

Failure Investigation Report – Sunoco Pipeline L.P., Darby Creek Tank Leak

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

Principal Investigator Christian Sellu
Senior Accident Investigator Michael Yazemboski
Region Director Byron Coy
Date of Report 7/12/2013
Subject Failure Investigation Report – Sunoco Pipeline L.P.,
Darby Creek Tank Leak

Operator, Location, & Consequences

Date of Failure 2/8/2011
Commodity Released Crude Oil
City/County & State Folcroft, Delaware County, Pennsylvania
OpID & Operator Name 18718 - Sunoco Pipeline L.P.
Unit # & Unit Name 20041 - Fort Mifflin-PA/NJ
SMART Activity # 133500
Milepost / Location Latitude: 39.89810181, Longitude: 75.26255272
Type of Failure Corrosion Leak in Tank DC9 tank bottom
Fatalities None
Injuries None
Description of Area Impacted Leak contained to tank dike area. Facility located in a High Consequence Area (HCA).
Total Costs \$257,250

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Executive Summary

At 12:13 p.m. on February 8, 2011, crude oil was discovered in the dike area of Tank DC9 in the Sunoco Logistics (Sunoco) Darby Creek Tank Farm (DCTF). Tank DC9 is designated as a break-out tank and is regulated under Part 195 of the Code of Federal Regulations (CFR). The leak originated from a hole in the bottom of the tank resulting in a spill of approximately 38 barrels of crude oil within the tank dike area. The cause of the leak was due to corrosion located on the internal topside and underside of the tank floor. The Tank is located in a designated high consequence area (HCA) and an Unusually Sensitive Area (USA) per Sunoco's Integrity Management program (IMP). The tank area is approximately 500 feet from a local highway and 600 feet from a residential community. There were no injuries or fatalities, evacuations, or supply disruptions as a result of the incident. The tank will remain out-of-service until remediation efforts can be completed.



An inspector from PHMSA's Eastern Region was dispatched to the location on February 14, 2011, to conduct an investigation into the cause of the release.

System Details

Sunoco Pipeline L.P. operates more than 7,500 miles of hazardous liquid pipelines. The Darby Creek Tank Farm (DCTF) is a crude oil storage terminal for Sunoco's Philadelphia refinery. This facility has a total storage capacity of approximately three million barrels. Darby Creek receives crude oil from the Fort Mifflin Terminal and Hog Island Wharf through its pipelines. The tank farm stores the crude oil and pumps it to the Philadelphia refinery.

The DCTF comprises 30 above-ground atmospheric breakout tanks that are utilized for transit, storing, and blending crude oils. The crude oils are sent to the tank farm from the 3-mile-long, 24-inch-diameter North and South Ship lines. These lines are supplied with products from barges and ships at Fort Mifflin Dock and Hog Island Wharf near the Philadelphia International Airport. The products are blended at the DCTF and are pumped to the Sunoco Girard Point refinery through a 4-mile, 16-inch-diameter crude line. The 24-inch-diameter ship lines and the 16-inch-diameter crude line are under PHMSA's jurisdiction (Appendix A).

Tank DC9 is a 96,000-barrel break-out tank, measures 48 feet high by 120 feet in diameter, and was constructed in 1948 (Appendix A, -4).

Events Leading up to the Failure

Prior to the leak that was discovered on February 8, 2011, Tank DC9 was in normal service. There were no leaks or operational issues reported since the tank bottom was replaced following the 1992 out-of-service inspection.

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Emergency Response

On February 8, 2011, at approximately 12:13 p.m., a company utility operator discovered product in the dike area around Tank DC9 at the DCTF. Upon confirming the leak, Sunoco began immediately transferring product from Tank DC9 to Tank 35. At approximately 12:49 p.m., a vacuum truck was dispatched to the location to begin removing spilled product from the dike area. On February 11, 2011, fresh product was found in a runoff trench near the outer wall of Tank DC9. Arrangements were made by Sunoco to have the DC9 tank bottom inspected using a Magnetic Flux Leakage Examination Scanner (MFE). An American Petroleum Institute (API) 653 out-of-service inspection was conducted by DJA Inspection Services Inc., and a report was issued on April 20, 2011 (Appendix E).

