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engineering and environmental consultants

BARR

Technical Memorandum

To: Alex Smith, Enbridge Energy
From: Ryan Erickson and Chris Goscinak
Subject: Superior Terminal Manifold 225 Release
Date: February 15, 2015
WDNR SERTS ID: 20141203NO16-1
Barr Project: 49161301

This memorandum summarizes the field screening, analytical sampling, and waste management assistance conducted by Barr Engineering (Barr) at the request of Enbridge Energy (Enbridge) in response to the Manifold 225 crude oil release at the Enbridge Superior Terminal in Superior, Wisconsin in December of 2014 (Figure 1).

Background and Response Activities

On December 3, 2014 at approximately 8:45 AM, approximately 5.95 barrels of crude oil were released from a vertical 2-inch pipe on Manifold 225 (Figure 2; Photos 1, 2, 3) during pipeline maintenance activities. The crude oil was released onto the ground surface beneath the release point and some product mist sprayed into the air and blew to the east of the release point (Photo 4). The Enbridge Pipe Line Maintenance (PLM) personnel conducting the maintenance immediately responded to the release by replacing the 2-inch pipeline plug to halt the release and initiated remediation activities. Remediation activities included: recovering product with a vacuum truck where possible; removing crude oil from the manifold infrastructure with a biodegradable degreaser; and excavating soil containing crude oil from the release area with hydrovacuum (hydrovac) trucks, excavators, and hand tools. Shortly after the release, PLM personnel notified Enbridge Environment and the Wisconsin Department of Natural Resources (WDNR). The WDNR assigned Substance Release Notification Report (SERTS) number 20141203NO16-1 to the release (Attachment A).

Enbridge Environment requested that Barr assist with the following activities:

- assess and document the environmental conditions present during the response actions and after completion of remedial activities,
- assist with the coordination of off-site disposal of contaminated soil,
- prepare a memorandum summarizing the release response activities and the site environmental conditions upon completion of the cleanup activities.

Field Activities

On December 3 and 4, 2014, Barr was onsite to field screen soil, collect analytical samples, and assist with the contaminated soil management.

Soil samples were collected from the excavation extents and field screened by Barr for the presence of organic vapors using a photoionization detector (PID). Samples were also physically inspected for the presence of other potential indicators of crude oil impacts such as obvious odor, discoloration and sheen. PID readings and physical observations were documented on screening logs (Attachment B).

Soil was classified as contaminated if PID headspace readings were greater than 10 parts per million (ppm), or other physical observations of oil impacts were observed, as outlined in the pending WDNR Enbridge Superior Terminal *Site Investigation and Response Action Plan* (SI/RAP) (2014). If contaminated soil remains in place following remediation activities, soil samples are to be submitted to a laboratory for analyses of petroleum volatile organic compounds (PVOC) and naphthalene to document contaminant concentrations.

Barr collected three analytical samples (*Manifold 225-S-1, Manifold 225-S-2, Manifold 225-B-1*) from the excavation and submitted them to Legend Technical Services in St. Paul, Minnesota for analysis. Analyte concentrations were then compared to WDNR industrial direct contact residual concentration limits (RCL's), WDNR groundwater RCL's and Cumulative Hazard Index criteria.

Excavated soil with field screening evidence of contamination was transported to the Terminal Soil Management Area (SMA) contaminated-soil staging area where it was stockpiled until off-site disposal could be arranged. Samples of the stockpiled soil were collected and submitted to Legend for characterization.

Results

Barr was onsite during the Manifold 225 release remedial actions on December 3 and December 4, 2014. Barr's analytical sampling locations are shown on Figure 3 and field screening data is provided in Attachment B. Laboratory results are summarized in Table 1 and laboratory reports are provided in Attachment C.

Barr observed that the area impacted by the crude oil release was approximately 65 feet long (east to west) by 25 feet wide (north to south). Soil at the ground surface was primarily sand fill that had been used as backfill around the recently constructed manifold structure. The ground surface was frozen to a depth of approximately 0.5 feet below ground surface (bgs); which prevented significant infiltration of the crude oil into the soil in most areas. The largest volume of product released onto the ground surface was focused in an area within 10 feet of the release point. Crude oil contaminated soil to the east of the release point, up to 60 feet away, was caused by the wind blowing the released crude oil mist.

Release Point Remedial Excavations

Remedial excavation activity near the release point was conducted on December 3 and December 4, 2014 (Photos 2, 5, 6, 7). Product pooled in this area before it could be removed and the crude oil was able to infiltrate beneath the frost layer along preferential pathways (e.g. pipeline infrastructure, wooden lathe). A surficial scrape of soil was conducted throughout the area to remove soil with crude oil impacts. Small pockets of crude oil were identified in two limited areas where soil impacts were observed at depths up to 7.5 feet bgs. Two remedial excavations were made in these areas, a 7-foot by 7-foot by 7.5-foot deep excavation (Photo 6) and a 5-foot by 5-foot by 4-foot deep excavation (Photo 7), to remove contaminated soil (Figure 3). Most crude oil contaminated soil in the release area was removed during the excavation activities; however, small areas of residual contamination could not be excavated due to the presence of buried pipeline infrastructure.

Barr collected 7 field screening samples from the final sidewalls and bottom of the two release point remedial excavations after completion of cleanup activities. PID headspace readings from excavation sidewall samples from 0 and 4 feet bgs were between 3.1 and 19.0 ppm. Soil from the final release point excavation bottom, at 7.5 feet bgs, had a PID headspace reading of 68.3 ppm (Attachment B).

Barr collected analytical soil sample *Manifold 225-S-1* (2 feet bgs) from the smaller excavation to the north of the release point and samples *Manifold 225-S-2* (4 feet bgs) and *Manifold 225-B-1* (7.5 feet bgs) from the larger southern release point excavation. Analyte concentrations in *Manifold 225-B-1* and *Manifold 225-S-1* were below WDNR Industrial Contact RCL's, above WDNR Groundwater RCL's and passed the Cumulative Hazard Index criteria (Table 1). Analyte concentrations in *Manifold 225-S-2* were below WDNR Industrial Contact RCL's, below WDNR Groundwater RCL's and passed the Cumulative Hazard Index criteria.

Release Area Surficial Scrape

The eastern 2/3 of the broader release area was impacted by the wind-blown crude oil spray and the impacts were limited to the surficial soil. In this area, a shallow surficial scrape using excavators, hydrovac trucks and hand tools was conducted to remove the contaminated soil (Photo 9). Barr collected 23 field screening soil samples from the spray area and PID headspace readings were all less than 10 ppm with the exception of screening point *B-10* at 0.25 feet bgs which had a headspace of 11.7 ppm (Attachment B). Soil from the *B-10* screening point had no visible crude oil staining and had a citrus odor that was similar to the odor of the degreaser that was used to clean the pipeline infrastructure. The 11.7 ppm headspace detection was attributed to the degreaser. No analytical samples were collected from the spray area after a discussion with the WDNR.

The release-point excavations and the surficial scrape areas were backfilled with clean fill upon completion of the remedial activities.

Discussion

No residual free-product was identified at the release site after completion of cleanup activities. PVOC and naphthalene concentrations in samples collected from the final excavation extents were below WDNR Industrial Direct Contact RCL's and passed the Cumulative Hazard Index criteria. Analyte concentrations in samples *Manifold 225-B-1* and *Manifold 225-S-1* did exceed WDNR Groundwater Criteria; however, groundwater monitoring at the Superior Terminal will be conducted on a facility-wide basis as part of the hydrogeologic performance standard established in the WDNR *SI/RAP* and project specific monitoring is not required for this site. No potential vapor receptors were identified as defined in the *WDNR Enbridge Superior Terminal SI/RAP* (2014).

Waste Disposal Coordination and Documentation

Barr collected four analytical waste characterization samples (*Manifold 225-STOCKPILE-1, Manifold 225-STOCKPILE-2, Manifold 225-STOCKPILE-3, Manifold 225-STOCKPILE-4*) from the crude oil impacted soil stockpile (Photo 10) for laboratory analysis at Legend Technical Services. Samples *Manifold 225-STOCKPILE-1* and *Manifold 225-STOCKPILE-2* were analyzed for diesel range organics (DRO) and benzene, toluene, ethyl benzene, and xylenes (BTEX) and samples *Manifold 225-STOCKPILE-3* and *Manifold 225-STOCKPILE-4* were analyzed for TCLP benzene. A waste profile application was submitted to the Shamrock Landfill located in Cloquet, Minnesota and the soil was accepted under waste profile #CL15-0001. A total of 51.57 tons of crude oil impacted soil was hauled to the landfill in January of 2015. Barr also prepared a soil management technical memo (1/26/2015) for Enbridge that described the statistical methodology used to evaluate the stockpile's average TCLP benzene value. The waste profile documents, the waste characterization laboratory report, the landfill summary report, and the Barr soil management technical memo are included in Attachment D.

Conclusions

Crude oil contaminated soil excavated from the Manifold 225 release site was managed of at an approved landfill. Contaminated soil that could not be excavated due to the presence of terminal infrastructure had PVOC and naphthalene concentrations less than WDNR Industrial Direct Contact RCLs and passed the WDNR Cumulative Hazard Index criteria. The presence of clean fill and employee-awareness will prevent direct contact exposure. Analyte concentrations did exceed WDNR Groundwater Criteria; however, groundwater monitoring at the Superior Terminal will be conducted on a facility-wide basis as part of the hydrogeologic performance standard established in the WDNR *SI/RAP* and project specific monitoring is not required for this site.

Barr believes that no further response action will be required by the WDNR at this site and that the release site will be added to the WDNR GIS Registry Enbridge Superior Terminal Super ERP Site.

Attachments

Photos Site Photos 1 through 10

Figure 1 Site Location Map

Figure 2 Site Layout Map

Figure 3 Sample Location Map

Table 1 Soil Analytical Data Summary

Attachment A Release Reporting Documents

Attachment B Site Investigation Field Sampling and Screening Log

Attachment C Legend Technical Services Laboratory Report

Attachment D Waste Disposal Documentation

Site Photos

Photo 1: Manifold 225 release area with remedial response personnel and equipment. Photo taken facing north on December 3, 2014.

Photo 2

Photo 3

Photo 2: Release location. The 2-inch pipe is located above the section of brown pipeline shown in the center of the photo and in Photo 3. Photo taken facing north on December 3, 2014.
Photo 3: The 2-inch pipe release source. The 2-inch pipe is the short vertical pipe above the section of brown pipeline. Photo taken facing north on December 3, 2014.

Photo 4

Photo 5

Photo 4: Crude oil contaminated soil and timber mat south of the release point. Photo taken facing east on December 3, 2014.
Photo 5: Remedial scrape/excavation activity using an excavator (left) and a hydrovac truck (silver tube on right). Photo taken facing northeast on December 3, 2014.

Photo 6

Photo 7

Photo 6: Remedial excavation located beneath the release point. Photo taken on December 4, 2014.
Photo 7: The smaller northern remedial excavation in the release area is shown in the center of the photo. Photo taken facing east on December 4, 2014.

