

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

Principal Investigator Joe Elmer
Senior Accident Investigator Karen Butler
Region Director Linda Daugherty/ Allan Beshore
Date of Report 05/26/2015
Subject Failure Investigation Report – Enterprise Products Operating, LLC –
Material Failure

Operator, Location, & Consequences

Date of Failure 08/12/2013
Commodity Released Ethane/Propane Mix
City/County & State Erie / Whiteside, Illinois
OpID & Operator Name 31618 Enterprise Products Operating, LLC
Unit # & Unit Name 2313 (MAPCO) IOWA CITY
SMART Activity # 144352
Milepost / Location MP 16.2 / Morris Lateral (LID 624)
Type of Failure Rupture, Material Failure
Fatalities 0
Injuries 0
Description of area impacted Rural (corn field), non-HCA
Total Costs \$515,000

Failure Investigation Report – Enterprise Products Operating LLC – Material Failure

Failure Date 08/12/2013

Executive Summary¹

On August 12, 2013, at approximately 11:14 p.m. CDT,² Enterprise Products Operating LLC's (Enterprise) 10-inch nominal diameter Morris Lateral (LID 624) pipeline ruptured at M.P. 16.2, in Whiteside County, near Erie, IL. The rupture resulted in the release of approximately 18,400 barrels of ethane/propane mix into an agricultural field and was not located in a High Consequence Area (HCA). The product did ignite, and an explosion associated with the rupture produced a crater in the ground approximately 36 feet long and 22 feet wide.

A section of pipe approximately 33 feet in length was ejected from the ditch during the failure. The pipe that was ejected from the ditch broke apart into 12 different pieces, which were recovered from the corn field. No fatalities or injuries occurred as a result of the failure. A total of five roads were closed and 32 homes evacuated as a result of the fire and explosion. The total cost of the failure, emergency response, pipeline repair, and environmental cleanup is estimated at \$515,000.

PHMSA worked with the operator throughout the week of August 12 to review and approve a restart plan including a 20 percent reduction in maximum operating pressure, have metallurgical specialists on-site before sections of the pipe failure were transferred, provide detailed emergency response timelines, review metallurgical protocols, review previous close internal survey (CIS) and inline inspection (ILI) data, and identify go forward integrity actions.

The fracture propagated both upstream and downstream from the origin of the failure. Metallurgical analysis determined that the pipe failure was caused by a defect that formed in the longitudinal ERW (HF) pipe seam. The defect was a combination of two flaws: an external surface breaking hook crack and a crack that formed at the base of the hook crack and that grew to a critical size over time. Significant corrosion by-products were also found present during the failure metallurgical analysis. Three failure mechanisms were present and possible: 1) Environmental cracking such as SCC, 2) Pressure-cycle induced fatigue crack growth, and 3) Corrosion-fatigue.

As a result of the failure and in concert with PHMSA discussion, Enterprise performed a hydrotest on the Morris Lateral (LID 624), and an additional failure occurred during the hydrotest at MP 32.66. This failed pipe also received a metallurgical analysis. The metallurgical analysis for the hydrotest failure identified the failure cause as SCC (near-neutral pH).

System Details

The Morris Lateral (LID 624) is also known as the Red Line and transports an ethane-propane mix from Iowa City, IA, to the Lyondell petrochemical plants in Morris, IL, and Clinton, IA. An AuxAble terminal called Channahon is located on the east end of the Morris Lateral, also called the Red Line in Illinois. The pipeline is a bi-directional line, but at the time of the failure the flow was from west to east. The pump stations from west to east are located in Iowa and are as follows: Iowa City Terminal, Clinton, and Willow. AuxAble is able to inject into the Morris Lateral at MP 107, therefore both AuxAble and Enterprise are capable of delivering ethane-propane to Morris/Lyondell and Clinton/Lyondell locations. At the failure location, the pipeline is constructed of API 5LX Grade X-52 line pipe manufactured in 1973

¹ This Failure Investigation Report is based upon facts and information available to PHMSA at the time of issuance. Any statements, conclusions, appendices, data summary, 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 reflect Central Daylight Time (CDT) zone unless otherwise specifically noted.

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by American Steel Pipe Company. The pipeline is 10.750-inch O.D., 0.188-inch wall thickness, high frequency ERW type pipe coated with cold applied tape. The pipeline is protected by an impressed current type of cathodic protection system.³ The nearest residence was located approximately 600 yards south of the rupture location. The nearest railroad line was located 2.75 miles north of the rupture site.

The Morris Lateral's maximum operating pressure (MOP) is 1,307 psig, which is equivalent to 72 percent of the specified minimum yield strength of the pipe. The pipeline was hydrostatically tested in 1986 with an 8-hour test and a minimum pressure of 1,741 psig, which was equivalent to 95.7 percent of the specified minimum yield strength of the pipe. Documentation indicated that the highest historical operating pressure for a portion of the pipeline from Clinton to MP 55.45 is 1,225 psig. Enterprise reported that during the 1986 hydrostatic test, the line was tested in 11 segments, and 3 experienced failures (two from mechanical damage and one from a pinhole in a weld). The metallurgical report indicated that no hydrotest failures were recorded for this section of the pipeline that failed on August 12, 2013.

Events Leading up to the Failure

At approximately 6:09 p.m. on August 12, 2013, the controller started Pump No. 1 at the Willow pump station in order to meet scheduled product delivery requirements. At 10:57 p.m., the discharge pressure at the Willow pump station reached 1,254 psig, which was the highest pressure that was recorded at the station just prior to the failure. This was also the highest pressure observed at this station in the 60 days prior to the failure, and for a portion of the pipeline, exceeded the highest historical operating pressure of 1,225 psig.

At 11:10 p.m., the discharge pressure at the Willow station dropped rapidly from 1,252 psig to 1,232 psig in a 15-second poll. At the same time, the Whiteside County Sheriff's Department started to receive 911 calls of a fire north of I-80 and Erie Bridge. At 11:11 p.m., the pressure continued to drop at the Willow station to 1,166 psig. The pressure was also dropping at the Van Orin block valve from 1,034 psig to 1,011 psig. However, the pressure at Collins Lake Block valve was holding at 931 psig.

At 11:14 p.m., the Erie Fire Department was dispatched to the accident site.

At approximately 11:16 p.m., on August 12, 2013, Pump No. 1 at the Willow pump station shut down because of low suction pressure and the SCADA system sensed a significant pressure drop on the pipeline. The Houston Pipeline Control issued a start command to the Willow station Pump No. 2 at 11:17 p.m., however the Pump No. 2 failed to start due to low pressure on the pump suction. The controller suspected a line break leak had occurred and requested that the operator at the Iowa City pump station shut down the pumps at that location. At 11:23 p.m., Pump No. 1 at the Iowa City station was shut down, and callouts to Enterprise personnel were started by 11:29 p.m.

Emergency Response

A resident who lives near the intersection of Albany Road and Stropes Road in Whiteside County, IL, called the Erie Fire Protection District at 11:14 p.m. on August 12, 2013, to report a large fire in a corn

³ Tape coating systems may shield the pipe from cathodic protection currents, resulting in ineffective protection.

