prepared pursuant to the November 2017 Agreement between Enbridge and the State of Michigan, and are not Consent Decree deliverables. These reports address alternative leak detection at the Straits (see paragraph 81-83 above); monitoring of the coating of the Dual Pipelines (see paragraph 69.c above); protection of the Dual Pipelines from vessel anchor strikes (see paragraph 68.a above); protection of Line 5 water crossings in Michigan other than at the Straits (see below) and alternatives for replacement of Line 5 (see below). Enbridge posted each of these Reports to its website and provided EPA with a copy of the reports for informational purposes on June 29, 2018, except the alternatives report which was provided to EPA on June 26, 2018.

The submission of several of these reports is noted above in connection with the discussion at Section E above. Two other reports submitted to the State, not referenced above, are as follows:

1. "Enhancing Safety and Reducing Potential Impacts at Line 5 water crossings." This report, submitted to the State on June 29, 2018, prioritizes Line 5 water crossings in Michigan other than the Straits and identifies measures to minimize the likelihood and/or consequences of release, as well an action plan and approximate timelines for implementation.

2. "Alternatives for Replacing Enbridge's Dual Line 5 pipelines crossing the Straits of Mackinac." This report, submitted to the State of Michigan on June 15, 2018, assesses the possibility of constructing a tunnel under the Straits for a new pipeline that would replace existing Line 5, as well as other replacement alternatives.

These reports are not Consent Decree deliverables and are provided for information purposes only.

In addition, as discussed in paragraph 69(c) above, Enbridge also submitted an Anchor Inspection Work Plan Interim Report to the State on January 16, 2018, and provided a copy of this Interim Report to EPA on March 2,

2018. This Interim Report was not a Consent Decree deliverable and is being noted here as a matter of information.

In addition, Enbridge submitted to various state agencies copies of reports prepared for EPA under the Consent Decree. Enbridge has indicated above where this occurred. For example, the submission of the Biota Work Plan to state agencies is noted in Paragraph 69.c above.

145. [Non-Compliance]

Line 6A FRE Placement on the Dig List Delay

After the Line 6A, AM-GT BH Gemini Caliper, which had a tool pull date of January 8, 2018, three FREs were issued to the Dig List four days later than the required Consent Decree timelines. The complexity and size of the overall dig program resulted in the delay of the issuance of the select features. The dig selection and approval date for the three digs are documented in the PI Listing. They include joints with Upstream Girth Weld numbers 57390, 86020 and 115870 (PPRs were not required for these features). The execution schedule for completing the integrity digs was not impacted by the delay in issuing the dig package. Enbridge believes that the processes currently implemented are appropriate to prevent reoccurrence. Enbridge has taken steps to review the requirements with the personnel implementing the Decree to ensure that this requirement, and the implementation processes are well understood.

Line 6A Pressure Restriction Implementation Delay

After the Line 6A, AM-GT BH Gemini MFL, which had a pull date of January 8, 2018, eight PPRs required on the joints with Upstream Girth Weld numbers 81970, 83110, 112360, 129350, 129910, 300010, 300310, and 303870, were not implemented until one day later than the requirements prescribed in the Consent Decree. Based on a date of discovery of Friday, May 11, 2018, the two calendar day milestone for implementation would fall on a Sunday; accordingly, the Consent Decree contemplates that the PPRs should have been implemented on the following business day, Monday, May 14, 2018. The PPR's instead were implemented on Tuesday, May 15, 2018. The cause of the delay was a misinterpretation of the Decree requirements, whereby the responsible personnel interpreted the requirements for PPR implementation to be two business days following date of discovery, as opposed to two calendar days. Enbridge has taken steps to review the requirements with the personnel implementing the Decree to ensure that this requirement, and the implementation processes are well understood.

146. [Discharges from a Lakehead System Pipeline]

Table 40 below identifies the one discharge from a Lakehead System Pipeline of one or more barrels of oil that occurred during the reporting period for this SAR, as well as any discharge of oil during the reporting period that reached any waterbody or waters of the United States or adjoining shoreline in a quantity as may be harmful. Enbridge has committed to report all Post Incident Reports that were not previously requested and provided during the current SAR reporting period. The reports at issue appear in Appendix 4.

Table 40: Discharges from a Lakehead System Pipeline	
Spill Date (MM/DD/YYYY)	3/23/2018
National Response Center #	Not Required
Spill Location	Superior, Douglas County, WI
MP#/Facility Name	Superior Terminal
Equipment or Line Number	Tank 21 Piping Flange
Cause of spill	Equipment Failure
Spill Material	Crude Oil
Quantity of Spill	2.00 Barrels
Distance Spill Travelled	50 feet
Sheen, Sludge or Emulsion Observed	Sludge
Name of Water that Spill Entered (if applicable)	Not Applicable
Water Quality Standard Exceeded/Violated	Not Applicable
Actions Taken or Planned to Address Spill	Tank line was shutdown. The flange connection was daylighted and torqued to current specifications using torqueing equipment on 3/23/18.
Actions Taken or Planned to Prevent Future Spills and Schedule for Future Actions	Pressure was reduced on connection. Flange studs were torqued to proper value. Area will be monitored at a minimum of twice per day for 2 months.
Environmental Impacts from Spill	Soil (Solely on Enbridge Property)
Root Cause	Non-threaded connection failure.

147. [Update on Discharges from a Lakehead System Pipeline reported in SAR 1, January 2018]

Updates to the discharges reported in the first SAR are italicized below.

Table 41: Discharges from a Lakehead System Pipeline			
Spill Date (MM/DD/YYYY)	07/13/2017	10/18/2017	11/14/2017
National Response Center #	1183969	1193571	Not Required
Spill Location	Mokena, Will County, IL	Griffith, Lake County, IN	Superior, Douglas County, WI
MP#/Facility Name	Mokena Station	Griffith Terminal	Superior Terminal
Equipment or Line Number	Line 14 Cross-Over Valve 461.17/6-XV-1	Booster Manifold 201 Bypass	Tank 45 Mixer
Cause of spill	Natural Force Damage (Frost Heave)	Corrosion	Equipment Failure
Spill Material	Crude Oil	Crude Oil	Crude Oil
Quantity of Spill	1.59 Barrels	10 Barrels	1.76 Barrels
Distance Spill Travelled	40 feet	720 feet	25 feet
Sheen, Sludge or Emulsion Observed	Sheen	Sludge	Sludge
Name of Water that Spill Entered (if applicable)	Enbridge owned retention pond	Not Applicable	Not Applicable
Water Quality Standard Exceeded/Violated	None	Not Applicable	Not Applicable
Actions Taken or Planned to Address Spill	Pipeline was shutdown	Affected pipe section was removed from Service	Affected mixer was taken out of service and locked out
Actions Taken or Planned to Prevent Future Spills and Schedule for Future Actions	Valve was repaired Project requested for replacing dike wall valve (outfall)	Determine if piping should be reinstalled	20 mixers on 5 tanks within the terminal were locked out until the investigation was complete. Mixer bearings were sent to the manufacturer for a failure analysis.

Table 41: Discharges from a Lakehead System Pipeline			
Final Actions Taken or Planned to Prevent Future Spills and Schedule for Future Actions	*Dike wall valve was replaced*	No further action warranted	*Analysis of 3 functional bearings that saw near-identical runtime and operating conditions indicated no signs of abnormal wear, suggesting a one-off failure.* *Vibration sensors are being evaluated to monitor these 19 mixers and mitigate risk of future releases. Enbridge will determine what, if any, next steps are required at the conclusion of this evaluation.*
Environmental Impacts from Spill	Soil, vegetation and surface water	Soil (Solely on Enbridge Property)	Gravel and clay road fill (Solely on Enbridge Property)
Preliminary Root Cause	Frost heave	Internal corrosion	Mixer seal leak due to improper belt tension
Final Root Cause	No change	No change	*Mixer leak due to compromised shaft bearing, leading to complete bearing failure and subsequent damage to sealing components of mixer.*

148. [Copies of all Post Incident Reports]

See Appendix 4.

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

FOR DEFENDANTS:

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

REDACTED

FOR DEFENDANTS:

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

REDACTED

ENBRIDGE

Appendix 1 – Lakehead Leak Alarm Report [108,110,111]

Reporting Period: November 23, 2017 to May 22, 2018

ENBRIDGE

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 May 25, 2018

For reporting period November 23, 2017 to May 22, 2018

Purpose of the Document

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

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

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

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

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

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

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

Terms of Reference

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

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

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

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

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

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

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

Vice President, Pipeline Control

REDACTED

1. Summary of Alarms (“SOA”)

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

Table 1a: Description of fields in this Report

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

Table 1b: Summary of Alarms (Reporting Period: November 23, 2017 to May 22, 2018)

Pipeline	Total Alarms	Total Non-Compliance (Alarming)	Total Non-Compliance (Non-Alarming)	Reasons and Corrective Actions for each Non-Compliance
01	9	0	0	
02	22	0	0	
03	26	0	0	
04	15	0	0	
05	54	0	0	
06A	9	0	0	
10	11	0	0	
14	27	0	0	
61	10	0	0	
62	0	0	0	
64	0	0	0	

Pipeline	Total Alarms	Total Non-Compliance (Alarming)	Total Non-Compliance (Non-Alarming)	Reasons and Corrective Actions for each Non-Compliance
65	2	0	0	
67	2	0	0	
78	19	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 time 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	2018-02-16 07:28:35
MBS Alarm Received Time **MBS Alarm Assessed Time**	2018-02-16 07:28:35 2018-02-16 07:49:25
Root Cause	LDS Error
CRO and STA Actions	LDAM - Leak Detection System (LDS) Alarm - Flowing Pipeline
LDA Actions	LD - MBS - Leak Alarm
Shutdown Commenced	2018-02-16 07:39:08*
Shutdown Completed	2018-02-16 07:53:24
Justification for Resumption	After shutdown, alarm deemed invalid following LDA investigation and CCO investigation identified no leak triggers
Startup Commenced	2018-02-16 08:31:18
Were Procedures Followed	Yes
Post Incident Report	

*Each alarm is assessed individually and shutdown is commenced within the 10-minute rule. An in-depth explanation and walk through of the 10-minute rule was provided to the ITP on September 28, 2017 and January 25, 2018.

Pipeline	02
Alarming Event Start Time	2018-03-15 12:08:34
MBS Alarm Received Time **MBS Alarm Assessed Time** **MBS Alarm Received Time** **MBS Alarm Assessed Time** **MBS Alarm Received Time** **MBS Alarm Assessed Time**	2018-03-15 12:08:34 2018-03-15 12:12:51 2018-03-15 12:08:34 2018-03-15 12:12:45 2018-03-15 12:10:04 2018-03-15 12:12:41
Root Cause	Fluid Loss
CRO and STA Actions	LDAM - Leak Detection System (LDS) Alarm - Flowing Pipeline
LDA Actions	LD - MBS - Leak Alarm
Shutdown Commenced	2018-03-15 12:10:16
Shutdown Completed	2018-03-15 12:32:47
Justification for Resumption	Authorized Fluid Withdrawal Test
Startup Commenced	2018-03-15 13:30:15
Were Procedures Followed	Yes
Post Incident Report	

Pipeline	03
Alarming Event Start Time	2017-12-17 17:46:04
MBS Alarm Received Time **MBS Alarm Assessed Time** **MBS Alarm Received Time** **MBS Alarm Assessed Time**	2017-12-17 17:46:04 2017-12-17 20:35:33 2017-12-17 17:53:34 2017-12-17 20:35:31
Root Cause	LDS Error
CRO and STA Actions	LDAM - Leak Detection System (LDS) Alarm - Flowing Pipeline
LDA Actions	LD - MBS - Leak Alarm
Shutdown Commenced	2017-12-17 17:56:42*
Shutdown Completed	2017-12-17 18:16:24
Justification for Resumption	After shutdown, alarm deemed invalid following LDA investigation and CCO investigation identified no leak triggers CCO investigation identified no leak triggers - Regional and CCO admin approvals granted [RETIRED 2018-01-31] CCO approval obtained by Emergency Notification Procedure NOTE: "RETIRED" indicates that the justification was updated with better wordings as of the date specified.
Startup Commenced	2017-12-17 21:55:00
Were Procedures Followed	Yes
Post Incident Report	

*Each alarm is assessed individually and shutdown is commenced within the 10-minute rule. An in-depth explanation and walk through of the 10-minute rule was provided to the ITP on September 28, 2017 and January 25, 2018.

Pipeline	03
Alarming Event Start Time	2017-12-27 09:02:11
MBS Alarm Received Time **MBS Alarm Assessed Time**	2017-12-27 09:02:11 2017-12-27 09:16:17
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	2017-12-27 10:00:00
Were Procedures Followed	Yes
Post Incident Report	

Pipeline	04
Alarming Event Start Time	2017-11-28 17:49:50
MBS Alarm Received Time **MBS Alarm Assessed Time**	2017-11-28 17:49:50 2017-11-28 18:04:41
Root Cause	Column Separation
CRO and STA Actions	LDAM - Leak Detection System (LDS) Alarm - Non-Flowing Pipeline
LDA Actions	LD - MBS - Leak Alarm
Shutdown Commenced	Not Applicable - pipeline was already Shutdown and Sectionalized
Shutdown Completed	Not Applicable - pipeline was already Shutdown and Sectionalized
Justification for Resumption	After shutdown, alarm deemed valid following LDA investigation. Column separation investigated by CCO with no unexplained leak triggers
Startup Commenced	2017-11-28 21:15:28
Were Procedures Followed	Yes
Post Incident Report	

Pipeline	04
Alarming Event Start Time	2017-11-28 20:15:16
MBS Alarm Received Time **MBS Alarm Assessed Time**	2017-11-28 20:15:16 2017-11-28 20:18:41
Root Cause	Column Separation
CRO and STA Actions	LDAM - Leak Detection System (LDS) Alarm - Non-Flowing Pipeline
LDA Actions	LD - MBS - Leak Alarm
Shutdown Commenced	Not Applicable - pipeline was already Shutdown and Sectionalized
Shutdown Completed	Not Applicable - pipeline was already Shutdown and Sectionalized
Justification for Resumption	After shutdown, alarm deemed valid following LDA investigation. Column separation investigated by CCO with no unexplained leak triggers
Startup Commenced	2017-11-28 21:15:13
Were Procedures Followed	Yes
Post Incident Report	

Pipeline	04
Alarming Event Start Time	2017-11-28 21:02:20
MBS Alarm Received Time **MBS Alarm Assessed Time**	2017-11-28 21:02:20 2017-11-28 21:10:26
Root Cause	Column Separation
CRO and STA Actions	Leak Detection System (LDS) Alarm - Non-Flowing Pipeline - LDAM Unavailable
LDA Actions	LD - MBS - Leak Alarm
Shutdown Commenced	2017-11-28 21:02:21
Shutdown Completed	2017-11-28 21:18:05
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	2017-11-28 23:15:40
Were Procedures Followed	Yes
Post Incident Report	

Pipeline	05
Alarming Event Start Time	2017-12-16 17:46:28
MBS Alarm Received Time **MBS Alarm Assessed Time** **MBS Alarm Received Time** **MBS Alarm Assessed Time**	2017-12-16 17:46:28 2017-12-16 18:45:55 2017-12-16 17:49:58 2017-12-16 18:45:57
Root Cause	Communication Interruption
CRO and STA Actions	LDAM - Leak Detection System (LDS) Alarm - Flowing Pipeline
LDA Actions	LD - MBS - Leak Alarm
Shutdown Commenced	2017-12-16 17:49:11
Shutdown Completed	2017-12-16 18:05:01
Justification for Resumption	After shutdown, alarm deemed invalid following LDA investigation and CCO investigation identified no leak triggers
Startup Commenced	2017-12-16 19:43:15
Were Procedures Followed	Yes
Post Incident Report	

Pipeline	05
Alarming Event Start Time	2017-12-31 05:54:05
MBS Alarm Received Time **MBS Alarm Assessed Time**	2017-12-31 05:54:05 2017-12-31 06:04:09
Root Cause	Transient Condition
CRO and STA Actions	LDAM - Leak Detection System (LDS) Alarm - Non-Flowing Pipeline
LDA Actions	LD - MBS - Leak Alarm
Shutdown Commenced	Not Applicable - pipeline was already Shutdown and Sectionalized
Shutdown Completed	Not Applicable - pipeline was already Shutdown and Sectionalized
Justification for Resumption	CCO investigation identified no leak triggers - Regional and CCO admin approvals granted
Startup Commenced	2017-12-31 08:00:00
Were Procedures Followed	Yes
Post Incident Report	

Pipeline	05
Alarming Event Start Time	2018-02-06 09:58:36
MBS Alarm Received Time **MBS Alarm Assessed Time**	2018-02-06 09:58:36 2018-02-06 10:02:59
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	2018-02-06 10:20:00
Were Procedures Followed	Yes
Post Incident Report	

Pipeline	05
Alarming Event Start Time	2018-04-16 09:36:15
MBS Alarm Received Time **MBS Alarm Assessed Time** **MBS Alarm Received Time** **MBS Alarm Assessed Time**	2018-04-16 09:36:15 2018-04-16 09:43:56 2018-04-16 09:36:15 2018-04-16 09:43:58
Root Cause	Transient Condition
CRO and STA Actions	LDAM - Leak Detection System (LDS) Alarm - Flowing Pipeline
LDA Actions	LD - MBS - Leak Alarm
Shutdown Commenced	2018-04-16 09:30:57 NOTE: Line 5 was in the process of shutting down when the alarm was generated. The Shutdown Commenced time identifies when the shutdown was initiated.
Shutdown Completed	2018-04-16 09:52:58
Justification for Resumption	CCO investigation identified no leak triggers - Regional and CCO admin approvals granted
Startup Commenced	2018-04-16 12:15:00
Were Procedures Followed	Yes
Post Incident Report	

Pipeline	06A
Alarming Event Start Time	2017-11-28 11:35:45
MBS Alarm Received Time **MBS Alarm Assessed Time** **MBS Alarm Received Time** **MBS Alarm Assessed Time** **MBS Alarm Received Time** **MBS Alarm Assessed Time** **MBS Alarm Received Time** **MBS Alarm Assessed Time**	2017-11-28 11:35:45 2017-11-28 11:48:28 2017-11-28 11:35:45 2017-11-28 11:48:30 2017-11-28 11:37:45 2017-11-28 11:48:42 2017-11-28 11:37:45 2017-11-28 11:48:44
Root Cause	LDS Error
CRO and STA Actions	LDAM - Leak Detection System (LDS) Alarm - Flowing Pipeline
LDA Actions	LD - MBS - Leak Alarm
Shutdown Commenced	2017-11-28 11:46:04*
Shutdown Completed	2017-11-28 12:05:58
Justification for Resumption	After shutdown, alarm deemed invalid following LDA investigation and CCO investigation identified no leak triggers
Startup Commenced	2017-11-28 12:46:13
Were Procedures Followed	Yes
Post Incident Report	

*Each alarm is assessed individually and shutdown is commenced within the 10-minute rule. An in-depth explanation and walk through of the 10-minute rule was provided to the ITP on September 28, 2017 and January 25, 2018.