Remediation of the area in which the product was spilled continued through February 14, 2011 (Appendix A-6 / Appendix A-7 / Appendix A-8). Sunoco notified the National Response Center (NRC) of the incident on February 11, 2011 (Appendix B), at approximately 4:20 p.m. Sunoco successfully implemented their Emergency Plan and Oil Pollution Act Plan in response to the tank leakage and resulting spill.

Summary of Return-to-Service

Tank DC9 will remain out of service until Sunoco can complete the repairs as outlined in the out of service inspection report, dated April 20, 2011, and provided by DJA Inspection Services.

Investigation Details

Tank DC9 is located in a designated High Consequence Area (HCA) and an Unusually Sensitive Area (USA) as described in Sunoco's Integrity Management Plan (IMP). The tank dike area is within approximately 500 feet from a local highway and 600 feet from a residential community. The investigation conducted by PHMSA's Eastern Region consisted of a review of the operating and maintenance history, tank inspection procedures, and records. Tank DC 9 was constructed in 1948 and was originally owned and operated by Chevron. Sunoco assumed ownership in 2003. The bottom of the tank consists of 3/8-inch annual ring plates and ¼-inch-thick inner bottom plates. The tank is insulated with no heating coils and stores crude at approximately 90 degrees Fahrenheit. The tank is currently sitting on soil over a High Density Polyethylene Liner (HDPE) with a 4-inch concrete base, and the original steel bottom. The HDPE liner was reported to be in good condition. The tank was under cathodic protection prior to 1992, but due to the installation of a double bottom in 1992, the cathodic protection was rendered ineffective.

The inspection history for tank DC9 consists of the following API Standard 653 Inspections:

Date	Type	Appendix
May 11, 1992	Out-of-Service	D4
Sept 28, 1993	Certification	D5
August 5, 1997	In-Service	D1

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August 1, 2002	In-Service	D2
June 5, 2007	In-Service	D3

The most recent API Standard 653 out-of-service inspection was performed on December 9, 1992 (Appendix D-4). This report identified a total of five deficiencies that required remediation. As a result of this out-of-service inspection, the entire tank bottom was replaced and a new protective fiberglass reinforcement plastics (FRP) coating was added.

The most recent API Standard 653 in-service inspection was performed on June 5, 2007. This inspection was conducted to collect data to evaluate the structural integrity of the tank and fitness for continued service. The results of the 2007 in-service inspection identified a total of six deficiencies. These deficiencies were external in nature and did not affect the overall integrity of the tank. The report identified the remaining life of the tank shell and nozzles to be greater than 20 years based on calculations using ultra-sonic thickness measurements.

A post-accident inspection conducted by DJA Inspection Services, dated April 20, 2011, identified significant topside corrosion on the floor plates in tank DC9 due to a failure of the FRP coating that was applied in 1992 (Appendix E). The report also indicated that approximately 60 percent of the floor could not be accurately MFE scanned during the post-accident inspection due to the severity of the topside corrosion and the FRP disbondment. The report also indicated that minor soil-side corrosion was found around the outside of the inner bottom plates against the annular ring. The report recommended replacing the entire bottom of the tank or repairing the tank by replacing approximately 60% of the bottom and performing various other procedures. The report also recommended that all of the annual rings be re-welded due to the amount of corrosion that was identified in these locations.

Findings and Contributing Factors

The primary immediate cause of this release was due to a hole in the tank bottom caused by a combination of internal topside corrosion and external underside soil-side corrosion. The topside corrosion was due to the failure of the FRP protective coating material that was applied when the tank bottom was replaced in 1992.

As a result of the investigation, PHMSA's Eastern Region findings are consistent with those identified in the post-accident inspection that was performed by DJA Inspection Services and the recommendations outlined in the subsequent report dated April 20, 2011.

Appendices

Appendix	Description
A	133500 Appendix A Maps and Photos
B	133500 Appendix B NRC Report 967232
C	133500 Appendix C Operator Liquid Accident Report ID 20110080
D	133500 Appendix D (D-1 to D-5) Operator Inspection Records
E	133500 Appendix E Post incident tank inspection

Appendix A
Map Removed

File Available at PHMSA

Failure Investigation Report – Sunoco Pipeline L.P., Darby Creek Tank Leak (Activity #133500)

Accident Date 02/08/2011

Photo 1 – Oil Water Box



Failure Investigation Report – Sunoco Pipeline L.P., Darby Creek Tank Leak (Activity #133500)

