

DOT	US Department of Transportation
PHMSA	Pipeline and Hazardous Materials Safety Administration
OPS	Office of Pipeline Safety
	Central Region

Principal Investigator	Dan Munthe (MNOPS)
PHMSA Investigators	Bryan Louque/Karen Butler
Region Director	David Barrett/Allan Beshore
Date of Report	05/30/2015
Subject	Failure Investigation Report—Enbridge Energy, Limited Partnership— Line 1 Leak, Equipment Failure

Operator, Location, & Consequences

Date of Failure	07/28/2010
Commodity Released	Crude Oil
City/County & State	Cass Lake/Cass, MN
OpID & Operator Name	11169 Enbridge Energy, Limited Partnership
Unit # & Unit Name	3083 ALL LINES IN MINNESOTA [IA]
SMART Activity #	130804
Milepost / Location	MP 958.33/Mainline Valve Setting
Type of Failure	Leak—Equipment Failure on Line 1
Fatalities	0
Injuries	0
Description of area impacted	Pipeline Right-of-Way, Rural, Non-HCA
Total Cost	\$18,352

Failure Investigation Report – Enbridge Energy, Limited Partnership – Leak, Equipment Failure

Failure Date 07/28/2010

Executive Summary¹

At approximately 7:45 a.m. CDT² on July 28, 2010, a painting crew working for Enbridge Energy, L.P. (Enbridge), discovered a crude oil leak located in Cass Lake, Cass County, MN. The leak occurred on the pipeline right-of-way (ROW) at a mainline valve setting located approximately four miles east of the Enbridge North Cass Lake pump station. No evacuations, injuries, or fatalities occurred as a result of the crude oil release. The accident did not occur in a High Consequence Area (HCA) and surface water was not affected. An estimated 10 gallons of crude oil were released. The total cost of the accident was reported as \$18,352.

The Minnesota Office of Pipeline Safety (MNOPS) sent a pipeline investigator to the failure location and conducted an investigation. There were no service interruptions or supply impacts as a result of the accident even though Line 1 and Line 2 were shut down for a brief period to confirm the pipeline source of the release. The cause of the release was worn valve stem packing on the 18-inch nominal diameter gate valve installed in 1951, located on Line 1 at MP 958.33. The valve stem packing was replaced on site and the pipeline returned to service later the same day.

System Details

Line 1 originates in Edmonton, Alberta, Canada, and crosses the U. S. border near Neche, ND. Line 1 consists of 136 miles of 20" nominal diameter pipe stretching from the U.S. border to the Clearbrook, MN Terminal and 189 miles of 18" nominal diameter pipe traveling from Clearbrook, MN, to Superior, WI. Line 1 terminates in Superior, WI. There are eight pumping stations associated with the U.S. portion of Line 1 (Joliette, ND—MP 792; Viking, MN—MP 848; Clearbrook, MN—MP 909; Wilton, MN—MP 929; North Cass Lake, MN—MP 953; Deer River, MN—MP 996; Blackberry, MN—MP 1018; and Floodwood, MN—MP 1053).

In the location where the valve stem leaked the pipeline is constructed with 18" nominal diameter API 5L X-46 flash-welded line pipe manufactured by A.O. Smith and installed in 1950. The pipe at the failure location has a 0.281" wall (thickness) that is coated with coal tar enamel and cathodically protected. The maximum operating pressure (MOP) of Line 1 at the time of the failure was 837psig. The gate valve located at MP 958.33 was manufactured by M&J Valve Company and installed in 1951. A system based on supervisory control and data acquisition (SCADA) was in place and operating on the pipeline at the time of failure, but a leak detection system was not. The leak was too small to be detected by the existing SCADA system or by a formal leak detection system.

Events Leading up to the Failure

A painting crew working for Enbridge on above-ground appurtenances discovered crude oil at approximately 7:45 a.m. at the MP 958.33 mainline valve setting. The maintenance crew contacted an Enbridge supervisor who confirmed release at the failure site. The Enbridge product lifecycle

¹ This Failure Investigation Report is based upon facts and information available to PHMSA and MNOPS at the time of issuance. Any statements, conclusions, appendices, data summaries, or findings stated herein are subject to revision and do not constitute any final determination about the need for further investigation or enforcement action by any government agency.

² All times are shown in Central Daylight Time unless otherwise noted.

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Failure Date 07/28/2010

management (PLM) supervisor contacted the Enbridge Control Center and had the controllers shut down both Line 1 and Line 2, as both pipelines were in close proximity to the confirmed leak location. Enbridge shut the pipelines down at approximately 8:00 a.m., and the crude oil released did not migrate beyond the immediate area. Approximately 10 gallons of crude oil were released from the pipeline into the surrounding soil, and the pressure at the Line 1 MP 958.33 valve setting at the time of failure was 393 psig.

Emergency Response

After the Enbridge controllers shut down Line 1 and Line 2, the pipeline was isolated using remote controlled valves between the North Cass Lake and Deer River pump stations. Enbridge notified the National Response Center (NRC) at 10:37 a.m. (NRC Report No. 949152) and dispatched additional employees to the MP 958.33 valve setting. The Pipeline and Hazardous Materials Safety Administration (PHMSA) was notified at 11:45 a.m. by MNOPS, which had an investigator on the way to the accident site. Enbridge reported the leak location as slightly north of the intersection of Pike Bay Loop NW and Highway 2 in Cass Lake, MN (on the east side of lake). Field crews excavated the pipeline with shovels at the leak site; *in situ* visual inspection of the pipeline revealed that crude oil was leaking from the mainline valve stem packing.