Pipeline	06A
Alarming Event Start Time	2018-04-27 05:58:07
MBS Alarm Received Time **MBS Alarm Assessed Time**	2018-04-27 05:58:07 2018-04-27 06:02:26
Root Cause	Column Separation
CRO and STA Actions	LDAM - Leak Detection System (LDS) Alarm - Non-Flowing Pipeline
LDA Actions	LD - MBS - Leak Alarm
Shutdown Commenced	Not Applicable - pipeline was already Shutdown and Sectionalized
Shutdown Completed	Not Applicable - pipeline was already Shutdown and Sectionalized
Justification for Resumption	After shutdown, alarm deemed valid following LDA investigation. Column separation investigated by CCO with no unexplained leak triggers
Startup Commenced	2018-04-27 08:00:11
Were Procedures Followed	Yes
Post Incident Report	

Pipeline	10
Alarming Event Start Time	2018-03-14 10:19:26
MBS Alarm Received Time **MBS Alarm Assessed Time** **MBS Alarm Received Time** **MBS Alarm Assessed Time** **MBS Alarm Received Time** **MBS Alarm Assessed Time**	2018-03-14 10:19:26 2018-03-14 10:34:17 2018-03-14 10:20:26 2018-03-14 10:34:19 2018-03-14 10:20:56 2018-03-14 10:34:21
Root Cause	SCADA Problem
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	2018-03-19 06:00:00
Were Procedures Followed	Yes
Post Incident Report	

Pipeline	10
Alarming Event Start Time	2018-05-17 05:32:48
MBS Alarm Received Time **MBS Alarm Assessed Time** **MBS Alarm Received Time** **MBS Alarm Assessed Time** **MBS Alarm Received Time** **MBS Alarm Assessed Time**	2018-05-17 05:32:48 2018-05-17 05:39:03 2018-05-17 05:42:47 2018-05-17 05:52:38 2018-05-17 05:43:18 2018-05-17 05:52:36
Root Cause	Transient Condition
CRO and STA Actions	LDAM - Leak Detection System (LDS) Alarm - Non-Flowing Pipeline
LDA Actions	LD - MBS - Leak Alarm
Shutdown Commenced	Not Applicable - pipeline was already Shutdown and Sectionalized
Shutdown Completed	Not Applicable - pipeline was already Shutdown and Sectionalized
Justification for Resumption	CCO investigation identified no leak triggers - Regional and CCO admin approvals granted
Startup Commenced	2018-05-17 07:50:48
Were Procedures Followed	Yes
Post Incident Report	

Pipeline	14
Alarming Event Start Time	2017-12-01 16:17:12
MBS Alarm Received Time **MBS Alarm Assessed Time** **MBS Alarm Received Time** **MBS Alarm Assessed Time** **MBS Alarm Received Time** **MBS Alarm Assessed Time** **MBS Alarm Received Time** **MBS Alarm Assessed Time**	2017-12-01 16:17:12 2017-12-01 16:27:13 2017-12-01 16:17:12 2017-12-01 16:27:20 2017-12-01 16:19:40 2017-12-01 16:27:21 2017-12-01 16:19:40 2017-12-01 16:27:23
Root Cause	Transient Condition
CRO and STA Actions	LDAM - Leak Detection System (LDS) Alarm - Flowing Pipeline
LDA Actions	LD - MBS - Leak Alarm
Shutdown Commenced	2017-12-01 16:20:50
Shutdown Completed	2017-12-01 16:46:17
Justification for Resumption	Aerial Patrol Performed - Regional and CCO admin approvals granted
Startup Commenced	2017-12-02 10:16:53
Were Procedures Followed	Yes
Post Incident Report	

Pipeline	14
Alarming Event Start Time	2017-12-23 12:39:53
MBS Alarm Received Time **MBS Alarm Assessed Time** **MBS Alarm Received Time** **MBS Alarm Assessed Time** **MBS Alarm Received Time** **MBS Alarm Assessed Time** **MBS Alarm Received Time** **MBS Alarm Assessed Time**	2017-12-23 12:39:53 2017-12-23 17:21:39 2017-12-23 12:50:27 2017-12-23 17:21:36 2017-12-23 13:00:54 2017-12-23 17:21:33 2017-12-23 13:13:00 2017-12-23 17:21:31
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	2017-12-23 21:33:02
Were Procedures Followed	Yes
Post Incident Report	

Pipeline	14
Alarming Event Start Time	2018-01-02 04:29:27
MBS Alarm Received Time **MBS Alarm Assessed Time**	2018-01-02 04:29:27 2018-01-02 04:37:59
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	CCO investigation identified no leak triggers - Regional and CCO admin approvals granted Visual inspection performed by field staff - Regional and CCO Admin approvals granted [RETIRED 2018-01-31] CCO approval obtained by Emergency Notification Procedure NOTE: "RETIRED" indicates that the justification was updated with better wordings as of the date specified.
Startup Commenced	2018-01-02 10:50:04
Were Procedures Followed	Yes
Post Incident Report	

Pipeline	14
Alarming Event Start Time	2018-01-16 07:22:27
MBS Alarm Received Time **MBS Alarm Assessed Time** **MBS Alarm Received Time** **MBS Alarm Assessed Time** **MBS Alarm Received Time** **MBS Alarm Assessed Time**	2018-01-16 07:22:27 2018-01-16 08:01:20 2018-01-16 07:31:26 2018-01-16 08:01:22 2018-01-16 08:20:29 2018-01-16 08:21:30
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	2018-01-16 08:20:13
Were Procedures Followed	Yes
Post Incident Report	

Pipeline	14
Alarming Event Start Time	2018-01-24 08:18:14
MBS Alarm Received Time **MBS Alarm Assessed Time** **MBS Alarm Received Time** **MBS Alarm Assessed Time** **MBS Alarm Received Time** **MBS Alarm Assessed Time** **MBS Alarm Received Time** **MBS Alarm Assessed Time** **MBS Alarm Received Time** **MBS Alarm Assessed Time** **MBS Alarm Received Time** **MBS Alarm Assessed Time**	2018-01-24 08:18:14 2018-01-24 08:29:37 2018-01-24 08:18:14 2018-01-24 08:29:35 2018-01-24 08:20:16 2018-01-24 08:29:47 2018-01-24 08:21:14 2018-01-24 08:29:32 2018-01-24 09:21:32 2018-01-24 09:26:23 2018-01-24 09:21:32 2018-01-24 09:26:20
Root Cause	Column Separation NOTE: A column separation already existed on the pipeline prior to the start up. The alarms were received during the startup and assessed by the ART. Based on the assessment, the aerial patrol was completed.
CRO and STA Actions	LDAM - Leak Detection System (LDS) Alarm - Flowing Pipeline
LDA Actions	LD - MBS - Leak Alarm
Shutdown Commenced	2018-01-24 08:19:59
Shutdown Completed	2018-01-24 08:20:55
Justification for Resumption	Aerial Patrol Performed - Regional and CCO admin approvals granted
Startup Commenced	2018-01-24 14:05:00
Were Procedures Followed	Yes
Post Incident Report	

Pipeline	14
Alarming Event Start Time	2018-02-23 21:33:41
RDS Alarm Received Time **RDS Alarm Assessed Time**	2018-02-23 21:33:41 2018-02-23 21:51:12
Root Cause	Transient Condition NOTE: A unit failure was the cause of this RDS alarm and it was investigated at the field level as part of the root cause investigation. The alarm was assessed by ART along with the aerial patrol.
CRO and STA Actions	Rupture Detection Alarm - Pipeline
LDA Actions	LD - RDS - Rupture Alarm
Shutdown Commenced	2018-02-23 21:33:40
Shutdown Completed	2018-02-23 21:52:06 NOTE: Line 14 was shut down automatically by the RDS system.
Justification for Resumption	Aerial Patrol Performed - Regional and CCO admin approvals granted
Startup Commenced	2018-02-24 12:41:56
Were Procedures Followed	Yes
Post Incident Report	

Pipeline	14
Alarming Event Start Time	2018-02-24 12:50:23
MBS Alarm Received Time **MBS Alarm Assessed Time** **MBS Alarm Received Time** **MBS Alarm Assessed Time** **MBS Alarm Received Time** **MBS Alarm Assessed Time**	2018-02-24 12:50:23 2018-02-24 12:57:13 2018-02-24 12:50:53 2018-02-24 12:57:14 2018-02-24 12:52:53 2018-02-24 12:57:11
Root Cause	Column Separation
CRO and STA Actions	LDAM - Leak Detection System (LDS) Alarm - Flowing Pipeline
LDA Actions	LD - MBS - Leak Alarm
Shutdown Commenced	2018-02-24 12:50:00 NOTE: Line 14 was in the process of shutting down when the alarm was generated. The Shutdown Commenced time identifies when the shutdown was initiated.
Shutdown Completed	2018-02-24 12:51:50
Justification for Resumption	After shutdown, alarm deemed valid following LDA investigation. Column separation investigated by CCO with no unexplained leak triggers CCO investigation identified no leak triggers - Regional and CCO admin approvals granted
Startup Commenced	2018-02-24 14:40:00
Were Procedures Followed	Yes
Post Incident Report	

Pipeline	14
Alarming Event Start Time	2018-03-07 08:25:29
MBS Alarm Received Time **MBS Alarm Assessed Time**	2018-03-07 08:25:29 2018-03-07 08:47:46
Root Cause	Transient Condition
CRO and STA Actions	LDAM - Leak Detection System (LDS) Alarm - Flowing Pipeline
LDA Actions	LD - MBS - Leak Alarm
Shutdown Commenced	2018-03-07 08:21:00 NOTE: Line 14 was in the process of shutting down when the alarm was generated. The Shutdown Commenced time identifies when the shutdown was initiated.
Shutdown Completed	2018-03-07 08:50:00
Justification for Resumption	CCO investigation identified no leak triggers - Regional and CCO admin approvals granted
Startup Commenced	2018-03-07 11:10:19
Were Procedures Followed	Yes
Post Incident Report	

Pipeline	14
Alarming Event Start Time	2018-03-22 07:02:23
MBS Alarm Received Time **MBS Alarm Assessed Time**	2018-03-22 07:02:23 2018-03-22 07:13:08
Root Cause	Transient Condition
CRO and STA Actions	LDAM - Leak Detection System (LDS) Alarm - Flowing Pipeline
LDA Actions	LD - MBS - Leak Alarm
Shutdown Commenced	2018-03-22 06:59:18 NOTE: Line 14 was in the process of shutting down when the alarm was generated. The Shutdown Commenced time identifies when the shutdown was initiated.
Shutdown Completed	2018-03-22 07:04:54
Justification for Resumption	CCO investigation identified no leak triggers - Regional and CCO admin approvals granted
Startup Commenced	2018-03-22 14:15:03
Were Procedures Followed	Yes
Post Incident Report	

Pipeline	61
Alarming Event Start Time	2018-01-19 07:55:22
MBS Alarm Received Time **MBS Alarm Assessed Time**	2018-01-19 07:55:22 2018-01-19 12:53:39
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 CCO investigation identified no leak triggers - Regional and CCO admin approvals granted
Startup Commenced	2018-01-19 18:40:50
Were Procedures Followed	Yes
Post Incident Report	

Pipeline	61
Alarming Event Start Time	2018-01-19 08:36:33
MBS Alarm Received Time **MBS Alarm Assessed Time** **MBS Alarm Received Time** **MBS Alarm Assessed Time** **MBS Alarm Received Time** **MBS Alarm Assessed Time**	2018-01-19 08:36:33 2018-01-19 08:41:07 2018-01-19 08:37:33 2018-01-19 08:41:09 2018-01-19 08:45:02 2018-01-19 08:46:38
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	2018-01-19 18:40:05
Were Procedures Followed	Yes
Post Incident Report	

Pipeline	61
Alarming Event Start Time	2018-01-19 16:29:33
MBS Alarm Received Time **MBS Alarm Assessed Time**	2018-01-19 16:29:33 2018-01-19 17:18:33
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	2018-01-19 18:40:22
Were Procedures Followed	Yes
Post Incident Report	

Pipeline	61
Alarming Event Start Time	2018-03-07 08:25:38
MBS Alarm Received Time **MBS Alarm Assessed Time**	2018-03-07 08:25:38 2018-03-07 08:48:17
Root Cause	Transient Condition
CRO and STA Actions	LDAM - Leak Detection System (LDS) Alarm - Flowing Pipeline
LDA Actions	LD - MBS - Leak Alarm
Shutdown Commenced	2018-03-07 08:21:00 NOTE: Line 61 was in the process of shutting down when the alarm was generated. The Shutdown Commenced time identifies when the shutdown was initiated.
Shutdown Completed	2018-03-07 08:42:00
Justification for Resumption	CCO investigation identified no leak triggers - Regional and CCO admin approvals granted
Startup Commenced	2018-03-07 11:10:04
Were Procedures Followed	Yes
Post Incident Report	

Pipeline	78
Alarming Event Start Time	2017-11-30 01:12:58
MBS Alarm Received Time **MBS Alarm Assessed Time** **MBS Alarm Received Time** **MBS Alarm Assessed Time**	2017-11-30 01:12:58 2017-11-30 01:23:30 2017-11-30 01:12:58 2017-11-30 01:22:30
Root Cause	Communication Interruption
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	2017-11-30 01:45:00
Were Procedures Followed	Yes
Post Incident Report	

Pipeline	78
Alarming Event Start Time	2017-12-02 12:27:29
MBS Alarm Received Time **MBS Alarm Assessed Time**	2017-12-02 12:27:29 2017-12-02 12:53:04
Root Cause	LDS Error
CRO and STA Actions	LDAM - Leak Detection System (LDS) Alarm - Flowing Pipeline
LDA Actions	LD - MBS - Leak Alarm
Shutdown Commenced	2017-12-02 12:30:47
Shutdown Completed	2017-12-02 12:50:21
Justification for Resumption	After shutdown, alarm deemed invalid following LDA investigation and CCO investigation identified no leak triggers
Startup Commenced	2017-12-02 14:00:53
Were Procedures Followed	Yes
Post Incident Report	

Pipeline	78
Alarming Event Start Time	2017-12-06 11:00:32
MBS Alarm Received Time **MBS Alarm Assessed Time**	2017-12-06 11:00:32 2017-12-06 11:05:21
MBS Alarm Received Time **MBS Alarm Assessed Time**	2017-12-06 13:22:10 2017-12-06 13:24:08
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	2017-12-06 13:30:34
Were Procedures Followed	Yes
Post Incident Report	

Pipeline	78
Alarming Event Start Time	2018-04-19 22:48:28
MBS Alarm Received Time **MBS Alarm Assessed Time**	2018-04-19 22:48:28 2018-04-19 22:54:16
MBS Alarm Received Time **MBS Alarm Assessed Time**	2018-04-19 23:19:59 2018-04-19 23:23:28
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	2018-04-20 03:00:58
Were Procedures Followed	Yes
Post Incident Report	

Pipeline	78
Alarming Event Start Time	2018-05-08 15:01:10
MBS Alarm Received Time **MBS Alarm Assessed Time** **MBS Alarm Received Time** **MBS Alarm Assessed Time**	2018-05-08 15:01:10 2018-05-08 15:09:51 2018-05-08 15:02:10 2018-05-08 15:09:52
Root Cause	Transient Condition
CRO and STA Actions	LDAM - Leak Detection System (LDS) Alarm - Flowing Pipeline
LDA Actions	LD - MBS - Leak Alarm
Shutdown Commenced	2018-05-08 14:59:55 NOTE: Line 78 was in the process of shutting down when the alarm was generated. The Shutdown Commenced time identifies when the shutdown was initiated.
Shutdown Completed	2018-05-08 15:21:19
Justification for Resumption	CCO investigation identified no leak triggers - Regional and CCO admin approvals granted
Startup Commenced	2018-05-09 13:00:00
Were Procedures Followed	Yes
Post Incident Report	

3. Weekly List of Alarms (“WLOA”)

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

Table 3a: Description of fields in this Report

Data	Description
Week	ISO 8601 week date label to identify the week in the “weekly” list of alarms.
Pipeline	Name (number) of the pipeline.
Type	Type of alarm (AVB, MBS or RDS): • AVB are 1-hour or 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

2017 Week 47: 2 Alarming Events in total

Pipeline	Alarming Event Start Time	Type	Alarm Received Time	Alarm Assessed Time	Alarm Cleared Time	Shutdown Required
01	2017-11-24 23:30:00	MBS	2017-11-24 23:30:00	2017-11-24 23:38:35	2017-11-24 23:38:35	No
		MBS	2017-11-24 23:30:31	2017-11-24 23:38:38	2017-11-24 23:38:38	
		MBS	2017-11-24 23:31:00	2017-11-24 23:38:27	2017-11-24 23:38:27	
04	2017-11-26 16:01:43	AVB	2017-11-26 16:01:43	2017-11-26 16:07:12	2017-11-26 16:07:12	No