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field. Erie Fire Protection District personnel were dispatched to the Albany Road location and arrived at the scene at 11:23 p.m. The Fire District personnel were able to determine that the fire was associated with a pipeline that had ruptured. Product that was released from the pipeline ignited, and flames from the fire reached heights up to 250 feet above the ground.

At 11:25 p.m., the controller closed MOV 9013 at Iowa City. By 11:45 p.m., the Iowa City Terminal operator had received a call from Cochin Pipeline's control room stating that they had been made aware of a pipeline fire in Illinois, and Enterprise technicians were being mobilized between Morris and Iowa City. Alternate supply by AuxsAble to Morris/Lyondell was established by 11:48 p.m. At 11:58 p.m. the control room received a call from a farmer located near the pipeline who reported observing the fire.

The Fire District personnel determined that the pipeline was operated by Enterprise Products Pipeline LLC and called the Enterprise Pipeline emergency number at approximately 12:00 a.m. on August 13, 2013. After the call from the Fire District, the Enterprise control room notified the Illinois Highway Patrol of the situation. Enterprise Pipeline Company personnel and Erie Fire Protection District personnel discussed the situation and together it was decided to set up a one-mile safety buffer around the rupture site. Fire district personnel, with the assistance of other emergency responders, blocked five roads within the safety buffer zone and evacuated all 32 residences that were located within the safety buffer zone. Other emergency responders that assisted with activities at the accident location included the Erie Police Department, the Fulton Police Department, the Prophetstown Police Department, the Illinois State Police, the Whiteside Sheriff's Department, and the Albany Fire Department.

At 12:04 a.m. on August 13, 2013, the controller closed the MOVs at MP 55 and MP 116, which isolated a 61-mile segment of the pipeline. On August 13, 2013, Enterprise Product Pipeline notified the National Response Center (NRC) of the release at 12:17 a.m. (1:17 ET). The #3 MOV at Willow station (MP 2) was closed by the controller at 12:17 a.m. and the manual valve at MP 107 was closed by operations personnel at 12:35 a.m. Enterprise Pipeline Company personnel began to arrive at the accident location at 1:03 a.m. Operations personnel closed the manual valve at MP 26 at 1:22 a.m. and the manual valve at MP 27 at 1:32 a.m. A total of four Enterprise employees including the Regional Manager were at the site by 2:17 a.m. The manual valve at MP 16 was closed at 2:35 a.m., isolating the line segment between MP 16 and MP 26.

The occupants of all but two of the residences were allowed to return home by approximately 4:00 a.m. At approximately 5:30 a.m. Enterprise Pipeline employees and the Erie District Fire Chief went to inspect the immediate area of the rupture determined to be MP 16.2. The area was determined to be safe and the fire was deemed under control. At that point the occupants of the final two residences were allowed to return home, the roads were opened, and the Erie Fire district personnel were released from the scene.

The Whiteside County ESDA and the U.S. Environmental Protection Agency Region 5 also responded to the scene. COMED inspected the electric power lines in the area and no damage was reported.

Summary of Return-to-Service

On the evening of August 14, 2013, excavation activities commenced at the rupture site. The initial goal of the excavation activities was to locate the girth weld immediately downstream of the rupture, located

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approximately 35 feet to the east of the crater. Enterprise submitted the repair plan to PHMSA on the morning of August 15 and that plan was approved in the afternoon of August 15. Excavation of the damaged section of the pipeline continued into the evening of August 15. At that point the length of the exposed pipeline was approximately 250 feet. Girth welds at each end of the exposed pipe were located and cuts were made at the girth welds and the exposed pipeline was removed from the ditch. The ends of the pipe that remained in the ditch were prepared for welding and then examined nondestructively to ensure that the pipe ends were free of any injurious defects.

While the excavation was proceeding, new replacement pipe was delivered to the repair site and was welded into a 300-foot long segment with end caps. The pipe and end caps were welded together by qualified welders who followed a qualified welding procedure. The welds were radiographed and met the requirements of API 1104.

The replacement pipe segment was located above ground adjacent to the excavation. It was filled with water and placed on hydrostatic at 2:45 p.m. on August 16, 2013. The replacement pipe segment was tested to a pressure of 2,000 psig, which is equivalent to 110 percent SMYS. The test was complete at 7:28 p.m. on August 16. After the test was complete, the segment was dewatered, the end caps were cut off, and the segment was cut into two segments to facilitate installation in the ditch.

The replacement pipe segments were placed in the ditch and aligned with the ends of the existing pipeline. The three welds were completed early in the morning of August 17. The welds were radiographed and met the requirements of API 1104.

After receiving PHMSA approval, Enterprise initiated the start-up plan at 7:00 a.m. on the morning of August 17 by notifying the first responders in the area of the pipeline failure that the pipeline was being re-started. After the notifications were made, the pipeline segment between the valve at MP 16 and MP 26, which contained the repair segment, was purged with nitrogen. At 2:10 p.m. Enterprise began filling that portion of the pipeline with product. At 6:00 p.m. the pressure in the line reached 860 psig and that segment of the line was placed on a 2-hour hold test in accordance with the start-up plan. During the hold test, aerial patrols were conducted and the line was monitored through the SCADA system to ensure it was leak free. At 8:00 p.m. the control room took over operation of the pipeline and was allowed to operate the line with an MOP of 960 psig at the Willow pump station. This represents a 20 percent reduction from the pressure at the time of the failure.

Investigation Details

PHMSA worked with the operator through teleconferences and data exchange throughout the week of August 12 to review and approve a restart plan including a 20 percent reduction in maximum operating pressure, have metallurgical specialists on-site before sections of the pipe failure were transferred, provide detailed emergency response timelines, review metallurgical protocols, review previous CIS and ILLI data, and identify go forward integrity actions.

After the area was declared safe on the morning of August 13, Enterprise began initial site investigation and located 11 small pieces of steel pipe that had been ejected from the ditch when the pipeline ruptured. The pieces were numbered and cataloged by the location of each piece. A twelfth pipe fragment was subsequently located.

On August 13, 2013, at approximately 1:36 p.m., a PHMSA Central Region Investigator arrived on scene. The investigator photographed and diagrammed the scene and then interviewed Enterprise personnel and first responders. On August 14, a metallurgist from Kiefner and Associates arrived at the failure site

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and began conducting an investigation into the cause of the failure, which included a visual examination of the failure site and magnetic particle inspections on some of the failed pieces of pipe. Detailed measurements of the longitudinal seam on each pipe fragment were made to ensure that all fragments had been located. Once it was determined that all pieces had been found, each fragment was processed and loaded onto a truck on August 16 for shipment to Kiefner's laboratory in Columbus, OH. A chain of custody document was prepared to ensure proper handling of the samples.

On August 15, 2013, Enterprise continued the site investigation and took a Ph reading in the crater (5.5). A pipe to soil reading at the failure location and A/C reading at the same location were recorded as - 1.848 volts and 12.2 volts respectively.

While the failure area was not in an HCA, integrity data indicated that the pipeline had been smart pigged several times:

A TDW Deformation tool run was performed on 4/10/2002 and a PII MFL tool run on 4/24/2002. While deformations were present on the pipeline, no repairs occurred in the nearby area from Valve AM76 to the small drainage ditch (drainage ditch was evident when reviewing the ROW in the area of the failure).