Summary of Return-to-Service

Enbridge personnel were able to repack the valve stem on site without removing the valve from the pipeline. The repair required the packing seal retainer to be tightened. In addition to making the repairs, monitoring wells were installed.

Once the repair was completed and inspected, the contaminated soil was removed from the site by a contractor and disposed of at an off-site facility. Enbridge returned the pipeline to service at full operating pressure at 5:45 p.m. on the same day the leak occurred (July 28, 2010).

Findings and Contributing Factors

The Enbridge Line 1 leak at MP 958.33 was caused by equipment failure that allowed crude oil to leak through a worn valve stem packing on a gate valve located at the mainline valve setting. The gate valve was originally installed in 1951. The valve stem packing was replaced on site and the pipeline was returned to service the same day.

PHMSA, in conjunction with MNOPS, reviewed the operator's PHMSA reported leak history for valve-related failures and did not find a systemic problem associating this type of valve with packing leaks.

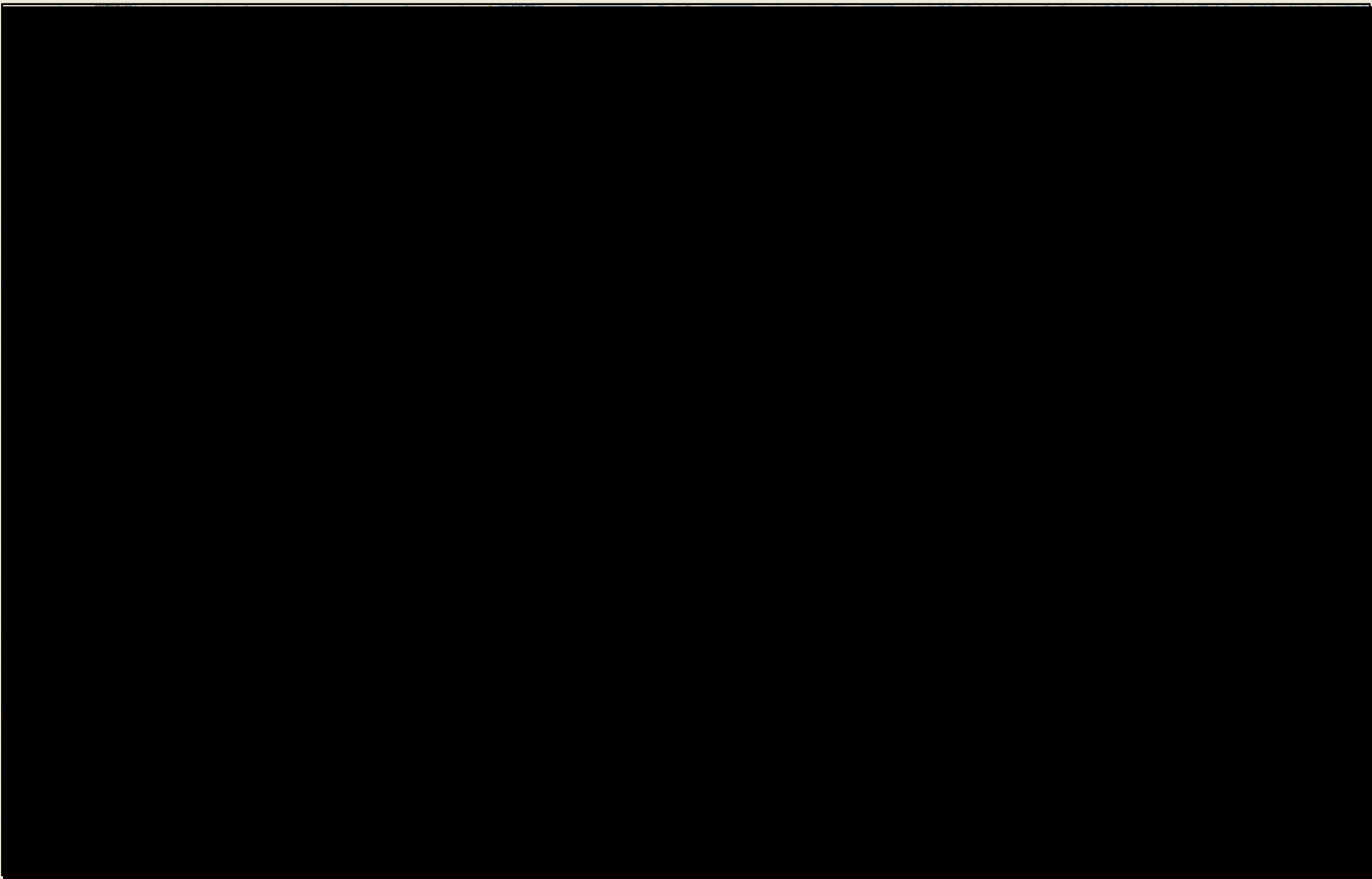
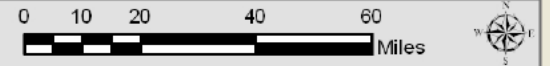
Appendices