Photo 8

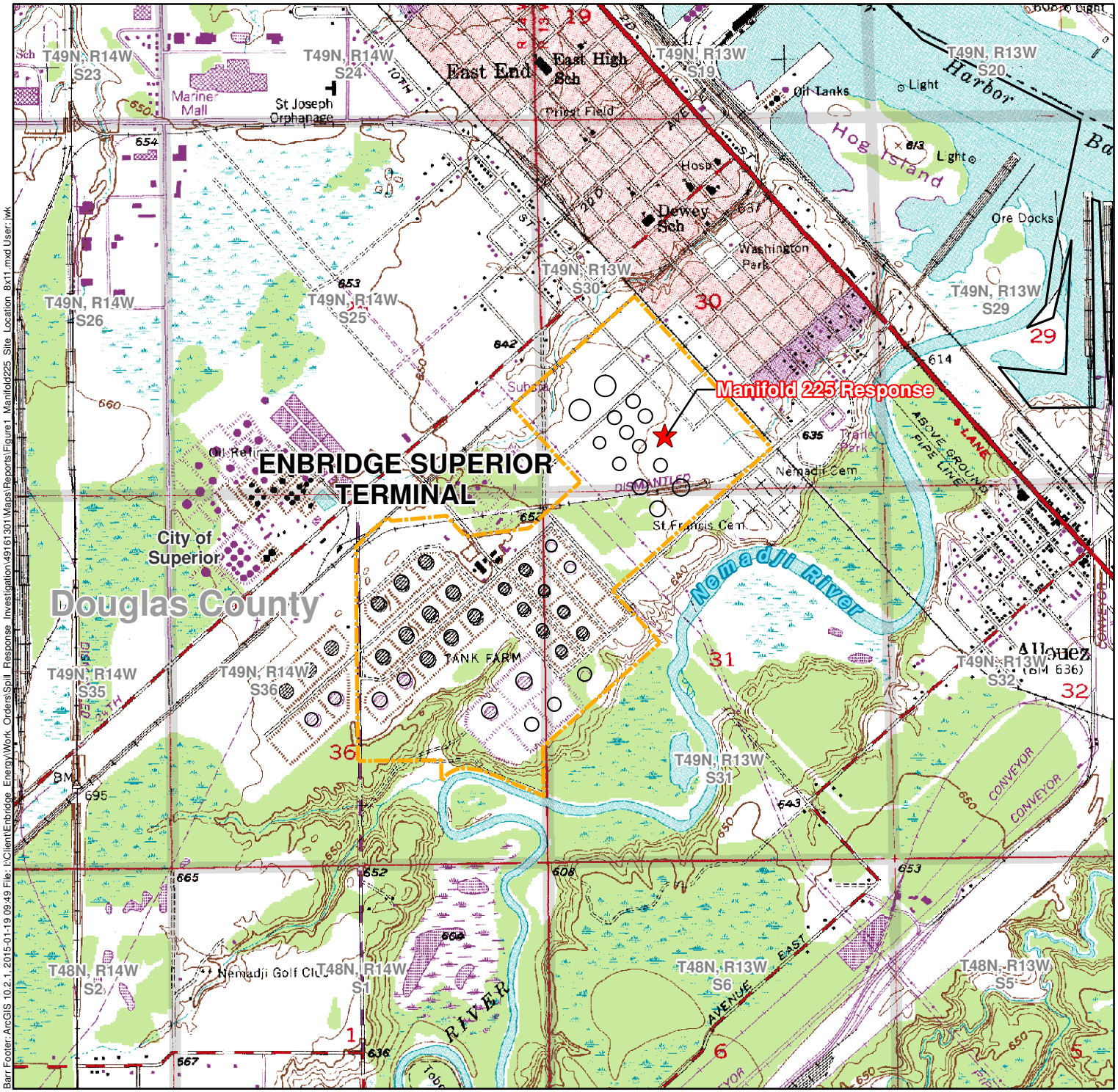
Photo 9

Photo 8: Crude oil contaminated soil encountered in northern remedial excavation. This contaminated soil is representative of the contaminated soil pockets encountered in the immediate release area excavations. Photo taken on December 4, 2014.
Photo 9: Final spray zone remedial scrape excavation. Photo taken facing west on December 4, 2014.

Photo 10: Manifold 225 crude oil release contaminated soil stockpile in the Superior Terminal SMA building on December 19, 2014.

Table 1
Soil Analytical Data Summary
Enbridge Manifold 225
Units, mg/kg (unless otherwise noted)

		Parameter	Solids, percent	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	Benzene	Ethyl benzene	Naphthalene	Toluene	Xylene, total	WDNR RCL Determinations[1]			
											Exceedance Count	Hazard Index	Cumulative Cancer Risk	Pass or Fail
	Effective Date	Exceedance Key												
Wisconsin Groundwater RCLs	06/01/2014	**Bold**		1.3793 TR	1.3793 TR	**0.0051**	0.785	0.3294	0.5536	1.97 XYL				
Wisconsin Industrial DC RCLs	06/01/2014	No Exceed		219	182	7.41	37	26	818	258	0	1.0	0.00001	Pass
Location	**Date**	**Depth (ft)**												
Manifold 225-B-1	12/04/2014	7.5	78 %	0.0069 j	< 0.0079	**0.034**	0.020 jb	< 0.028	0.0081 j	< 0.018	0	0.0001	6.2E-09	Pass
Manifold 225-S-1	12/04/2014	3	90 %	0.0070 j	< 0.0086	**0.011 j**	0.024 jb	< 0.031	0.012 j	0.034 j	0	0.0001	3.3E-09	Pass
Manifold 225-S-2	12/04/2014	4	97 %	< 0.0031	< 0.0071	< 0.0033	0.017 jb	< 0.025	< 0.0047	< 0.016	0	0	1.9E-09	Pass



Site Location

Terminal Property Boundary

0 2,000 4,000

Feet

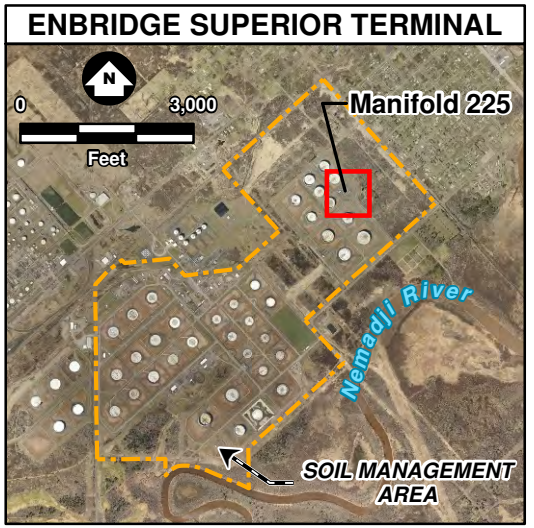
1 Inch = 2,000 Feet

Figure 1

SITE LOCATION
MANIFOLD 225 RESPONSE
SUPERIOR TERMINAL
Enbridge Energy, L.P.
Superior, Wisconsin

ENBRIDGE

Barr Footer ArcGIS 10.2.1, 2015-01-19 09:49 File: I:\Client\Enbridge_Energy\Work_Orders\Spill_Response_Investigation\49161301\Maps\Reports\Figure1_Manifold225_Site_Location_8x11.mxd User: jwk



Release Location

New Manifold 225 Infrastructure

Pipeline Infrastructure

Terminal Property Boundary

N

0 100 200

Feet

1 Inch = 100 Feet

Douglas County Imagery Circa May, 2013

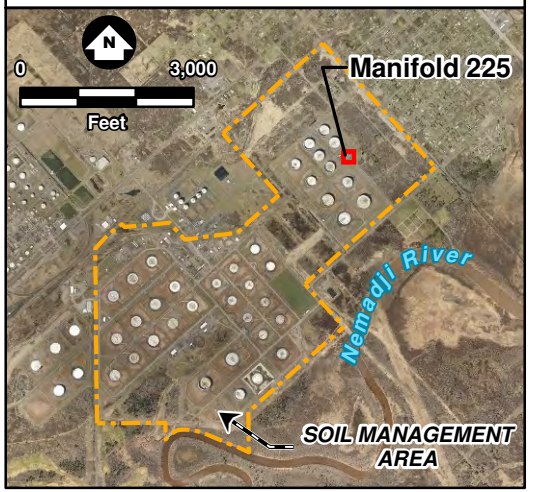
Figure 2

SITE LAYOUT
MANIFOLD 225 RESPONSE
SUPERIOR TERMINAL
Enbridge Energy, L.P.
Superior, Wisconsin

ENBRIDGE

Barr Footer: ArcGIS 10.3, 2015-02-09 09:04 File: I:\Client\Enbridge_Energy\Work_Orders\Spill_Response_Investigation\49161301\Maps\Reports\Figure2_Manifold225_Site_Layout_8x11.mxd User: jwk

ENBRIDGE SUPERIOR TERMINAL



- Release Location
- Analytical Sample Location
- New Manifold 225 Infrastructure
- Remedial Excavation Extent
- Release Extent & Remedial Scrape Excavation
- Pipeline Infrastructure
- Terminal Property Boundary

N

0 25 50

Feet

1 Inch = 25 Feet

Douglas County Imagery Circa May, 2013

Figure 3

SAMPLE LOCATIONS
MANIFOLD 225 RESPONSE
SUPERIOR TERMINAL
Enbridge Energy, L.P.
Superior, Wisconsin

ENBRIDGE

Attachment A

Release Reporting Documents

Ryan E. Erickson

From: Alex Smith <alex.smith@enbridge.com>
Sent: Friday, December 05, 2014 10:43 AM
To: Ryan E. Erickson
Subject: FW: WI SPILL #8799 SERTS ID 20141203NO16-1 - CRUDE OIL

Ryan, the spill number from the WDNR is listed below.

Thanks,
Alex

-----Original Message-----
From: Theresa Picton
Sent: Wednesday, December 03, 2014 12:48 PM
To: Alex Smith
Subject: FW: WI SPILL #8799 SERTS ID 20141203NO16-1 - CRUDE OIL

Confirmation of call to the state of WI.

-----Original Message-----
From: lukas.wiersema@wisconsin.gov [mailto:lukas.wiersema@wisconsin.gov]
Sent: Wednesday, December 03, 2014 12:47 PM
To: Theresa Picton
Subject: WI SPILL #8799 SERTS ID 20141203NO16-1 - CRUDE OIL

Substance Release Notification from Wisconsin DNR Spill Electronic Reporting and Tracking System (SERTS):

SERTS Spill ID:
20141203NO16-1

Date/Time Reported:
12/03/2014 12:31

Person Reporting (PR):
TERRI PICTON
COMPLIANCE COORDINATOR
ENBRIDGE PIPELINES
theresa.picton@enbridge.com
(715) 398-4779
Person Reporting is RP Contact

Date/Time Occurred:
12/03/2014 08:45

Location:
NO REGION
DOUGLAS COUNTY

CITY OF SUPERIOR
ENBRIDGE SUPERIOR TERMINAL
2800 E 21ST ST

Responsible Party (RP):
ENBRIDGE PIPELINES

Substance:
CRUDE OIL (Petroleum)
Released Amt: 60 Gal
Recovered Amt: UNKNOWN

Spill Cause:
PLUGGING TOR'S TO REMOVE VALVE'S PLUG IN THE TOR WAS NOT CEDED/ TOR PLUG RELEASED AND LET OIL OUT.

NO EVACUATION

NO INJURIES

Weather:
COLD
WINDY

Contractor Hired:
BARR ENGINEERING

Cleanup Method:
CLEAN UP IS BEING DONE BUT CALLER IS UNSURE OF WHAT IS BEING DONE.

Additional Comments:
NONE ENTERED

Notified JOHN SAGER at 12:38 by Voicemail

Form Completed by:
LUKAS WIERSEMA
(608) 267-0844
lukas.wiersema@wisconsin.gov

Notification sent to:
andrew.savagian@wisconsin.gov
anita.smith@wi.gov
danielle.wincentsen@wisconsin.gov
dmawemdutyofficer@wisconsin.gov
dnrledo@wisconsin.gov
dnrlehotline@wisconsin.gov
frank.docimo@wisconsin.gov
halbur.kathy@epa.gov
jason.lowery@wisconsin.gov
john.sager@wisconsin.gov

kkesler@douglascountywi.org
laura.kwilinski@dot.gov
philip.richard@wisconsin.gov
randy.books@wi.gov
robert.clatterbuck@dot.gov
stephanie.krueger@dhs.wisconsin.gov
theresa.picton@enbridge.com

NOTICE: This report is required by 49 CFR Part 195. Failure to report can result in a civil penalty not to exceed $100,000 for each violation for each day that such violation persists except that the maximum civil penalty shall not exceed $1,000,000 as provided in 49 USC 60122.	OMB NO: 2137-0047 EXPIRATION DATE: 01/31/2014

U.S Department of Transportation Pipeline and Hazardous Materials Safety Administration	**Original Report Date:**	12/23/2014
	No.	20140438 - 20016 --- (DOT Use Only)

ACCIDENT REPORT - HAZARDOUS LIQUID PIPELINE SYSTEMS

A federal agency may not conduct or sponsor, and a person is not required to respond to, nor shall a person be subject to a penalty for failure to comply with a collection of information subject to the requirements of the Paperwork Reduction Act unless that collection of information displays a current valid OMB Control Number. The OMB Control Number for this information collection is 2137-0047. Public reporting for this collection of information is estimated to be approximately 10 hours per response (5 hours for a small release), including the time for reviewing instructions, gathering the data needed, and completing and reviewing the collection of information. All responses to this collection of information are mandatory. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to: Information Collection Clearance Officer, PHMSA, Office of Pipeline Safety (PHP-30) 1200 New Jersey Avenue, SE, Washington, D.C. 20590.