A Tuboscope Deformation tool run on 7/14/2005 was performed to verify that the Tuboscope UT tool run on 8/24/2005 could occur without damaging the tool. No deformation data was analyzed. The ultrasonic tool run did not require any repairs in the area of the failure. However, the pipeline contained 37 crack features: 6 crack-field, 30 crack-like, and 1 notch-like feature. 13 crack-like features were repaired with Type B sleeves and 14 crack-like features were recoated. Two crack-fields features were sleeved, and four crack-field features were recoated. Field observations did not indicate the presence of SCC, but three remaining crack-like features and one remaining notch-like feature were not investigated.

A Magpie Combo MFL/DEF tool run occurred on 11/8/2006. The tool run did result in several identifications but only one was found in the immediate area and was a topside dent with metal loss. This feature was repaired with a Type B sleeve on 1/22/2007 and new coating was applied but remained approximately 271 feet away from the failure site. Corrosion and deformation anomalies do exist and indications appear to be increasing over time.

A Magpie Compo MFL/DEP tool run occurred again on 5/12/2010. While anomalies were found, no repairs were made in the area of the failure (Valve AM76 to the drainage ditch). Corrosion and deformation anomalies do exist and appear to be increasing (vendor threshold of detections are more accurate but not all increases appear to be explained by this factor).

A close interval survey (CIS) was performed on a portion of the pipeline between MP 26 and MP 55.4 in 2007. While this did not cover the immediate area of the failure, findings from the CIS required that the cathodic protection system be improved. An annual review of cathodic protection system performance was completed in 2009 and did appear to have addressed concerns identified by the 2007 CIS. The corrosion growth rate as it existed at the time of the failure determined that the earliest possible non-repaired feature would fail by 5/8/2027. The pipeline has 39 reported casings. None are thought to be shorted in the CIS area conducted in 2007.

A corrosion coupon is monitored upstream of Iowa City Terminal and has not shown a corrosion rate in excess of 1 mil per year from 1997-2010.

Analysis for SCC was part of the integrity program prior to the failure, and a Phase II SCC study was referenced. However in light of the failure, this program should benefit from being more aggressive and a hydrotest was warranted.

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As part of the investigation, PHMSA requested that numerous documents be provided for review. The documents provided by Enterprise included the CPDM Survey report (2011 – 2013) for the line segment between Clinton and Morris pump stations, 2010 Inline Inspection (ILI) indications for the Morris Lateral, the 2006 Close Interval Survey (CIS) Data between MP 14 and MP 19, the pressure/flow data for August 11, 12, and 13, Abnormal Operation Conditions (AOC) for 2013, coupon monitoring inspection records, emergency incident logs, 2006 Magpie Combo MFL/DEF tool results, and the 2010 Magpie Combo MFL/DEF tool results.

Findings and Contributing Factors

The Kiefner metallurgical examination determined that the cause of the failure was an original manufacturing defect that grew in service until it reached critical size and failed at the operating pressure. The original manufacturing defect was an external surface-breaking hook crack that measured approximately 4.4 inches long and had a maximum depth of .062 inches, approximately 30 percent of actual pipe wall thickness. A secondary defect formed at the base of the hook crack and grew over time while the pipeline was in service. The overall length of the defect at the time of failure was 4.4 inches, and the maximum depth of the combined defects was 0.161 inches, approximately 78 percent of actual pipe wall thickness. Fractographic and metallographic examinations of the fracture surface were completed. Thermal damage of the fracture surface prevented detailed microscopic examination of the fracture surface, which could have helped to identify the actual growth mechanism of the secondary defect. Metallurgical characteristics of the fracture surface were consistent with environmental cracking (SCC) and with pressure-cycle induced fatigue, but were insufficient to conclusively identify the exact growth mechanism. Corrosion-fatigue could also not be eliminated.

Pipe material properties were consistent with the requirements for the specified size and grade of pipe.

Enterprise Products Pipeline Company conducted a hydro-test of the Morris Lateral Pipeline for much of the pipeline (from station # 0+0 to 6315+75). The hydro-test was planned to be conducted in four sections in a 2 week span starting on July 7, 2014. On August 2, 2014, a hydro-test failure occurred at MP 32.66 (station # 1724+53) at 1,425 psig with a target spike test pressure of 1,702 psig. The failed pipe joint containing the failure measured 63.5 feet and was cut in the field to 20 feet-8 inches for shipping to Keifner and Associates for metallurgical analysis.

The hydrotest failed pipe in the rupture area measured 46.5 inches long and was located approximately 27 inches downstream of a girth weld (labeled ESN 1724+47). The pipeline was constructed in 1973 of 10.75-inch outside diameter, 0.188-inch wall thickness, grade X52, high frequency electric-resistance welded (HF-ERW) line pipe manufactured by American Steel Pipe and was coated with cold applied tape.

After the pipeline was repaired, the pipeline was successfully hydrotested to a spike test pressure of 1,702 psig for 30 minutes, followed by an 8-hour strength test at 1,653-psig on August 12, 2014.

The Kiefner metallurgical examination of the rupture determined that the cause of the hydro-test failure was stress corrosion cracking (SCC) that developed in the ERW seam area. The SCC grew to a maximum size of 3.3-inches long by .15-inches deep, approximately 80 percent of the pipe's 0.188-inch nominal wall thickness.

Enterprise will perform an Information Analysis to determine the method for reassessment of the pipeline. Enterprise expects to complete the Information Analysis no later than the fall of 2016. The reassessment date for this pipeline will be determined through the Information Analysis process but will not be longer than the 5-year interval, not to exceed 68 months.

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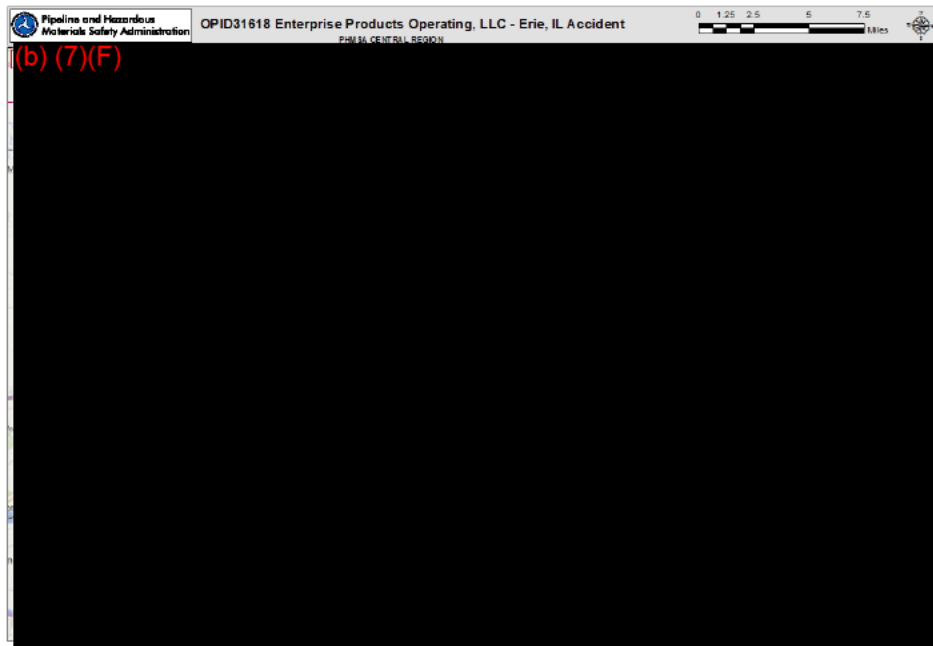
Based on the SCC threat, coating type, and other potential corrosion issues, PHMSA should elevate this pipeline risk factor for inspection cycles/frequency.