- A Map and Photographs
- B NRC Report
- C Operator Accident Report
- D Interstate Agent PIM



Enbridge Line 1 Release, Cass Lake, MN

PHMSA CENTRAL REGION



Appendix A - Map and Photographs



Appendix B - NRC Report

NATIONAL RESPONSE CENTER 1-800-424-8802

*** For Public Use ***

Information released to a third party shall comply with any applicable federal and/or state Freedom of Information and Privacy Laws

Incident Report # 949152

INCIDENT DESCRIPTION

*Report taken at 11:37 on 28-JUL-10

Incident Type: PIPELINE

Incident Cause: UNKNOWN

Affected Area:

The incident was discovered on 28-JUL-10 at 09:15 local time.

Affected Medium: SUBSURFACE SUBSURFACE AND SOIL

SUSPECTED RESPONSIBLE PARTY

Organization: ENBRIDGE
SUPERIOR, WI 54880

Type of Organization: PRIVATE ENTERPRISE

INCIDENT LOCATION

NEAR CASS LAKE County: CASS
PIPELINE MILEPOST 958.33
City: CASS LAKE State: MN
Distance from City: 3 MILES
Direction from City: SE

RELEASED MATERIAL(S)

CHRIS Code: OIL Official Material Name: OIL: CRUDE

Also Known As:

Qty Released: 5 BARREL(S)

DESCRIPTION OF INCIDENT

CALLER IS REPORTING THAT A GALLON OF CRUDE WAS DISCOVERED BUBBLING UP FROM SUBSURFACE. TWO LINES IN THE AREA HAVE BEEN SHUT DOWN WHILE CHECKING FOR THE EXACT SOURCE. CALLER IS ESTIMATED 5 BARRELS RELEASED FROM THE UNDERGROUND PIPELINE AT THIS TIME.

INCIDENT DETAILS

Pipeline Type: TRANSMISSION
DOT Regulated: YES
Pipeline Above/Below Ground: BELOW
Exposed or Under Water: NO
Pipeline Covered: UNKNOWN

DAMAGES

Fire Involved: NO Fire Extinguished: UNKNOWN

INJURIES:	NO	Hospitalized:	Empl/Crew:	Passenger:
FATALITIES:	NO	Empl/Crew:	Passenger:	Occupant:
EVACUATIONS:	NO	Who Evacuated:	Radius/Area:	

Damages: NO

<u>Closure Type</u>	<u>Description of Closure</u>	<u>Length of Closure</u>	<u>Direction of Closure</u>
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Air: N

Road: N

Waterway: N

Major
Artery: N

Track: N

Passengers Transferred: NO
Environmental Impact: UNKNOWN
Media Interest: NONE Community Impact due to Material:

REMEDIAL ACTIONS

TWO LINES IN THE AREA IS SECURED AND ISOLATED. MOBILIZING EQUIPMENT TO EXCAVATE AND INVESTIGATE.

Release Secured: YES

Release Rate:

Estimated Release Duration:

WEATHER

Weather: SUNNY, 80°F

ADDITIONAL AGENCIES NOTIFIED

Federal: NONE

State/Local: NONE

State/Local On Scene: NONE

State Agency Number: NONE

NOTIFICATIONS BY NRC

ATLANTIC STRIKE TEAM (MAIN OFFICE)

28-JUL-10 11:43

USCG ICC (ICC ONI)

28-JUL-10 11:43

DOT CRISIS MANAGEMENT CENTER (MAIN OFFICE)

28-JUL-10 11:43

U.S. EPA V (MAIN OFFICE)

28-JUL-10 11:45

MN BUREAU OF CRIMINAL APPREHENSION (OPERATIONS CENTER)

28-JUL-10 11:43

MN DEPT OF HEALTH (MAIN OFFICE)

28-JUL-10 11:43

MN U.S. ATTORNEY'S OFFICE (MAIN OFFICE)

28-JUL-10 11:43

NATIONAL INFRASTRUCTURE COORD CTR (MAIN OFFICE)

28-JUL-10 11:43

NOAA RPTS FOR MN (MAIN OFFICE)

28-JUL-10 11:43

PIPELINE & HAZMAT SAFETY ADMIN (OFFICE OF PIPELINE SAFETY (AUTO))

28-JUL-10 11:43


ADDITIONAL INFORMATION

CALLER WILL MAKE NOTIFICATIONS TO STATE AGENCIES.

*** END INCIDENT REPORT # 949152 ***

The National Response Center is strictly an initial report taking agency and does not participate in the investigation or incident response. The NRC receives initial reporting information only and notifies Federal and State On-Scene Coordinators for response. The NRC does not verify nor does it take follow-on incident information. Verification of data and incident response is the sole responsibility of Federal/State On-Scene Coordinators. Data contained within the FOIA Web Database is initial information only. All reports provided via this server are for informational purposes only. Data to be used in legal proceedings must be obtained via written correspondence from the NRC.