Accident Date 02/08/2011

Photo 2 - Apparent Leakage from tank bottom



Failure Investigation Report – Sunoco Pipeline L.P., Darby Creek Tank Leak (Activity #133500)

Accident Date 02/08/2011

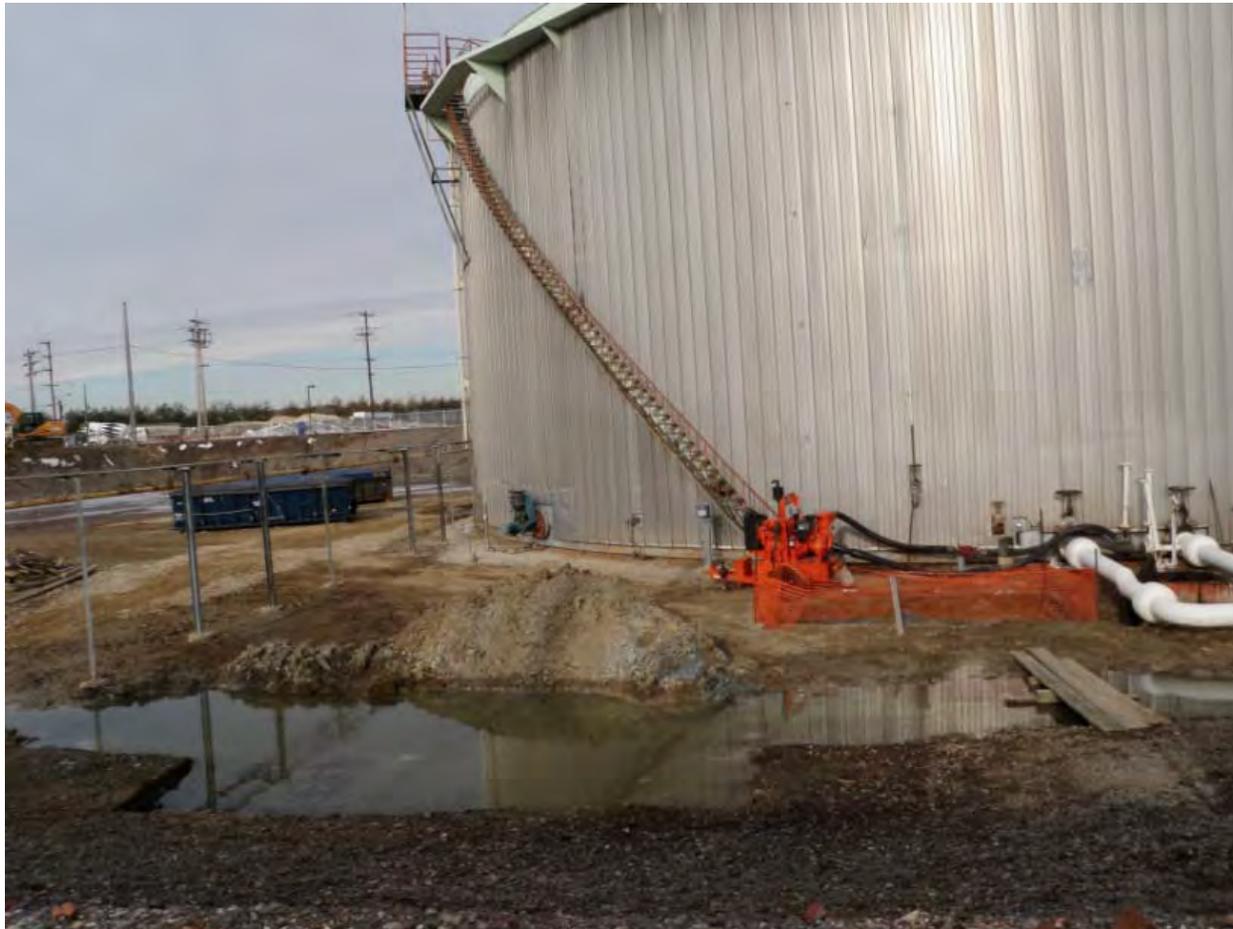
Photo 3 – Tank Piping



Failure Investigation Report – Sunoco Pipeline L.P., Darby Creek Tank Leak (Activity #133500)

Accident Date 02/08/2011

Photo 4 – Tank Dike



Failure Investigation Report – Sunoco Pipeline L.P., Darby Creek Tank Leak (Activity #133500)

Accident Date 02/08/2011

Photo 5 – Traces of Crude – Tank Dike



Failure Investigation Report – Sunoco Pipeline L.P., Darby Creek Tank Leak (Activity #133500)

Accident Date 02/08/2011

Photo 6 – Tank Dike



Failure Investigation Report – Sunoco Pipeline L.P., Darby Creek Tank Leak (Activity #133500)

Accident Date 02/08/2011

Photo 7 – Hole on bottom of tank DC9. Floor Plate #35.