2017 Week 48: 18 Alarming Events in total

Pipeline	Alarming Event Start Time	Type	Alarm Received Time	Alarm Assessed Time	Alarm Cleared Time	Shutdown Required
02	2017-11-29 03:37:18	MBS	2017-11-29 03:37:18	2017-11-29 03:46:46	2017-11-29 03:46:46	No
		MBS	2017-11-29 03:43:47	2017-11-29 03:47:14	2017-11-29 03:47:14	
03	2017-11-29 12:25:04	MBS	2017-11-29 12:25:04	2017-11-29 12:28:47	2017-11-29 12:28:47	No
		MBS	2017-11-29 12:32:06	2017-11-29 12:38:09	2017-11-29 12:38:09	
04	2017-11-28 17:49:50	MBS	2017-11-28 17:49:50	2017-11-28 18:04:41	2017-11-28 20:55:11	Yes
04	2017-11-28 20:15:16	MBS	2017-11-28 20:15:16	2017-11-28 20:18:41	2017-11-28 20:55:45	Yes
04	2017-11-28 21:02:20	MBS	2017-11-28 21:02:20	2017-11-28 21:10:26	2017-11-28 22:53:24	Yes
04	2017-11-30 08:01:49	AVB	2017-11-30 08:01:49	2017-11-30 08:04:26	2017-11-30 08:04:26	No
05	2017-11-27 20:23:00	MBS	2017-11-27 20:23:00	2017-11-27 20:32:37	2017-11-27 20:32:37	No
		MBS	2017-11-27 20:25:07	2017-11-27 20:32:37	2017-11-27 20:32:37	
05	2017-11-29 21:43:15	MBS	2017-11-29 21:43:15	2017-11-29 21:51:04	2017-11-29 21:51:04	No
		MBS	2017-11-29 21:44:44	2017-11-29 21:51:06	2017-11-29 21:51:06	
		MBS	2017-11-29 21:45:44	2017-11-29 21:52:59	2017-11-29 21:52:59	
06A	2017-11-28 11:35:45	MBS	2017-11-28 11:35:45	2017-11-28 11:48:28	2017-11-28 11:55:00	Yes
		MBS	2017-11-28 11:35:45	2017-11-28 11:48:30	2017-11-28 11:55:00	
		MBS	2017-11-28 11:37:45	2017-11-28 11:48:42	2017-11-28 11:55:00	
		MBS	2017-11-28 11:37:45	2017-11-28 11:48:44	2017-11-28 11:55:00	
10	2017-11-27 09:50:23	MBS	2017-11-27 09:50:23	2017-11-27 09:53:21	2017-11-27 09:53:21	No
		MBS	2017-11-27 09:50:23	2017-11-27 09:53:26	2017-11-27 09:53:26	
14	2017-12-01 16:17:12	MBS	2017-12-01 16:17:12	2017-12-01 16:27:13	2017-12-02 09:56:39	Yes
		MBS	2017-12-01 16:17:12	2017-12-01 16:27:20	2017-12-02 09:56:39	
		MBS	2017-12-01 16:19:40	2017-12-01 16:27:21	2017-12-02 09:56:39	
		MBS	2017-12-01 16:19:40	2017-12-01 16:27:23	2017-12-02 09:56:39	
14	2017-12-02 04:18:26	MBS	2017-12-02 04:18:26	2017-12-02 04:25:50	2017-12-02 04:25:50	No
		MBS	2017-12-02 04:18:57	2017-12-02 04:25:49	2017-12-02 04:25:49	

Pipeline	Alarming Event Start Time	Type	Alarm Received Time	Alarm Assessed Time	Alarm Cleared Time	Shutdown Required
14	2017-12-02 10:23:57	MBS	2017-12-02 10:23:57	2017-12-02 10:29:47	2017-12-02 10:29:47	No
		MBS	2017-12-02 10:23:57	2017-12-02 10:29:48	2017-12-02 10:29:48	
14	2017-12-02 10:34:30	MBS	2017-12-02 10:34:30	2017-12-02 10:41:38	2017-12-02 10:41:38	No
		MBS	2017-12-02 10:34:30	2017-12-02 10:41:39	2017-12-02 10:41:39	
		MBS	2017-12-02 10:34:30	2017-12-02 10:41:40	2017-12-02 10:41:40	
78	2017-11-27 14:49:45	MBS	2017-11-27 14:49:45	2017-11-27 14:53:55	2017-11-27 14:53:55	No
78	2017-11-30 01:12:58	MBS	2017-11-30 01:12:58	2017-11-30 01:23:30	2017-11-30 01:45:00	Yes
		MBS	2017-11-30 01:12:58	2017-11-30 01:22:30	2017-11-30 01:45:00	
78	2017-11-30 03:47:22	MBS	2017-11-30 03:47:22	2017-11-30 03:54:23	2017-11-30 03:54:23	No
		MBS	2017-11-30 03:47:52	2017-11-30 03:54:25	2017-11-30 03:54:25	
		MBS	2017-11-30 03:51:53	2017-11-30 03:57:34	2017-11-30 03:57:34	
78	2017-12-02 12:27:29	MBS	2017-12-02 12:27:29	2017-12-02 12:53:04	2017-12-02 12:58:25	Yes

2017 Week 49: 10 Alarming Events in total

Pipeline	Alarming Event Start Time	Type	Alarm Received Time	Alarm Assessed Time	Alarm Cleared Time	Shutdown Required
02	2017-12-09 13:02:17	MBS	2017-12-09 13:02:17	2017-12-09 13:08:22	2017-12-09 13:08:22	No
		MBS	2017-12-09 13:02:17	2017-12-09 13:08:24	2017-12-09 13:08:24	
03	2017-12-04 08:51:09	MBS	2017-12-04 08:51:09	2017-12-04 08:54:40	2017-12-04 08:54:40	No
		MBS	2017-12-04 08:51:10	2017-12-04 08:54:38	2017-12-04 08:54:38	
03	2017-12-10 23:48:03	MBS	2017-12-10 23:48:03	2017-12-10 23:50:27	2017-12-10 23:50:27	No
05	2017-12-05 14:27:25	MBS	2017-12-05 14:27:25	2017-12-05 14:35:17	2017-12-05 14:35:17	No
05	2017-12-05 21:35:19	MBS	2017-12-05 21:35:19	2017-12-05 21:41:46	2017-12-05 21:41:46	No
05	2017-12-06 03:25:36	MBS	2017-12-06 03:25:36	2017-12-06 03:33:00	2017-12-06 03:33:00	No
05	2017-12-09 05:21:44	MBS	2017-12-09 05:21:44	2017-12-09 05:29:35	2017-12-09 05:29:35	No
65	2017-12-06 12:06:56	MBS	2017-12-06 12:06:56	2017-12-06 12:12:18	2017-12-06 12:12:18	No
		MBS	2017-12-06 12:06:56	2017-12-06 12:12:20	2017-12-06 12:12:20	
78	2017-12-06 11:00:32	MBS	2017-12-06 11:00:32	2017-12-06 11:05:21	2017-12-06 13:28:34	Yes
		MBS	2017-12-06 13:22:10	2017-12-06 13:24:08	2017-12-06 13:28:34	
78	2017-12-06 15:08:13	MBS	2017-12-06 15:08:13	2017-12-06 15:14:54	2017-12-06 15:14:54	No

2017 Week 50: 10 Alarming Events in total

Pipeline	Alarming Event Start Time	Type	Alarm Received Time	Alarm Assessed Time	Alarm Cleared Time	Shutdown Required
02	2017-12-15 03:10:18	MBS	2017-12-15 03:10:18	2017-12-15 03:17:23	2017-12-15 03:17:23	No
03	2017-12-17 17:46:04	MBS	2017-12-17 17:46:04	2017-12-17 20:35:33	2017-12-17 20:54:05	Yes
		MBS	2017-12-17 17:53:34	2017-12-17 20:35:31	2017-12-17 20:54:05	
04	2017-12-12 06:01:56	AVB	2017-12-12 06:01:56	2017-12-12 06:09:42	2017-12-12 06:09:42	No
05	2017-12-11 17:14:25	MBS	2017-12-11 17:14:25	2017-12-11 17:17:51	2017-12-11 17:17:51	No
05	2017-12-11 17:18:23	MBS	2017-12-11 17:18:23	2017-12-11 17:20:49	2017-12-11 17:20:49	No
		MBS	2017-12-11 17:20:24	2017-12-11 17:20:49	2017-12-11 17:20:49	
05	2017-12-11 17:23:52	MBS	2017-12-11 17:23:52	2017-12-11 17:29:25	2017-12-11 17:29:25	No
		MBS	2017-12-11 17:25:53	2017-12-11 17:29:44	2017-12-11 17:29:44	
		MBS	2017-12-11 17:26:23	2017-12-11 17:29:19	2017-12-11 17:29:19	
05	2017-12-11 18:01:25	AVB	2017-12-11 18:01:25	2017-12-11 18:03:29	2017-12-11 18:03:29	No
05	2017-12-16 17:46:28	MBS	2017-12-16 17:46:28	2017-12-16 18:45:55	2017-12-16 19:00:54	Yes
		MBS	2017-12-16 17:49:58	2017-12-16 18:45:57	2017-12-16 19:00:54	
05	2017-12-16 20:12:04	MBS	2017-12-16 20:12:04	2017-12-16 20:14:48	2017-12-16 20:14:48	No
06A	2017-12-13 19:56:02	MBS	2017-12-13 19:56:02	2017-12-13 20:03:14	2017-12-13 20:03:14	No
		MBS	2017-12-13 19:56:32	2017-12-13 20:00:33	2017-12-13 20:00:33	

2017 Week 51: 4 Alarming Events in total

Pipeline	Alarming Event Start Time	Type	Alarm Received Time	Alarm Assessed Time	Alarm Cleared Time	Shutdown Required
02	2017-12-19 10:03:32	MBS	2017-12-19 10:03:32	2017-12-19 10:11:01	2017-12-19 10:11:01	No
		MBS	2017-12-19 10:03:32	2017-12-19 10:11:02	2017-12-19 10:11:02	
		MBS	2017-12-19 10:05:31	2017-12-19 10:11:04	2017-12-19 10:11:04	
		MBS	2017-12-19 10:07:01	2017-12-19 10:11:05	2017-12-19 10:11:05	
02	2017-12-24 07:04:56	MBS	2017-12-24 07:04:56	2017-12-24 07:08:13	2017-12-24 07:08:13	No
		MBS	2017-12-24 07:06:54	2017-12-24 07:08:10	2017-12-24 07:08:10	
14	2017-12-23 12:39:53	MBS	2017-12-23 12:39:53	2017-12-23 17:21:39	2017-12-23 17:59:29	Yes
		MBS	2017-12-23 12:50:27	2017-12-23 17:21:36	2017-12-23 17:59:29	
		MBS	2017-12-23 13:00:54	2017-12-23 17:21:33	2017-12-23 17:59:29	
		MBS	2017-12-23 13:13:00	2017-12-23 17:21:31	2017-12-23 17:59:29	
67	2017-12-20 21:37:16	MBS	2017-12-20 21:37:16	2017-12-20 21:42:13	2017-12-20 21:42:13	No
		MBS	2017-12-20 21:37:46	2017-12-20 21:42:15	2017-12-20 21:42:15	

2017 Week 52: 13 Alarming Events in total

Pipeline	Alarming Event Start Time	Type	Alarm Received Time	Alarm Assessed Time	Alarm Cleared Time	Shutdown Required
02	2017-12-30 18:37:00	MBS	2017-12-30 18:37:00	2017-12-30 18:43:43	2017-12-30 18:43:43	No
03	2017-12-27 09:02:11	MBS	2017-12-27 09:02:11	2017-12-27 09:16:17	2017-12-27 09:26:35	Yes
03	2017-12-28 08:59:07	MBS	2017-12-28 08:59:07	2017-12-28 09:02:24	2017-12-28 09:02:24	No
03	2017-12-29 17:49:33	MBS	2017-12-29 17:49:33	2017-12-29 17:56:44	2017-12-29 17:56:44	No
05	2017-12-26 22:21:11	MBS	2017-12-26 22:21:11	2017-12-26 22:29:00	2017-12-26 22:29:00	No
		MBS	2017-12-26 22:23:39	2017-12-26 22:28:58	2017-12-26 22:28:58	
05	2017-12-31 05:54:05	MBS	2017-12-31 05:54:05	2017-12-31 06:04:09	2017-12-31 07:37:41	Yes
05	2017-12-31 10:03:45	MBS	2017-12-31 10:03:45	2017-12-31 10:06:10	2017-12-31 10:06:10	No
05	2017-12-31 15:09:27	MBS	2017-12-31 15:09:27	2017-12-31 15:13:37	2017-12-31 15:13:37	No
14	2017-12-26 13:13:24	MBS	2017-12-26 13:13:24	2017-12-26 13:23:00	2017-12-26 13:23:00	No
		MBS	2017-12-26 13:27:58	2017-12-26 13:32:29	2017-12-26 13:32:29	
		MBS	2017-12-26 13:32:59	2017-12-26 13:34:51	2017-12-26 13:34:51	
14	2017-12-27 14:56:50	MBS	2017-12-27 14:56:50	2017-12-27 15:02:57	2017-12-27 15:02:57	No
		MBS	2017-12-27 14:56:50	2017-12-27 15:02:58	2017-12-27 15:02:58	
		MBS	2017-12-27 14:56:50	2017-12-27 15:03:00	2017-12-27 15:03:00	
		MBS	2017-12-27 14:59:01	2017-12-27 15:03:01	2017-12-27 15:03:01	
		MBS	2017-12-27 15:07:42	2017-12-27 15:12:59	2017-12-27 15:12:59	
		MBS	2017-12-27 15:10:45	2017-12-27 15:13:01	2017-12-27 15:13:01	
61	2017-12-31 04:39:51	MBS	2017-12-31 04:39:51	2017-12-31 04:44:32	2017-12-31 04:44:32	No
78	2017-12-31 13:08:54	MBS	2017-12-31 13:08:54	2017-12-31 13:12:12	2017-12-31 13:12:12	No
		MBS	2017-12-31 13:08:54	2017-12-31 13:12:14	2017-12-31 13:12:14	
78	2017-12-31 13:13:53	MBS	2017-12-31 13:13:53	2017-12-31 13:17:21	2017-12-31 13:17:21	No

2018 Week 01: 7 Alarming Events in total

Pipeline	Alarming Event Start Time	Type	Alarm Received Time	Alarm Assessed Time	Alarm Cleared Time	Shutdown Required
01	2018-01-02 16:19:06	MBS	2018-01-02 16:19:06	2018-01-02 16:22:18	2018-01-02 16:22:18	No
02	2018-01-05 21:21:27	MBS	2018-01-05 21:21:27	2018-01-05 21:26:17	2018-01-05 21:26:17	No
02	2018-01-06 05:44:46	MBS	2018-01-06 05:44:46	2018-01-06 05:48:15	2018-01-06 05:48:15	No
06A	2018-01-02 05:36:08	MBS	2018-01-02 05:36:08	2018-01-02 05:40:17	2018-01-02 05:40:17	No
		MBS	2018-01-02 05:36:38	2018-01-02 05:40:14	2018-01-02 05:40:14	
14	2018-01-02 04:29:27	MBS	2018-01-02 04:29:27	2018-01-02 04:37:59	2018-01-02 08:08:56	Yes
14	2018-01-02 06:48:59	MBS	2018-01-02 06:48:59	2018-01-02 06:52:06	2018-01-02 06:52:06	No
		MBS	2018-01-02 06:48:59	2018-01-02 06:52:06	2018-01-02 06:52:06	
		MBS	2018-01-02 06:48:59	2018-01-02 06:52:07	2018-01-02 06:52:07	
78	2018-01-03 09:45:01	MBS	2018-01-03 09:45:01	2018-01-03 09:50:00	2018-01-03 09:50:00	No

2018 Week 02: 10 Alarming Events in total

Pipeline	Alarming Event Start Time	Type	Alarm Received Time	Alarm Assessed Time	Alarm Cleared Time	Shutdown Required
01	2018-01-13 20:18:02	MBS	2018-01-13 20:18:02	2018-01-13 20:25:11	2018-01-13 20:25:11	No
		MBS	2018-01-13 20:18:35	2018-01-13 20:25:07	2018-01-13 20:25:07	
02	2018-01-09 09:49:34	MBS	2018-01-09 09:49:34	2018-01-09 09:52:29	2018-01-09 09:52:29	No
		MBS	2018-01-09 09:50:01	2018-01-09 09:52:26	2018-01-09 09:52:26	
02	2018-01-09 23:14:30	MBS	2018-01-09 23:14:30	2018-01-09 23:21:42	2018-01-09 23:21:42	No
05	2018-01-10 09:01:41	AVB	2018-01-10 09:01:41	2018-01-10 09:06:08	2018-01-10 09:06:08	No
05	2018-01-11 04:51:20	MBS	2018-01-11 04:51:20	2018-01-11 04:54:56	2018-01-11 04:54:56	No
10	2018-01-10 12:10:56	MBS	2018-01-10 12:10:56	2018-01-10 12:14:26	2018-01-10 12:14:26	No
		MBS	2018-01-10 12:10:56	2018-01-10 12:14:22	2018-01-10 12:14:22	
14	2018-01-10 08:31:56	MBS	2018-01-10 08:31:56	2018-01-10 08:36:50	2018-01-10 08:36:50	No
		MBS	2018-01-10 08:31:56	2018-01-10 08:36:47	2018-01-10 08:36:47	
14	2018-01-10 15:45:28	MBS	2018-01-10 15:45:28	2018-01-10 15:53:52	2018-01-10 15:53:52	No
78	2018-01-10 00:04:33	MBS	2018-01-10 00:04:33	2018-01-10 00:10:03	2018-01-10 00:10:03	No
78	2018-01-14 15:45:36	MBS	2018-01-14 15:45:36	2018-01-14 15:49:19	2018-01-14 15:49:19	No