Appendix C - Operator's Report

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: 01/31/2013	
 U.S Department of Transportation Pipeline and Hazardous Materials Safety Administration	Report Date:	08/27/2010	
	No.	20100184 - 15264 ----- (DOT Use Only)	
ACCIDENT REPORT - HAZARDOUS LIQUID PIPELINE SYSTEMS			
A federal agency may not conduct or sponsor, and a person is not required to respond to, nor shall a person be subject to a penalty for failure to comply with a collection of information subject to the requirements of the Paperwork Reduction Act unless that collection of information displays a current valid OMB Control Number. The OMB Control Number for this information collection is 2137-0047. Public reporting for this collection of information is estimated to be approximately 10 hours per response (5 hours for a small release), including the time for reviewing instructions, gathering the data needed, and completing and reviewing the collection of information. All responses to this collection of information are mandatory. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to: Information Collection Clearance Officer, PHMSA, Office of Pipeline Safety (PHP-30) 1200 New Jersey Avenue, SE, Washington, D.C. 20590.			
INSTRUCTIONS <i>Important: Please read the separate instructions for completing this form before you begin. They clarify the information requested and provide specific examples. If you do not have a copy of the instructions, you can obtain one from the PHMSA Pipeline Safety Community Web Page at http://www.phmsa.dot.gov/pipeline.</i>			
PART A - KEY REPORT INFORMATION			
Report Type: <i>(select all that apply)</i>	Original:	Supplemental:	Final:
	Yes		Yes
Report Status:	Submitted		
Create Date:	08/27/2010		
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 <i>(24-hr clock)</i> and date of the Accident:	07/28/2010 07:45		
5. Location of Accident:			
Latitude:	47.372103		
Longitude:	-94.57539		
6. National Response Center Report Number (if applicable):	949152		
7. Local time <i>(24-hr clock)</i> and date of initial telephonic report to the National Response Center (if applicable):	07/28/2010 10:37		
8. Commodity released: <i>(select only one, based on predominant volume released)</i>	Crude Oil		
- Specify Commodity Subtype:			
- If "Other" Subtype, Describe:			
- If Biofuel/Alternative Fuel and Commodity Subtype is Ethanol Blend, then % Ethanol Blend:	%		
- If Biofuel/Alternative Fuel and Commodity Subtype is Biodiesel, then Biodiesel Blend (e.g. B2, B20, B100):	B		
9. Estimated volume of commodity released unintentionally (Barrels):	.23		
10. Estimated volume of intentional and/or controlled release/blowdown (Barrels):			
11. Estimated volume of commodity recovered (Barrels):	.23		
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			

Appendix C - Operator's Report

13d. Workers working on the right-of-way, but NOT associated with this Operator	
13e. General public	
13f. Total injuries (sum of above)	
14. Was the pipeline/facility shut down due to the Accident?	Yes
- If No, Explain:	
- If Yes, complete Questions 14a and 14b: (use local time, 24-hr clock)	
14a. Local time and date of shutdown:	07/28/2010 08:00
14b. Local time pipeline/facility restarted:	07/28/2010 17:45
- Still shut down? (* Supplemental Report Required)	
15. Did the commodity ignite?	No
16. Did the commodity explode?	No
17. Number of general public evacuated:	
18. Time sequence (use local time, 24-hour clock):	
18a. Local time Operator identified Accident:	07/28/2010 07:45
18b. Local time Operator resources arrived on site:	07/28/2010 07:55
PART B - ADDITIONAL LOCATION INFORMATION	
1. Was the origin of Accident onshore?	Yes
<i>If Yes, Complete Questions (2-12)</i>	
<i>If No, Complete Questions (13-15)</i>	
- If Onshore:	
2. State:	Minnesota
3. Zip Code:	56633
4. City	Cass Lake
5. County or Parish	Cass
6. Operator-designated location:	Milepost/Valve Station
Specify:	958.33
7. Pipeline/Facility name:	Line 1
8. Segment name/ID:	Valve at MP 958.33
9. Was Accident on Federal land, other than the Outer Continental Shelf (OCS)?	No
10. Location of Accident:	Pipeline Right-of-way
11. Area of Accident (as found):	Underground
Specify:	Under soil
- If Other, Describe:	
Depth-of-Cover (in):	6
12. Did Accident occur in a crossing?	No
- If Yes, specify below:	
- If Bridge crossing –	
Cased/ Uncased:	
- If Railroad crossing –	
Cased/ Uncased/ Bored/drilled	
- If Road crossing –	
Cased/ Uncased/ Bored/drilled	
- If Water crossing –	
Cased/ Uncased	
- Name of body of water, if commonly known:	
- Approx. water depth (ft) at the point of the Accident:	
- Select:	
- If Offshore:	
13. Approximate water depth (ft) at the point of the Accident:	
14. Origin of Accident:	
- In State waters - Specify:	
- State:	
- Area:	
- Block/Tract #:	
- Nearest County/Parish:	
- On the Outer Continental Shelf (OCS) - Specify:	
- Area:	
- Block #:	
15. Area of Accident:	
PART C - ADDITIONAL FACILITY INFORMATION	
1. Is the pipeline or facility:	Interstate
2. Part of system involved in Accident:	Onshore Pipeline, Including Valve Sites
- If Onshore Breakout Tank or Storage Vessel, Including Attached Appurtenances, specify:	
3. Item involved in Accident:	Valve