133500 Appendix B NRC Report 967232



HMIS->INCIDENTS->TELEPHONICS

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NRC Number: 967232
 Call Date: 02/11/2011 Call Time: 16:20:08

Caller Information

First Name: Last Name:
 Company Name:
 Address:
 City: State:
 Country: Zip:
 Phone 1: Phone 2:
 Organization Type: Is caller the spiller? Yes No No Response
 Confidential: Yes No No Response

Discharger Information

First Name: Last Name:
 Company Name:
 Address:
 City: State:
 Country: Zip:
 Phone 1: Phone 2:
 Organization Type:

Spill Information

State: County:
 Nearest City: Zip Code:

Location

Spill Date: (mm/dd/yyyy) Spill Time: (24hh:mm:ss)

DTG Type:

Incident Type: Reported Incident Type:

Description

Materials Involved

Material / Chris Name	Chris Code	Total Qty.	Water Qty.
OIL: CRUDE	OIL	1600 GALLON(S)	

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Medium Type: LAND

Additional Medium Information:

TANK DIKE

Injuries: Fatalites:

Evacuations: Yes No Unknown No. of Evacuations:

Damages: Yes No Unknown Damage Amount:

Federal Agency Notified: Yes No Unknown State Agency Notified: Yes No Unknown

Other Agency Notified: Yes No Unknown

Remedial Actions

REMOVAL OF PRODUCT. TANK BEING EMPTIED. EXPLORATORY DIGS INTO WATER LINES.

Additional Info

WEB REPORT.

Latitude

Degrees: 39 Minutes: 53 Seconds: 42 Quadrant: N

Longitude

Degrees: 75 Minutes: 15 Seconds: 38 Quadrant: W

Distance from City: Direction:

Section: Township: DARBY

Range: Milepost:

Rescinded Comments (max 250 characters)

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associated with this Operator	
13e. General public	
13f. Total injuries (sum of above)	
14. Was the pipeline/facility shut down due to the Accident?	No
- If No, Explain:	Facility was on scheduled shut down. Facility resumed operations on 2/23/11
- If Yes, complete Questions 14a and 14b: (use local time, 24-hr clock)	
14a. Local time and date of shutdown:	
14b. Local time pipeline/facility restarted:	
- Still shut down? (* Supplemental Report Required)	
15. Did the commodity ignite?	No
16. Did the commodity explode?	No
17. Number of general public evacuated:	0
18. Time sequence (use local time, 24-hour clock):	
18a. Local time Operator identified Accident:	02/08/2011 12:13
18b. Local time Operator resources arrived on site:	02/08/2011 12:49

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:	Pennsylvania
3. Zip Code:	19079
4. City	Sharon Hill
5. County or Parish	Delaware
6. Operator-designated location:	
Specify:	
7. Pipeline/Facility name:	Darby Creek Tank Farm
8. Segment name/ID:	
9. Was Accident on Federal land, other than the Outer Continental Shelf (OCS)?	No
10. Location of Accident:	Totally contained on Operator-controlled property
11. Area of Accident (as found):	Tank, including attached appurtenances
Specify:	
- If Other, Describe:	
Depth-of-Cover (in):	
12. Did Accident occur in a crossing?	No
- If Yes, specify below:	
- If Bridge crossing –	
Cased/ Uncased:	
- If Railroad crossing –	
Cased/ Uncased/ Bored/drilled	
- If Road crossing –	
Cased/ Uncased/ Bored/drilled	
- If Water crossing –	
Cased/ Uncased	
- Name of body of water, if commonly known:	
- Approx. water depth (ft) at the point of the Accident:	
- Select:	
- If Offshore:	
13. Approximate water depth (ft) at the point of the Accident:	
14. Origin of Accident:	
- In State waters - Specify:	
- State:	
- Area:	
- Block/Tract #:	
- Nearest County/Parish:	
- On the Outer Continental Shelf (OCS) - Specify:	
- Area:	
- Block #:	
15. Area of Accident:	