Appendices

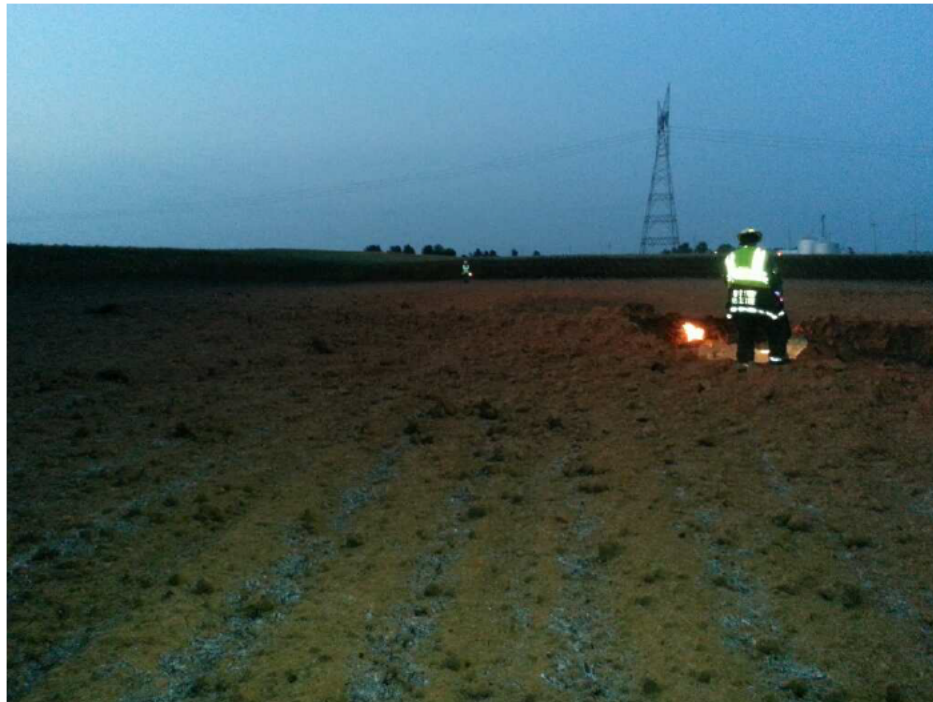
- A Map and Photographs
- B NRC Report
- C Operator's Accident Report
- D Metallurgical Analysis
- E Hydrostatic Test Results

Appendix A Maps and Photographs

Map of accident location

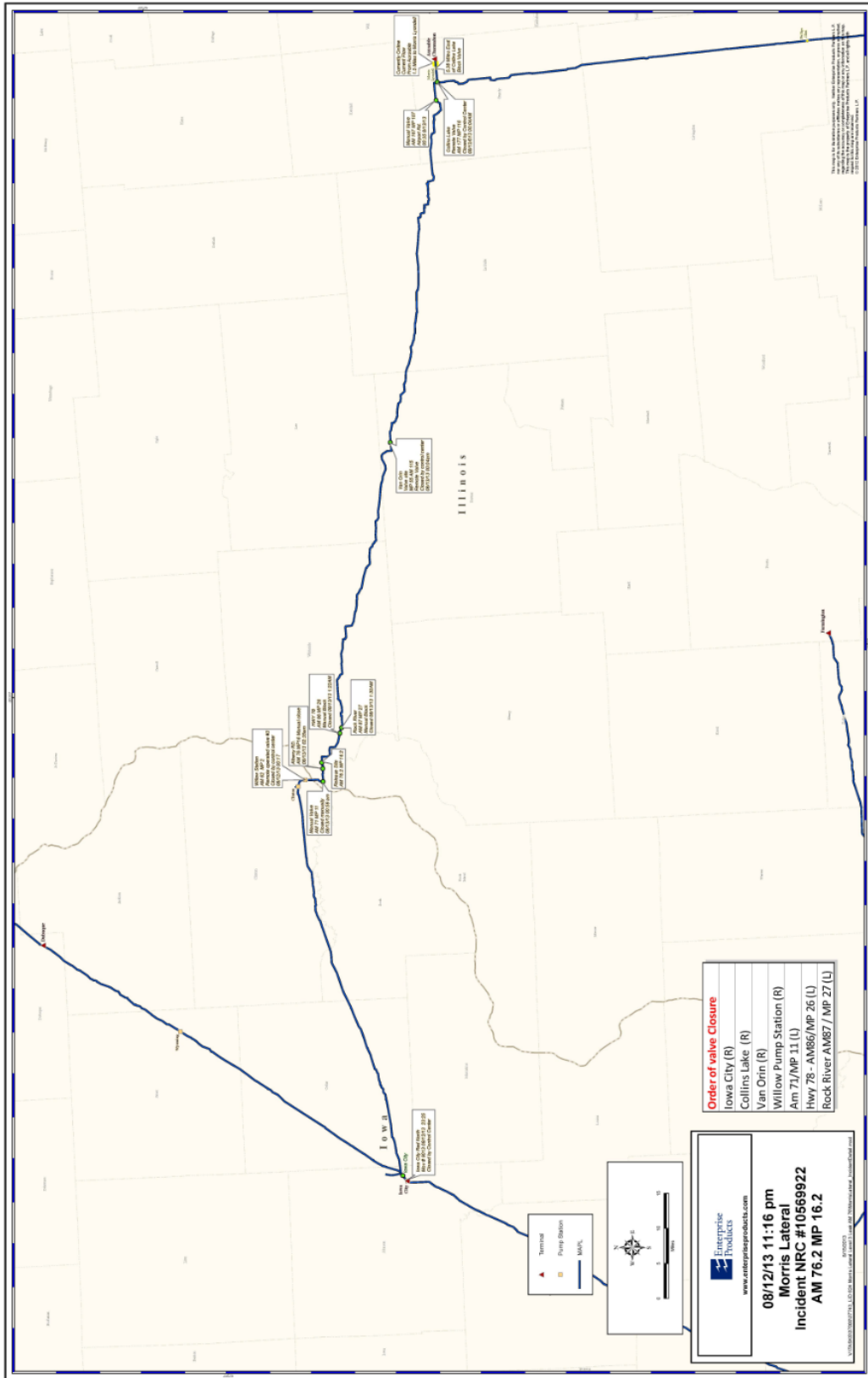


View of Accident Site Looking South
(Photograph Taken by Enterprise Products Operating, LLC)



Appendix A Maps and Photographs

Morris Lateral Map (Red Line).