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- 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 Other, Describe:	
- If Valve, specify:	Mainline
- If Mainline, specify:	Gate
- If Other, Describe:	
3i. Manufactured by:	M & J
3j. Year of manufacture:	1951
- If Tank/Vessel, specify:	
- If Other - Describe:	
- If Other, describe:	
4. Year item involved in Accident was installed:	1951
5. Material involved in Accident:	Material other than Carbon Steel
- If Material other than Carbon Steel, specify:	Valve Stem Packing
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?	No
7. Did the released commodity reach or occur in one or more High Consequence Area (HCA)?	No
7a. If Yes, specify HCA type(s): (Select all that apply)	
- Commercially Navigable Waterway:	
Was this HCA identified in the "could affect"	

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determination for this Accident site in the Operator's Integrity Management Program?	
- High Population Area:	
Was this HCA identified in the "could affect" determination for this Accident site in the Operator's Integrity Management Program?	
- Other Populated Area	
Was this HCA identified in the "could affect" determination for this Accident site in the Operator's Integrity Management Program?	
- Unusually Sensitive Area (USA) - Drinking Water	
Was this HCA identified in the "could affect" determination for this Accident site in the Operator's Integrity Management Program?	
- Unusually Sensitive Area (USA) - Ecological	
Was this HCA identified in the "could affect" determination for this Accident site in the Operator's Integrity Management Program?	
8. Estimated cost to Operator :	
8a. Estimated cost of public and non-Operator private property damage paid/reimbursed by the Operator	\$
8b. Estimated cost of commodity lost	\$
8c. Estimated cost of Operator's property damage & repairs	\$
8d. Estimated cost of Operator's emergency response	\$ 3,500
8e. Estimated cost of Operator's environmental remediation	\$ 14,852
8f. Estimated other costs	\$
Describe:	
8g. Estimated total costs (sum of above)	\$ 18,352
PART E - ADDITIONAL OPERATING INFORMATION	
1. Estimated pressure at the point and time of the Accident (psig):	393.00
2. Maximum Operating Pressure (MOP) at the point and time of the Accident (psig):	837.00
3. Describe the pressure on the system or facility relating to the Accident (psig):	Pressure did not exceed MOP
4. Not including pressure reductions required by PHMSA regulations (such as for repairs and pipe movement), was the system or facility relating to the Accident operating under an established pressure restriction with pressure limits below those normally allowed by the MOP?	No
- If Yes, Complete 4.a and 4.b below:	
4a. Did the pressure exceed this established pressure restriction?	
4b. Was this pressure restriction mandated by PHMSA or the State?	
5. Was "Onshore Pipeline, Including Valve Sites" OR "Offshore Pipeline, Including Riser and Riser Bend" selected in PART C, Question 2?	Yes
- If Yes - (Complete 5a. – 5f. below)	
5a. Type of upstream valve used to initially isolate release source:	Remotely Controlled
5b. Type of downstream valve used to initially isolate release source:	Remotely Controlled
5c. Length of segment isolated between valves (ft):	171,758
5d. Is the pipeline configured to accommodate internal inspection tools?	Yes
- If No, Which physical features limit tool accommodation? (select all that apply)	
- Changes in line pipe diameter	
- Presence of unsuitable mainline valves	
- Tight or mitered pipe bends	
- Other passage restrictions (i.e. unbarred tee's, projecting instrumentation, etc.)	
- Extra thick pipe wall (applicable only for magnetic flux leakage internal inspection tools)	
- Other -	
- If Other, Describe:	
5e. For this pipeline, are there operational factors which significantly complicate the execution of an internal inspection tool run?	No
- If Yes, Which operational factors complicate execution? (select all that apply)	
- Excessive debris or scale, wax, or other wall buildup	

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- 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 "Guard Patrol by Operator or its contractor" is selected in Question 8, specify the following:	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)	Controller would not be able to detect or control such a small release of product initiated from a valve stem packing.
- 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:	

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

Appendix C - Operator's Report

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, Descr be:	
- If Heavy Rains/Floods:	

Appendix C - Operator's Report

2. Specify:	
- If Other, Descr be:	
- If Lightning:	
3. Specify:	
- If Temperature:	
4. Specify:	
- If Other, Descr be:	
- If High Winds:	
- If Other Natural Force Damage:	
5. Describe:	
Complete the following if any Natural Force Damage sub-cause is selected.	
6. Were the natural forces causing the Accident generated in conjunction with an extreme weather event?	
6a. If Yes, specify: <i>(select all that apply)</i>	
- Hurricane	
- Tropical Storm	
- Tornado	
- Other	
- If Other, Descr be:	
G3 - Excavation Damage - only one sub-cause can be picked from shaded left-hand column	
Excavation Damage – Sub-Cause:	
- If Excavation Damage by Operator (First Party):	
- If Excavation Damage by Operator's Contractor (Second Party):	
- If Excavation Damage by Third Party:	
- 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:
Descr be:	
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?	