2018 Week 03: 12 Alarming Events in total

Pipeline	Alarming Event Start Time	Type	Alarm Received Time	Alarm Assessed Time	Alarm Cleared Time	Shutdown Required
02	2018-01-19 06:10:26	MBS	2018-01-19 06:10:26	2018-01-19 06:17:17	2018-01-19 06:17:17	No
		MBS	2018-01-19 06:10:59	2018-01-19 06:17:16	2018-01-19 06:17:16	
02	2018-01-19 06:20:58	MBS	2018-01-19 06:20:58	2018-01-19 06:24:14	2018-01-19 06:24:14	No
		MBS	2018-01-19 06:20:58	2018-01-19 06:24:15	2018-01-19 06:24:15	
03	2018-01-19 23:40:34	MBS	2018-01-19 23:40:34	2018-01-19 23:46:17	2018-01-19 23:46:17	No
05	2018-01-15 17:39:07	MBS	2018-01-15 17:39:07	2018-01-15 17:43:38	2018-01-15 17:43:38	No
		MBS	2018-01-15 17:39:07	2018-01-15 17:43:36	2018-01-15 17:43:36	
		MBS	2018-01-15 17:40:08	2018-01-15 17:43:33	2018-01-15 17:43:33	
05	2018-01-20 17:16:55	MBS	2018-01-20 17:16:55	2018-01-20 17:22:43	2018-01-20 17:22:43	No
14	2018-01-16 07:22:27	MBS	2018-01-16 07:22:27	2018-01-16 08:01:20	2018-01-16 08:08:49	Yes
		MBS	2018-01-16 07:31:26	2018-01-16 08:01:22	2018-01-16 08:08:49	
		MBS	2018-01-16 08:20:29	2018-01-16 08:21:30	2018-01-16 08:08:49	
14	2018-01-17 10:48:59	MBS	2018-01-17 10:48:59	2018-01-17 10:56:58	2018-01-17 10:56:58	No
14	2018-01-17 12:22:23	MBS	2018-01-17 12:22:23	2018-01-17 12:30:14	2018-01-17 12:30:14	No
		MBS	2018-01-17 12:22:23	2018-01-17 12:30:17	2018-01-17 12:30:17	
		MBS	2018-01-17 12:22:54	2018-01-17 12:30:12	2018-01-17 12:30:12	
61	2018-01-19 07:55:22	MBS	2018-01-19 07:55:22	2018-01-19 12:53:39	2018-01-19 13:15:00	Yes
61	2018-01-19 08:36:33	MBS	2018-01-19 08:36:33	2018-01-19 08:41:07	2018-01-19 09:00:00	Yes
		MBS	2018-01-19 08:37:33	2018-01-19 08:41:09	2018-01-19 09:00:00	
		MBS	2018-01-19 08:45:02	2018-01-19 08:46:38	2018-01-19 09:00:00	
61	2018-01-19 16:29:33	MBS	2018-01-19 16:29:33	2018-01-19 17:18:33	2018-01-19 18:00:42	Yes
78	2018-01-21 02:04:55	MBS	2018-01-21 02:04:55	2018-01-21 02:10:19	2018-01-21 02:10:19	No
		MBS	2018-01-21 02:04:55	2018-01-21 02:10:17	2018-01-21 02:10:17	

2018 Week 04: 11 Alarming Events in total

Pipeline	Alarming Event Start Time	Type	Alarm Received Time	Alarm Assessed Time	Alarm Cleared Time	Shutdown Required
02	2018-01-23 08:36:56	MBS	2018-01-23 08:36:56	2018-01-23 08:39:57	2018-01-23 08:39:57	No
		MBS	2018-01-23 08:56:25	2018-01-23 08:58:34	2018-01-23 08:58:34	
02	2018-01-23 18:19:04	MBS	2018-01-23 18:19:04	2018-01-23 18:21:32	2018-01-23 18:21:32	No
02	2018-01-24 05:01:58	MBS	2018-01-24 05:01:58	2018-01-24 05:11:04	2018-01-24 05:11:04	No
		MBS	2018-01-24 05:02:28	2018-01-24 05:11:07	2018-01-24 05:11:07	
		MBS	2018-01-24 05:03:28	2018-01-24 05:11:09	2018-01-24 05:11:09	
		MBS	2018-01-24 05:03:28	2018-01-24 05:13:15	2018-01-24 05:13:15	
02	2018-01-24 10:28:38	MBS	2018-01-24 10:28:38	2018-01-24 10:31:50	2018-01-24 10:31:50	No
02	2018-01-24 11:04:40	MBS	2018-01-24 11:04:40	2018-01-24 11:11:49	2018-01-24 11:11:49	No
03	2018-01-26 15:53:56	MBS	2018-01-26 15:53:56	2018-01-26 16:01:44	2018-01-26 16:01:44	No
		MBS	2018-01-26 15:53:56	2018-01-26 16:01:46	2018-01-26 16:01:46	
04	2018-01-23 04:29:15	MBS	2018-01-23 04:29:15	2018-01-23 04:38:12	2018-01-23 04:38:12	No
04	2018-01-23 07:38:29	MBS	2018-01-23 07:38:29	2018-01-23 07:41:39	2018-01-23 07:41:39	No
		MBS	2018-01-23 07:38:57	2018-01-23 07:41:36	2018-01-23 07:41:36	
14	2018-01-24 08:18:14	MBS	2018-01-24 08:18:14	2018-01-24 08:29:37	2018-01-24 13:40:39	Yes
		MBS	2018-01-24 08:18:14	2018-01-24 08:29:35	2018-01-24 13:40:39	
		MBS	2018-01-24 08:20:16	2018-01-24 08:29:47	2018-01-24 13:40:39	
		MBS	2018-01-24 08:21:14	2018-01-24 08:29:32	2018-01-24 13:40:39	
		MBS	2018-01-24 09:21:32	2018-01-24 09:26:23	2018-01-24 13:40:39	
		MBS	2018-01-24 09:21:32	2018-01-24 09:26:20	2018-01-24 13:40:39	
14	2018-01-28 17:29:04	MBS	2018-01-28 17:29:04	2018-01-28 17:35:21	2018-01-28 17:35:21	No
		MBS	2018-01-28 17:29:34	2018-01-28 17:35:22	2018-01-28 17:35:22	
78	2018-01-26 04:43:00	MBS	2018-01-26 04:43:00	2018-01-26 04:48:16	2018-01-26 04:48:16	No

2018 Week 05: 4 Alarming Events in total

Pipeline	Alarming Event Start Time	Type	Alarm Received Time	Alarm Assessed Time	Alarm Cleared Time	Shutdown Required
02	2018-02-03 18:58:53	MBS	2018-02-03 18:58:53	2018-02-03 19:08:44	2018-02-03 19:08:44	No
		MBS	2018-02-03 19:02:34	2018-02-03 19:10:45	2018-02-03 19:10:45	
		MBS	2018-02-03 19:04:40	2018-02-03 19:10:46	2018-02-03 19:10:46	
03	2018-02-01 07:39:36	MBS	2018-02-01 07:39:36	2018-02-01 07:44:41	2018-02-01 07:44:41	No
05	2018-01-30 21:28:21	MBS	2018-01-30 21:28:21	2018-01-30 21:29:28	2018-01-30 21:29:28	No
14	2018-01-30 06:28:34	MBS	2018-01-30 06:28:34	2018-01-30 06:34:07	2018-01-30 06:34:07	No
		MBS	2018-01-30 06:28:34	2018-01-30 06:34:09	2018-01-30 06:34:09	

2018 Week 06: 6 Alarming Events in total

Pipeline	Alarming Event Start Time	Type	Alarm Received Time	Alarm Assessed Time	Alarm Cleared Time	Shutdown Required
05	2018-02-06 09:24:06	MBS	2018-02-06 09:24:06	2018-02-06 09:32:36	2018-02-06 09:32:36	No
		MBS	2018-02-06 09:26:06	2018-02-06 09:32:38	2018-02-06 09:32:38	
05	2018-02-06 09:58:36	MBS	2018-02-06 09:58:36	2018-02-06 10:02:59	2018-02-06 10:10:38	Yes
05	2018-02-06 10:34:06	MBS	2018-02-06 10:34:06	2018-02-06 10:39:35	2018-02-06 10:39:35	No
05	2018-02-08 08:20:29	MBS	2018-02-08 08:20:29	2018-02-08 08:22:30	2018-02-08 08:22:30	No
05	2018-02-11 04:51:32	MBS	2018-02-11 04:51:32	2018-02-11 04:59:33	2018-02-11 04:59:33	No
		MBS	2018-02-11 04:53:33	2018-02-11 04:59:35	2018-02-11 04:59:35	
14	2018-02-07 20:48:07	MBS	2018-02-07 20:48:07	2018-02-07 20:51:55	2018-02-07 20:51:55	No

2018 Week 07: 5 Alarming Events in total

Pipeline	Alarming Event Start Time	Type	Alarm Received Time	Alarm Assessed Time	Alarm Cleared Time	Shutdown Required
01	2018-02-14 03:46:03	MBS	2018-02-14 03:46:03	2018-02-14 03:50:30	2018-02-14 03:50:30	No
01	2018-02-16 07:28:35	MBS	2018-02-16 07:28:35	2018-02-16 07:49:25	2018-02-16 08:03:07	Yes
05	2018-02-12 00:13:35	MBS	2018-02-12 00:13:35	2018-02-12 00:21:45	2018-02-12 00:21:45	No
05	2018-02-12 23:36:39	MBS	2018-02-12 23:36:39	2018-02-12 23:45:29	2018-02-12 23:45:29	No
10	2018-02-18 06:52:15	MBS	2018-02-18 06:52:15	2018-02-18 06:59:23	2018-02-18 06:59:23	No

2018 Week 08: 7 Alarming Events in total

Pipeline	Alarming Event Start Time	Type	Alarm Received Time	Alarm Assessed Time	Alarm Cleared Time	Shutdown Required
01	2018-02-22 07:21:20	MBS	2018-02-22 07:21:20	2018-02-22 07:30:18	2018-02-22 07:30:18	No
05	2018-02-20 08:01:15	MBS	2018-02-20 08:01:15	2018-02-20 08:09:24	2018-02-20 08:09:24	No
		MBS	2018-02-20 08:01:15	2018-02-20 08:09:25	2018-02-20 08:09:25	
		MBS	2018-02-20 08:02:45	2018-02-20 08:09:27	2018-02-20 08:09:27	
		MBS	2018-02-20 08:03:14	2018-02-20 08:09:28	2018-02-20 08:09:28	
		MBS	2018-02-20 08:03:14	2018-02-20 08:09:29	2018-02-20 08:09:29	
05	2018-02-21 06:38:57	MBS	2018-02-21 06:38:57	2018-02-21 06:44:58	2018-02-21 06:44:58	No
05	2018-02-23 00:15:05	MBS	2018-02-23 00:15:05	2018-02-23 00:23:04	2018-02-23 00:23:04	No
		MBS	2018-02-23 00:15:05	2018-02-23 00:23:05	2018-02-23 00:23:05	
14	2018-02-23 21:33:41	RDS	2018-02-23 21:33:41	2018-02-23 21:51:12	2018-02-24 12:30:20	Yes
14	2018-02-24 12:50:23	MBS	2018-02-24 12:50:23	2018-02-24 12:57:13	2018-02-24 13:33:00	Yes
		MBS	2018-02-24 12:50:53	2018-02-24 12:57:14	2018-02-24 13:33:00	
		MBS	2018-02-24 12:52:53	2018-02-24 12:57:11	2018-02-24 13:33:00	
14	2018-02-24 14:56:54	MBS	2018-02-24 14:56:54	2018-02-24 15:01:50	2018-02-24 15:01:50	No
		MBS	2018-02-24 14:56:54	2018-02-24 15:01:42	2018-02-24 15:01:42	
		MBS	2018-02-24 15:10:31	2018-02-24 15:15:11	2018-02-24 15:15:11	
		MBS	2018-02-24 15:10:31	2018-02-24 15:15:08	2018-02-24 15:15:08	
		MBS	2018-02-24 15:11:00	2018-02-24 15:15:05	2018-02-24 15:15:05	

2018 Week 09: 6 Alarming Events in total

Pipeline	Alarming Event Start Time	Type	Alarm Received Time	Alarm Assessed Time	Alarm Cleared Time	Shutdown Required
01	2018-03-04 16:15:02	MBS	2018-03-04 16:15:02	2018-03-04 16:21:12	2018-03-04 16:21:12	No
03	2018-02-28 15:52:29	MBS	2018-02-28 15:52:29	2018-02-28 15:58:04	2018-02-28 15:58:04	No
		MBS	2018-02-28 15:55:29	2018-02-28 15:58:24	2018-02-28 15:58:24	
		MBS	2018-02-28 17:12:30	2018-02-28 17:14:20	2018-02-28 17:14:20	
		MBS	2018-02-28 17:12:30	2018-02-28 17:14:18	2018-02-28 17:14:18	
05	2018-02-28 01:02:16	MBS	2018-02-28 01:02:16	2018-02-28 01:07:14	2018-02-28 01:07:14	No
06A	2018-03-04 13:13:33	MBS	2018-03-04 13:13:33	2018-03-04 13:18:17	2018-03-04 13:18:17	No
14	2018-03-04 07:40:57	MBS	2018-03-04 07:40:57	2018-03-04 07:48:14	2018-03-04 07:48:14	No
		MBS	2018-03-04 07:41:55	2018-03-04 07:48:18	2018-03-04 07:48:18	
67	2018-03-04 23:53:08	MBS	2018-03-04 23:53:08	2018-03-04 23:57:21	2018-03-04 23:57:21	No

2018 Week 10: 7 Alarming Events in total

Pipeline	Alarming Event Start Time	Type	Alarm Received Time	Alarm Assessed Time	Alarm Cleared Time	Shutdown Required
03	2018-03-10 03:35:48	MBS	2018-03-10 03:35:48	2018-03-10 03:40:31	2018-03-10 03:40:31	No
		MBS	2018-03-10 03:35:48	2018-03-10 03:40:26	2018-03-10 03:40:26	
04	2018-03-08 10:44:19	MBS	2018-03-08 10:44:19	2018-03-08 10:52:27	2018-03-08 10:52:27	No
04	2018-03-08 13:49:55	MBS	2018-03-08 13:49:55	2018-03-08 13:59:05	2018-03-08 13:59:05	No
04	2018-03-08 21:01:53	AVB	2018-03-08 21:01:53	2018-03-08 21:07:16	2018-03-08 21:07:16	No
04	2018-03-10 18:01:43	AVB	2018-03-10 18:01:43	2018-03-10 18:04:56	2018-03-10 18:04:56	No
14	2018-03-07 08:25:29	MBS	2018-03-07 08:25:29	2018-03-07 08:47:46	2018-03-07 11:00:00	Yes
61	2018-03-07 08:25:38	MBS	2018-03-07 08:25:38	2018-03-07 08:48:17	2018-03-07 11:00:00	Yes

2018 Week 11: 6 Alarming Events in total

Pipeline	Alarming Event Start Time	Type	Alarm Received Time	Alarm Assessed Time	Alarm Cleared Time	Shutdown Required
02	2018-03-15 12:08:34	MBS	2018-03-15 12:08:34	2018-03-15 12:12:51	2018-03-15 13:16:12	Yes
		MBS	2018-03-15 12:08:34	2018-03-15 12:12:45	2018-03-15 13:16:12	
		MBS	2018-03-15 12:10:04	2018-03-15 12:12:41	2018-03-15 13:16:12	
03	2018-03-15 17:20:25	MBS	2018-03-15 17:20:25	2018-03-15 17:25:17	2018-03-15 17:25:17	No
04	2018-03-12 07:28:44	MBS	2018-03-12 07:28:44	2018-03-12 07:34:45	2018-03-12 07:34:45	No
		MBS	2018-03-12 07:29:15	2018-03-12 07:34:43	2018-03-12 07:34:43	
10	2018-03-12 23:06:51	MBS	2018-03-12 23:06:51	2018-03-12 23:14:17	2018-03-12 23:14:17	No
		MBS	2018-03-12 23:07:20	2018-03-12 23:14:20	2018-03-12 23:14:20	
10	2018-03-13 09:40:40	MBS	2018-03-13 09:40:40	2018-03-13 09:48:13	2018-03-13 09:48:13	No
		MBS	2018-03-13 09:40:40	2018-03-13 09:48:16	2018-03-13 09:48:16	
10	2018-03-14 10:19:26	MBS	2018-03-14 10:19:26	2018-03-14 10:34:17	2018-03-14 10:56:24	Yes
		MBS	2018-03-14 10:20:26	2018-03-14 10:34:19	2018-03-14 10:56:24	
		MBS	2018-03-14 10:20:56	2018-03-14 10:34:21	2018-03-14 10:56:24	

2018 Week 12: 4 Alarming Events in total

Pipeline	Alarming Event Start Time	Type	Alarm Received Time	Alarm Assessed Time	Alarm Cleared Time	Shutdown Required
10	2018-03-21 16:49:25	MBS	2018-03-21 16:49:25	2018-03-21 16:51:19	2018-03-21 16:51:19	No
		MBS	2018-03-21 16:49:25	2018-03-21 16:51:17	2018-03-21 16:51:17	
		MBS	2018-03-21 16:54:24	2018-03-21 16:55:02	2018-03-21 16:55:02	
		MBS	2018-03-21 16:54:24	2018-03-21 16:54:59	2018-03-21 16:54:59	
		MBS	2018-03-21 16:56:54	2018-03-21 16:57:41	2018-03-21 16:57:41	
14	2018-03-22 07:02:23	MBS	2018-03-22 07:02:23	2018-03-22 07:13:08	2018-03-22 14:15:03	Yes
61	2018-03-23 13:41:48	MBS	2018-03-23 13:41:48	2018-03-23 13:45:39	2018-03-23 13:45:39	No
61	2018-03-24 01:53:54	MBS	2018-03-24 01:53:54	2018-03-24 01:57:23	2018-03-24 01:57:23	No