PART C - ADDITIONAL FACILITY INFORMATION

1. Is the pipeline or facility:	Interstate
2. Part of system involved in Accident:	Onshore Breakout Tank or Storage Vessel, including Attached Appurtenances
- If Onshore Breakout Tank or Storage Vessel, Including Attached Appurtenances, specify:	Atmospheric or Low Pressure

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Was this HCA identified in the "could affect" determination for this Accident site in the Operator's Integrity Management Program?	Yes
- High Population Area:	Yes
Was this HCA identified in the "could affect" determination for this Accident site in the Operator's Integrity Management Program?	Yes
- Other Populated Area	
Was this HCA identified in the "could affect" determination for this Accident site in the Operator's Integrity Management Program?	
- Unusually Sensitive Area (USA) - Drinking Water	
Was this HCA identified in the "could affect" determination for this Accident site in the Operator's Integrity Management Program?	
- Unusually Sensitive Area (USA) - Ecological	Yes
Was this HCA identified in the "could affect" determination for this Accident site in the Operator's Integrity Management Program?	Yes
8. Estimated Property Damage:	
8a. Estimated cost of public and non-Operator private property damage	\$ 0
8b. Estimated cost of commodity lost	\$ 0
8c. Estimated cost of Operator's property damage & repairs	\$ 0
8d. Estimated cost of Operator's emergency response	\$ 257,250
8e. Estimated cost of Operator's environmental remediation	\$ 0
8f. Estimated other costs	\$ 0
Describe:	This includes emergency response and cleaning of the tank to investigate cause.
8g. Total estimated property damage (sum of above)	\$ 257,250
PART E - ADDITIONAL OPERATING INFORMATION	
1. Estimated pressure at the point and time of the Accident (psig):	.00
2. Maximum Operating Pressure (MOP) at the point and time of the Accident (psig):	.00
3. Describe the pressure on the system or facility relating to the Accident (psig):	Pressure did not exceed MOP
4. Not including pressure reductions required by PHMSA regulations (such as for repairs and pipe movement), was the system or facility relating to the Accident operating under an established pressure restriction with pressure limits below those normally allowed by the MOP?	No
- If Yes, Complete 4.a and 4.b below:	
4a. Did the pressure exceed this established pressure restriction?	
4b. Was this pressure restriction mandated by PHMSA or the State?	
5. Was "Onshore Pipeline, Including Valve Sites" OR "Offshore Pipeline, Including Riser and Riser Bend" selected in PART C, Question 2?	No
- If Yes - (Complete 5a. – 5f. below)	
5a. Type of upstream valve used to initially isolate release source:	
5b. Type of downstream valve used to initially isolate release source:	
5c. Length of segment isolated between valves (ft):	
5d. Is the pipeline configured to accommodate internal inspection tools?	
- If No, Which physical features limit tool accommodation? (select all that apply)	
- Changes in line pipe diameter	
- Presence of unsuitable mainline valves	
- Tight or mitered pipe bends	
- Other passage restrictions (i.e. unbarred tee's, projecting instrumentation, etc.)	
- Extra thick pipe wall (applicable only for magnetic flux leakage internal inspection tools)	
- Other -	
- If Other, Describe:	
5e. For this pipeline, are there operational factors which significantly complicate the execution of an internal inspection tool run?	

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- If Yes, Which operational factors complicate execution? <i>(select all that apply)</i>	
- 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:	
6. Was a Supervisory Control and Data Acquisition (SCADA)-based system in place on the pipeline or facility involved in the Accident?	Yes
If Yes -	
6a. Was it operating at the time of the Accident?	Yes
6b. Was it fully functional at the time of the Accident?	Yes
6c. Did SCADA-based information (such as alarm(s), alert(s), event(s), and/or volume calculations) assist with the detection of the Accident?	No
6d. Did SCADA-based information (such as alarm(s), alert(s), event(s), and/or volume calculations) assist with the confirmation of the Accident?	No
7. Was a CPM leak detection system in place on the pipeline or facility involved in the Accident?	Yes
- If Yes:	
7a. Was it operating at the time of the Accident?	Yes
7b. Was it fully functional at the time of the Accident?	Yes
7c. Did CPM leak detection system information (such as alarm(s), alert(s), event(s), and/or volume calculations) assist with the detection of the Accident?	No
7d. Did CPM leak detection system information (such as alarm(s), alert(s), event(s), and/or volume calculations) assist with the confirmation of the Accident?	No
8. How was the Accident initially identified for the Operator?	Local Operating Personnel, including contractors
- If Other, Specify:	
8a. If "Controller", "Local Operating Personnel", including contractors", "Air Patrol", or "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: <i>(provide an explanation for why the operator did not investigate)</i>	The facility was down for maintenance at the time of the accident
- If Yes, specify investigation result(s): <i>(select all that apply)</i>	
- 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	