Appendix C - Operator's Report

5a. If Yes, for each examination, conducted since January 1, 2002, select type of non-destructive examination and indicate most recent year the examination was conducted:	
- Radiography	Most recent year conducted:
- Guided Wave Ultrasonic	Most recent year conducted:
- Handheld Ultrasonic Tool	Most recent year conducted:
- Wet Magnetic Particle Test	Most recent year conducted:
- Dry Magnetic Particle Test	Most recent year conducted:
- Other	Most recent year conducted:
Describe:	
Complete the following if Excavation Damage by Third Party is selected as the sub-cause.	
6. Did the operator get prior notification of the excavation activity?	
6a. If Yes, Notification received from: <i>(select all that apply)</i> -	
- One-Call System	
- Excavator	
- Contractor	
- Landowner	
Complete the following mandatory CGA-DIRT Program questions if any Excavation Damage sub-cause is selected.	
7. Do you want PHMSA to upload the following information to CGA-DIRT (www.cga-dirt.com)?	
8. Right-of-Way where event occurred: <i>(select all that apply)</i> -	
- Public	
- If "Public", Specify:	
- Private	
- If "Private", Specify:	
- Pipeline Property/Easement	
- Power/Transmission Line	
- Railroad	
- Dedicated Public Utility Easement	
- Federal Land	
- Data not collected	
- Unknown/Other	
9. Type of excavator:	
10. Type of excavation equipment:	
11. Type of work performed:	
12. Was the One-Call Center notified?	
12a. If Yes, specify ticket number:	
12b. If this is a State where more than a single One-Call Center exists, list the name of the One-Call Center notified:	
13. Type of Locator:	
14. Were facility locate marks visible in the area of excavation?	
15. Were facilities marked correctly?	
16. Did the damage cause an interruption in service?	
16a. If Yes, specify duration of the interruption (hours)	
17. Description of the CGA-DIRT Root Cause <i>(select only the one predominant first level CGA-DIRT Root Cause and then, where available as a choice, the one predominant second level CGA-DIRT Root Cause as well):</i>	
Root Cause:	
- If One-Call Notification Practices Not Sufficient, specify:	
- If Locating Practices Not Sufficient, specify:	
- If Excavation Practices Not Sufficient, specify:	
- If Other/None of the Above, explain:	
G4 - Other Outside Force Damage - only one sub-cause can be selected from the shaded left-hand column	
Other Outside Force Damage – Sub-Cause:	
- If Nearby Industrial, Man-made, or Other Fire/Explosion as Primary Cause of Incident:	
- 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	

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- Tropical Storm	
- Tornado	
- Heavy Rains/Flood	
- Other	
- If Other, Descr be:	
- If Routine or Normal Fishing or Other Maritime Activity NOT Engaged in Excavation:	
- If Electrical Arcing from Other Equipment or Facility:	
- 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, Descr be:
- 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	

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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 selected below is based on the following: <i>(select all that apply)</i>	
- Field Examination	
- Determined by Metallurgical Analysis	
- Other Analysis	
- If "Other Analysis", Descr be:	
- Sub-cause is Tentative or Suspected; Still Under Investigation (Supplemental Report required)	
- If Construction, Installation, or Fabrication-related:	
2. List contributing factors: <i>(select all that apply)</i>	
- Fatigue or Vibration-related	
Specify:	
- If Other, Descr be:	
- Mechanical Stress:	
- Other	
- If Other, Descr be:	
- If Original Manufacturing-related (NOT girth weld or other welds formed in the field):	
2. List contributing factors: <i>(select all that apply)</i>	
- Fatigue or Vibration-related:	
Specify:	
- If Other, Descr be:	
- Mechanical Stress:	
- Other	
- If Other, Descr be:	
- If Environmental Cracking-related:	
3. Specify:	
- Other - Describe:	
Complete the following if any Material Failure of Pipe or Weld sub-cause is selected.	
4. Additional factors: <i>(select all that apply)</i> :	
- Dent	
- Gouge	
- Pipe Bend	
- Arc Burn	
- Crack	
- Lack of Fusion	
- Lamination	
- Buckle	
- Wrinkle	
- Misalignment	
- Burnt Steel	
- Other:	
- If Other, Describe:	
5. Has one or more internal inspection tool collected data at the point of the Accident?	
5a. If Yes, for each tool used, select type of internal inspection tool and indicate most recent year run:	
- Magnetic Flux Leakage	Most recent year run:
- Ultrasonic	Most recent year run:
- Geometry	Most recent year run:
- Caliper	Most recent year run:
- Crack	Most recent year run:
- Hard Spot	Most recent year run:
- Combination Tool	Most recent year run:
- Transverse Field/Triaxial	Most recent year run:
- Other	Most recent year run:
Describe:	
6. Has one or more hydrotest or other pressure test been conducted since original construction at the point of the Accident?	

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- 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:	
Descr be:	
G6 – Equipment Failure - only one sub-cause can be selected from the shaded left-hand column	
Equipment Failure – Sub-Cause:	Non-threaded Connection Failure
- If Malfunction of Control/Relief Equipment:	
1. Specify: <i>(select all that apply)</i> -	
- Control Valve	
- Instrumentation	
- SCADA	
- Communications	
- Block Valve	
- Check Valve	
- Relief Valve	
- Power Failure	
- Stopple/Control Fitting	
- ESD System Failure	
- Other	
- If Other – Descr be:	
- If Pump or Pump-related Equipment:	
2. Specify:	
- If Other – Descr be:	
- If Threaded Connection/Coupling Failure:	
3. Specify:	
- If Other – Descr be:	
- If Non-threaded Connection Failure:	
4. Specify:	Seal (NOT pump seal) or packing
- If Other – Descr be:	
- If Defective or Loose Tubing or Fitting:	
- If Failure of Equipment Body (except Pump), Tank Plate, or other Material:	
- If Other Equipment Failure:	
5. Describe:	
Complete the following if any Equipment Failure sub-cause is selected.	
6. Additional factors that contributed to the equipment failure: <i>(select all that apply)</i>	
- Excessive vibration	
- Overpressurization	
- No support or loss of support	
- Manufacturing defect	
- Loss of electricity	
- Improper installation	