Appendix A Maps and Photographs

View Rupture Area Looking Southeast
(Photograph Taken by Enterprise Products Operating, LLC)



View of ROW Looking Northwest



Appendix A Maps and Photographs

View of Rupture Area Looking Southeast



Exterior View of Piece # 2 (Containing Failure Origin)



Appendix A Maps and Photographs

Interior View of Piece # 2 (Containing Failure Origin)



View of All Fragments Being Processed



Appendix A Maps and Photographs

View of All Fragments Processed For Shipping



View of Pressure Gauge During Hydrostatic Test of Replacement Pipe



Appendix A Maps and Photographs

View of Crater with Replacement Pipe



View of Repaired Pipe Looking Northwest



NATIONAL RESPONSE CENTER 1-800-424-8802

GOVERNMENT USE ONLYGOVERNMENT USE ONLY***

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

Incident Report # 1056922

INCIDENT DESCRIPTION

*Report taken by: CIV ANTONAY GREER at 01:17 on 13-AUG-13

Incident Type: PIPELINE

Incident Cause: EQUIPMENT FAILURE

Affected Area:

Incident was discovered on 12-AUG-13 at 23:20 local incident time.

Affected Medium: AIR / ATMOSPHERE

REPORTING PARTY

Name: GREG BENDER

Organization: ENTERPRISE PRODUCT PIPELINE

Address: 9420 WEST SAM HOUSTON PKWY NORTH

HOUSTON, TX 77064

PRIMARY Phone: (281)8872640

Type of Organization: PRIVATE ENTERPRISE

SUSPECTED RESPONSIBLE PARTY

Name: GREG BENDER
Organization: ENTERPRISE PRODUCT PIPELINE
Address: 9420 WEST SAM HOUSTON PKWY NORTH
HOUSTON, TX 77064
PRIMARY Phone: (281)8872640

INCIDENT LOCATION

County: WHITESIDE
City: ERIE State: IL
ERIE AND ALBANY RD.

RELEASED MATERIAL(S)

CHRIS Code: NCC Official Material Name: NO CHRIS CODE
Also Known As: ETHANE PROPANE
Qty Released: 32818 BARREL(S)

DESCRIPTION OF INCIDENT

THE CALLER REPORTED THAT ETHANE PROPANE IS RELEASING FROM A 10" STEEL PIPELINE DUE TO A LINE RUPTURE. AS A RESULT OF THE RELEASE A FIRE IGNITED, WITH THE POSSIBILITY TO RELEASE UP TO 32,818 BARRELS OF MATERIAL (THIS NUMBER HAS NOT BEEN CONFIRMED, HOWEVER IS A SPECULATED AMOUNT FROM BLOCK VALVE TO BLOCK VALVE). THE REPORTING SOURCE WILL CONTACT THE NRC WITH AN UPDATED QUANTITY.

SENSITIVE INFORMATION

INCIDENT DETAILS

Pipeline Type: DISTRIBUTION

DOT Regulated: YES

Pipeline Above/Below Ground: BELOW

Exposed or Under Water: NO

Pipeline Covered: UNKNOWN

IMPACT

Fire Involved: YES Fire Extinguished: NO

INJURIES: NO Hospitalized: Empl/Crew: Passenger:

FATALITIES: NO Empl/Crew: Passenger: Occupant:

EVACUATIONS:NO Who Evacuated: Radius/Area:

Damages: NO

	Hours	Direction of
Closure Type	Description of Closure	Closed Closure
N		
Air:		
N		Major
Road:		Artery:N
N		

Waterway:

N

Track:

Environmental Impact: UNKNOWN

Media Interest: NONE Community Impact due to Material:

REMEDIAL ACTIONS

THAT SECTION OF THE PIPE HAS BEEN ISOLATED

Release Secured: NO

Release Rate:

Estimated Release Duration:

WEATHER

Weather: UNKNOWN, °F

ADDITIONAL AGENCIES NOTIFIED

Federal:

State/Local: STATE POLICE

State/Local On Scene:

State Agency Number:

NOTIFICATIONS BY NRC

ATLANTIC STRIKE TEAM (MAIN OFFICE)

13-AUG-13 01:33 (609)7240008

CG INVESTIGATIVE SVC CHICAGO (CGIS RAO CHICAGO)

13-AUG-13 01:33 (630)9862160

CGIS RAO ST. LOUIS (COMMAND CENTER)

13-AUG-13 01:33 (314)2692420

DHS PROTECTIVE SECURITY ADVISOR (PSA DESK)

13-AUG-13 01:33 (703)2355724

DOT CRISIS MANAGEMENT CENTER (MAIN OFFICE)

13-AUG-13 01:33 (202)3661863

EPA CRIMINAL INVESTIGATION DIVISION (CID REGION V)

13-AUG-13 01:33 (312)8869872

U.S. EPA V (MAIN OFFICE)

(312)3532318

USCG NATIONAL COMMAND CENTER (MAIN OFFICE)

(202)3722100

IA U.S. ATTORNEY'S OFFICE (INTELLIGENCE OFFICER)

13-AUG-13 01:33 (515)4739345

IL U.S. ATTORNEY'S OFFICE CENTRAL (MAIN OFFICE)

13-AUG-13 01:33 (217)4924402

IL DNR (MAIN OFFICE)

13-AUG-13 01:33 (217)5577817

IL STATE EMERG AGCY (MAIN OFFICE)

13-AUG-13 01:33 (217)7827860

NATIONAL INFRASTRUCTURE COORD CTR (MAIN OFFICE)

13-AUG-13 01:33 (202)2829201

NOAA RPTS FOR IL (MAIN OFFICE)

13-AUG-13 01:33 (206)5264911

NATIONAL RESPONSE CENTER HQ (MAIN OFFICE)

(202)2671136

NATIONAL RESPONSE CENTER HQ (AUTOMATIC REPORTS)

13-AUG-13 01:33 (202)2671136

NRC SENIOR WATCH OFFICER (MAIN OFFICE)

(202)2672100

NTSB PIPELINE (MAIN OFFICE)

13-AUG-13 01:33 (202)3146293

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

13-AUG-13 01:33 (202)3660568

MSD QUAD CITIES (MAIN OFFICE)

13-AUG-13 01:33 (309)7820627

SECTOR UPPER MISSISSIPPI RIVER (COMMAND CENTER)

(314)2692332

IA DEPT NAT RES ATTN: DUTY OFFICER (MAIN OFFICE)

13-AUG-13 01:33 (515)2818694

IL EPA ERT (MAIN OFFICE)

13-AUG-13 01:33 (217)7823637

DOI/OEPC DENVER (MAIN OFFICE)

13-AUG-13 01:33 (303)4452500

USCG DISTRICT 8 (MAIN OFFICE)

13-AUG-13 01:33 (504)5896225

ADDITIONAL INFORMATION


THE CALLER HAD VERY LITTLE INFORMATION AT THE TIME OF THE REPORT.