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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? - If Yes:	No
1a. Specify how many were tested:	
1b. Specify how many failed:	
2. As a result of this Accident, were any Operator contractor employees tested under the post-accident drug and alcohol testing requirements of DOT's Drug & Alcohol Testing regulations? - If Yes:	No
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:	G1 - Corrosion Failure
G1 - Corrosion Failure - only one sub-cause can be picked from shaded left-hand column	
External Corrosion:	
Internal Corrosion:	Yes
- 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:	Localized Pitting
7. Type of corrosion <i>(select all that apply):</i> -	
- Corrosive Commodity	
- Water drop-out/Acid	
- Microbiological	
- Erosion	Yes
- 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	

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- Determined by metallurgical analysis	Yes
- Other:	
- If Other, Describe:	
9. Location of corrosion (select all that apply): -	
- Low point in pipe	
- Elbow	
- Other:	Yes
- If Other, Describe:	Tank Floor
10. Was the commodity treated with corrosion inhibitors or biocides?	No
11. Was the interior coated or lined with protective coating?	Yes
12. Were cleaning/dewatering pigs (or other operations) routinely utilized?	Not applicable - Not mainline pipe
13. Were corrosion coupons routinely utilized?	Not applicable - Not mainline pipe
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	Yes
- No Out-of-Service Inspection completed	2011
14b. API Std 653 In-Service Inspection	Yes
- No In-Service Inspection completed	2011
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:

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Describe:	
G2 - Natural Force Damage - only one sub-cause can be picked from shaded left-handed column	
Natural Force Damage – Sub-Cause:	
- If Earth Movement, NOT due to Heavy Rains/Floods:	
1. Specify:	
- If Other, Describe:	
- If Heavy Rains/Floods:	
2. Specify:	
- If Other, Describe:	
- If Lightning:	
3. Specify:	
- If Temperature:	
4. Specify:	
- If Other, Describe:	
- If 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, Describe:	
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:	
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:	

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

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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	
- Tropical Storm	
- Tornado	
- Heavy Rains/Flood	
- Other	
- If Other, Describe:	
- 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:

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- Other	
Most recent year conducted:	
Describe:	
- If Intentional Damage:	
8. Specify:	
- If Other, Describe:	
- If Other Outside Force Damage:	
9. Describe:	
G5 - Material Failure of Pipe or Weld - only one sub-cause can be selected from the shaded left-hand column	
Use this section to report material failures ONLY IF the "Item Involved in Accident" (from PART C, Question 3) is "Pipe" or "Weld."	
Material Failure of Pipe or Weld – Sub-Cause:	
1. The sub-cause selected below is based on the following: <i>(select all that apply)</i>	
- Field Examination	
- Determined by Metallurgical Analysis	
- Other Analysis	
- If "Other Analysis", Describe:	
- Sub-cause is Tentative or Suspected; Still Under Investigation (Supplemental Report required)	
- If Construction, Installation, or Fabrication-related:	
2. List contributing factors: <i>(select all that apply)</i>	
- Fatigue or Vibration-related	
Specify:	
- If Other, Describe:	
- Mechanical Stress:	
- Other	
- If Other, Describe:	
- If 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, Describe:	
- Mechanical Stress:	
- Other	
- If Other, Describe:	
- 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:

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- Hard Spot	
Most recent year run:	
- Combination Tool	
Most recent year run:	
- Transverse Field/Triaxial	
Most recent year run:	
- Other	
Most recent year run:	
Describe:	
6. Has one or more hydrotest or other pressure test been conducted since original construction at the point of the Accident?	
- If Yes:	
Most recent year tested:	
Test pressure (psig):	
7. Has one or more Direct Assessment been conducted on the pipeline segment?	
- If Yes, and an investigative dig was conducted at the point of the Accident -	
Most recent year conducted:	
- If Yes, but the point of the Accident was not identified as a dig site -	
Most recent year conducted:	
8. Has one or more non-destructive examination(s) been conducted at the point of the Accident since January 1, 2002?	
8a. If Yes, for each examination conducted since January 1, 2002, select type of non-destructive examination and indicate most recent year the examination was conducted: -	
- Radiography	
Most recent year conducted:	
- Guided Wave Ultrasonic	
Most recent year conducted:	
- Handheld Ultrasonic Tool	
Most recent year conducted:	
- Wet Magnetic Particle Test	
Most recent year conducted:	
- Dry Magnetic Particle Test	
Most recent year conducted:	
- Other	
Most recent year conducted:	
Describe:	
G6 – Equipment Failure - only one sub-cause can be selected from the shaded left-hand column	
Equipment Failure – Sub-Cause:	
- If Malfunction of Control/Relief Equipment:	
1. Specify: <i>(select all that apply)</i> -	
- Control Valve	
- Instrumentation	
- SCADA	
- Communications	
- Block Valve	
- Check Valve	
- Relief Valve	
- Power Failure	
- Stopple/Control Fitting	
- ESD System Failure	
- Other	
- If Other – Describe:	
- If Pump or Pump-related Equipment:	
2. Specify:	
- If Other – Describe:	
- If Threaded Connection/Coupling Failure:	
3. Specify:	
- If Other – Describe:	
- If Non-threaded Connection Failure:	
4. Specify:	
- If Other – Describe:	
- If Defective or Loose Tubing or Fitting:	
- If Failure of Equipment Body (except Pump), Tank Plate, or other Material:	
- If Other Equipment Failure:	

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5. Describe:	
Complete the following if any Equipment Failure sub-cause is selected.	
6. Additional factors that contributed to the equipment failure: <i>(select all that apply)</i>	
- Excessive vibration	
- Overpressurization	
- No support or loss of support	
- Manufacturing defect	
- Loss of electricity	
- Improper installation	
- Mismatched items (different manufacturer for tubing and tubing fittings)	
- Dissimilar metals	
- Breakdown of soft goods due to compatibility issues with transported commodity	
- Valve vault or valve can contributed to the release	
- Alarm/status failure	
- Misalignment	
- Thermal stress	
- Other	
- If Other, Describe:	
G7 - Incorrect Operation - only one sub-cause can be selected from the shaded left-hand column	
Incorrect Operation – Sub-Cause:	
Damage by Operator or Operator's Contractor NOT Related to Excavation and NOT due to Motorized Vehicle/Equipment Damage	No
Tank, Vessel, or Sump/Separator Allowed or Caused to Overflow or Overflow	No
1. Specify:	
- If Other, Describe:	
Valve Left or Placed in Wrong Position, but NOT Resulting in a Tank, Vessel, or Sump/Separator Overflow or Facility Overpressure	No
Pipeline or Equipment Overpressured	No
Equipment Not Installed Properly	No
Wrong Equipment Specified or Installed	No
Other Incorrect Operation	No
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:	

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- If Unknown:	
2. Specify:	
PART H - NARRATIVE DESCRIPTION OF THE ACCIDENT	
Internal corrosion on the tank floor. Tank removed from service, API Std. 653 out-of-service inspection and In-Service Inspection completed. The tank will remain out-of-service until the operations of the system warrant repair of this tank.	
File Full Name	
PART I - PREPARER AND AUTHORIZED SIGNATURE	
Preparer's Name	Brian McTiernan
Preparer's Title	DOT Specialist
Preparer's Telephone Number	215-937-6278
Preparer's E-mail Address	bdmctiernan@sunocologistics.com
Preparer's Facsimile Number	877-588-8590
Authorized Signature's Name	Brian McTiernan
Authorized Signature Title	DOT Specialist
Authorized Signature Telephone Number	215-937-6278
Authorized Signature Email	bdmctiernan@sunocologistics.com
Date	08/28/2012

Appendix D
Operator Inspection Records
Removed

File Available at PHMSA

Appendix E
Post Incident Tank Inspection
Report
Removed

File Available at PHMSA