INSTRUCTIONS

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.*

PART A - KEY REPORT INFORMATION

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

1. Operator's OPS-issued Operator Identification Number (OPID):	11169
2. Name of Operator	ENBRIDGE ENERGY, LIMITED PARTNERSHIP
3. Address of Operator:	
3a. Street Address	1100 LOUISIANA, SUITE 3300
3b. City	HOUSTON
3c. State	Texas
3d. Zip Code	77002
4. Local time *(24-hr clock)* and date of the Accident:	12/03/2014 08:45
5. Location of Accident:	
Latitude:	46.69354
Longitude:	-92.049
6. National Response Center Report Number (if applicable):	
7. Local time *(24-hr clock)* and date of initial telephonic report to the National Response Center (if applicable):	
8. Commodity released: *(select only one, based on predominant volume released)*	Crude Oil
- Specify Commodity Subtype:	
- If "Other" Subtype, Describe:	
- If Biofuel/Alternative Fuel and Commodity Subtype is Ethanol Blend, then % Ethanol Blend: %:	
- If Biofuel/Alternative Fuel and Commodity Subtype is Biodiesel, then Biodiesel Blend (e.g. B2, B20, B100): B	
9. Estimated volume of commodity released unintentionally (Barrels):	5.95
10. Estimated volume of intentional and/or controlled release/blowdown (Barrels):	
11. Estimated volume of commodity recovered (Barrels):	5.95
12. Were there fatalities?	No
- If Yes, specify the number in each category:	
12a. Operator employees	
12b. Contractor employees working for the Operator	
12c. Non-Operator emergency responders	
12d. Workers working on the right-of-way, but NOT associated with this Operator	
12e. General public	
12f. Total fatalities (sum of above)	
13. Were there injuries requiring inpatient hospitalization?	No
- If Yes, specify the number in each category:	
13a. Operator employees	
13b. Contractor employees working for the Operator	
13c. Non-Operator emergency responders	

13d. Workers working on the right-of-way, but NOT associated with this Operator	
13e. General public	
13f. Total injuries (sum of above)	
14. Was the pipeline/facility shut down due to the Accident?	No
- If No, Explain:	Line was already shut down for routine maintenance
- 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:	12/03/2014 08:45
18b. Local time Operator resources arrived on site:	12/03/2014 08:45
PART B - ADDITIONAL LOCATION INFORMATION	
1. Was the origin of Accident onshore?	Yes
If Yes, Complete Questions (2-12)	
If No, Complete Questions (13-15)	
- If Onshore:	
2. State:	Wisconsin
3. Zip Code:	
4. City	Superior
5. County or Parish	Douglas
6. Operator-designated location:	
Specify:	
7. Pipeline/Facility name:	PE/Superior Terminal
8. Segment name/ID:	Manifold 225 Piping
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):	Aboveground
Specify:	Typical aboveground facility piping or appurtenance
- 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 Terminal/Tank Farm Equipment and Piping
- If Onshore Breakout Tank or Storage Vessel, Including Attached Appurtenances, specify:	
3. Item involved in Accident:	Other

- If Pipe, specify:	
3a. Nominal diameter of pipe (in):	
3b. Wall thickness (in):	
3c. SMYS (Specified Minimum Yield Strength) of pipe (psi):	
3d. Pipe specification:	
3e. Pipe Seam , specify:	
- If Other, Describe:	
3f. Pipe manufacturer:	
3g. Year of manufacture:	
3h. Pipeline coating type at point of Accident, specify:	
- If Other, Describe:	
- If Weld, including heat-affected zone, specify:	
- If Other, Describe:	
- If Valve, specify:	
- If Mainline, specify:	
- If Other, Describe:	
3i. Manufactured by:	
3j. Year of manufacture:	
- If Tank/Vessel, specify:	
- If Other - Describe:	
- If Other, describe:	TOR Fitting
4. Year item involved in Accident was installed:	2014
5. Material involved in Accident:	Carbon Steel
- If Material other than Carbon Steel, specify:	
6. Type of Accident Involved:	Leak
- If Mechanical Puncture – Specify Approx. size:	
in. (axial) by	
in. (circumferential)	
- If Leak - Select Type:	Connection Failure
- If Other, Describe:	
- If Rupture - Select Orientation:	
- If Other, Describe:	
Approx. size: in. (widest opening) by	
in. (length circumferentially or axially)	
- If Other – Describe:	

PART D - ADDITIONAL CONSEQUENCE INFORMATION

1. Wildlife impact:	No
1a. If Yes, specify all that apply:	
- Fish/aquatic	
- Birds	
- Terrestrial	
2. Soil contamination:	Yes
3. Long term impact assessment performed or planned:	No
4. Anticipated remediation:	No
4a. If Yes, specify all that apply:	
- Surface water	
- Groundwater	
- Soil	
- Vegetation	
- Wildlife	
5. Water contamination:	No
5a. If Yes, specify all that apply:	
- Ocean/Seawater	
- Surface	
- Groundwater	
- Drinking water: *(Select one or both)*	
- Private Well	
- Public Water Intake	
5b. Estimated amount released in or reaching water (Barrels):	
5c. Name of body of water, if commonly known:	
6. At the location of this Accident, had the pipeline segment or facility been identified as one that "could affect" a High Consequence Area (HCA) as determined in the Operator's Integrity Management Program?	Yes
7. Did the released commodity reach or occur in one or more High Consequence Area (HCA)?	Yes
7a. If Yes, specify HCA type(s): *(Select all that apply)*	
- Commercially Navigable Waterway:	Yes
Was this HCA identified in the "could affect"	Yes

determination for this Accident site in the Operator's Integrity Management Program?	
- High Population Area:	Yes
Was this HCA identified in the "could affect" determination for this Accident site in the Operator's Integrity Management Program?	Yes
- Other Populated Area	Yes
Was this HCA identified in the "could affect" determination for this Accident site in the Operator's Integrity Management Program?	Yes
- Unusually Sensitive Area (USA) - Drinking Water	Yes
Was this HCA identified in the "could affect" determination for this Accident site in the Operator's Integrity Management Program?	Yes
- Unusually Sensitive Area (USA) - Ecological	
Was this HCA identified in the "could affect" determination for this Accident site in the Operator's Integrity Management Program?	
8. Estimated Property Damage:	
8a. Estimated cost of public and non-Operator private property damage	$ 0
8b. Estimated cost of commodity lost	$ 168
8c. Estimated cost of Operator's property damage & repairs	$ 19,784
8d. Estimated cost of Operator's emergency response	$ 15,976
8e. Estimated cost of Operator's environmental remediation	$ 5,950
8f. Estimated other costs	$ 0
Describe:	
8g. Total estimated property damage (sum of above)	$ 41,878

PART E - ADDITIONAL OPERATING INFORMATION

1. Estimated pressure at the point and time of the Accident (psig):	10.00
2. Maximum Operating Pressure (MOP) at the point and time of the Accident (psig):	275.00
3. Describe the pressure on the system or facility relating to the Accident (psig):	Pressure did not exceed MOP
4. Not including pressure reductions required by PHMSA regulations (such as for repairs and pipe movement), was the system or facility relating to the Accident operating under an established pressure restriction with pressure limits below those normally allowed by the MOP?	No
- If Yes, Complete 4.a and 4.b below:	
4a. Did the pressure exceed this established pressure restriction?	
4b. Was this pressure restriction mandated by PHMSA or the State?	
5. Was "Onshore Pipeline, Including Valve Sites" OR "Offshore Pipeline, Including Riser and Riser Bend" selected in PART C, Question 2?	No
- If Yes - (*Complete 5a. – 5e below)*	
5a. Type of upstream valve used to initially isolate release source:	
5b. Type of downstream valve used to initially isolate release source:	
5c. Length of segment isolated between valves (ft):	
5d. Is the pipeline configured to accommodate internal inspection tools?	
- If No, Which physical features limit tool accommodation? (*select all that apply)*	
- Changes in line pipe diameter	
- Presence of unsuitable mainline valves	
- Tight or mitered pipe bends	
- Other passage restrictions (i.e. unbarred tee's, projecting instrumentation, etc.)	
- Extra thick pipe wall (applicable only for magnetic flux leakage internal inspection tools)	
- Other -	
- If Other, Describe:	
5e. For this pipeline, are there operational factors which significantly complicate the execution of an internal inspection tool run?	
- If Yes, Which operational factors complicate execution? (*select all that apply*)	
- Excessive debris or scale, wax, or other wall buildup	

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

PART F - DRUG & ALCOHOL TESTING INFORMATION

1. As a result of this Accident, were any Operator employees tested under the post-accident drug and alcohol testing requirements of DOT's Drug & Alcohol Testing regulations?	Yes
- If Yes:	
1a. Specify how many were tested:	2
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

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

Apparent Cause:	G7 - Incorrect Operation

G1 - Corrosion Failure - only one **sub-cause** can be picked from shaded left-hand column

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

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

G2 - Natural Force Damage - only one **sub-cause** can be picked from shaded left-handed column	
Natural Force Damage – Sub-Cause:	
- If Earth Movement, NOT due to Heavy Rains/Floods:	
1. Specify:	
- If Other, Describe:	
- If Heavy Rains/Floods:	
2. Specify:	
- If Other, Describe:	
- If Lightning:	
3. Specify:	
- If Temperature:	
4. Specify:	
- If Other, Describe:	
- If 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: *(select all that apply)*	
- Hurricane	
- Tropical Storm	
- Tornado	
- Other	
- If Other, Describe:	
G3 - Excavation Damage - only one **sub-cause** can be picked from shaded left-hand column	
Excavation Damage – Sub-Cause:	
- If 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:	
Most recent year tested:	
Test pressure (psig):	

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

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

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

Complete the following if any Equipment Failure sub-cause is selected.	
6. Additional factors that contributed to the equipment failure: *(select all that apply)*	
- Excessive vibration	
- Overpressurization	
- No support or loss of support	
- Manufacturing defect	
- Loss of electricity	
- Improper installation	
- Mismatched items (different manufacturer for tubing and tubing fittings)	
- Dissimilar metals	
- Breakdown of soft goods due to compatibility issues with transported commodity	
- Valve vault or valve can contributed to the release	
- Alarm/status failure	
- Misalignment	
- Thermal stress	
- Other	
- 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 Overfill 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	Yes
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 *(select all that apply)*: -	
- Inadequate procedure	
- No procedure established	
- Failure to follow procedure	Yes
- Other:	
- If Other, Describe:	
4. What category type was the activity that caused the Accident?	Routine Maintenance
5. Was the task(s) that led to the Accident identified as a covered task in your Operator Qualification Program?	Yes
5a. If Yes, were the individuals performing the task(s) qualified for the task(s)?	Yes, they were qualified for the task(s)

G8 - Other Accident Cause - only one **sub-cause** can be selected from the shaded left-hand column	
Other Accident Cause – Sub-Cause:	
- If Miscellaneous:	
1. Describe:	
- If Unknown:	

2. Specify:	

PART H - NARRATIVE DESCRIPTION OF THE ACCIDENT

On December 3 the Pipeline Maintenance (PLM) crew was working in the Superior Terminal Booster Pump 8 and 9 discharge piping near the 225 manifold. They were installing a brass plug in a 2 inch TDW Thread O-ring (TOR) fitting with a TDW T-101 plugging/tapping unit in order to remove a valve for replacement. The plug in the TOR was not properly seated and when the valve was removed, the plug released which caused approximately 250 gallons of crude oil to spill on the ground. The valve and cap were reinstalled to stop the flow of oil. An outage was scheduled for Friday December 5 to isolate the manifold pipe to allow for inspection and plug installation. In order for the plug to be properly seated the shoulder of the new brass plug needed to be sanded down. Once sanded down, the plug was fully inserted to the required completion distance, and the valve removed.

It was discovered that the depth measurements before installing the plug were not calculated (per the Enbridge Operations and Maintenance Manual). It was also determined that the threads on the TOR fitting had become deformed which prohibited the brass plug from being fully inserted and allowing full thread engagement.

Approximately 45 cubic yards of contaminated soil has been removed from the leak site. The contaminated soil is waiting proper disposal facility approval.