*** END INCIDENT REPORT #1056922 ***

Report any problems by calling 1-800-424-8802

PLEASE VISIT OUR WEB SITE AT <http://www.nrc.uscg.mil>

Appendix C - Operator's Accident 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: 07/31/2015	
 U.S. Department of Transportation Pipeline and Hazardous Materials Safety Administration	Original Report Date:		09/10/2013
	No.		20130307 - 20452 ----- (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. All responses to the collection of information are mandatory. Send comments regarding this burden or any other aspect of his collection of information, including suggestions for reducing the burden to: Information Collection Clearance Officer, PHMSA, Office of Pipeline Safety (PHP-30) 1200 New Jersey Avenue, SE, Washington, D.C. 20590.			
INSTRUCTIONS			
<i>Important: Please read the separate instructions for completing this form before you begin. They clarify the information requested and provide specific examples. If you do not have a copy of the instructions, you can obtain one from the PHMSA Pipeline Safety Community Web Page at http://www.phmsa.dot.gov/pipeline/library/forms.</i>			
PART A - KEY REPORT INFORMATION			
Report Type: <i>(select all that apply)</i>		Original:	Supplemental:
		Yes	Final:
		Yes	Yes
Last Revision Date:		05/18/2015	
1. Operator's OPS-issued Operator Identification Number (OPID):		31618	
2. Name of Operator		ENTERPRISE PRODUCTS OPERATING LLC	
3. Address of Operator:			
3a. Street Address		1100 Louisiana Street	
3b. City		HOUSTON	
3c. State		Texas	
3d. Zip Code		77002	
4. Local time (24-hr clock) and date of the Accident:		08/12/2013 23:10	
5. Location of Accident:			
Latitude:		41.697667	
Longitude:		-90.098627	
6. National Response Center Report Number (if applicable):		1056922	
7. Local time (24-hr clock) and date of initial telephonic report to the National Response Center (if applicable):		08/13/2013 00:17	
8. Commodity released: <i>(select only one, based on predominant volume released)</i>		HVL or Other Flammable or Toxic Fluid which is a Gas at Ambient Conditions	
- Specify Commodity Subtype:		Other HVL	
- If "Other" Subtype, Descr be:		Ethane/Propane Mix	
- 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):		18,400.00	
10. Estimated volume of intentional and/or controlled release/blowdown (Barrels):			
11. Estimated volume of commodity recovered (Barrels):			
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			

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13f. Total injuries (sum of above)	
14. Was the pipeline/facility shut down due to the Accident?	Yes
- If No, Explain:	
- If Yes, complete Questions 14a and 14b: (use local time, 24-hr clock)	
14a. Local time and date of shutdown:	08/12/2013 23:16
14b. Local time pipeline/facility restarted:	08/17/2013 20:33
- Still shut down? (* Supplemental Report Required)	
15. Did the commodity ignite?	Yes
16. Did the commodity explode?	Yes
17. Number of general public evacuated:	32
18. Time sequence (use local time, 24-hour clock):	
18a. Local time Operator identified Accident - effective 7- 2014 changed to "Local time Operator identified failure":	08/12/2013 23:16
18b. Local time Operator resources arrived on site:	08/13/2013 01:03
PART B - ADDITIONAL LOCATION INFORMATION	
1. Was the origin of the Accident onshore?	Yes
<i>If Yes, Complete Questions (2-12)</i>	
<i>If No, Complete Questions (13-15)</i>	
- If Onshore:	
2. State:	Illinois
3. Zip Code:	61250
4. City	Erie
5. County or Parish	Whiteside
6. Operator-designated location:	Milepost/Valve Station
Specify:	Milepost 16.2
7. Pipeline/Facility name:	MAPL East Leg - Morris Lateral
8. Segment name/ID:	LID 624
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):	48
12. Did Accident occur in a crossing?	No
- If Yes, specify type below:	
- If Bridge crossing –	
Cased/ Uncased:	
- If Railroad crossing –	
Cased/ Uncased/ Bored/drilled	
- If Road crossing –	
Cased/ Uncased/ Bored/drilled	
- If Water crossing –	
Cased/ Uncased	
- Name of body of water, if commonly known:	
- Approx. water depth (ft) at the point of the Accident:	
- Select:	
- If Offshore:	
13. Approximate water depth (ft) at the point of the Accident:	
14. Origin of Accident:	
- In State waters - Specify:	
- State:	
- Area:	
- Block/Tract #:	
- Nearest County/Parish:	
- On the Outer Continental Shelf (OCS) - Specify:	
- Area:	
- Block #:	
15. Area of Accident:	
PART C - ADDITIONAL FACILITY INFORMATION	
1. Is the pipeline or facility:	Interstate
2. Part of system involved in Accident:	Onshore Pipeline, Including Valve Sites
- If Onshore Breakout Tank or Storage Vessel, Including Attached Appurtenances, specify:	
3. Item involved in Accident:	Pipe
- If Pipe, specify:	Pipe Seam
3a. Nominal diameter of pipe (in):	10

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3b. Wall thickness (in):	.188
3c. SMYS (Specified Minimum Yield Strength) of pipe (psi):	52,000
3d. Pipe specification:	API 5L
3e. Pipe Seam , specify:	Longitudinal ERW - High Frequency
- If Other, Describe:	
3f. Pipe manufacturer:	American Steel
3g. Year of manufacture:	1973
3h. Pipeline coating type at point of Accident, specify:	Cold Applied Tape
- If Other, Describe:	
- If Weld, including heat-affected zone, specify. If Pipe Girth Weld, 3a through 3h above are required:	
- 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:	
4. Year item involved in Accident was installed:	1973
5. Material involved in Accident:	Carbon Steel
- If Material other than Carbon Steel, specify:	
6. Type of Accident Involved:	Rupture
- If Mechanical Puncture – Specify Approx. size:	
in. (axial) by	
in. (circumferential)	
- If Leak - Select Type:	
- If Other, Describe:	
- If Rupture - Select Orientation:	Longitudinal
- If Other, Describe:	
Approx. size: in. (widest opening) by	10
in. (length circumferentially or axially)	393
- 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:	Yes
4. Anticipated remediation:	Yes
4a. If Yes, specify all that apply:	
- Surface water	
- Groundwater	Yes
- Soil	Yes
- Vegetation	
- Wildlife	
5. Water contamination:	Yes
5a. If Yes, specify all that apply:	
- Ocean/Seawater	
- Surface	
- Groundwater	Yes
- Drinking water: (Select one or both)	
- Private Well	
- Public Water Intake	
5b. Estimated amount released in or reaching water (Barrels):	.00
5c. Name of body of water, if commonly known:	Perched water bearing zone.
6. At the location of this Accident, had the pipeline segment or facility been identified as one that "could affect" a High Consequence Area (HCA) as determined in the Operator's Integrity Management Program?	No
7. Did the released commodity reach or occur in one or more High Consequence Area (HCA)?	No
7a. If Yes, specify HCA type(s): (Select all that apply)	
- Commercially Navigable Waterway:	
Was this HCA identified in the "could affect" determination for this Accident site in the Operator's	