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- 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:	Stem nut seal - normal wear.		
G7 - Incorrect Operation - only one sub-cause can be selected from the shaded left-hand column			
Incorrect Operation – Sub-Cause:			
- If Damage by Operator or Operator's Contractor NOT Related to Excavation and NOT due to Motorized Vehicle/Equipment Damage:			
- If Tank, Vessel, or Sump/Separator Allowed or Caused to Overfill or Overflow:			
1. Specify:			
- If Other, Describe:			
- If Valve Left or Placed in Wrong Position, but NOT Resulting in a Tank, Vessel, or Sump/Separator Overflow or Facility Overpressure:			
- If Pipeline or Equipment Overpressured:			
- If Equipment Not Installed Properly:			
- If Wrong Equipment Specified or Installed:			
- If Other Incorrect Operation:			
2. Describe:			
Complete the following if any Incorrect Operation sub-cause is selected.			
3. Was this Accident related to (<i>select all that apply</i>): -			
- Inadequate procedure			
- No procedure established			
- Failure to follow procedure			
- Other:			
- If Other, Describe:			
4. What category type was the activity that caused the Accident?			
5. Was the task(s) that led to the Accident identified as a covered task in your Operator Qualification Program?			
5a. If Yes, were the individuals performing the task(s) qualified for the task(s)?			
G8 - Other Accident Cause - only one sub-cause can be selected from the shaded left-hand column			
Other Accident Cause – Sub-Cause:			
- If Miscellaneous:			
1. Describe:			
- If Unknown:			
2. Specify:			
PART H - NARRATIVE DESCRIPTION OF THE ACCIDENT			
<p>Enbridge field laborers working along the right-of-way reported seeing evidence of oil on the ground around a mainline valve at MP-958.33, which is located north of Hwy 2 on the East side of Cass Lake. The laborers contacted their Supervisor who confirmed the release and mobilized Enbridge response. Lines 1 and 2 in this route were shut down and valves on either side of the location isolated the section as a precaution. The Pipeline Maintenance Supervisor, who responded to the site, confirmed the valve leak on Line 1 and estimated a small amount of oil had been released on the ground around the valve. Enbridge maintenance personnel excavated, by hand, the soil around the site, evaluated the valve condition and confirmed that the valve stem packing was leaking. Enbridge maintenance personnel were able to make on site repairs to the valve stem packing. Estimated volume released was 10 gallons. Once the packing was repaired, the line was restarted at 17:45 PM local time.</p> <p>All affected soil has been removed and disposed at an appropriate off-site facility.</p> <p>The incident was reported to the MN Duty Officer and the National Response Center. A representative from MNOPS visited to inspect the site.</p>			
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="background-color: #e0e0e0; padding: 2px;">File Full Name</td> </tr> <tr> <td style="height: 20px;"></td> </tr> </table>		File Full Name	
File Full Name			

Appendix C - Operator's Report

File Full Name	
PART I - PREPARER AND AUTHORIZED SIGNATURE	
Preparer's Name	Theresa Picton
Preparer's Title	Compliance Analyst
Preparer's Telephone Number	715-394-1468
Preparer's E-mail Address	theresa.picton@enbridge.com
Preparer's Facsimile Number	832-325-5477
Authorized Signature's Name	David Hoffman
Authorized Signature Title	Supervisor Pipeline Safety Compliance
Authorized Signature Telephone Number	715-394-1540
Authorized Signature Email	david.hoffman@enbridge.com
Date	08/27/2010

RECEIVED
12/9/2010

Post Inspection Memorandum (PIM)

A completed **Standard Inspection Report** is to be submitted to the Director within 60 days from completion of the inspection. A **Post Inspection Memorandum (PIM)** is to be completed and submitted to the Director within 30 days from the completion of the inspection, or series of inspections, and is to be filed as part of the **Standard Inspection Report**.

Inspection Report		Post Inspection Memorandum	
Inspector/Submit Date:	12/09/10	Inspector/Submit Date: 12/9/10	<i>[Signature]</i>
		Peer Reviewer/Date:	<i>[Signature]</i> 12/9/2010
		Director Approval	<i>[Signature]</i>
POST INSPECTION MEMORANDUM (PIM)			
Name of Operator:	Enbridge	OPID #:	11169
Name of Unit(s):	Clearbrook to Deer River - IU 3083	Unit #(s):	3083
Records Location:	Superior WI		
Unit Type & Commodity:	Hazardous Liquids Transmission		
Inspection Type:	Accidental Release	Inspection Date(s):	1
For OPS :		AFO Days:	
For MNOPS :	Dan Munthe	AFO Days:	1
MNOPS CASE #:	1186036		

Synopsis:

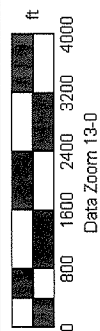
On 7/28/10 in the AM, an Enbridge Energy painting crew discovered a leaking substance from a Kerotest 600 gate valve stem on Line #1 (18") which was located on the NW corner of Hwy 2 and Pike Bay Loop NW road in the Unorganized township of Cass Lake which is just east of the City of Cass Lake at MP958.33, Cass County. Though reported to the NRC (#949152 at 11:37) by Enbridge as an estimated 5 barrel spill, actual leakage was minimal. The contaminated soil was hand excavated and removed. The ~1950s vintage valve stem was repacked, observed for leakage, and returned to service.