PART I - PREPARER AND AUTHORIZED SIGNATURE

Preparer's Name	Stacy Soine
Preparer's Title	Compliance Analyst
Preparer's Telephone Number	218-464-5754
Preparer's E-mail Address	stacy.soine@enbridge.com
Preparer's Facsimile Number	218-464-5992
Authorized Signature's Name	David Stafford
Authorized Signature Title	Manager US Pipeline Compliance
Authorized Signature Telephone Number	218-464-5751
Authorized Signature Email	david.stafford@enbridge.com
Date	12/23/2014

Attachment B

Site Investigation Field Sampling and Screening Log

SITE INVESTIGATION FIELD SAMPLING AND SCREENING LOG

Location: *Milepost or Facility* Enbridge Terminal Manitoba 225 Response

Equipment used: PID -*ionization detector with* 11.7 *eV lamp* Background Headspace: 0.5 ppm Date: 12/3/14

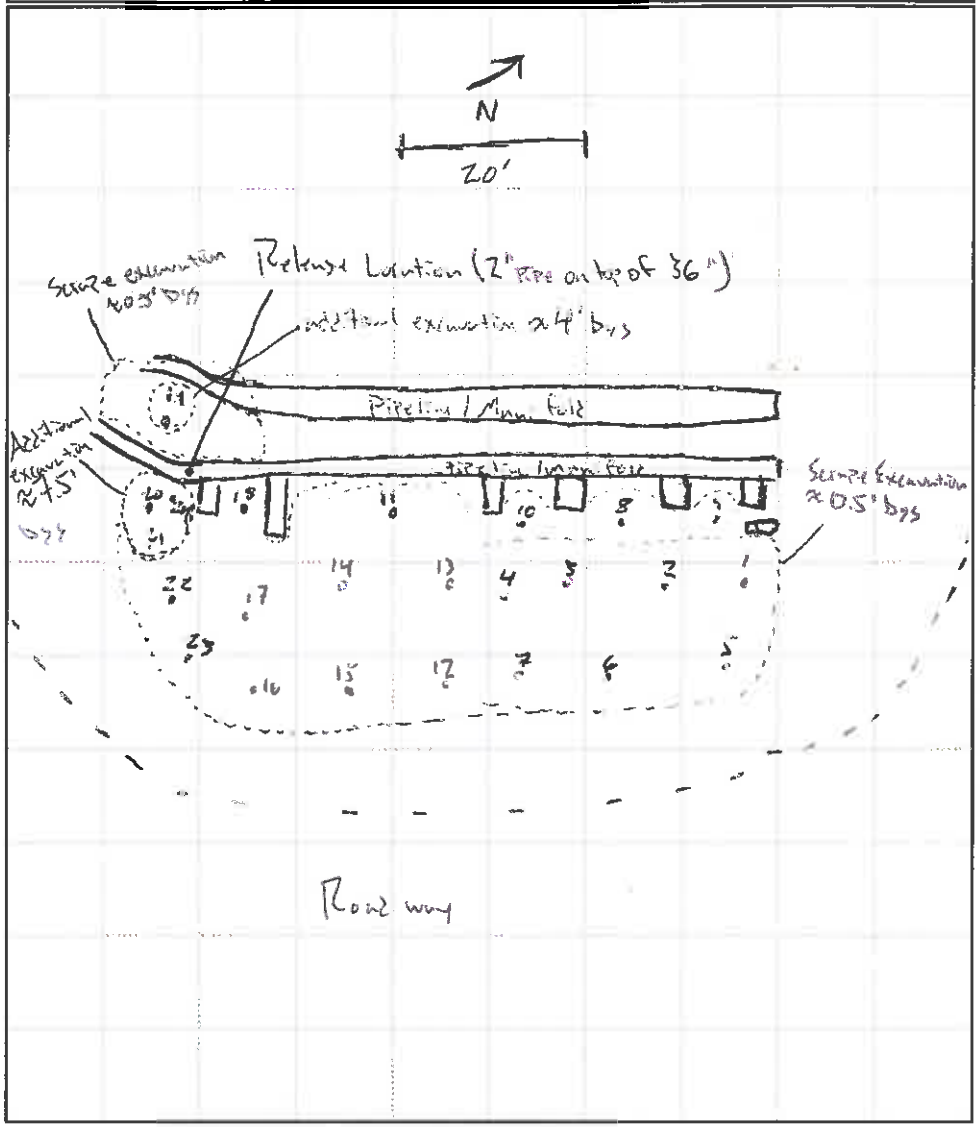
Sample Nomenclature *(Location - sample type - #):* Sampler: CTaz

Soil Sample Types: **R** = *Removed Sample* ; **S** = *Sidewall Sample* ; **B** = *Bottom Sample* ; **Stockpile** = *Stockpile Sample* Calibration Time: 1015 900

Sample ID	Depth (FT)	Time (military)	Soil Type (USCS)	Color/ Discolor	Odor/ Sheen	Headspace Reading (ppm)
Example: TK99-S-1	4	16:30	CL	Reddish brown	Petroleum/ Rainbow	275
B-1	0.5	1330	SP/CL	Red brown/lmn		5.7
B-2	0.5		SP/CL			2.6
B-3	0.5		SP/CL			1.8
B-4	0.5		SP/CL			5.1
B-5	0.5		CL			6.0
B-6	0.5		CL			1.1
B-7	0.5		CL			1.4
B-8	0	1345	SP/SM	Red brown/lmn	Slight Sweet	150+
B-9	0		SP/SM			20+
B-10	6		SP/SM			100+
B-11	0.25	1410	SP/SM	Red brown/lmn	none	1.4
B-8	0.25	1450	SP/SM	Red brown/lmn	none	1.0
B-9	0.25		SP/SM			2.5
B-10	0.25		SP/SM			11.7
B-12	0.5	1510	CL/SP	Red brown/lmn	none	6.0
B-13	0.5		CL/SP			5.4
B-14	0.5		CL/SP			6.1
B-15	0.5		CL/SP			5.7
B-16	0.5	900	CL/SP	Red brown/lmn	none	5.6
B-17	0.5		CL/SP			6.1
B-18	0.25		SP/SM			2.1
S-14	2.0	1330	SP/SM	Red brown/lmn	none	145.7
B 14	4.0		CL/SP			45.2

12/4/14

SITE SKETCH: *north is up; excavation extents & depths, impacted areas, sample locations, borings, wells, structures, utilities, natural features...* ***1 inch/grid =*** 20 ***FEET***



SITE INVESTIGATION FIELD SAMPLING AND SCREENING LOG

Page__of__

Location: *Milepost or Facility* Superior Terminal Manifold 225

Equipment used: Photo -*ionization detector with* 11.7 *eV lamp* Background Headspace: 0.5 ppm

Sample Nomenclature *(Location - sample type - #)*: _____

Soil Sample Types: **R** = *Removed Sample* ; **S** = *Sidewall Sample* ; **B** = *Bottom Sample* ; **Stockpile** = *Stockpile Sample*

Date: 12/3/14, 12/4/14

Sampler: CSG2

Calibration Time: 1045, 900

BARR

Sample ID	Depth (FT)	Time (military)	Soil Type (uscs)	Color/ Discolor	Odor/ Sheen	Headspace Reading (ppm)
Example: TK99-S-1	4	16:30	CL	Reddish brown	Petroleum/ Rainbow	275
B-20	7.5	1350	LL	Red brown/mix	slight/mix	68.3
S-21	4	1400	SP/SM	Red brown/mix	none	14.0
S-21	2	↓	CL/SP	↓	↓	3.1
B-22	0.5	↓	↓	↓	↓	2.1
B-23	0.5	↓	↓	↓	↓	1.4
S-24	2	1415	CL/SP	Red brown/mix	none	12.6
S-24	4	1415	↓	↓	↓	18.2
Analytical Samples:						
Manifold 225-S-1	@ S-19, 2' bgs					
Manifold 225-S-2	@ S-21, 4' bgs					
Manifold 225-B-1	@ B-20, 7.5' bgs					

SITE SKETCH: *north is up; excavation extents & depths, impacted areas, sample locations, borings, wells, structures, utilities, natural features...* ***1 inch/grid =*** ***FEET***

Attachment C

Legend Technical Services Laboratory Report

LEGEND
Technical Services, Inc.
www.legend-group.com

88 Empire Drive
St Paul, MN 55103
Tel: 651-642-1150
Fax: 651-642-1239

January 06, 2015

REVISION

Ms. Andrea Nord
Barr Engineering Co.
4700 W 77th St
Minneapolis, MN 55435

Work Order Number: 1405494
RE: 49161301

This is a revised report. The details of the revision are listed in the case narrative on the following page.

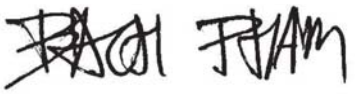
Enclosed are the results of analyses for samples received by the laboratory on 12/05/14. If you have any questions concerning this report, please feel free to contact me.

Results are not blank corrected unless noted within the report. Additionally, all QC results meet requirements unless noted.

All samples will be retained by Legend Technical Services, Inc., unless consumed in the analysis, at ambient conditions for 30 days from the date of this report and then discarded unless other arrangements are made. All samples were received in acceptable condition unless otherwise noted.

WI Certification #998022410

Prepared by,
LEGEND TECHNICAL SERVICES, INC



Bach Pham
Client Manager II
bpham@legend-group.com

LEGEND Technical Services, Inc.
www.legend-group.com

88 Empire Drive
St Paul, MN 55103
Tel: 651-642-1150
Fax: 651-642-1239

Barr Engineering Co.	Project:	49161301	
4700 W 77th St	Project Number:	49161301	Work Order #: 1405494
Minneapolis, MN 55435	Project Manager:	Ms. Andrea Nord	Date Reported: 01/06/15

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
Manifold 225-S-1_3-3	1405494-01	Soil	12/04/14 13:30	12/05/14 09:10
Manifold 225-B-1_7.5-7.5	1405494-02	Soil	12/04/14 14:00	12/05/14 09:10
Manifold 225-S-2_4-4	1405494-03	Soil	12/04/14 14:15	12/05/14 09:10

Shipping Container Information

Default Cooler Temperature (°C): 1.2

Received on ice: Yes
Temperature blank was present
Received on ice pack: No
Received on melt water: No
Ambient: No
Acceptable (IH/ISO only): No
Custody seals: No

Case Narrative:

The dry weight correction and dilution applies to the sample result, MDL, and RL.

Ethylbenzene was present in the method blank between the MDL and RL for the BTEX analysis.

This report was revised on January 6, 2015 to include missing recoveries for the BTEX batch B4L0807 MS. This report supersedes the report dated December 15, 2014.

LEGEND Technical Services, Inc.
www.legend-group.com

88 Empire Drive
St Paul, MN 55103
Tel: 651-642-1150
Fax: 651-642-1239

Barr Engineering Co.	Project:	49161301	
4700 W 77th St	Project Number:	49161301	Work Order #: 1405494
Minneapolis, MN 55435	Project Manager:	Ms. Andrea Nord	Date Reported: 01/06/15

WI(95) GRO/8015D
Legend Technical Services, Inc.