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Integrity Management Program?	
- High Population Area:	
Was this HCA identified in the "could affect" determination for this Accident site in the Operator's Integrity Management Program?	
- Other Populated Area	
Was this HCA identified in the "could affect" determination for this Accident site in the Operator's Integrity Management Program?	
- Unusually Sensitive Area (USA) - Drinking Water	
Was this HCA identified in the "could affect" determination for this Accident site in the Operator's Integrity Management Program?	
- Unusually Sensitive Area (USA) - Ecological	
Was this HCA identified in the "could affect" determination for this Accident site in the Operator's Integrity Management Program?	
8. Estimated cost to Operator – effective 12-2012, changed to "Estimated Property Damage":	
8a. Estimated cost of public and non-Operator private property damage paid/reimbursed by the Operator – effective 12-2012, "paid/reimbursed by the Operator" removed	\$ 50,000
8b. Estimated cost of commodity lost	\$ 160,000
8c. Estimated cost of Operator's property damage & repairs	\$ 200,000
8d. Estimated cost of Operator's emergency response	\$ 5,000
8e. Estimated cost of Operator's environmental remediation	\$ 50,000
8f. Estimated other costs	\$ 50,000
Describe:	Metallurgical analysis of failure pipe
8g. Estimated total costs (sum of above) – effective 12-2012, changed to "Total estimated property damage (sum of above)"	\$ 515,000
PART E - ADDITIONAL OPERATING INFORMATION	
1. Estimated pressure at the point and time of the Accident (psig):	1,207.00
2. Maximum Operating Pressure (MOP) at the point and time of the Accident (psig):	1,307.00
3. Describe the pressure on the system or facility relating to the Accident (psig):	Pressure did not exceed MOP
4. Not including pressure reductions required by PHMSA regulations (such as for repairs and pipe movement), was the system or facility relating to the Accident operating under an established pressure restriction with pressure limits below those normally allowed by the MOP?	No
- If Yes, Complete 4.a and 4.b below:	
4a. Did the pressure exceed this established pressure restriction?	
4b. Was this pressure restriction mandated by PHMSA or the State?	
5. Was "Onshore Pipeline, Including Valve Sites" OR "Offshore Pipeline, Including Riser and Riser Bend" selected in PART C, Question 2?	Yes
- If Yes - (Complete 5a. – 5f below) effective 12-2012, changed to "(Complete 5.a – 5.e below)"	
5a. Type of upstream valve used to initially isolate release source:	Remotely Controlled
5b. Type of downstream valve used to initially isolate release source:	Remotely Controlled
5c. Length of segment isolated between valves (ft):	322,080
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)	

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- Excessive debris or scale, wax, or other wall buildup	
- Low operating pressure(s)	
- Low flow or absence of flow	
- Incompatible commodity	
- Other -	
- If Other, Describe:	
5f. Function of pipeline system:	> 20% SMYS Regulated Trunkline/Transmission
6. Was a Supervisory Control and Data Acquisition (SCADA)-based system in place on the pipeline or facility involved in the Accident?	Yes
If Yes -	
6a. Was it operating at the time of the Accident?	Yes
6b. Was it fully functional at the time of the Accident?	Yes
6c. Did SCADA-based information (such as alarm(s), alert(s), event(s), and/or volume calculations) assist with the detection of the Accident?	Yes
6d. Did SCADA-based information (such as alarm(s), alert(s), event(s), and/or volume calculations) assist with the confirmation of the Accident?	Yes
7. Was a CPM leak detection system in place on the pipeline or facility involved in the Accident?	Yes
- If Yes:	
7a. Was it operating at the time of the Accident?	Yes
7b. Was it fully functional at the time of the Accident?	Yes
7c. Did CPM leak detection system information (such as alarm(s), alert(s), event(s), and/or volume calculations) assist with the detection of the Accident?	No
7d. Did CPM leak detection system information (such as alarm(s), alert(s), event(s), and/or volume calculations) assist with the confirmation of the Accident?	No
8. How was the Accident initially identified for the Operator?	CPM leak detection system or SCADA-based information (such as alarm(s), alert(s), event(s), and/or volume calculations)
- If Other, Specify:	
8a. If "Controller", "Local Operating Personnel", including contractors", "Air Patrol", or "Ground Patrol by Operator or its contractor" is selected in Question 8, specify:	
9. Was an investigation initiated into whether or not the controller(s) or control room issues were the cause of or a contributing factor to the Accident?	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	Yes
- Investigation did NOT review work schedule rotations, continuous hours of service (while working for the Operator), and other factors associated with fatigue	
Provide an explanation for why not:	
- Investigation identified no control room issues	Yes
- Investigation identified no controller issues	Yes
- Investigation identified incorrect controller action or controller error	
- Investigation identified that fatigue may have affected the controller(s) involved or impacted the involved controller(s) response	
- Investigation identified incorrect procedures	
- Investigation identified incorrect control room equipment operation	
- Investigation identified maintenance activities that affected control room operations, procedures, and/or controller response	
- Investigation identified areas other than those above:	
Describe:	
PART F - DRUG & ALCOHOL TESTING INFORMATION	

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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?	Yes
- If Yes:	
1a. Specify how many were tested:	1
1b. Specify how many failed:	0
2. As a result of this Accident, were any Operator contractor employees tested under the post-accident drug and alcohol testing requirements of DOT's Drug & Alcohol Testing regulations?	No
- If Yes:	
2a. Specify how many were tested:	
2b. Specify how many failed:	
PART G – APPARENT CAUSE	
<i>Select only one box from PART G in shaded column on left representing the APPARENT Cause of the Accident, and answer the questions on the right. Describe secondary, contributing or root causes of the Accident in the narrative (PART H).</i>	
Apparent Cause:	G5 - Material Failure of Pipe or Weld
G1 - Corrosion Failure - only one sub-cause can be picked from shaded left-hand column	
Corrosion Failure – Sub-Cause:	
- If External Corrosion:	
1. Results of visual examination:	
- If Other, Descr be:	
2. Type of corrosion: <i>(select all that apply)</i>	
- Galvanic	
- Atmospheric	
- Stray Current	
- Microbiological	
- Selective Seam	
- Other:	
- If Other, Descr be:	
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, Descr be:	
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 - ear 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, Descr be:	
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:	

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- 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:		

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G2 - Natural Force Damage - only one sub-cause can be picked from shaded left-handed column	
Natural Force Damage – Sub-Cause:	
- If Earth Movement, NOT due to Heavy Rains/Floods:	
1. Specify:	
- If Other, Describe:	
- If Heavy Rains/Floods:	
2. Specify:	
- If Other, Describe:	
- If Lightning:	
3. Specify:	
- If Temperature:	
4. Specify:	
- If Other, Describe:	
- If Other Natural Force Damage:	
5. Describe:	
Complete the following if any Natural Force Damage sub-cause is selected.	
6. Were the natural forces causing the Accident generated in conjunction with an extreme weather event?	
6a. If Yes, specify: <i>(select all that apply)</i>	
- Hurricane	
- Tropical Storm	
- Tornado	
- Other	
- If Other, Describe:	
G3 - Excavation Damage - only one sub-cause can be picked from shaded left-hand column	
Excavation Damage – Sub-Cause:	
- If Previous Damage due to Excavation Activity: Complete Questions 1-5 ONLY IF the "Item Involved in Accident" (from PART C, Question 3) is Pipe or Weld.	
1. Has one or more internal inspection tool collected data at the point of the Accident?	
1a. If Yes, for each tool used, select type of internal inspection tool and indicate most recent year run: -	
- Magnetic Flux Leakage	Most recent year conducted:
- Ultrasonic	Most recent year conducted:
- Geometry	Most recent year conducted:
- Caliper	Most recent year conducted:
- Crack	Most recent year conducted:
- Hard Spot	Most recent year conducted:
- Combination Tool	Most recent year conducted:
- Transverse Field/Triaxial	Most recent year conducted:
- Other	Most recent year conducted:
Describe:	
2. Do you have reason to believe that the internal inspection was completed BEFORE the damage was sustained?	
3. Has one or more hydrotest or other pressure test been conducted since original construction at the point of the Accident?	
- If Yes:	Most recent year tested:
	Test pressure (psig):
4. Has one or more Direct Assessment been conducted on the pipeline segment?	
- If Yes, and an investigative dig was conducted at the point of the Accident:	Most recent year conducted:
- If Yes, but the point of the Accident was not identified as a dig site:	Most recent year conducted:
5. Has one or more non-destructive examination been conducted at the point of the Accident since January 1, 2002?	