2018 Week 13: 9 Alarming Events in total

Pipeline	Alarming Event Start Time	Type	Alarm Received Time	Alarm Assessed Time	Alarm Cleared Time	Shutdown Required
01	2018-04-01 03:26:11	MBS	2018-04-01 03:26:11	2018-04-01 03:30:14	2018-04-01 03:30:14	No
03	2018-04-01 12:59:23	MBS	2018-04-01 12:59:23	2018-04-01 13:08:38	2018-04-01 13:08:38	No
05	2018-03-29 08:55:00	MBS	2018-03-29 08:55:00	2018-03-29 09:01:12	2018-03-29 09:01:12	No
		MBS	2018-03-29 08:57:31	2018-03-29 09:03:38	2018-03-29 09:03:38	
05	2018-03-31 08:19:30	MBS	2018-03-31 08:19:30	2018-03-31 08:24:55	2018-03-31 08:24:55	No
		MBS	2018-03-31 08:20:00	2018-03-31 08:24:58	2018-03-31 08:24:58	
05	2018-04-01 06:15:22	MBS	2018-04-01 06:15:22	2018-04-01 06:21:29	2018-04-01 06:21:29	No
05	2018-04-01 13:11:28	MBS	2018-04-01 13:11:28	2018-04-01 13:16:41	2018-04-01 13:16:41	No
65	2018-04-01 21:36:45	MBS	2018-04-01 21:36:45	2018-04-01 21:44:10	2018-04-01 21:44:10	No
		MBS	2018-04-01 21:36:45	2018-04-01 21:44:11	2018-04-01 21:44:11	
78	2018-03-29 22:13:10	MBS	2018-03-29 22:13:10	2018-03-29 22:18:55	2018-03-29 22:18:55	No
		MBS	2018-03-29 22:13:10	2018-03-29 22:18:52	2018-03-29 22:18:52	
78	2018-03-30 05:20:49	MBS	2018-03-30 05:20:49	2018-03-30 05:24:05	2018-03-30 05:24:05	No
		MBS	2018-03-30 05:20:49	2018-03-30 05:24:01	2018-03-30 05:24:01	

2018 Week 14: 4 Alarming Events in total

Pipeline	Alarming Event Start Time	Type	Alarm Received Time	Alarm Assessed Time	Alarm Cleared Time	Shutdown Required
05	2018-04-04 10:44:53	MBS	2018-04-04 10:44:53	2018-04-04 10:49:04	2018-04-04 10:49:04	No
05	2018-04-04 12:56:24	MBS	2018-04-04 12:56:24	2018-04-04 13:02:16	2018-04-04 13:02:16	No
		MBS	2018-04-04 12:56:55	2018-04-04 13:02:14	2018-04-04 13:02:14	
10	2018-04-07 18:31:25	MBS	2018-04-07 18:31:25	2018-04-07 18:36:31	2018-04-07 18:36:31	No
		MBS	2018-04-07 18:31:55	2018-04-07 18:36:29	2018-04-07 18:36:29	
		MBS	2018-04-07 18:32:26	2018-04-07 18:36:27	2018-04-07 18:36:27	
61	2018-04-04 06:49:32	MBS	2018-04-04 06:49:32	2018-04-04 06:58:03	2018-04-04 06:58:03	No
		MBS	2018-04-04 06:49:32	2018-04-04 06:58:00	2018-04-04 06:58:00	

2018 Week 15: 12 Alarming Events in total

Pipeline	Alarming Event Start Time	Type	Alarm Received Time	Alarm Assessed Time	Alarm Cleared Time	Shutdown Required
02	2018-04-12 03:59:14	MBS	2018-04-12 03:59:14	2018-04-12 04:01:38	2018-04-12 04:01:38	No
03	2018-04-12 08:25:44	MBS	2018-04-12 08:25:44	2018-04-12 08:34:09	2018-04-12 08:34:09	No
		MBS	2018-04-12 08:26:14	2018-04-12 08:34:22	2018-04-12 08:34:22	
		MBS	2018-04-12 08:29:45	2018-04-12 08:34:38	2018-04-12 08:34:38	
		MBS	2018-04-12 08:31:14	2018-04-12 08:36:25	2018-04-12 08:36:25	
03	2018-04-12 14:39:02	MBS	2018-04-12 14:39:02	2018-04-12 14:43:06	2018-04-12 14:43:06	No
05	2018-04-10 13:38:07	MBS	2018-04-10 13:38:07	2018-04-10 13:45:31	2018-04-10 13:45:31	No
05	2018-04-10 16:14:42	MBS	2018-04-10 16:14:42	2018-04-10 16:18:39	2018-04-10 16:18:39	No
		MBS	2018-04-10 17:16:46	2018-04-10 17:23:50	2018-04-10 17:23:50	
05	2018-04-11 10:39:55	MBS	2018-04-11 10:39:55	2018-04-11 10:45:30	2018-04-11 10:45:30	No
		MBS	2018-04-11 10:39:55	2018-04-11 10:45:28	2018-04-11 10:45:28	
05	2018-04-15 05:17:12	MBS	2018-04-15 05:17:12	2018-04-15 05:21:24	2018-04-15 05:21:24	No
06A	2018-04-12 01:03:16	MBS	2018-04-12 01:03:16	2018-04-12 01:07:47	2018-04-12 01:07:47	No
10	2018-04-10 05:59:36	MBS	2018-04-10 05:59:36	2018-04-10 06:04:13	2018-04-10 06:04:13	No
10	2018-04-10 07:59:09	MBS	2018-04-10 07:59:09	2018-04-10 08:05:35	2018-04-10 08:05:35	No
14	2018-04-11 17:05:53	MBS	2018-04-11 17:05:53	2018-04-11 17:09:17	2018-04-11 17:09:17	No
		MBS	2018-04-11 17:06:52	2018-04-11 17:09:14	2018-04-11 17:09:14	
78	2018-04-13 06:17:13	MBS	2018-04-13 06:17:13	2018-04-13 06:25:48	2018-04-13 06:25:48	No

2018 Week 16: 6 Alarming Events in total

Pipeline	Alarming Event Start Time	Type	Alarm Received Time	Alarm Assessed Time	Alarm Cleared Time	Shutdown Required
05	2018-04-16 09:36:15	MBS	2018-04-16 09:36:15	2018-04-16 09:43:56	2018-04-16 11:58:30	Yes
		MBS	2018-04-16 09:36:15	2018-04-16 09:43:58	2018-04-16 11:58:30	
05	2018-04-16 14:26:56	MBS	2018-04-16 14:26:56	2018-04-16 14:32:37	2018-04-16 14:32:37	No
05	2018-04-20 05:49:52	MBS	2018-04-20 05:49:52	2018-04-20 05:56:02	2018-04-20 05:56:02	No
05	2018-04-22 20:50:03	MBS	2018-04-22 20:50:03	2018-04-22 20:54:53	2018-04-22 20:54:53	No
78	2018-04-19 22:48:28	MBS	2018-04-19 22:48:28	2018-04-19 22:54:16	2018-04-19 23:32:38	Yes
		MBS	2018-04-19 23:19:59	2018-04-19 23:23:28	2018-04-19 23:32:38	
78	2018-04-22 22:04:15	MBS	2018-04-22 22:04:15	2018-04-22 22:12:17	2018-04-22 22:12:17	No

2018 Week 17: 11 Alarming Events in total

Pipeline	Alarming Event Start Time	Type	Alarm Received Time	Alarm Assessed Time	Alarm Cleared Time	Shutdown Required
02	2018-04-24 11:32:17	MBS	2018-04-24 11:32:17	2018-04-24 11:39:55	2018-04-24 11:39:55	No
		MBS	2018-04-24 11:35:46	2018-04-24 11:39:57	2018-04-24 11:39:57	
03	2018-04-23 14:47:54	MBS	2018-04-23 14:47:54	2018-04-23 14:57:18	2018-04-23 14:57:18	No
		MBS	2018-04-23 14:47:54	2018-04-23 14:57:20	2018-04-23 14:57:20	
		MBS	2018-04-23 14:48:54	2018-04-23 14:57:25	2018-04-23 14:57:25	
03	2018-04-24 06:31:28	MBS	2018-04-24 06:31:28	2018-04-24 06:38:21	2018-04-24 06:38:21	No
		MBS	2018-04-24 06:31:28	2018-04-24 06:38:22	2018-04-24 06:38:22	
		MBS	2018-04-24 06:32:29	2018-04-24 06:38:24	2018-04-24 06:38:24	
05	2018-04-24 08:18:11	MBS	2018-04-24 08:18:11	2018-04-24 08:23:27	2018-04-24 08:23:27	No
		MBS	2018-04-24 08:18:11	2018-04-24 08:23:29	2018-04-24 08:23:29	
		MBS	2018-04-24 08:18:40	2018-04-24 08:23:30	2018-04-24 08:23:30	
		MBS	2018-04-24 08:21:41	2018-04-24 08:23:31	2018-04-24 08:23:31	
		MBS	2018-04-24 08:21:41	2018-04-24 08:23:33	2018-04-24 08:23:33	
05	2018-04-26 06:04:07	MBS	2018-04-26 06:04:07	2018-04-26 06:10:15	2018-04-26 06:10:15	No
		MBS	2018-04-26 06:04:37	2018-04-26 06:10:16	2018-04-26 06:10:16	
		MBS	2018-04-26 06:05:07	2018-04-26 06:10:17	2018-04-26 06:10:17	
		MBS	2018-04-26 06:06:07	2018-04-26 06:10:19	2018-04-26 06:10:19	
		MBS	2018-04-26 06:06:37	2018-04-26 06:10:20	2018-04-26 06:10:20	
		MBS	2018-04-26 06:17:07	2018-04-26 06:18:20	2018-04-26 06:18:20	
05	2018-04-26 09:10:16	MBS	2018-04-26 09:10:16	2018-04-26 09:14:58	2018-04-26 09:14:58	No
06A	2018-04-23 14:19:43	MBS	2018-04-23 14:19:43	2018-04-23 14:28:25	2018-04-23 14:28:25	No
06A	2018-04-25 06:21:28	MBS	2018-04-25 06:21:28	2018-04-25 06:27:24	2018-04-25 06:27:24	No
		MBS	2018-04-25 06:21:28	2018-04-25 06:27:25	2018-04-25 06:27:25	
		MBS	2018-04-25 06:21:28	2018-04-25 06:27:26	2018-04-25 06:27:26	
06A	2018-04-26 09:25:56	MBS	2018-04-26 09:25:56	2018-04-26 09:29:12	2018-04-26 09:29:12	No
		MBS	2018-04-26 09:25:56	2018-04-26 09:29:14	2018-04-26 09:29:14	

Pipeline	Alarming Event Start Time	Type	Alarm Received Time	Alarm Assessed Time	Alarm Cleared Time	Shutdown Required
06A	2018-04-27 05:58:07	MBS	2018-04-27 05:58:07	2018-04-27 06:02:26	2018-04-27 06:49:43	Yes
61	2018-04-25 09:58:45	MBS	2018-04-25 09:58:45	2018-04-25 10:04:49	2018-04-25 10:04:49	No
		MBS	2018-04-25 09:59:15	2018-04-25 10:04:50	2018-04-25 10:04:50	

2018 Week 18: 6 Alarming Events in total

Pipeline	Alarming Event Start Time	Type	Alarm Received Time	Alarm Assessed Time	Alarm Cleared Time	Shutdown Required
01	2018-05-01 03:37:57	MBS	2018-05-01 03:37:57	2018-05-01 03:42:13	2018-05-01 03:42:13	No
		MBS	2018-05-01 03:37:57	2018-05-01 03:42:15	2018-05-01 03:42:15	
03	2018-05-04 00:53:37	MBS	2018-05-04 00:53:37	2018-05-04 00:55:34	2018-05-04 00:55:34	No
		MBS	2018-05-04 00:53:37	2018-05-04 00:55:31	2018-05-04 00:55:31	
05	2018-05-03 14:40:48	MBS	2018-05-03 14:40:48	2018-05-03 14:50:30	2018-05-03 14:50:30	No
05	2018-05-03 14:56:18	MBS	2018-05-03 14:56:18	2018-05-03 15:03:12	2018-05-03 15:03:12	No
14	2018-05-05 06:22:57	MBS	2018-05-05 06:22:57	2018-05-05 06:30:19	2018-05-05 06:30:19	No
14	2018-05-06 02:26:28	MBS	2018-05-06 02:26:28	2018-05-06 02:35:42	2018-05-06 02:35:42	No

2018 Week 19: 3 Alarming Events in total

Pipeline	Alarming Event Start Time	Type	Alarm Received Time	Alarm Assessed Time	Alarm Cleared Time	Shutdown Required
05	2018-05-07 14:17:11	MBS	2018-05-07 14:17:11	2018-05-07 14:24:54	2018-05-07 14:24:54	No
61	2018-05-09 08:54:26	MBS	2018-05-09 08:54:26	2018-05-09 08:57:55	2018-05-09 08:57:55	No
		MBS	2018-05-09 08:54:26	2018-05-09 08:57:57	2018-05-09 08:57:57	
		MBS	2018-05-09 08:54:26	2018-05-09 08:57:52	2018-05-09 08:57:52	
		MBS	2018-05-09 09:02:27	2018-05-09 09:04:13	2018-05-09 09:04:13	
		MBS	2018-05-09 09:02:27	2018-05-09 09:04:17	2018-05-09 09:04:17	
		MBS	2018-05-09 09:02:27	2018-05-09 09:04:11	2018-05-09 09:04:11	
78	2018-05-08 15:01:10	MBS	2018-05-08 15:01:10	2018-05-08 15:09:51	2018-05-08 16:35:00	Yes
		MBS	2018-05-08 15:02:10	2018-05-08 15:09:52	2018-05-08 16:35:00	

2018 Week 20: 6 Alarming Events in total

Pipeline	Alarming Event Start Time	Type	Alarm Received Time	Alarm Assessed Time	Alarm Cleared Time	Shutdown Required
02	2018-05-18 20:24:41	MBS	2018-05-18 20:24:41	2018-05-18 20:27:59	2018-05-18 20:27:59	No
03	2018-05-19 03:28:38	MBS	2018-05-19 03:28:38	2018-05-19 03:36:35	2018-05-19 03:36:35	No
03	2018-05-20 07:40:18	MBS	2018-05-20 07:40:18	2018-05-20 07:50:05	2018-05-20 07:50:05	No
05	2018-05-15 21:38:43	MBS	2018-05-15 21:38:43	2018-05-15 21:48:16	2018-05-15 21:48:16	No
		MBS	2018-05-15 21:40:13	2018-05-15 21:48:18	2018-05-15 21:48:18	
		MBS	2018-05-15 21:41:43	2018-05-15 21:48:19	2018-05-15 21:48:19	
		MBS	2018-05-15 21:42:13	2018-05-15 21:48:21	2018-05-15 21:48:21	
		MBS	2018-05-15 21:51:12	2018-05-15 21:57:36	2018-05-15 21:57:36	
05	2018-05-16 00:55:24	MBS	2018-05-16 00:55:24	2018-05-16 01:03:38	2018-05-16 01:03:38	No
10	2018-05-17 05:32:48	MBS	2018-05-17 05:32:48	2018-05-17 05:39:03	2018-05-17 07:18:27	Yes
		MBS	2018-05-17 05:42:47	2018-05-17 05:52:38	2018-05-17 07:18:27	
		MBS	2018-05-17 05:43:18	2018-05-17 05:52:36	2018-05-17 07:18:27	

2018 Week 21: 7 Alarming Events in total

Pipeline	Alarming Event Start Time	Type	Alarm Received Time	Alarm Assessed Time	Alarm Cleared Time	Shutdown Required
03	2018-05-21 18:37:59	MBS	2018-05-21 18:37:59	2018-05-21 18:43:33	2018-05-21 18:43:33	No
		MBS	2018-05-21 18:37:59	2018-05-21 18:43:31	2018-05-21 18:43:31	
		AVB	2018-05-21 19:02:01	2018-05-21 19:03:16	2018-05-21 19:03:16	
		AVB	2018-05-21 19:02:01	2018-05-21 19:03:14	2018-05-21 19:03:14	
03	2018-05-21 20:02:02	AVB	2018-05-21 20:02:02	2018-05-21 20:09:33	2018-05-21 20:09:33	No
		AVB	2018-05-21 20:02:02	2018-05-21 20:09:35	2018-05-21 20:09:35	
03	2018-05-22 13:31:26	MBS	2018-05-22 13:31:26	2018-05-22 13:38:12	2018-05-22 13:38:12	No
		MBS	2018-05-22 13:31:56	2018-05-22 13:38:07	2018-05-22 13:38:07	
		MBS	2018-05-22 13:32:56	2018-05-22 13:38:10	2018-05-22 13:38:10	
		MBS	2018-05-22 13:34:26	2018-05-22 13:38:04	2018-05-22 13:38:04	
03	2018-05-22 21:32:08	MBS	2018-05-22 21:32:08	2018-05-22 21:38:54	2018-05-22 21:38:54	No
		MBS	2018-05-22 21:32:08	2018-05-22 21:38:52	2018-05-22 21:38:52	
03	2018-05-22 21:47:40	MBS	2018-05-22 21:47:40	2018-05-22 21:55:23	2018-05-22 21:55:23	No
		MBS	2018-05-22 21:47:40	2018-05-22 21:55:18	2018-05-22 21:55:18	
04	2018-05-21 10:39:47	MBS	2018-05-21 10:39:47	2018-05-21 10:48:11	2018-05-21 10:48:11	No
04	2018-05-21 20:01:58	AVB	2018-05-21 20:01:58	2018-05-21 20:05:22	2018-05-21 20:05:22	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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Appendix 2 – Lakehead System Pipeline Incident Reporting [112]