Analyte	Result	RL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Manifold 225-S-1_3-3 (1405494-01) Soil Sampled: 12/04/14 13:30 Received: 12/05/14 9:10										
1,2,4-Trimethylbenzene	**0.0070**	0.035	0.0038	mg/kg dry	1	B4L0807	12/08/14	12/08/14	WI(95) GRO	J
1,3,5-Trimethylbenzene	<0.0086	0.035	0.0086	mg/kg dry	1	"	"	"	"	
Benzene	**0.011**	0.035	0.0040	mg/kg dry	1	"	"	"	"	J
Ethylbenzene	**0.024**	0.035	0.0089	mg/kg dry	1	"	"	"	"	B-01, J
Naphthalene	<0.031	0.69	0.031	mg/kg dry	1	"	"	"	"	T-1
Toluene	**0.012**	0.035	0.0057	mg/kg dry	1	"	"	"	"	J
Xylenes (total)	**0.034**	0.10	0.020	mg/kg dry	1	"	"	"	"	J
Surrogate: 4-Fluorochlorobenzene	*96.4*			*80-150 %*		"	"	"	"	
Manifold 225-B-1_7.5-7.5 (1405494-02) Soil Sampled: 12/04/14 14:00 Received: 12/05/14 9:10										
1,2,4-Trimethylbenzene	**0.0069**	0.032	0.0035	mg/kg dry	1	B4L0807	12/08/14	12/08/14	WI(95) GRO	J
1,3,5-Trimethylbenzene	<0.0079	0.032	0.0079	mg/kg dry	1	"	"	"	"	
Benzene	**0.034**	0.032	0.0037	mg/kg dry	1	"	"	"	"	
Ethylbenzene	**0.020**	0.032	0.0082	mg/kg dry	1	"	"	"	"	B-01, J
Naphthalene	<0.028	0.64	0.028	mg/kg dry	1	"	"	"	"	T-1
Toluene	**0.0081**	0.032	0.0053	mg/kg dry	1	"	"	"	"	J
Xylenes (total)	<0.018	0.096	0.018	mg/kg dry	1	"	"	"	"	
Surrogate: 4-Fluorochlorobenzene	*97.5*			*80-150 %*		"	"	"	"	
Manifold 225-S-2_4-4 (1405494-03) Soil Sampled: 12/04/14 14:15 Received: 12/05/14 9:10										
1,2,4-Trimethylbenzene	<0.0031	0.029	0.0031	mg/kg dry	1	B4L0807	12/08/14	12/08/14	WI(95) GRO	
1,3,5-Trimethylbenzene	<0.0071	0.029	0.0071	mg/kg dry	1	"	"	"	"	
Benzene	<0.0033	0.029	0.0033	mg/kg dry	1	"	"	"	"	
Ethylbenzene	**0.017**	0.029	0.0073	mg/kg dry	1	"	"	"	"	B-01, J
Naphthalene	<0.025	0.57	0.025	mg/kg dry	1	"	"	"	"	T-1
Toluene	<0.0047	0.029	0.0047	mg/kg dry	1	"	"	"	"	
Xylenes (total)	<0.016	0.086	0.016	mg/kg dry	1	"	"	"	"	
Surrogate: 4-Fluorochlorobenzene	*96.2*			*80-150 %*		"	"	"	"	

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Barr Engineering Co.	Project:	49161301	
4700 W 77th St	Project Number:	49161301	Work Order #: 1405494
Minneapolis, MN 55435	Project Manager:	Ms. Andrea Nord	Date Reported: 01/06/15

PERCENT SOLIDS
Legend Technical Services, Inc.

Analyte	Result	RL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Manifold 225-S-1_3-3 (1405494-01) Soil	**Sampled: 12/04/14 13:30**			**Received: 12/05/14 9:10**						
% Solids	**90**			%	1	B4L1109	12/11/14	12/11/14	% calculation	
Manifold 225-B-1_7.5-7.5 (1405494-02) Soil	**Sampled: 12/04/14 14:00**			**Received: 12/05/14 9:10**						
% Solids	**78**			%	1	B4L1109	12/11/14	12/11/14	% calculation	
Manifold 225-S-2_4-4 (1405494-03) Soil	**Sampled: 12/04/14 14:15**			**Received: 12/05/14 9:10**						
% Solids	**97**			%	1	B4L1109	12/11/14	12/11/14	% calculation	

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Barr Engineering Co.	Project:	49161301	
4700 W 77th St	Project Number:	49161301	Work Order #: 1405494
Minneapolis, MN 55435	Project Manager:	Ms. Andrea Nord	Date Reported: 01/06/15

WI(95) GRO/8015D - Quality Control
Legend Technical Services, Inc.

Analyte	Result	RL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	%RPD	%RPD Limit	Notes
Batch B4L0807 - EPA 5035 Soil (Purge and Trap)											
Blank (B4L0807-BLK1)					Prepared & Analyzed: 12/08/14						
1,2,4-Trimethylbenzene	< 0.0027	0.025	0.0027	mg/kg wet							
1,3,5-Trimethylbenzene	< 0.0062	0.025	0.0062	mg/kg wet							
Benzene	< 0.0029	0.025	0.0029	mg/kg wet							
Ethylbenzene	0.0142	0.025	0.0064	mg/kg wet							B-02, J
Naphthalene	< 0.022	0.50	0.022	mg/kg wet							
Toluene	< 0.0041	0.025	0.0041	mg/kg wet							
Xylenes (total)	< 0.014	0.075	0.014	mg/kg wet							
Surrogate: 4-Fluorochlorobenzene	*24.3*			*ug/L*	*25.0*		*97.2*	*80-150*			
LCS (B4L0807-BS1)					Prepared & Analyzed: 12/08/14						
1,2,4-Trimethylbenzene	94.6			ug/L	100		94.6	80-120			
1,3,5-Trimethylbenzene	100			ug/L	100		100	80-120			
Benzene	104			ug/L	100		104	80-120			
Ethylbenzene	103			ug/L	100		103	80-120			
Naphthalene	81.3			ug/L	100		81.3	80-120			
Toluene	104			ug/L	100		104	80-120			
Xylenes (total)	314			ug/L	300		105	80-120			
Surrogate: 4-Fluorochlorobenzene	*24.4*			*ug/L*	*25.0*		*97.6*	*80-150*			
LCS Dup (B4L0807-BSD1)					Prepared: 12/08/14 Analyzed: 12/09/14						
1,2,4-Trimethylbenzene	95.2			ug/L	100		95.2	80-120	0.682	20	
1,3,5-Trimethylbenzene	101			ug/L	100		101	80-120	0.860	20	
Benzene	106			ug/L	100		106	80-120	2.35	20	
Ethylbenzene	105			ug/L	100		105	80-120	1.99	20	
Naphthalene	81.3			ug/L	100		81.3	80-120	0.0135	20	
Toluene	106			ug/L	100		106	80-120	1.96	20	
Xylenes (total)	318			ug/L	300		106	80-120	1.31	20	
Surrogate: 4-Fluorochlorobenzene	*24.4*			*ug/L*	*25.0*		*97.7*	*80-150*			
Matrix Spike (B4L0807-MS1)		**Source: 1405494-03**			Prepared: 12/08/14 Analyzed: 12/09/14						
1,2,4-Trimethylbenzene	99.4			ug/L	100	<	99.4	80-120			
1,3,5-Trimethylbenzene	103			ug/L	100	<	103	80-120			
Benzene	105			ug/L	100	<	105	80-120			
Ethylbenzene	106			ug/L	100	0.292	105	80-120			
Naphthalene	84.2			ug/L	100	<	84.2	80-120			
Toluene	105			ug/L	100	<	105	80-120			
Xylenes (total)	315			ug/L	300	0.161	105	80-120			
Surrogate: 4-Fluorochlorobenzene	*24.1*			*ug/L*	*25.0*		*96.5*	*80-150*			

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Barr Engineering Co.	Project:	49161301	
4700 W 77th St	Project Number:	49161301	Work Order #: 1405494
Minneapolis, MN 55435	Project Manager:	Ms. Andrea Nord	Date Reported: 01/06/15

PERCENT SOLIDS - Quality Control
Legend Technical Services, Inc.

Analyte	Result	RL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	%RPD	%RPD Limit	Notes
Batch B4L1109 - General Preparation											
Duplicate (B4L1109-DUP1)		**Source: 1405525-02**			Prepared & Analyzed: 12/11/14						
% Solids	57.0			%		59.0			3.45	20	

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Barr Engineering Co.	Project:	49161301	
4700 W 77th St	Project Number:	49161301	Work Order #: 1405494
Minneapolis, MN 55435	Project Manager:	Ms. Andrea Nord	Date Reported: 01/06/15

Notes and Definitions

T-1	MDH does not offer certification for this parameter.
J	Parameter was present between the MDL and RL and should be considered an estimated value
B-02	Target analyte was present in the method blank between the MDL and RL.
B-01	Analyte was present in the method blank. Sample result is less than or equal to 10 times the blank concentration.
<	Less than value listed
dry	Sample results reported on a dry weight basis
NA	Not applicable. The %RPD is not calculated from values less than the reporting limit.
MDL	Method Detection Limit
RL	Reporting Limit
RPD	Relative Percent Difference
LCS	Laboratory Control Spike = Blank Spike (BS) = Laboratory Fortified Blank (LFB)
MS	Matrix Spike = Laboratory Fortified Matrix (LFM)

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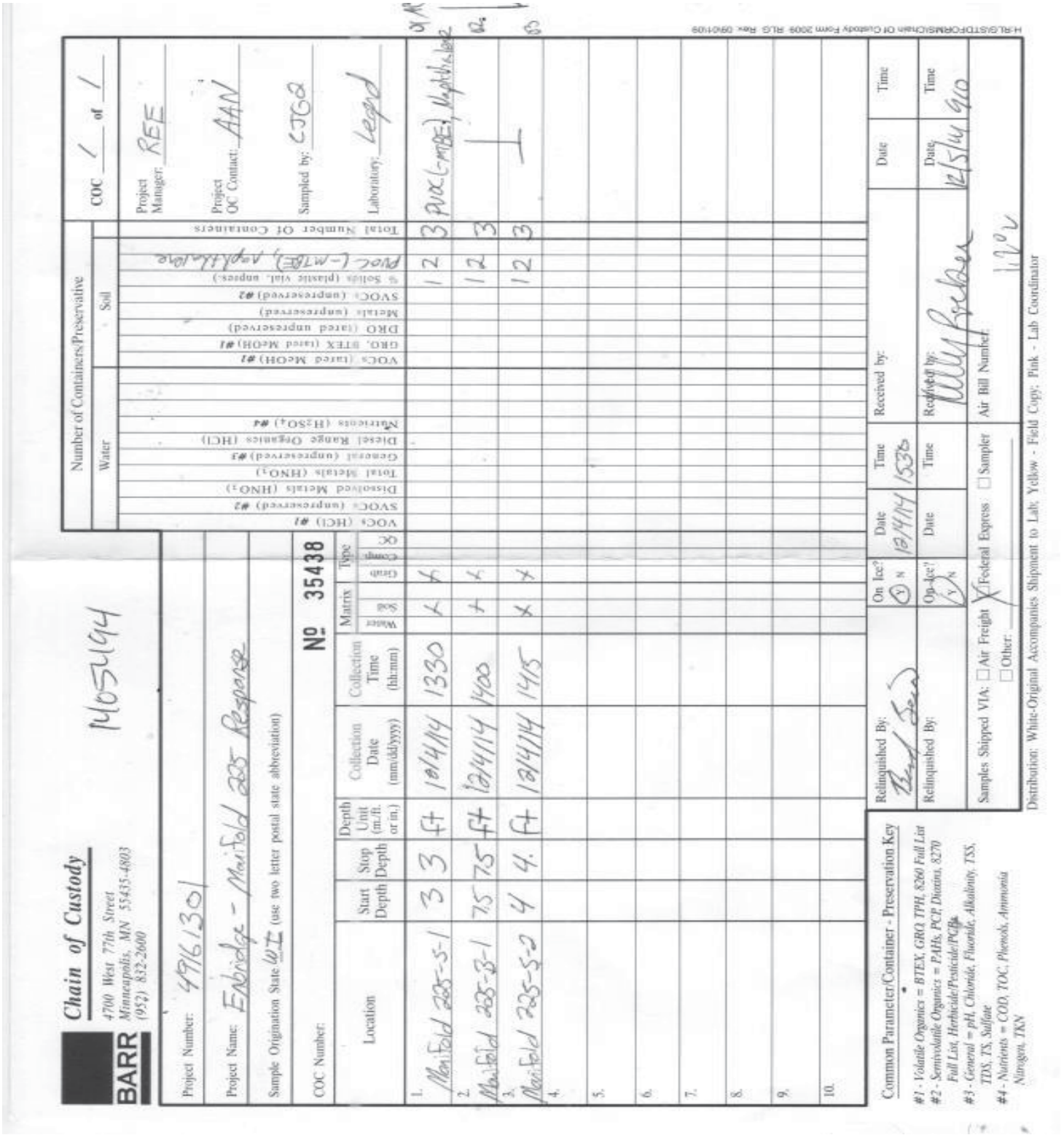

Chain of Custody

BARR
4700 West 77th Street
Minneapolis, MN 55435-4803
(952) 832-2600

Project Number: 49161301

Project Name: Enbridge - Manifold 225 Response

Sample Origination State: WI (use two letter postal state abbreviation)

COC Number:

№ 35438

Location	Start Depth	Stop Depth	Depth Unit (m-ft. or in.)	Collection Date (mm/dd/yyyy)	Collection Time (hh:mm)	Matrix: Water	Matrix: Soil	Type: Grab	Type: Comp	QC
1. Manifold 225-S-1	3	3	ft	10/4/14	1330	X		X		
2. Manifold 225-B-1	75	75	ft	10/4/14	1400	X		X		
3. Manifold 225-S-2	4	4	ft	10/4/14	1415	X		X		
4.										
5.										
6.										
7.										
8.										
9.										
10.										