Case Status:


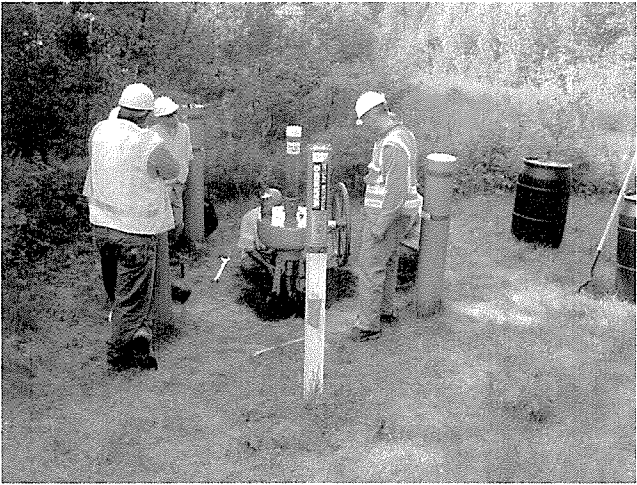
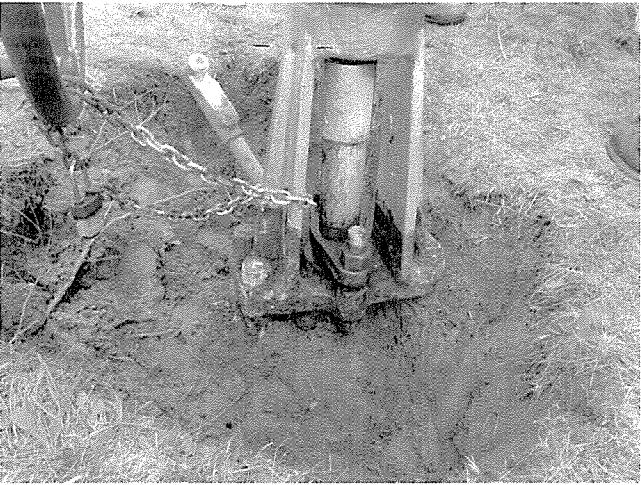
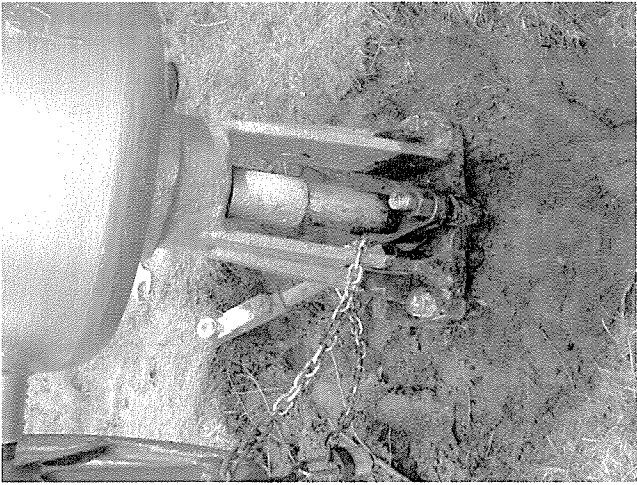
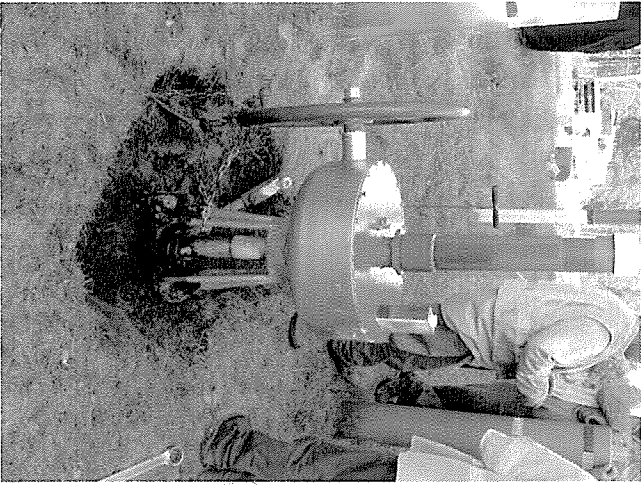
No further action recommended or requested. Case will be closed. This PIM also serves as final report.

On Site Enbridge Personnel included:

Al Aleknavicius
Justin Hoffman



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www.delorme.com

	
100728 1700 – Valve Site	100728 1700 – Valve Site
	
100728 1700 – Valve Stem	100728 1700 – Valve Stem
	
100728 1700 – Valve Stem	