Reporting Period: November 23, 2017 to May 22, 2018

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Lakehead System Pipeline Incident Reporting						
Incident Description	**Date and Time Notice Received**	**Date and Time Investigation Began**	**Date and time when preliminary investigation complete and shutdown initiated**	**Information Provided with Notice**	**Conclusion and Findings of the Investigation**	**Lakehead Lines Affected**
REDACTED	11/24/2017 16:03 MST	11/24/2017 16:10 MST	11/24/2017 16:15 MST	REDACTED		Line 1 Line 2B Line 3 Line 4 Line 5 Line 14 Line 65 Line 67
	11/28/2017 10:37 MST	11/28/2017 10:42 MST	11/28/2017 10:40 MST			Line 5 Line 6
	12/09/2017 08:25 MST	12/09/2017 08:36 MST	12/09/2017 08:38 MST			Line 14 Line 78

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Lakehead System Pipeline Incident Reporting						
Incident Description	**Date and Time Notice Received**	**Date and Time Investigation Began**	**Date and time when preliminary investigation complete and shutdown initiated**	**Information Provided with Notice**	**Conclusion and Findings of the Investigation**	**Lakehead Lines Affected**
REDACTED	12/10/2017 12:57 MST	12/10/2017 13:01 MST	12/10/2017 13:06 MST	REDACTED		Line 78
	01/06/2018 13:16 MST	01/06/2018 13:19 MST	01/06/2018 13:23 MST			Line 6A Line 14 Line 78
	01/17/2018 07:22 MST	01/17/2018 07:29 MST	01/17/2018 07:31 MST			Line 6A Line 14 Line 61

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Lakehead System Pipeline Incident Reporting						
Incident Description	**Date and Time Notice Received**	**Date and Time Investigation Began**	**Date and time when preliminary investigation complete and shutdown initiated**	**Information Provided with Notice**	**Conclusion and Findings of the Investigation**	**Lakehead Lines Affected**
REDACTED	01/22/2018 16:43 MST	01/22/2018 16:47 MST	01/22/2018 16:51 MST	REDACTED		Line 78
	02/07/2018 07:50 MST	02/07/2018 07:55 MST	02/07/2018 08:04 MST			Line 1 Line 2B Line 3 Line 4 Line 5 Line 14 Line 67
	02/28/2018 10:40 MST	02/28/2018 10:40 MST	02/28/2018 10:47 MST			Line 5 Line 6

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Lakehead System Pipeline Incident Reporting						
Incident Description	**Date and Time Notice Received**	**Date and Time Investigation Began**	**Date and time when preliminary investigation complete and shutdown initiated**	**Information Provided with Notice**	**Conclusion and Findings of the Investigation**	**Lakehead Lines Affected**
REDACTED	03/10/2018 14:15 MST	03/10/2018 14:19 MST	03/10/2018 14:21 MST	REDACTED		Line 78
	03/29/2018 15:55 MST	03/29/2018 16:01 MST	03/29/2018 16:04 MST			Line 5 Line 6 Line 78
	4/3/2018 14:21 MST	4/3/2018 14:27 MST	4/3/2018 14:30 MST			Line 5

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Lakehead System Pipeline Incident Reporting						
Incident Description	**Date and Time Notice Received**	**Date and Time Investigation Began**	**Date and time when preliminary investigation complete and shutdown initiated**	**Information Provided with Notice**	**Conclusion and Findings of the Investigation**	**Lakehead Lines Affected**
REDACTED	04/12/2018 02:20 MST	04/12/2018 02:22 MST	04/12/2018 02:25 MST	REDACTED		Line 5
	04/23/2018 14:51 MST	04/23/2018 14:51 MST	04/23/2018 14:53 MST			Line 5 Line 6
	04/26/2018 03:29 MST	04/26/2018 03:29 MST	04/26/2018 03:35 MST			Line 78

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Lakehead System Pipeline Incident Reporting						
Incident Description	**Date and Time Notice Received**	**Date and Time Investigation Began**	**Date and time when preliminary investigation complete and shutdown initiated**	**Information Provided with Notice**	**Conclusion and Findings of the Investigation**	**Lakehead Lines Affected**
REDACTED	05/01/2018 11:00 MST	05/01/2018 11:09 MST	05/01/2018 11:14 MST	REDACTED		Line 6A
	05/14/2018 11:06 MST	05/14/2018 11:12 MST	05/14/2018 11:15 MST			Line 78
	05/16/2018 09:43 MST	05/16/2018 09:50 MST	05/16/2018 09:48 MST			Line 10

ENBRIDGE

Lakehead System Pipeline Incident Reporting						
Incident Description	**Date and Time Notice Received**	**Date and Time Investigation Began**	**Date and time when preliminary investigation complete and shutdown initiated**	**Information Provided with Notice**	**Conclusion and Findings of the Investigation**	**Lakehead Lines Affected**
REDACTED	05/19/2018 09:04 MST	05/19/2018 09:10 MST	05/19/2018 09:14 MST	REDACTED	d l	Line 6A Line 14
	05/20/2018 07:10 MST	05/20/2018 07:16 MST	05/20/2018 07:19 MST		d l	Line 1 Line 2B Line 3 Line 4 Line 5 Line 14 Line 67

ENBRIDGE

Lakehead System Pipeline Incident Reporting						
Incident Description	**Date and Time Notice Received**	**Date and Time Investigation Began**	**Date and time when preliminary investigation complete and shutdown initiated**	**Information Provided with Notice**	**Conclusion and Findings of the Investigation**	**Lakehead Lines Affected**
REDACTED	11/24/2017 16:03 MST	11/24/2017 16:10 MST	11/24/2017 16:15 MST	REDACTED		Line 1 Line 2B Line 3 Line 4 Line 5 Line 14 Line 65 Line 67
	11/28/2017 10:37 MST	11/28/2017 10:42 MST	11/28/2017 10:40 MST			Line 5 Line 6
	12/09/2017 08:25 MST	12/09/2017 08:36 MST	12/09/2017 08:38 MST			Line 14 Line 78

ENBRIDGE

Lakehead System Pipeline Incident Reporting						
Incident Description	**Date and Time Notice Received**	**Date and Time Investigation Began**	**Date and time when preliminary investigation complete and shutdown initiated**	**Information Provided with Notice**	**Conclusion and Findings of the Investigation**	**Lakehead Lines Affected**
REDACTED	12/10/2017 12:57 MST	12/10/2017 13:01 MST	12/10/2017 13:06 MST	REDACTED		Line 78
	01/06/2018 13:16 MST	01/06/2018 13:19 MST	01/06/2018 13:23 MST			Line 6A Line 14 Line 78
	01/17/2018 07:22 MST	01/17/2018 07:29 MST	01/17/2018 07:31 MST			Line 6A Line 14 Line 61

ENBRIDGE

Lakehead System Pipeline Incident Reporting						
Incident Description	**Date and Time Notice Received**	**Date and Time Investigation Began**	**Date and time when preliminary investigation complete and shutdown initiated**	**Information Provided with Notice**	**Conclusion and Findings of the Investigation**	**Lakehead Lines Affected**
REDACTED	01/22/2018 16:43 MST	01/22/2018 16:47 MST	01/22/2018 16:51 MST	REDACTED		Line 78
	02/07/2018 07:50 MST	02/07/2018 07:55 MST	02/07/2018 08:04 MST			Line 1 Line 2B Line 3 Line 4 Line 5 Line 14 Line 67
	02/28/2018 10:40 MST	02/28/2018 10:40 MST	02/28/2018 10:47 MST			Line 5 Line 6

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Lakehead System Pipeline Incident Reporting						
Incident Description	**Date and Time Notice Received**	**Date and Time Investigation Began**	**Date and time when preliminary investigation complete and shutdown initiated**	**Information Provided with Notice**	**Conclusion and Findings of the Investigation**	**Lakehead Lines Affected**
REDACTED	03/10/2018 14:15 MST	03/10/2018 14:19 MST	03/10/2018 14:21 MST	REDACTED		Line 78
	03/29/2018 15:55 MST	03/29/2018 16:01 MST	03/29/2018 16:04 MST			Line 5 Line 6 Line 78
	4/3/2018 14:21 MST	4/3/2018 14:27 MST	4/3/2018 14:30 MST			Line 5

ENBRIDGE

Lakehead System Pipeline Incident Reporting						
Incident Description	**Date and Time Notice Received**	**Date and Time Investigation Began**	**Date and time when preliminary investigation complete and shutdown initiated**	**Information Provided with Notice**	**Conclusion and Findings of the Investigation**	**Lakehead Lines Affected**
REDACTED	04/12/2018 02:20 MST	04/12/2018 02:22 MST	04/12/2018 02:25 MST	REDACTED		ine 5
	04/23/2018 14:51 MST	04/23/2018 14:51 MST	04/23/2018 14:53 MST			ine 5 ine 6
	04/26/2018 03:29 MST	04/26/2018 03:29 MST	04/26/2018 03:35 MST			ine 78

ENBRIDGE

Lakehead System Pipeline Incident Reporting						
Incident Description	**Date and Time Notice Received**	**Date and Time Investigation Began**	**Date and time when preliminary investigation complete and shutdown initiated**	**Information Provided with Notice**	**Conclusion and Findings of the Investigation**	**Lakehead Lines Affected**
REDACTED	05/01/2018 11:00 MST	05/01/2018 11:09 MST	05/01/2018 11:14 MST	REDACTED		Line 6A
	05/14/2018 11:06 MST	05/14/2018 11:12 MST	05/14/2018 11:15 MST			Line 78
	05/16/2018 09:43 MST	05/16/2018 09:50 MST	05/16/2018 09:48 MST			Line 10

ENBRIDGE

Lakehead System Pipeline Incident Reporting						
Incident Description	**Date and Time Notice Received**	**Date and Time Investigation Began**	**Date and time when preliminary investigation complete and shutdown initiated**	**Information Provided with Notice**	**Conclusion and Findings of the Investigation**	**Lakehead Lines Affected**
REDACTED	05/19/2018 09:04 MST	05/19/2018 09:10 MST	05/19/2018 09:14 MST	REDACTED		ine 6A ine 14
	05/20/2018 07:10 MST	05/20/2018 07:16 MST	05/20/2018 07:19 MST			ine 1 ine 2B ine 3 ine 4 ine 5 ine 14 ine 67

ENBRIDGE

Appendix 3 – Table of Temporary MBS Suspension [93-94, 96-97]

Reporting Period: November 23, 2017 to May 22, 2018

ENBRIDGE

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	17	0
Bypass of ILI Tool	4 hours	58	0
Scheduled maintenance or repairs	4 days	33	0

Appendix 4 – PHMSA Reports from Lakehead Discharges [146] and Update on Discharges from a Lakehead System Pipeline [147]

Reporting Period: November 23, 2017 to May 22, 2018

ENBRIDGE

PHMSA Reports from Lakehead Discharges [146]

NOTICE: This report is required by 49 CFR Part 195. Failure to report can result in a civil penalty not to exceed $100,000 for each violation for each day that such violation persists except that the maximum civil penalty shall not exceed $1,000,000 as provided in 49 USC 60122.		OMB NO: 2137-0047 EXPIRATION DATE: 8/31/2020
U.S Department of Transportation Pipeline and Hazardous Materials Safety Administration	**Original Report Date:**	04/20/2018
	No.	20180116 - 30223 --- (DOT Use Only)

ACCIDENT REPORT - HAZARDOUS LIQUID PIPELINE SYSTEMS

INSTRUCTIONS

Important: *Please read the separate instructions for completing this form before you begin. They clarify the information requested and provide specific examples. If you do not have a copy of the instructions, you can obtain one from the PHMSA Pipeline Safety Community Web Page at http://www.phmsa.dot.gov/pipeline/library/forms.*

PART A - KEY REPORT INFORMATION

Report Type: *(select all that apply)*	**Original:**	**Supplemental:**	**Final:**
	Yes		**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	1100 LOUISIANA, SUITE 3300
3b. City	HOUSTON
3c. State	Texas
3d. Zip Code	77002
4. Local time *(24-hr clock)* and date of the Accident:	03/23/2018 13:45
5. Location of Accident:	
Latitude:	REDAC
Longitude:	REDAC
6. National Response Center Report Number (if applicable):	NRC Notification Not Required
7. Local time *(24-hr clock)* and date of initial telephonic report to the National Response Center (if applicable):	
8. Commodity released: *(select only one, based on predominant volume released)*	Crude Oil
- Specify Commodity Subtype:	
- If "Other" Subtype, Describe:	
- If Biofuel/Alternative Fuel and Commodity Subtype is Ethanol Blend, then % Ethanol Blend:	
- If Biofuel/Alternative Fuel and Commodity Subtype is Biodiesel, then Biodiesel Blend e.g. B2, B20, B100	
9. Estimated volume of commodity released unintentionally (Barrels):	2.00
10. Estimated volume of intentional and/or controlled release/blowdown (Barrels):	
11. Estimated volume of commodity recovered (Barrels):	2.00
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:	03/23/2018 14:15
14b. Local time pipeline/facility restarted:	03/23/2018 20:22
- 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":	03/23/2018 13:45
18b. Local time Operator resources arrived on site:	03/23/2018 13:45
PART B - ADDITIONAL LOCATION INFORMATION	
1. Was the origin of the Accident onshore?	Yes
If Yes, Complete Questions (2-12)	
If No, Complete Questions (13-15)	
- If Onshore:	
2. State:	Wisconsin
3. Zip Code:	54880
4. City	Superior
5. County or Parish	Douglas
6. Operator-designated location:	Milepost/Valve Station
Specify:	1098
7. Pipeline/Facility name:	Superior Terminal
8. Segment name/ID:	Tank 21 Pad Area
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):	42
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:	1975
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: *(Select one or both)*	
- Private Well	
- Public Water Intake	
5b. Estimated amount released in or reaching water (Barrels):	
5c. Name of body of water, if commonly known:	
6. At the location of this Accident, had the pipeline segment or facility been identified as one that "could affect" a High Consequence Area (HCA) as determined in the Operator's Integrity Management Program?	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): *(Select all that apply)*	
- Commercially Navigable Waterway:	
Was this HCA identified in the "could affect" determination for this Accident site in the Operator's	

Integrity Management Program?	
- High Population Area:	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	Yes
Was this HCA identified in the "could affect" determination for this Accident site in the Operator's Integrity Management Program?	Yes
- Unusually Sensitive Area (USA) - Drinking Water	Yes
Was this HCA identified in the "could affect" determination for this Accident site in the Operator's Integrity Management Program?	Yes
- 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	$ R
8b. Estimated cost of commodity lost	$ RE
8c. Estimated cost of Operator's property damage & repairs	$ RE
8d. Estimated cost of Operator's emergency response	$ RE
8e. Estimated cost of Operator's environmental remediation	$ RED
8f. Estimated other costs	$ R
Describe:	
8g. Estimated total costs (sum of above) – effective 12-2012, changed to "Total estimated property damage (sum of above)"	$ RED

PART E - ADDITIONAL OPERATING INFORMATION

1. Estimated pressure at the point and time of the Accident (psig):	37.00
2. Maximum Operating Pressure (MOP) at the point and time of the Accident (psig):	216.00
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	
- 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:	Yes
Describe:	Field identified
PART F - DRUG & ALCOHOL TESTING INFORMATION	
1. As a result of this Accident, were any Operator employees tested under the post-accident drug and alcohol testing requirements of DOT's Drug & Alcohol Testing regulations?	No
- If Yes:	
1a. Specify how many were tested:	
1b. Specify how many failed:	

2. As a result of this Accident, were any Operator contractor employees tested under the post-accident drug and alcohol testing requirements of DOT's Drug & Alcohol Testing regulations?	No
- If Yes:	
2a. Specify how many were tested:	
2b. Specify how many failed:	

PART G – APPARENT CAUSE

Select only one box from PART G in shaded column on left representing the APPARENT Cause of the Accident, and answer the questions on the right. Describe secondary, contributing or root causes of the Accident in the narrative (PART H).

Apparent Cause:	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: *(select all that apply)*	
- Galvanic	
- Atmospheric	
- Stray Current	
- Microbiological	
- Selective Seam	
- Other:	
- If Other, Describe:	
3. The type(s) of corrosion selected in Question 2 is based on the following: *(select all that apply)*	
- Field examination	
- Determined by metallurgical analysis	
- Other:	
- If Other, Describe:	
4. Was the failed item buried under the ground?	
- If Yes :	
4a. Was failed item considered to be under cathodic protection at the time of the Accident?	
If Yes - Year protection started:	
4b. Was shielding, tenting, or disbonding of coating evident at the point of the Accident?	
4c. Has one or more Cathodic Protection Survey been conducted at the point of the Accident?	
If "Yes, CP Annual Survey" – Most recent year conducted:	
If "Yes, Close Interval Survey" – Most recent year conducted:	
If "Yes, Other CP Survey" – Most recent year conducted:	
- If No:	
4d. Was the failed item externally coated or painted?	
5. Was there observable damage to the coating or paint in the vicinity of the corrosion?	
- If Internal Corrosion:	
6. Results of visual examination:	
- Other:	
7. Type of corrosion *(select all that apply)*: -	
- Corrosive Commodity	
- Water drop-out/Acid	
- Microbiological	
- Erosion	
- Other:	
- If Other, Describe:	
8. The cause(s) of corrosion selected in Question 7 is based on the following *(select all that apply)*: -	
- Field examination	
- Determined by metallurgical analysis	
- Other:	
- If Other, Describe:	
9. Location of corrosion *(select all that apply)*: -	
- Low point in pipe	
- Elbow	
- Other:	
- If Other, Describe:	
10. Was the commodity treated with corrosion inhibitors or biocides?	