Number of Containers/Preservative

Water	Soil	
		VOCs (HCl) #1
		SVOCs (unpreserved) #2
		Dissolved Metals (HNO_3)
		Total Metals (HNO_3)
		General (unpreserved) #3
		Diesel Range Organics (HCl)
		Nutrients (H_2SO_4) #4
		VOCs (HCl) #1
		GRO, BTEX (lard MeOH) #1
		DRO (lard unpreserved)
		Metals (unpreserved)
		SVOCs (unpreserved) #2
	1	% Solids (plastic vial, unpres.)
	2	PVOC (-MTBE), Naphthalene
	3	Total Number Of Containers

COC 1 of 1

Project Manager: REE

Project QC Contact: AAN

Sampled by: CJG2

Laboratory: Legend

Common Parameter/Container - Preservation Key

#1 - Volatile Organics = BTEX, GRO, TPH, 8260 Full List
#2 - Semivolatile Organics = PAHs, PCP, Dioxins, 8270 Full List, Herbicide/Pesticide/PCBs
#3 - General = pH, Chloride, Fluoride, Alkalinity, TSS, TDS, TS, Sulfate
#4 - Nutrients = COD, TOC, Phenols, Ammonia Nitrogen, TKN

Relinquished By: [signature] On Ice? Y N Date: 10/4/14 Time: 1535 Received by:

Relinquished By: Op-Ice? Y N Date: Time: Received by: [signature] Date: 10/5/14 Time: 910

Samples Shipped VIA: ☐ Air Freight ☒ Federal Express ☐ Sampler ☐ Other:

Air Bill Number: 1.1°C

Distribution: White-Original Accompanies Shipment to Lab; Yellow - Field Copy; Pink - Lab Coordinator

H:\LG\STDFORMS\Chain Of Custody Form 2009 RLG Rev 09/01/09

Attachment D

Waste Management Documentation

Shamrock Landfill

Waste Profile Sheet

Shamrock Landfill

P.O. Number	Customer Code	SKB Representative	CL

I. Generator Information

Generator Name: Enbridge Pipelines Limited Partnership, LLC		Generator EPA ID Number	SIC Code
Generator Location: Enbridge Superior Terminal - 141203 Manifold 225	County: Douglas	Generator Contact: Alex Smith	
		Phone: 715-398-4795	Fax: 832-325-5511
Generator Mailing Address (if different: 1320 Grand Ave, Superior, WI 54880		Generator Email Address: alex.smith@enbridge.com	
Bill To Name & Address: Enbridge Energy, 1100 Louisiana Ave, STE. 3300, Houston, TX 77002	Bill To #:	Billing Contact: Alex Smith	
		Phone: 715-398-4795	Fax: 832-325-5511
Invoice Contact:		Billing Email Address: alex.smith@enbridge.com	

II. Waste Generation Information

Waste Name: Crude contaminated soil - 141203 Manifold 225	Estimated rate of waste generation: 40 ☐ Lbs. ☐ tons ☒ cy ☐ drums	☒ one time ☐ yearly
Generator Facility Operations and/or Site History: Enbridge Pipeline Terminal		
Describe the generating process or source of contaminated soil/debris and/or waste: Pipeline Terminal Activities		

III. Waste Composition and Constituents (list all known)

	Actual Range %	ppm
Crude contaminated soil	100	

IV. Waste Properties

Physical state:	Free Liquids:	pH Range:	Flash point:	Color:	Odor (describe):
☒ Solid ☐ Liquid ☐ Sludge ☐ Gas	☐ Yes ☒ No Content _____%	☐ <2 ☐ 2-4 ☐ 5-8 ☐ 8-12.4 ☐ >12.5	☐ ≤ 140°F ☐ > 140°F to < 200°F ☐ > 200°F	Brown	petroleum odor

V. Waste Classification

Waste stream properties (answer ALL questions)			Does this waste contain absorbents?	☐ Yes	☒ No
Does this waste stream contain any D, F, K, U or P listed as hazardous waste, either in pure form, as a mixture, or treatment residue?	☐ Yes	☒ No	Is this waste lethal (by Minn. Rules 7045.0131 Subp. 6)?	☐ Yes	☒ No
Does this waste stream contain PCB material	☐ Yes	☒ No	Is this waste recyclable?	☐ Yes	☒ No
If yes, concentration: _____ppm			Is this waste explosive?	☐ Yes	☒ No
Does this waste stream contain fuming acids?	☐ Yes	☒ No	Is this waste infectious?	☐ Yes	☒ No
Does this waste contain asbestos?	☐ Yes	☒ No	Is this putrescible waste?	☐ Yes	☒ No
Does this waste contain oxidizers?	☐ Yes	☒ No	Is this waste demolition debris?	☐ Yes	☒ No
Does this waste contain radioactive material?	☐ Yes	☒ No	Is this waste sewer sludge?	☐ Yes	☒ No

Please attach any available information or analytical test results that have previously been performed on this waste that substantiates these determinations. Include MSDS's and any information from other agencies (i.e., MPCA, USEPA)

VI. Shipping Information

Proper DOT Shipping Name (per CFR 172.101) where applicable			
Reportable Quantity	DOT Hazard Class	UN/NA Number	Packing Group
Method of packaging: ☐ drums (size _____) ☒ Bulk Solids ☐ boxes (size _____)		Method of shipment ☐ Roll-off ☒ End dump ☐ Rail ☐ Other (Specify) _____	

VII. Certification of Non Hazardous Waste & Approval Conditions

I hereby certify and warrant, on behalf of the generator and myself that, to the best of my knowledge and belief, the information contained herein is accurate, and true and that the waste is nonhazardous as defined in Title 42, Unites States Code Section 6903, Minnesota Statute Section 116.06, Subdivision 13, and/or any rules adopted by the Minnesota Pollution Control Agency under Minnesota Statute Section 116.07.

I understand that any approval is no longer valid if there are any changes in the process generating the waste or there have been changes in the composition of the waste. Therefore, if the composition of the waste stream changes or potentially changes, I or someone representing the generator, will immediately notify SKB Environmental. I, on behalf of the generator, hereby agree to fully indemnify SKB Environmental for any damages and/or costs incurred as a result of this certification being inaccurate or untrue.

Signature	Printed Name	Title	Date
	Alex Smith	Environmental Analyst	1-20-15

Version 2012

LEGEND
Technical Services, Inc.
www.legend-group.com

88 Empire Drive
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December 16, 2014

REVISION

Ms. Andrea Nord
Barr Engineering Co.
4700 W 77th St
Minneapolis, MN 55435

Work Order Number: 1405493
RE: 49161301

This is a revised report. The details of the revision are listed in the case narrative on the following page.

Enclosed are the results of analyses for samples received by the laboratory on 12/05/14. If you have any questions concerning this report, please feel free to contact me.

Results are not blank corrected unless noted within the report. Additionally, all QC results meet requirements unless noted.

All samples will be retained by Legend Technical Services, Inc., unless consumed in the analysis, at ambient conditions for 30 days from the date of this report and then discarded unless other arrangements are made. All samples were received in acceptable condition unless otherwise noted.

WI Certification #998022410

Prepared by,
LEGEND TECHNICAL SERVICES, INC

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bpham@legend-group.com

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Barr Engineering Co.	Project:	49161301	
4700 W 77th St	Project Number:	49161301	Work Order #: 1405493
Minneapolis, MN 55435	Project Manager:	Ms. Andrea Nord	Date Reported: 12/16/14

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
Manifold225-Stockpile-1	1405493-01	Soil	12/03/14 12:00	12/05/14 09:10
Manifold225-Stockpile-2	1405493-02	Soil	12/03/14 12:05	12/05/14 09:10

Shipping Container Information

Default Cooler Temperature (°C): 0.9

Received on ice: Yes
Temperature blank was present
Received on ice pack: No
Received on melt water: No
Ambient: No
Acceptable (IH/ISO only): No
Custody seals: No

Case Narrative:

The dry weight correction and dilution applies to the sample result, MDL, and RL.

Ethylbenzene was present in the method blank between the MDL and RL for the BTEX analysis.

Recoveries of the DRO surrogates for both samples were not available due to sample dilution required from high analyte concentration. The DRO chromatograms fro both samples are attached.

At the client's request, this report was revised on December 16, 2014 to include TCLP benzene and flashpoint analyses for both samples. WI Accreditation #998022410 does not apply to either of these analyses. This report supersedes the report dated December 11, 2014.

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Tel: 651-642-1150
Fax: 651-642-1239

Barr Engineering Co.	Project:	49161301	
4700 W 77th St	Project Number:	49161301	Work Order #: 1405493
Minneapolis, MN 55435	Project Manager:	Ms. Andrea Nord	Date Reported: 12/16/14

DRO/8015D
Legend Technical Services, Inc.

Analyte	Result	RL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Manifold225-Stockpile-1 (1405493-01) Soil Sampled: 12/03/14 12:00 Received: 12/05/14 9:10										
Diesel Range Organics	**14000**	1300	210	mg/kg dry	100	B4L0904	12/09/14	12/10/14	WI(95) DRO	L1
Surrogate: Triacontane (C-30)				*70-130 %*		"	"	"	"	*D-1*
Manifold225-Stockpile-2 (1405493-02) Soil Sampled: 12/03/14 12:05 Received: 12/05/14 9:10										
Diesel Range Organics	**8600**	1200	190	mg/kg dry	100	B4L0904	12/09/14	12/10/14	WI(95) DRO	L1
Surrogate: Triacontane (C-30)				*70-130 %*		"	"	"	"	*D-1*

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4700 W 77th St	Project Number:	49161301	Work Order #: 1405493
Minneapolis, MN 55435	Project Manager:	Ms. Andrea Nord	Date Reported: 12/16/14

WI(95) GRO/8015D
Legend Technical Services, Inc.

Analyte	Result	RL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Manifold225-Stockpile-1 (1405493-01) Soil	**Sampled: 12/03/14 12:00**			**Received: 12/05/14 9:10**						
Benzene	**56**	0.36	0.042	mg/kg dry	10	B4L0514	12/05/14	12/06/14	WI(95) GRO	
Ethylbenzene	**18**	0.36	0.092	mg/kg dry	10	"	"	"	"	
Toluene	**110**	0.36	0.059	mg/kg dry	10	"	"	"	"	
Xylenes (total)	**130**	1.1	0.20	mg/kg dry	10	"	"	"	"	
Surrogate: 4-Fluorochlorobenzene	*114*			*80-150 %*		"	"	"	"	
Manifold225-Stockpile-2 (1405493-02) Soil	**Sampled: 12/03/14 12:05**			**Received: 12/05/14 9:10**						W-03
Benzene	**40**	0.38	0.044	mg/kg dry	10	B4L0514	12/05/14	12/06/14	WI(95) GRO	
Ethylbenzene	**13**	0.38	0.097	mg/kg dry	10	"	"	"	"	
Toluene	**79**	0.38	0.062	mg/kg dry	10	"	"	"	"	
Xylenes (total)	**91**	1.1	0.22	mg/kg dry	10	"	"	"	"	
Surrogate: 4-Fluorochlorobenzene	*118*			*80-150 %*		"	"	"	"	

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Minneapolis, MN 55435	Project Manager:	Ms. Andrea Nord	Date Reported: 12/16/14

PERCENT SOLIDS
Legend Technical Services, Inc.

Analyte	Result	RL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Manifold225-Stockpile-1 (1405493-01) Soil	**Sampled: 12/03/14 12:00**			**Received: 12/05/14 9:10**						
% Solids	**87**			%	1	B4L0517	12/05/14	12/08/14	% calculation	
Manifold225-Stockpile-2 (1405493-02) Soil	**Sampled: 12/03/14 12:05**			**Received: 12/05/14 9:10**						
% Solids	**94**			%	1	B4L0517	12/05/14	12/08/14	% calculation	

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4700 W 77th St	Project Number:	49161301	Work Order #: 1405493
Minneapolis, MN 55435	Project Manager:	Ms. Andrea Nord	Date Reported: 12/16/14

TCLP VOC
Legend Technical Services, Inc.