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

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- 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:	Original Manufacturing-related (NOT girth weld or other welds formed in the field)
1. The sub-cause shown above is based on the following: <i>(select all that apply)</i>	

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- Field Examination	
- Determined by Metallurgical Analysis	Yes
- Other Analysis	
- If "Other Analysis", Describe:	
- Sub-cause is Tentative or Suspected; Still Under Investigation (Supplemental Report required)	
- If Construction, Installation, or Fabrication-related:	
2. List contributing factors: <i>(select all that apply)</i>	
- Fatigue or Vibration-related	
Specify:	
- If Other, Describe:	
- Mechanical Stress:	
- Other	
- If Other, Describe:	
- If Environmental Cracking-related:	
3. Specify:	
- If Other - Describe:	
Complete the following if any Material Failure of Pipe or Weld sub-cause is selected.	
4. Additional factors: <i>(select all that apply)</i> :	
- Dent	
- Gouge	
- Pipe Bend	
- Arc Burn	
- Crack	Yes
- 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?	Yes
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	Yes
Most recent year run:	2005
- Hard Spot	
Most recent year run:	
- Combination Tool	Yes
Most recent year run:	2010
- Transverse Field/Triaxial	
Most recent year run:	
- Other	
Most recent year run:	
Describe:	
6. Has one or more hydrotest or other pressure test been conducted since original construction at the point of the Accident?	Yes
- If Yes:	
Most recent year tested:	1986
Test pressure (psig):	1,741.00
7. Has one or more Direct Assessment been conducted on the pipeline segment?	No
- 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?	No
8a. If Yes, for each examination conducted since January 1, 2002, select type of non-destructive examination and indicate most recent year the examination was conducted: -	

Appendix C - Operator's Accident Report

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

Appendix C - Operator's Accident Report

- If Tank, Vessel, or Sump/Separator Allowed or Caused to Overfill or Overflow	
1. Specify:	
- If Other, Describe:	
- If Other Incorrect Operation	
2. Describe:	
Complete the following if any Incorrect Operation sub-cause is selected.	
3. Was this Accident related to <i>(select all that apply)</i> : -	
- Inadequate procedure	
- No procedure established	
- Failure to follow procedure	
- Other:	
- If Other, Describe:	
4. What category type was the activity that caused the Accident?	
5. Was the task(s) that led to the Accident identified as a covered task in your Operator Qualification Program?	
5a. If Yes, were the individuals performing the task(s) qualified for the task(s)?	
G8 - Other Accident Cause - only one sub-cause can be selected from the shaded left-hand column	
Other Accident Cause – Sub-Cause:	
- If Miscellaneous:	
1. Describe:	
- If Unknown:	
2. Specify:	
PART H - NARRATIVE DESCRIPTION OF THE ACCIDENT	
<p>At 23:16 on August 12, 2013 Willow Station Pump went down on low suction pressure and SCADA indicated a significant drop in pressure. The controller suspected a leak and notified the Willow Station operator to shut down the pumps. Local operations personnel were notified and placed on standby once the location was confirmed. At 23:58, a farmer reported a fire in his field near Aerial Marker (AM) 76 / Milepost (MP) 16. Operations personnel were immediately dispatched to the area. The controller blocked in the MOVs at AM 115 / MP 55 and AM 177 / MP 116. Local operations personnel closed manual block valves at AM 71 / MP 11, AM 86 / MP 26 and AM 87 / MP 27. A 1-mile safety buffer was established around the leak site, traffic was blocked and all homes were evacuated within the buffer zone.</p> <p>At 02:35 on 8/13/2013, local operations personnel were able to get closer to the leak site and closed the block valve at AM 76 / MP 16. This isolated the leaking segment between AM 76 / MP 16 and AM 86 / MP 26. The area was secured and preserved for examination by a third-party.</p> <p>Affected pipe was cut out and sent in for metallurgical analysis along with the pieces that were collected. The affected pipeline segment was replaced and the pipeline was returned to service on 8/17/2013.</p> <p>=====Notes=====</p> <p>Through a review of SCADA data, the time of the accident was later determined to be at 23:10 on August 12, 2013 as indicated by a rapid pressure drop on the line pressure and discharge pressure at Willow Station.</p> <p>The evacuation of the general public was carried out by local emergency officials. The response provided in Part A question 17 is the number of homes that were evacuated. The exact number of people evacuated cannot be verified.</p> <p>Soil contamination: Fourteen samples were collected from the rupture site, including the depression, only one sample analysis exhibited benzene results. The benzene detected in this sample did not exceed regulatory (IL EPA) soil standards and the origins of the detection have not been confirmed to be resulting from this release.</p> <p>Groundwater contamination: One groundwater sample was collected from the depression, this sample analysis exhibited BTEX (Benzene, Toluene, Ethyl benzene, Xylene) results above the regulatory (IL EPA) groundwater standards and the origins of the detection has not been confirmed to be resulting from this release.</p> <p>=====Metallurgical Analysis=====</p> <p>Results from the metallurgical analysis identified the failure was caused by a defect that formed in the longitudinal ERW seam of the pipe. The defect was a combination of two flaws: an external surface-breaking hook crack and a crack that formed at the base of the hook crack and enlarged over time while the pipe was in service. The hook crack was a manufacturing defect that formed when the pipe was manufactured. Fractographic and metallographic examination was unable to conclusively determine the cause of the in-service flaw growth.</p> <p>=====8/15/2014 Update=====</p> <p>Part C #6. The length and width of the rupture opening represents the nominal OD and the gap between the ends of the pipe.</p>	
PART I - PREPARER AND AUTHORIZED SIGNATURE	
Preparer's Name	Nhan Truong
Preparer's Title	Senior Compliance Engineer
Preparer's Telephone Number	7133812493

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Preparer's E-mail Address	NVTruong@eprod.com
Preparer's Facsimile Number	
Authorized Signer Name	Nhan Truong
Authorized Signer Title	Senior Compliance Engineer
Authorized Signer Telephone Number	713-381-2493
Authorized Signer Email	NVTruong@eprod.com
Date	05/18/2015

Appendix D

Metallurgical Analysis

This document is on file at PHMSA

Appendix E
Hydrostatic Test Results

This document is on file at PHMSA