11. Was the interior coated or lined with protective coating?	
12. Were cleaning/dewatering pigs (or other operations) routinely utilized?	
13. Were corrosion coupons routinely utilized?	
Complete the following if any Corrosion Failure sub-cause is selected AND the "Item Involved in Accident" (from PART C, Question 3) is Tank/Vessel.	
14. List the year of the most recent inspections:	
14a. API Std 653 Out-of-Service Inspection	
- No Out-of-Service Inspection completed	
14b. API Std 653 In-Service Inspection	
- No In-Service Inspection completed	
Complete the following if any Corrosion Failure sub-cause is selected AND the "Item Involved in Accident" (from PART C, Question 3) is Pipe or Weld.	
15. Has one or more internal inspection tool collected data at the point of the Accident?	
15a. If Yes, for each tool used, select type of internal inspection tool and indicate most recent year run: -	
- Magnetic Flux Leakage Tool	
Most recent year:	
- Ultrasonic	
Most recent year:	
- Geometry	
Most recent year:	
- Caliper	
Most recent year:	
- Crack	
Most recent year:	
- Hard Spot	
Most recent year:	
- Combination Tool	
Most recent year:	
- Transverse Field/Triaxial	
Most recent year:	
- Other	
Most recent year:	
Describe:	
16. Has one or more hydrotest or other pressure test been conducted since original construction at the point of the Accident?	
If Yes -	
Most recent year tested:	
Test pressure:	
17. Has one or more Direct Assessment been conducted on this segment?	
- If Yes, and an investigative dig was conducted at the point of the Accident::	
Most recent year conducted:	
- If Yes, but the point of the Accident was not identified as a dig site:	
Most recent year conducted:	
18. Has one or more non-destructive examination been conducted at the point of the Accident since January 1, 2002?	
18a. If Yes, for each examination conducted since January 1, 2002, select type of non-destructive examination and indicate most recent year the examination was conducted:	
- Radiography	
Most recent year conducted:	
- Guided Wave Ultrasonic	
Most recent year conducted:	
- Handheld Ultrasonic Tool	
Most recent year conducted:	
- Wet Magnetic Particle Test	
Most recent year conducted:	
- Dry Magnetic Particle Test	
Most recent year conducted:	
- Other	
Most recent year conducted:	
Describe:	

G2 - Natural Force Damage - only one **sub-cause** can be picked from shaded left-handed column

Natural Force Damage – Sub-Cause:	
- If Earth Movement, NOT due to Heavy Rains/Floods:	
1. Specify:	
- If Other, Describe:	
- If Heavy Rains/Floods:	

2. Specify:	
- If Other, Describe:	
- If Lightning:	
3. Specify:	
- If Temperature:	
4. Specify:	
- If Other, Describe:	
- If Other Natural Force Damage:	
5. Describe:	
Complete the following if any Natural Force Damage sub-cause is selected.	
6. Were the natural forces causing the Accident generated in conjunction with an extreme weather event?	
6a. If Yes, specify: *(select all that apply)*	
- Hurricane	
- Tropical Storm	
- Tornado	
- Other	
- If Other, Describe:	
G3 - Excavation Damage - only one **sub-cause** can be picked from shaded left-hand column	
Excavation Damage – Sub-Cause:	
- If Previous Damage due to Excavation Activity: Complete Questions 1-5 ONLY IF the "Item Involved in Accident" (from PART C, Question 3) is Pipe 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: *(select all that apply)* -	
- One-Call System	
- Excavator	
- Contractor	
- Landowner	
Complete the following mandatory CGA-DIRT Program questions if any Excavation Damage sub-cause is selected.	
7. Do you want PHMSA to upload the following information to CGA-DIRT (www.cga-dirt.com)?	
8. Right-of-Way where event occurred: *(select all that apply)* -	
- Public	
- If "Public", Specify:	
- Private	
- If "Private", Specify:	
- Pipeline Property/Easement	
- Power/Transmission Line	
- Railroad	
- Dedicated Public Utility Easement	
- Federal Land	
- Data not collected	
- Unknown/Other	
9. Type of excavator:	
10. Type of excavation equipment:	
11. Type of work performed:	
12. Was the One-Call Center notified?	
12a. If Yes, specify ticket number:	
12b. If this is a State where more than a single One-Call Center exists, list the name of the One-Call Center notified:	
13. Type of Locator:	
14. Were facility locate marks visible in the area of excavation?	
15. Were facilities marked correctly?	
16. Did the damage cause an interruption in service?	
16a. If Yes, specify duration of the interruption (hours)	
17. Description of the CGA-DIRT Root Cause *(select only the one predominant first level CGA-DIRT Root Cause and then, where available as a choice, the one predominant second level CGA-DIRT Root Cause as well):*	
Root Cause:	
- If One-Call Notification Practices Not Sufficient, specify:	
- If Locating Practices Not Sufficient, specify:	
- If Excavation Practices Not Sufficient, specify:	
- If Other/None of the Above, explain:	
G4 - Other Outside Force Damage - *only one **sub-cause** can be selected from the shaded left-hand column*	
Other Outside Force Damage – Sub-Cause:	
- If Damage by Car, Truck, or Other Motorized Vehicle/Equipment NOT Engaged in Excavation:	
1. Vehicle/Equipment operated by:	
- If Damage by Boats, Barges, Drilling Rigs, or Other Maritime Equipment or Vessels Set Adrift or Which Have Otherwise Lost Their Mooring:	
2. Select one or more of the following IF an extreme weather event was a factor:	
- Hurricane	
- Tropical Storm	
- Tornado	
- Heavy Rains/Flood	
- Other	
- If Other, Describe:	
- If Previous Mechanical Damage NOT Related to Excavation: Complete Questions 3-7 ONLY IF the "Item Involved in Accident" (from PART C, Question 3) is Pipe or Weld.	
3. Has one or more internal inspection tool collected data at the point of the Accident?	
3a. If Yes, for each tool used, select type of internal inspection tool and indicate most recent year run:	

- Magnetic Flux Leakage	
Most recent year conducted:	
- Ultrasonic	
Most recent year conducted:	
- Geometry	
Most recent year conducted:	
- Caliper	
Most recent year conducted:	
- Crack	
Most recent year conducted:	
- Hard Spot	
Most recent year conducted:	
- Combination Tool	
Most recent year conducted:	
- Transverse Field/Triaxial	
Most recent year conducted:	
- Other	
Most recent year conducted:	
Describe:	
4. Do you have reason to believe that the internal inspection was completed BEFORE the damage was sustained?	
5. Has one or more hydrotest or other pressure test been conducted since original construction at the point of the Accident?	
- If Yes:	
Most recent year tested:	
Test pressure (psig):	
6. Has one or more Direct Assessment been conducted on the pipeline segment?	
- If Yes, and an investigative dig was conducted at the point of the Accident:	
Most recent year conducted:	
- If Yes, but the point of the Accident was not identified as a dig site:	
Most recent year conducted:	
7. Has one or more non-destructive examination been conducted at the point of the Accident since January 1, 2002?	
7a. If Yes, for each examination conducted since January 1, 2002, select type of non-destructive examination and indicate most recent year the examination was conducted:	
- Radiography	
Most recent year conducted:	
- Guided Wave Ultrasonic	
Most recent year conducted:	
- Handheld Ultrasonic Tool	
Most recent year conducted:	
- Wet Magnetic Particle Test	
Most recent year conducted:	
- Dry Magnetic Particle Test	
Most recent year conducted:	
- Other	
Most recent year conducted:	
Describe:	
- If Intentional Damage:	
8. Specify:	
- If Other, Describe:	
- If Other Outside Force Damage:	
9. Describe:	

G5 - Material Failure of Pipe or Weld - only one **sub-cause** can be selected from the shaded left-hand column

Use this section to report material failures ONLY IF the "Item Involved in Accident" (from PART C, Question 3) is "Pipe" or "Weld."	
Material Failure of Pipe or Weld – Sub-Cause:	
1. The sub-cause shown above is based on the following: *(select all that apply)*	
- Field Examination	
- Determined by Metallurgical Analysis	
- Other Analysis	
- If "Other Analysis", Describe:	
- Sub-cause is Tentative or Suspected; Still Under Investigation (Supplemental Report required)	
- If Construction, Installation, or Fabrication-related:	
2. List contributing factors: *(select all that apply)*	

- Fatigue or Vibration-related	
Specify:	
- If Other, Describe:	
- Mechanical Stress:	
- Other	
- If Other, Describe:	
- If Environmental Cracking-related:	
3. Specify:	
- If Other - Describe:	
Complete the following if any Material Failure of Pipe or Weld sub-cause is selected.	
4. Additional factors: (*select all that apply*):	
- Dent	
- Gouge	
- Pipe Bend	
- Arc Burn	
- Crack	
- Lack of Fusion	
- Lamination	
- Buckle	
- Wrinkle	
- Misalignment	
- Burnt Steel	
- Other:	
- If Other, Describe:	
5. Has one or more internal inspection tool collected data at the point of the Accident?	
5a. If Yes, for each tool used, select type of internal inspection tool and indicate most recent year run:	
- Magnetic Flux Leakage	
Most recent year run:	
- Ultrasonic	
Most recent year run:	
- Geometry	
Most recent year run:	
- Caliper	
Most recent year run:	
- Crack	
Most recent year run:	
- Hard Spot	
Most recent year run:	
- Combination Tool	
Most recent year run:	
- Transverse Field/Triaxial	
Most recent year run:	
- Other	
Most recent year run:	
Describe:	
6. Has one or more hydrotest or other pressure test been conducted since original construction at the point of the Accident?	
- If Yes:	
Most recent year tested:	
Test pressure (psig):	
7. Has one or more Direct Assessment been conducted on the pipeline segment?	
- If Yes, and an investigative dig was conducted at the point of the Accident -	
Most recent year conducted:	
- If Yes, but the point of the Accident was not identified as a dig site -	
Most recent year conducted:	
8. Has one or more non-destructive examination(s) been conducted at the point of the Accident since January 1, 2002?	
8a. If Yes, for each examination conducted since January 1, 2002, select type of non-destructive examination and indicate most recent year the examination was conducted: -	
- Radiography	
Most recent year conducted:	
- Guided Wave Ultrasonic	
Most recent year conducted:	
- Handheld Ultrasonic Tool	
Most recent year conducted:	
- Wet Magnetic Particle Test	
Most recent year conducted:	

- Dry Magnetic Particle Test	
Most recent year conducted:	
- Other	
Most recent year conducted:	
Describe:	
G6 – Equipment Failure - only one **sub-cause** can be selected from the shaded left-hand column	
Equipment Failure – Sub-Cause:	Non-threaded Connection Failure
- If Malfunction of Control/Relief Equipment:	
1. Specify: *(select all that apply)* -	
- Control Valve	
- Instrumentation	
- SCADA	
- Communications	
- Block Valve	
- Check Valve	
- Relief Valve	
- Power Failure	
- Stopple/Control Fitting	
- ESD System Failure	
- Other	
- If Other – Describe:	
- If Pump or Pump-related Equipment:	
2. Specify:	
- If Other – Describe:	
- If Threaded Connection/Coupling Failure:	
3. Specify:	
- If Other – Describe:	
- If Non-threaded Connection Failure:	
4. Specify:	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: *(select all that apply)*	
- Excessive vibration	
- Overpressurization	
- No support or loss of support	
- Manufacturing defect	
- Loss of electricity	
- Improper installation	
- Mismatched items (different manufacturer for tubing and tubing fittings)	
- Dissimilar metals	
- Breakdown of soft goods due to compatibility issues with transported commodity	
- Valve vault or valve can contributed to the release	
- Alarm/status failure	
- Misalignment	
- Thermal stress	
- Other	Yes
- If Other, Describe:	Torqueing relaxed over time
G7 - Incorrect Operation - only one **sub-cause** can be selected from the shaded left-hand column	
Incorrect Operation – Sub-Cause:	
- If Tank, Vessel, or Sump/Separator Allowed or Caused to Overfill or Overflow	
1. Specify:	
- If Other, Describe:	
- If Other Incorrect Operation	
2. Describe:	
Complete the following if any Incorrect Operation sub-cause is selected.	

3. Was this Accident related to *(select all that apply)*: -	
- Inadequate procedure	
- No procedure established	
- Failure to follow procedure	
- Other:	
- If Other, Describe:	
4. What category type was the activity that caused the Accident?	
5. Was the task(s) that led to the Accident identified as a covered task in your Operator Qualification Program?	
5a. If Yes, were the individuals performing the task(s) qualified for the task(s)?	

G8 - Other Accident Cause - only one **sub-cause** can be selected from the shaded left-hand column

Other Accident Cause – Sub-Cause:	
- If Miscellaneous:	
1. Describe:	
- If Unknown:	
2. Specify:	

PART H - NARRATIVE DESCRIPTION OF THE ACCIDENT

On March 23, 2018 at 1:45 PM local time, approximately two barrels of crude oil was discovered on the west side of the Tank 21 pad area by Enbridge personnel at the Superior Terminal. The Edmonton Control Center was contacted and the tank line was shut down. Superior Pipeline Maintenance personnel were dispatched to begin clean up and investigate the source of the release.

After further excavation, the source of the release was identified as a buried flange on the tank line piping. The bolts on the flange were re-torqued, and the line was restarted later that evening. The area was monitored to confirm the leak was repaired. Approximately 13 cubic yards of contaminated soil was removed and will be treated at the soil management site at the Superior Terminal.

PART I - PREPARER AND AUTHORIZED SIGNATURE

Preparer's Name	RE RED
Preparer's Title	Compliance Analyst
Preparer's Telephone Number	RE RE RE
Preparer's E-mail Address	REDACTED
Preparer's Facsimile Number	
Authorized Signer Name	REDACTE
Authorized Signer Title	Supervisor US Pipeline Compliance
Authorized Signer Telephone Number	REDACTE
Authorized Signer Email	REDACTED
Date	04/20/2018

ENBRIDGE

Update on Discharges from a Lakehead System Pipeline [147]

NOTICE: This report is required by 49 CFR Part 195. Failure to report can result in a civil penalty not to exceed $100,000 for each violation for each day that such violation persists except that the maximum civil penalty shall not exceed $1,000,000 as provided in 49 USC 60122.		OMB NO: 2137-0047 EXPIRATION DATE: 8/31/2020
U.S Department of Transportation Pipeline and Hazardous Materials Safety Administration	**Original Report Date:**	12/13/2017
	No.	20170410 - 30473 --- (DOT Use Only)

ACCIDENT REPORT - HAZARDOUS LIQUID PIPELINE SYSTEMS

INSTRUCTIONS

Important: *Please read the separate instructions for completing this form before you begin. They clarify the information requested and provide specific examples. If you do not have a copy of the instructions, you can obtain one from the PHMSA Pipeline Safety Community Web Page at http://www.phmsa.dot.gov/pipeline/library/forms.*

PART A - KEY REPORT INFORMATION

Report Type: *(select all that apply)*	**Original:**	**Supplemental:**	**Final:**
		Yes	**Yes**

Last Revision Date:	06/07/2018
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:	11/14/2017 07:35
5. Location of Accident:	
Latitude:	REDAC
Longitude:	REDAC
6. National Response Center Report Number (if applicable):	NRC Notification Not Required
7. Local time *(24-hr clock)* and date of initial telephonic report to the National Response Center (if applicable):	
8. Commodity released: *(select only one, based on predominant volume released)*	Crude Oil
- Specify Commodity Subtype:	
- If "Other" Subtype, Describe:	
- If Biofuel/Alternative Fuel and Commodity Subtype is Ethanol Blend, then % Ethanol Blend:	
- If Biofuel/Alternative Fuel and Commodity Subtype is Biodiesel, then Biodiesel Blend e.g. B2, B20, B100	
9. Estimated volume of commodity released unintentionally (Barrels):	1.76
10. Estimated volume of intentional and/or controlled release/blowdown (Barrels):	
11. Estimated volume of commodity recovered (Barrels):	1.76
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?	No
- If No, Explain:	Mixer was locked out
- If Yes, complete Questions 14a and 14b: *(use local time, 24-hr clock)*	
14a. Local time and date of shutdown:	
14b. Local time pipeline/facility restarted:	
- 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":	11/14/2017 07:35
18b. Local time Operator resources arrived on site:	11/14/2017 07:35
PART B - ADDITIONAL LOCATION INFORMATION	
1. Was the origin of the Accident onshore?	Yes
If Yes, Complete Questions (2-12)	
If No, Complete Questions (13-15)	
- If Onshore:	
2. State:	Wisconsin
3. Zip Code:	54880
4. City	Superior
5. County or Parish	Douglas
6. Operator-designated location:	Milepost/Valve Station
Specify:	1096
7. Pipeline/Facility name:	Superior Terminal
8. Segment name/ID:	Tank 45 Mixer
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):	Tank, including attached appurtenances
Specify:	
- If Other, Describe:	
Depth-of-Cover (in):	
12. Did Accident occur in a crossing?	No
- If Yes, specify type below:	
- If Bridge crossing –	
Cased/ Uncased:	
- If Railroad crossing –	
Cased/ Uncased/ Bored/drilled	
- If Road crossing –	
Cased/ Uncased/ Bored/drilled	
- If Water crossing –	
Cased/ Uncased	
- Name of body of water, if commonly known:	
- Approx. water depth (ft) at the point of the Accident:	
- Select:	
- If Offshore:	
13. Approximate water depth (ft) at the point of the Accident:	
14. Origin of Accident:	
- In State waters - Specify:	
- State:	
- Area:	
- Block/Tract #:	
- Nearest County/Parish:	
- On the Outer Continental Shelf (OCS) - Specify:	
- Area:	
- Block #:	
15. Area of Accident:	
PART C - ADDITIONAL FACILITY INFORMATION	
1. Is the pipeline or facility:	Interstate
2. Part of system involved in Accident:	Onshore Breakout Tank or Storage Vessel, including Attached Appurtenances
- If Onshore Breakout Tank or Storage Vessel, Including Attached Appurtenances, specify:	Atmospheric or Low Pressure
3. Item involved in Accident:	Tank/Vessel
- 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:	Mixer
- If Other - Describe:	
- If Other, describe:	
4. Year item involved in Accident was installed:	2015
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:	Seal or Packing
- If Other, Describe:	
- If Rupture - Select Orientation:	
- If Other, Describe:	
Approx. size: in. (widest opening) by	
in. (length circumferentially or axially)	
- If Other – Describe:	

PART D - ADDITIONAL CONSEQUENCE INFORMATION

1. Wildlife impact:	No
1a. If Yes, specify all that apply:	
- Fish/aquatic	
- Birds	
- Terrestrial	
2. Soil contamination:	Yes
3. Long term impact assessment performed or planned:	No
4. Anticipated remediation:	No
4a. If Yes, specify all that apply:	
- Surface water	
- Groundwater	
- Soil	
- Vegetation	
- Wildlife	
5. Water contamination:	No
5a. If Yes, specify all that apply:	
- Ocean/Seawater	
- Surface	
- Groundwater	
- Drinking water: *(Select one or both)*	
- Private Well	
- Public Water Intake	
5b. Estimated amount released in or reaching water (Barrels):	
5c. Name of body of water, if commonly known:	
6. At the location of this Accident, had the pipeline segment or facility been identified as one that "could affect" a High Consequence Area (HCA) as determined in the Operator's Integrity Management Program?	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): *(Select all that apply)*	
- Commercially Navigable Waterway:	Yes
Was this HCA identified in the "could affect"	Yes

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	Yes
Was this HCA identified in the "could affect" determination for this Accident site in the Operator's Integrity Management Program?	Yes
- Unusually Sensitive Area (USA) - Drinking Water	Yes
Was this HCA identified in the "could affect" determination for this Accident site in the Operator's Integrity Management Program?	Yes
- 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	$ R
8b. Estimated cost of commodity lost	$ R
8c. Estimated cost of Operator's property damage & repairs	$ RED
8d. Estimated cost of Operator's emergency response	$ RE
8e. Estimated cost of Operator's environmental remediation	$ RE
8f. Estimated other costs	$ R
Describe:	
8g. Estimated total costs (sum of above) – effective 12-2012, changed to "Total estimated property damage (sum of above)"	$ RED

PART E - ADDITIONAL OPERATING INFORMATION

1. Estimated pressure at the point and time of the Accident (psig):	.00
2. Maximum Operating Pressure (MOP) at the point and time of the Accident (psig):	15.00
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?	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)*	Field identified and 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

Select only one box from PART G in shaded column on left representing the APPARENT Cause of the Accident, and answer the questions on the right. Describe secondary, contributing or root causes of the Accident in the narrative (PART H).