Analyte	Result	RL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Manifold225-Stockpile-1 (1405493-01) Soil	**Sampled: 12/03/14 12:00**			**Received: 12/05/14 9:10**						
Benzene	**0.67**	0.10	0.0048	mg/L	1	B4L1608	12/15/14	12/16/14	EPA 1311/8260B	
Surrogate: 4-Bromofluorobenzene	*93.8*			*80-120 %*		"	"	"	"	
Surrogate: Dibromofluoromethane	*92.7*			*80-120 %*		"	"	"	"	
Surrogate: Toluene-d8	*90.9*			*80-120 %*		"	"	"	"	
Manifold225-Stockpile-2 (1405493-02) Soil	**Sampled: 12/03/14 12:05**			**Received: 12/05/14 9:10**						
Benzene	**0.12**	0.10	0.0048	mg/L	1	B4L1608	12/15/14	12/16/14	EPA 1311/8260B	
Surrogate: 4-Bromofluorobenzene	*94.4*			*80-120 %*		"	"	"	"	
Surrogate: Dibromofluoromethane	*91.8*			*80-120 %*		"	"	"	"	
Surrogate: Toluene-d8	*92.7*			*80-120 %*		"	"	"	"	

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4700 W 77th St	Project Number:	49161301	Work Order #: 1405493
Minneapolis, MN 55435	Project Manager:	Ms. Andrea Nord	Date Reported: 12/16/14

ANALYTICAL RESULTS
Legend Technical Services, Inc.

Analyte	Result	RL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Manifold225-Stockpile-1 (1405493-01) Soil Sampled: 12/03/14 12:00 Received: 12/05/14 9:10										
Flashpoint	> 200			°F	1	B4L1506	12/16/14	12/16/14	EPA 1010A/ASTM D93(M)	
Manifold225-Stockpile-2 (1405493-02) Soil Sampled: 12/03/14 12:05 Received: 12/05/14 9:10										
Flashpoint	> 200			°F	1	B4L1506	12/16/14	12/16/14	EPA 1010A/ASTM D93(M)	

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4700 W 77th St	Project Number:	49161301	Work Order #: 1405493
Minneapolis, MN 55435	Project Manager:	Ms. Andrea Nord	Date Reported: 12/16/14

DRO/8015D - Quality Control
Legend Technical Services, Inc.

Analyte	Result	RL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	%RPD	%RPD Limit	Notes
Batch B4L0904 - Sonication (Wisc DRO)											
Blank (B4L0904-BLK1)					Prepared: 12/09/14 Analyzed: 12/10/14						
Diesel Range Organics	< 1.3	8.0	1.3	mg/kg wet							
Surrogate: Triacontane (C-30)	*15.3*			*mg/kg wet*	*16.0*		*95.9*	*70-130*			
LCS (B4L0904-BS1)					Prepared: 12/09/14 Analyzed: 12/10/14						
Diesel Range Organics	49.1	8.0	1.3	mg/kg wet	64.0		76.7	70-120			
Surrogate: Triacontane (C-30)	*12.5*			*mg/kg wet*	*16.0*		*78.3*	*70-130*			
LCS Dup (B4L0904-BSD1)					Prepared: 12/09/14 Analyzed: 12/10/14						
Diesel Range Organics	55.8	8.0	1.3	mg/kg wet	64.0		87.2	70-120	12.8	20	
Surrogate: Triacontane (C-30)	*15.7*			*mg/kg wet*	*16.0*		*97.8*	*70-130*			

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Barr Engineering Co.	Project:	49161301	
4700 W 77th St	Project Number:	49161301	Work Order #: 1405493
Minneapolis, MN 55435	Project Manager:	Ms. Andrea Nord	Date Reported: 12/16/14

WI(95) GRO/8015D - Quality Control
Legend Technical Services, Inc.

Analyte	Result	RL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	%RPD	%RPD Limit	Notes
Batch B4L0514 - EPA 5035 Soil (Purge and Trap)											
Blank (B4L0514-BLK1)					Prepared & Analyzed: 12/05/14						
Benzene	< 0.0029	0.025	0.0029	mg/kg wet							
Ethylbenzene	0.0147	0.025	0.0064	mg/kg wet							B-02, J
Toluene	< 0.0041	0.025	0.0041	mg/kg wet							
Xylenes (total)	< 0.014	0.075	0.014	mg/kg wet							
Surrogate: 4-Fluorochlorobenzene	*24.1*			*ug/L*	*25.0*		*96.5*	*80-150*			
LCS (B4L0514-BS1)					Prepared & Analyzed: 12/05/14						
Benzene	95.5			ug/L	100		95.5	80-120			
Ethylbenzene	95.8			ug/L	100		95.8	80-120			
Toluene	96.1			ug/L	100		96.1	80-120			
Xylenes (total)	287			ug/L	300		95.6	80-120			
Surrogate: 4-Fluorochlorobenzene	*24.3*			*ug/L*	*25.0*		*97.1*	*80-150*			
LCS Dup (B4L0514-BSD1)					Prepared: 12/05/14		Analyzed: 12/06/14				
Benzene	96.2			ug/L	100		96.2	80-120	0.812	20	
Ethylbenzene	96.2			ug/L	100		96.2	80-120	0.441	20	
Toluene	96.9			ug/L	100		96.9	80-120	0.776	20	
Xylenes (total)	286			ug/L	300		95.5	80-120	0.125	20	
Surrogate: 4-Fluorochlorobenzene	*24.6*			*ug/L*	*25.0*		*98.3*	*80-150*			
Matrix Spike (B4L0514-MS1)		**Source: 1405489-01**			Prepared: 12/05/14		Analyzed: 12/06/14				
Benzene	95.4			ug/L	100	<	95.4	80-120			
Ethylbenzene	97.6			ug/L	100	0.313	97.3	80-120			
Toluene	96.5			ug/L	100	<	96.5	80-120			
Xylenes (total)	293			ug/L	300	0.189	97.7	80-120			
Surrogate: 4-Fluorochlorobenzene	*24.9*			*ug/L*	*25.0*		*99.5*	*80-150*			

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Barr Engineering Co.	Project:	49161301	
4700 W 77th St	Project Number:	49161301	Work Order #: 1405493
Minneapolis, MN 55435	Project Manager:	Ms. Andrea Nord	Date Reported: 12/16/14

PERCENT SOLIDS - Quality Control
Legend Technical Services, Inc.

Analyte	Result	RL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	%RPD	%RPD Limit	Notes
Batch B4L0517 - General Preparation											
Duplicate (B4L0517-DUP1)		**Source: 1405444-04**			Prepared: 12/05/14		Analyzed: 12/08/14				
% Solids	97.0			%		97.0			0.00	20	
Duplicate (B4L0517-DUP2)		**Source: 1405493-02**			Prepared: 12/05/14		Analyzed: 12/08/14				
% Solids	89.0			%		94.0			5.46	20	

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4700 W 77th St	Project Number:	49161301	Work Order #: 1405493
Minneapolis, MN 55435	Project Manager:	Ms. Andrea Nord	Date Reported: 12/16/14

TCLP VOC - Quality Control
Legend Technical Services, Inc.

Analyte	Result	RL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	%RPD	%RPD Limit	Notes
Batch B4L1608 - EPA 5030 TCLP											
Blank (B4L1608-BLK1)					Prepared: 12/15/14 Analyzed: 12/16/14						
Benzene	< 0.10	0.10	0.0048	mg/L							
Surrogate: 4-Bromofluorobenzene	*46.5*			*ug/L*	*50.0*		*93.0*	*80-120*			
Surrogate: Dibromofluoromethane	*46.5*			*ug/L*	*50.0*		*93.1*	*80-120*			
Surrogate: Toluene-d8	*45.3*			*ug/L*	*50.0*		*90.7*	*80-120*			
LCS (B4L1608-BS1)					Prepared & Analyzed: 12/15/14						
Benzene	45.9			ug/L	50.0		91.7	80-120			
Surrogate: 4-Bromofluorobenzene	*49.4*			*ug/L*	*50.0*		*98.9*	*80-120*			
Surrogate: Dibromofluoromethane	*45.5*			*ug/L*	*50.0*		*90.9*	*80-120*			
Surrogate: Toluene-d8	*46.2*			*ug/L*	*50.0*		*92.5*	*80-120*			
Matrix Spike (B4L1608-MS1)		**Source: 1405493-01**			Prepared: 12/15/14 Analyzed: 12/16/14						
Benzene	52.8			ug/L	50.0	6.66	92.3	80-120			
Surrogate: 4-Bromofluorobenzene	*50.3*			*ug/L*	*50.0*		*101*	*80-120*			
Surrogate: Dibromofluoromethane	*47.5*			*ug/L*	*50.0*		*95.0*	*80-120*			
Surrogate: Toluene-d8	*47.8*			*ug/L*	*50.0*		*95.6*	*80-120*			
Matrix Spike Dup (B4L1608-MSD1)		**Source: 1405493-01**			Prepared: 12/15/14 Analyzed: 12/16/14						
Benzene	53.2			ug/L	50.0	6.66	93.0	80-120	0.730	20	
Surrogate: 4-Bromofluorobenzene	*49.7*			*ug/L*	*50.0*		*99.4*	*80-120*			
Surrogate: Dibromofluoromethane	*46.7*			*ug/L*	*50.0*		*93.3*	*80-120*			
Surrogate: Toluene-d8	*47.0*			*ug/L*	*50.0*		*94.1*	*80-120*			

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Barr Engineering Co.	Project:	49161301	
4700 W 77th St	Project Number:	49161301	Work Order #: 1405493
Minneapolis, MN 55435	Project Manager:	Ms. Andrea Nord	Date Reported: 12/16/14

ANALYTICAL RESULTS - Quality Control
Legend Technical Services, Inc.

Analyte	Result	RL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	%RPD	%RPD Limit	Notes
Batch B4L1506 - General Prep											
Reference (B4L1506-SRM1)					Prepared & Analyzed: 12/16/14						
Flashpoint	78.0			°F	77.0		101	97.5-102.5			

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4700 W 77th St	Project Number:	49161301	Work Order #: 1405493
Minneapolis, MN 55435	Project Manager:	Ms. Andrea Nord	Date Reported: 12/16/14

Notes and Definitions

W-03	The initial sample weight was less than 8.0 grams.
L1	Results in the diesel organics range are primarily due to overlap from a heavy oil range product.
J	Parameter was present between the MDL and RL and should be considered an estimated value
D-1	The surrogate recovery for this sample is not available due to sample dilution required from high analyte concentration and/or matrix interferences.
B-02	Target analyte was present in the method blank between the MDL and RL.
<	Less than value listed
dry	Sample results reported on a dry weight basis
NA	Not applicable. The %RPD is not calculated from values less than the reporting limit.
MDL	Method Detection Limit
RL	Reporting Limit
RPD	Relative Percent Difference
LCS	Laboratory Control Spike = Blank Spike (BS) = Laboratory Fortified Blank (LFB)
MS	Matrix Spike = Laboratory Fortified Matrix (LFM)

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Chain of Custody

BARR
4700 West 77th Street
Minneapolis, MN 55435-4803
(952) 832-2600

1405493

COC 1 of 1

Project Number: 49161301

Project Manager: REE

Project Name: Enbridge - Manifold 225 Response

Project QC Contact: AAN

Sample Origination State W I (use two letter postal state abbreviation)

Sampled by: CSG2

COC Number: № 44744

Laboratory: Legend

Location	Start Depth	Stop Depth	Depth Unit (m./ft. or in.)	Collection Date (mm/dd/yyyy)	Collection Time (hh:mm)	Matrix: Water	Matrix: Soil	Type: Grab	Type: Comp.	Type: QC	Water: VOCs (HCl) #1	Water: SVOCs (unpreserved) #2	Water: Dissolved Metals (HNO_3)	Water: Total Metals (HNO_3)	Water: General (unpreserved) #3	Water: Diesel Range Organics (HCl)	Water: Nutrients (H_2SO_4) #4	Soil: VOCs (tared MeOH) #1	Soil: BTEX (tared MeOH) #1	Soil: DRO (tared unpreserved)	Soil: Metals (unpreserved)	Soil: SVOCs (unpreserved) #2	Soil: % Solids (plastic vial, unpres.)	Soil: Extra Jar - hold	Total Number Of Containers	
1. Manifold 225-Stockpile-1				12/3/14	1200		X	X											1	1			1	1	4	BTEX, DRO, % solids
2. Manifold 225-Stockpile-2				↓	1205		X	X											1	1			1	1	4	↓ ↓ ↓
3.																										
4.																										
5.																										ASAP TAT
6.																										
7.																										
8.																										
9.																										
10.																										