Apparent Cause:	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: *(select all that apply)*	
- Galvanic	
- Atmospheric	
- Stray Current	
- Microbiological	
- Selective Seam	
- Other:	
- If Other, Describe:	
3. The type(s) of corrosion selected in Question 2 is based on the following: *(select all that apply)*	
- Field examination	
- Determined by metallurgical analysis	
- Other:	
- If Other, Describe:	
4. Was the failed item buried under the ground?	
- If Yes :	
4a. Was failed item considered to be under cathodic protection at the time of the Accident?	
If Yes - Year protection started:	
4b. Was shielding, tenting, or disbonding of coating evident at the point of the Accident?	
4c. Has one or more Cathodic Protection Survey been conducted at the point of the Accident?	
If "Yes, CP Annual Survey" – Most recent year conducted:	
If "Yes, Close Interval Survey" – Most recent year conducted:	
If "Yes, Other CP Survey" – Most recent year conducted:	
- If No:	
4d. Was the failed item externally coated or painted?	
5. Was there observable damage to the coating or paint in the vicinity of the corrosion?	
- If Internal Corrosion:	
6. Results of visual examination:	
- Other:	
7. Type of corrosion *(select all that apply)*: -	
- Corrosive Commodity	
- Water drop-out/Acid	
- Microbiological	
- Erosion	
- Other:	
- If Other, Describe:	
8. The cause(s) of corrosion selected in Question 7 is based on the following *(select all that apply)*: -	
- Field examination	
- Determined by metallurgical analysis	
- Other:	

- If Other, Describe:	
9. Location of corrosion *(select all that apply)*: -	
- Low point in pipe	
- Elbow	
- Other:	
- If Other, Describe:	
10. Was the commodity treated with corrosion inhibitors or biocides?	
11. Was the interior coated or lined with protective coating?	
12. Were cleaning/dewatering pigs (or other operations) routinely utilized?	
13. Were corrosion coupons routinely utilized?	
Complete the following if any Corrosion Failure sub-cause is selected AND the "Item Involved in Accident" (from PART C, Question 3) is Tank/Vessel.	
14. List the year of the most recent inspections:	
14a. API Std 653 Out-of-Service Inspection	
- No Out-of-Service Inspection completed	
14b. API Std 653 In-Service Inspection	
- No In-Service Inspection completed	
Complete the following if any Corrosion Failure sub-cause is selected AND the "Item Involved in Accident" (from PART C, Question 3) is Pipe or Weld.	
15. Has one or more internal inspection tool collected data at the point of the Accident?	
15a. If Yes, for each tool used, select type of internal inspection tool and indicate most recent year run: -	
- Magnetic Flux Leakage Tool	
Most recent year:	
- Ultrasonic	
Most recent year:	
- Geometry	
Most recent year:	
- Caliper	
Most recent year:	
- Crack	
Most recent year:	
- Hard Spot	
Most recent year:	
- Combination Tool	
Most recent year:	
- Transverse Field/Triaxial	
Most recent year:	
- Other	
Most recent year:	
Describe:	
16. Has one or more hydrotest or other pressure test been conducted since original construction at the point of the Accident?	
If Yes -	
Most recent year tested:	
Test pressure:	
17. Has one or more Direct Assessment been conducted on this segment?	
- If Yes, and an investigative dig was conducted at the point of the Accident::	
Most recent year conducted:	
- If Yes, but the point of the Accident was not identified as a dig site:	
Most recent year conducted:	
18. Has one or more non-destructive examination been conducted at the point of the Accident since January 1, 2002?	
18a. If Yes, for each examination conducted since January 1, 2002, select type of non-destructive examination and indicate most recent year the examination was conducted:	
- Radiography	
Most recent year conducted:	
- Guided Wave Ultrasonic	
Most recent year conducted:	
- Handheld Ultrasonic Tool	
Most recent year conducted:	
- Wet Magnetic Particle Test	
Most recent year conducted:	
- Dry Magnetic Particle Test	
Most recent year conducted:	
- Other	
Most recent year conducted:	
Describe:	

G2 - Natural Force Damage - only one **sub-cause** can be picked from shaded left-handed column	
Natural Force Damage – Sub-Cause:	
- If Earth Movement, NOT due to Heavy Rains/Floods:	
1. Specify:	
- If Other, Describe:	
- If Heavy Rains/Floods:	
2. Specify:	
- If Other, Describe:	
- If Lightning:	
3. Specify:	
- If Temperature:	
4. Specify:	
- If Other, Describe:	
- If Other Natural Force Damage:	
5. Describe:	
Complete the following if any Natural Force Damage sub-cause is selected.	
6. Were the natural forces causing the Accident generated in conjunction with an extreme weather event?	
6a. If Yes, specify: *(select all that apply)*	
- Hurricane	
- Tropical Storm	
- Tornado	
- Other	
- If Other, Describe:	
G3 - Excavation Damage - only one **sub-cause** can be picked from shaded left-hand column	
Excavation Damage – Sub-Cause:	
- If Previous Damage due to Excavation Activity: Complete Questions 1-5 ONLY IF the "Item Involved in Accident" (from PART C, Question 3) is Pipe 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: *(select all that apply)* -	
- One-Call System	
- Excavator	
- Contractor	
- Landowner	
Complete the following mandatory CGA-DIRT Program questions if any Excavation Damage sub-cause is selected.	
7. Do you want PHMSA to upload the following information to CGA-DIRT (www.cga-dirt.com)?	
8. Right-of-Way where event occurred: *(select all that apply)* -	
- Public	
- If "Public", Specify:	
- Private	
- If "Private", Specify:	
- Pipeline Property/Easement	
- Power/Transmission Line	
- Railroad	
- Dedicated Public Utility Easement	
- Federal Land	
- Data not collected	
- Unknown/Other	
9. Type of excavator:	
10. Type of excavation equipment:	
11. Type of work performed:	
12. Was the One-Call Center notified?	
12a. If Yes, specify ticket number:	
12b. If this is a State where more than a single One-Call Center exists, list the name of the One-Call Center notified:	
13. Type of Locator:	
14. Were facility locate marks visible in the area of excavation?	
15. Were facilities marked correctly?	
16. Did the damage cause an interruption in service?	
16a. If Yes, specify duration of the interruption (hours)	
17. Description of the CGA-DIRT Root Cause *(select only the one predominant first level CGA-DIRT Root Cause and then, where available as a choice, the one predominant second level CGA-DIRT Root Cause as well):*	
Root Cause:	
- If One-Call Notification Practices Not Sufficient, specify:	
- If Locating Practices Not Sufficient, specify:	
- If Excavation Practices Not Sufficient, specify:	
- If Other/None of the Above, explain:	
G4 - Other Outside Force Damage - *only one **sub-cause** can be selected from the shaded left-hand column*	
Other Outside Force Damage – Sub-Cause:	
- If Damage by Car, Truck, or Other Motorized Vehicle/Equipment NOT Engaged in Excavation:	
1. Vehicle/Equipment operated by:	
- If Damage by Boats, Barges, Drilling Rigs, or Other Maritime Equipment or Vessels Set Adrift or Which Have Otherwise Lost Their Mooring:	
2. Select one or more of the following IF an extreme weather event was a factor:	
- Hurricane	
- Tropical Storm	
- Tornado	

- Heavy Rains/Flood	
- Other	
- If Other, Describe:	
- If Previous Mechanical Damage NOT Related to Excavation: Complete Questions 3-7 ONLY IF the "Item Involved in Accident" (from PART C, Question 3) is Pipe or Weld.	
3. Has one or more internal inspection tool collected data at the point of the Accident?	
3a. If Yes, for each tool used, select type of internal inspection tool and indicate most recent year run:	
- Magnetic Flux Leakage	
Most recent year conducted:	
- Ultrasonic	
Most recent year conducted:	
- Geometry	
Most recent year conducted:	
- Caliper	
Most recent year conducted:	
- Crack	
Most recent year conducted:	
- Hard Spot	
Most recent year conducted:	
- Combination Tool	
Most recent year conducted:	
- Transverse Field/Triaxial	
Most recent year conducted:	
- Other	
Most recent year conducted:	
Describe:	
4. Do you have reason to believe that the internal inspection was completed BEFORE the damage was sustained?	
5. Has one or more hydrotest or other pressure test been conducted since original construction at the point of the Accident?	
- If Yes:	
Most recent year tested:	
Test pressure (psig):	
6. Has one or more Direct Assessment been conducted on the pipeline segment?	
- If Yes, and an investigative dig was conducted at the point of the Accident:	
Most recent year conducted:	
- If Yes, but the point of the Accident was not identified as a dig site:	
Most recent year conducted:	
7. Has one or more non-destructive examination been conducted at the point of the Accident since January 1, 2002?	
7a. If Yes, for each examination conducted since January 1, 2002, select type of non-destructive examination and indicate most recent year the examination was conducted:	
- Radiography	
Most recent year conducted:	
- Guided Wave Ultrasonic	
Most recent year conducted:	
- Handheld Ultrasonic Tool	
Most recent year conducted:	
- Wet Magnetic Particle Test	
Most recent year conducted:	
- Dry Magnetic Particle Test	
Most recent year conducted:	
- Other	
Most recent year conducted:	
Describe:	
- If Intentional Damage:	
8. Specify:	
- If Other, Describe:	
- If Other Outside Force Damage:	
9. Describe:	

G5 - Material Failure of Pipe or Weld - only one **sub-cause** can be selected from the shaded left-hand column

Use this section to report material failures ONLY IF the "Item Involved in Accident" (from PART C, Question 3) is "Pipe" or "Weld."	
Material Failure of Pipe or Weld – Sub-Cause:	
1. The sub-cause shown above is based on the following: *(select all that apply)*	

- Field Examination	
- Determined by Metallurgical Analysis	
- Other Analysis	
- If "Other Analysis", Describe:	
- Sub-cause is Tentative or Suspected; Still Under Investigation (Supplemental Report required)	
- If Construction, Installation, or Fabrication-related:	
2. List contributing factors: *(select all that apply)*	
- Fatigue or Vibration-related	
Specify:	
- If Other, Describe:	
- Mechanical Stress:	
- Other	
- If Other, Describe:	
- If Environmental Cracking-related:	
3. Specify:	
- If Other - Describe:	
Complete the following if any Material Failure of Pipe or Weld sub-cause is selected.	
4. Additional factors: (*select all that apply*):	
- Dent	
- Gouge	
- Pipe Bend	
- Arc Burn	
- Crack	
- Lack of Fusion	
- Lamination	
- Buckle	
- Wrinkle	
- Misalignment	
- Burnt Steel	
- Other:	
- If Other, Describe:	
5. Has one or more internal inspection tool collected data at the point of the Accident?	
5a. If Yes, for each tool used, select type of internal inspection tool and indicate most recent year run:	
- Magnetic Flux Leakage	
Most recent year run:	
- Ultrasonic	
Most recent year run:	
- Geometry	
Most recent year run:	
- Caliper	
Most recent year run:	
- Crack	
Most recent year run:	
- Hard Spot	
Most recent year run:	
- Combination Tool	
Most recent year run:	
- Transverse Field/Triaxial	
Most recent year run:	
- Other	
Most recent year run:	
Describe:	
6. Has one or more hydrotest or other pressure test been conducted since original construction at the point of the Accident?	
- If Yes:	
Most recent year tested:	
Test pressure (psig):	
7. Has one or more Direct Assessment been conducted on the pipeline segment?	
- If Yes, and an investigative dig was conducted at the point of the Accident -	
Most recent year conducted:	
- If Yes, but the point of the Accident was not identified as a dig site -	
Most recent year conducted:	
8. Has one or more non-destructive examination(s) been conducted at the point of the Accident since January 1, 2002?	
8a. If Yes, for each examination conducted since January 1, 2002, select type of non-destructive examination and indicate most recent year the examination was conducted: -	

- Radiography	
Most recent year conducted:	
- Guided Wave Ultrasonic	
Most recent year conducted:	
- Handheld Ultrasonic Tool	
Most recent year conducted:	
- Wet Magnetic Particle Test	
Most recent year conducted:	
- Dry Magnetic Particle Test	
Most recent year conducted:	
- Other	
Most recent year conducted:	
Describe:	
G6 – Equipment Failure - only one **sub-cause** can be selected from the shaded left-hand column	
Equipment Failure – Sub-Cause:	Other Equipment Failure
- If Malfunction of Control/Relief Equipment:	
1. Specify: *(select all that apply)* -	
- Control Valve	
- Instrumentation	
- SCADA	
- Communications	
- Block Valve	
- Check Valve	
- Relief Valve	
- Power Failure	
- Stopple/Control Fitting	
- ESD System Failure	
- Other	
- If Other – Describe:	
- If Pump or Pump-related Equipment:	
2. Specify:	
- If Other – Describe:	
- If Threaded Connection/Coupling Failure:	
3. Specify:	
- If Other – Describe:	
- If Non-threaded Connection Failure:	
4. Specify:	
- If Other – Describe:	
- If Other Equipment Failure:	
5. Describe:	Mixer Seal
Complete the following if any Equipment Failure sub-cause is selected.	
6. Additional factors that contributed to the equipment failure: *(select all that apply)*	
- Excessive vibration	
- Overpressurization	
- No support or loss of support	
- Manufacturing defect	
- Loss of electricity	
- Improper installation	
- Mismatched items (different manufacturer for tubing and tubing fittings)	
- Dissimilar metals	
- Breakdown of soft goods due to compatibility issues with transported commodity	
- Valve vault or valve can contributed to the release	
- Alarm/status failure	
- Misalignment	
- Thermal stress	
- Other	Yes
- If Other, Describe:	Shaft bearing failure
G7 - Incorrect Operation - only one **sub-cause** can be selected from the shaded left-hand column	
Incorrect Operation – Sub-Cause:	

- If Tank, Vessel, or Sump/Separator Allowed or Caused to Overfill or Overflow	
1. Specify:	
- If Other, Describe:	
- If Other Incorrect Operation	
2. Describe:	
Complete the following if any Incorrect Operation sub-cause is selected.	
3. Was this Accident related to *(select all that apply)*: -	
- Inadequate procedure	
- No procedure established	
- Failure to follow procedure	
- Other:	
- If Other, Describe:	
4. What category type was the activity that caused the Accident?	
5. Was the task(s) that led to the Accident identified as a covered task in your Operator Qualification Program?	
5a. If Yes, were the individuals performing the task(s) qualified for the task(s)?	

G8 - Other Accident Cause - only one **sub-cause** can be selected from the shaded left-hand column

Other Accident Cause – Sub-Cause:	
- If Miscellaneous:	
1. Describe:	
- If Unknown:	
2. Specify:	

PART H - NARRATIVE DESCRIPTION OF THE ACCIDENT

On November 14, 2017 at 7:35 AM CST, approximately 74 gallons of crude oil was discovered near one of the mixers on Tank 45 by two maintainers at the Superior Terminal while completing routine rounds. Superior Pipeline Maintenance personnel, along with a mechanic technician were dispatched to investigate the source of the crude oil and begin cleanup of the contaminated soil. It was discovered that the seal on the mixer was damaged, due to improper belt tension causing the release of crude oil. The mixer has been taken apart, the bearings have been sent to the manufacturer for a failure analysis, and will be repaired once all appropriate parts have been received and an outage scheduled. Four cubic yards of contaminated soil has been cleaned up and taken to an approved landfill.

The results of the failure analysis revealed that the release was due to a compromised shaft bearing, leading to complete bearing failure and subsequent damage to sealing components of the mixer.

PART I - PREPARER AND AUTHORIZED SIGNATURE

Preparer's Name	REDACT
Preparer's Title	Compliance Analyst
Preparer's Telephone Number	REDACTE
Preparer's E-mail Address	REDACTED
Preparer's Facsimile Number	
Authorized Signer Name	REDACTE
Authorized Signer Title	Supervisor US Pipeline Compliance
Authorized Signer Telephone Number	REDACTE
Authorized Signer Email	REDACTED
Date	06/07/2018