Common Parameter/Container - Preservation Key

#1 - Volatile Organics = BTEX, GRO, TPH, 8260 Full List
#2 - Semivolatile Organics = PAHs, PCP, Dioxins, 8270 Full List, Herbicide/Pesticide/PCBs
#3 - General = pH, Chloride, Fluoride, Alkalinity, TSS, TDS, TS, Sulfate
#4 - Nutrients = COD, TOC, Phenols, Ammonia Nitrogen, TKN

Relinquished By:	On Ice?	Date	Time	Received by:	Date	Time
[signature]	(Y) N	12/3/14	1400			
Relinquished By:	On Ice? (Y) N			Received by: [signature]	12/5/14	910

Samples Shipped VIA: ☐ Air Freight ☒ Federal Express ☐ Sampler ☐ Other: ______ Air Bill Number: 0.9

Distribution: White-Original Accompanies Shipment to Lab; Yellow - Field Copy; Pink - Lab Coordinator

H:\RLG\STDFORMS\Chain Of Custody Form 2009 RLG Rev. 09/01/09

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

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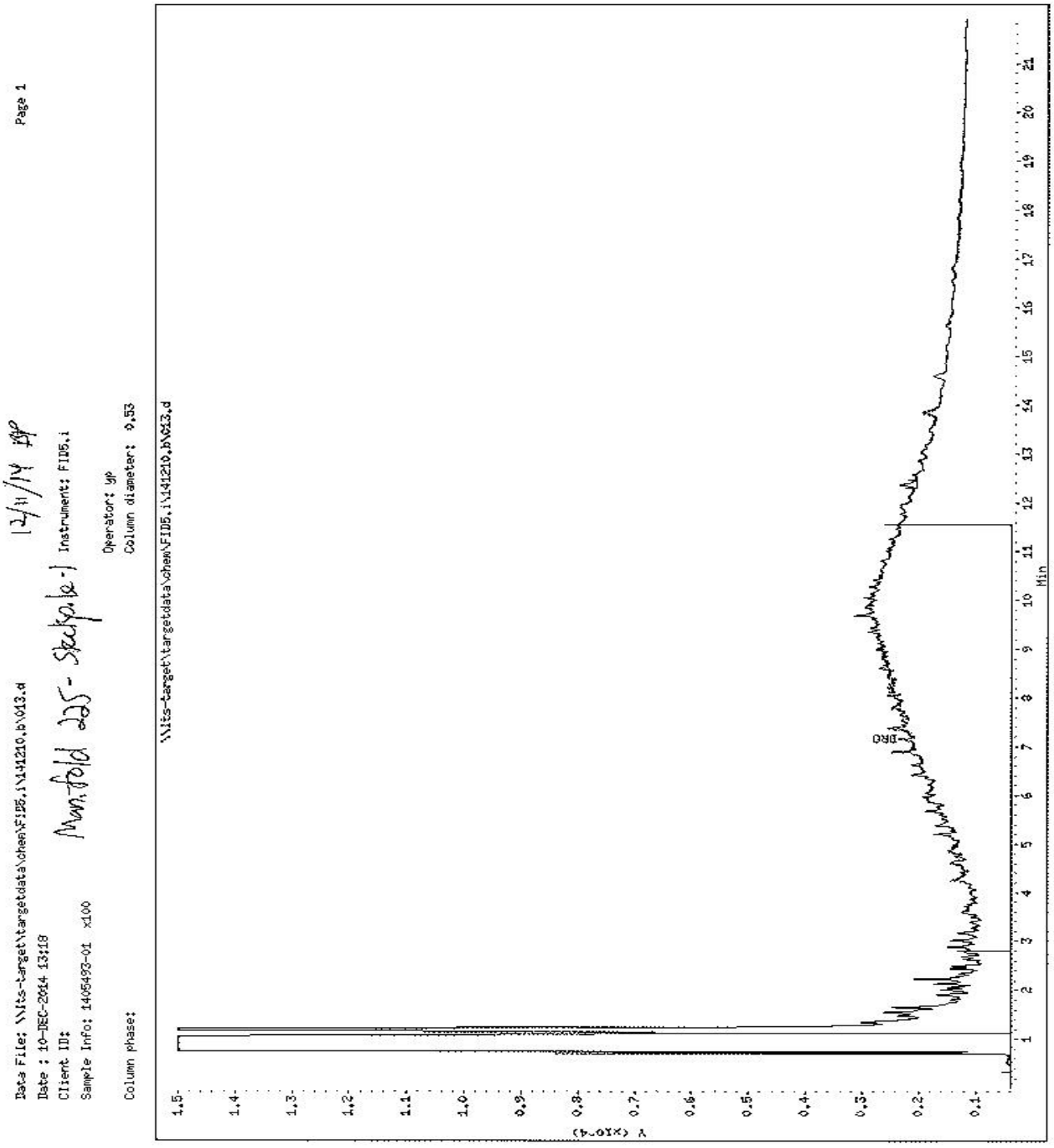

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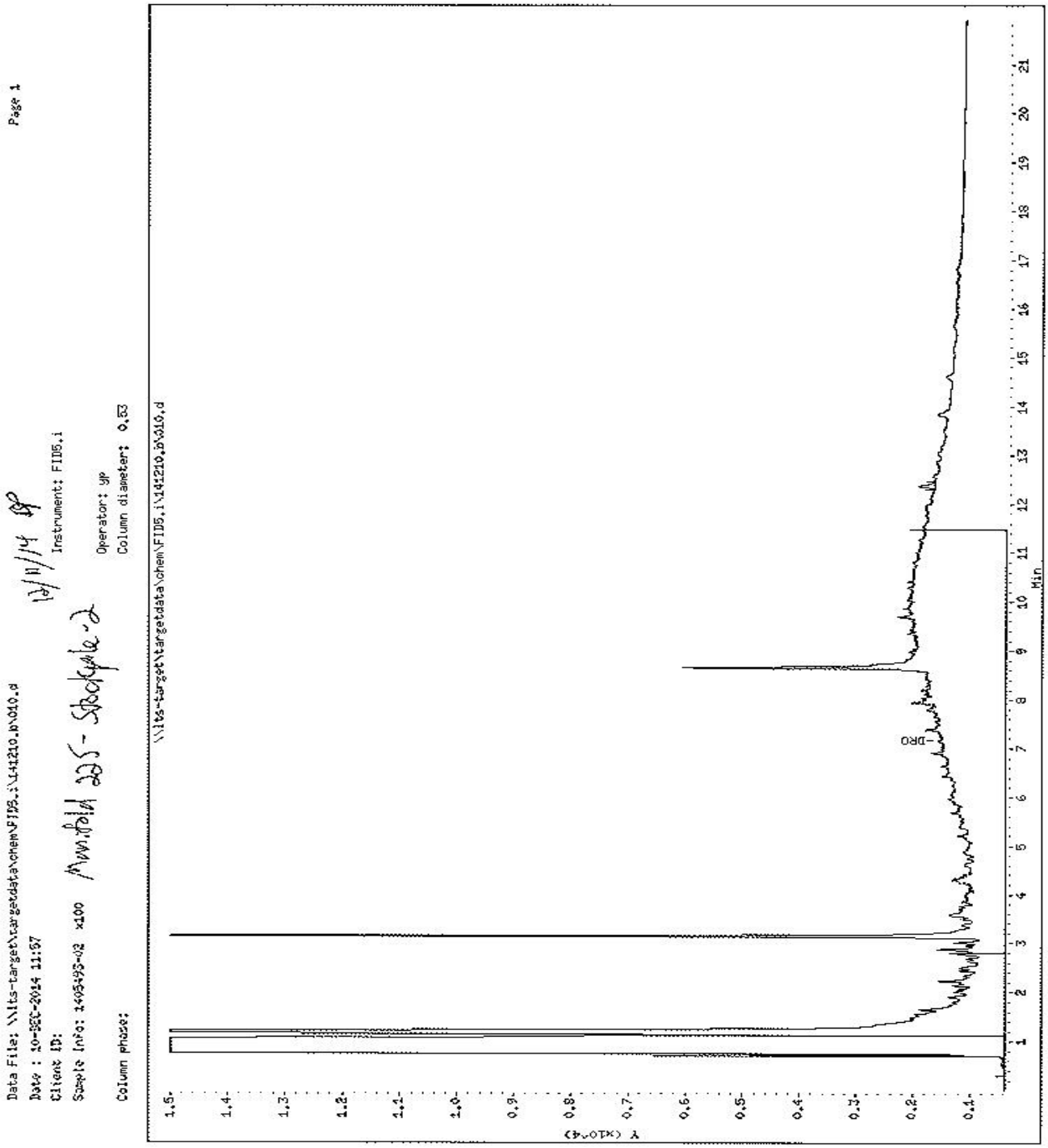

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January 16, 2015

Mr. James E. Taraldsen
Barr Engineering Co.
4700 W 77th St
Minneapolis, MN 55435

Work Order Number: 1500075
RE: 49161301

Enclosed are the results of analyses for samples received by the laboratory on 01/09/15. If you have any questions concerning this report, please feel free to contact me.

Results are not blank corrected unless noted within the report. Additionally, all QC results meet requirements unless noted.

All samples will be retained by Legend Technical Services, Inc., unless consumed in the analysis, at ambient conditions for 30 days from the date of this report and then discarded unless other arrangements are made. All samples were received in acceptable condition unless otherwise noted.

All test results and QC meet requirements of the 2003 NELAC standard.

MDH (NELAP) Accreditation #027-123-295

Prepared by,
LEGEND TECHNICAL SERVICES, INC

Bach Pham
Client Manager II
bpham@legend-group.com

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Barr Engineering Co.	Project:	49161301	
4700 W 77th St	Project Number:	49161301.00 100 001	Work Order #: 1500075
Minneapolis, MN 55435	Project Manager:	Mr. James E. Taraldsen	Date Reported: 01/16/15

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
Manifold 225-Stockpile-3	1500075-01	Soil	01/08/15 08:15	01/09/15 09:45
Manifold 225-Stockpile-4	1500075-02	Soil	01/08/15 08:20	01/09/15 09:45

Shipping Container Information

Default Cooler Temperature (°C): 0.9

Received on ice: Yes
Temperature blank was present
Received on ice pack: No
Received on melt water: No
Ambient: No
Acceptable (IH/ISO only): No
Custody seals: Yes

Case Narrative:

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Barr Engineering Co.	Project:	49161301	
4700 W 77th St	Project Number:	49161301.00 100 001	Work Order #: 1500075
Minneapolis, MN 55435	Project Manager:	Mr. James E. Taraldsen	Date Reported: 01/16/15

TCLP VOC
Legend Technical Services, Inc.

Analyte	Result	RL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Manifold 225-Stockpile-3 (1500075-01) Soil Sampled: 01/08/15 08:15 Received: 01/09/15 9:45										
Benzene	<0.10	0.10	0.0048	mg/L	1	B5A1616	01/15/15	01/15/15	EPA 1311/8260B	
Surrogate: 4-Bromofluorobenzene	*93.0*			*80-120 %*		"	"	"	"	
Surrogate: Dibromofluoromethane	*94.6*			*80-120 %*		"	"	"	"	
Surrogate: Toluene-d8	*93.7*			*80-120 %*		"	"	"	"	
Manifold 225-Stockpile-4 (1500075-02) Soil Sampled: 01/08/15 08:20 Received: 01/09/15 9:45										
Benzene	<0.10	0.10	0.0048	mg/L	1	B5A1616	01/15/15	01/15/15	EPA 1311/8260B	
Surrogate: 4-Bromofluorobenzene	*90.8*			*80-120 %*		"	"	"	"	
Surrogate: Dibromofluoromethane	*96.9*			*80-120 %*		"	"	"	"	
Surrogate: Toluene-d8	*94.2*			*80-120 %*		"	"	"	"	

LEGEND Technical Services, Inc.
www.legend-group.com

88 Empire Drive
St Paul, MN 55103
Tel: 651-642-1150
Fax: 651-642-1239

Barr Engineering Co.	Project:	49161301	
4700 W 77th St	Project Number:	49161301.00 100 001	Work Order #: 1500075
Minneapolis, MN 55435	Project Manager:	Mr. James E. Taraldsen	Date Reported: 01/16/15

TCLP VOC - Quality Control
Legend Technical Services, Inc.

Analyte	Result	RL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	%RPD	%RPD Limit	Notes
Batch B5A1616 - EPA 5030 TCLP											
Blank (B5A1616-BLK1)					Prepared & Analyzed: 01/15/15						
Benzene	< 0.10	0.10	0.0048	mg/L							
Surrogate: 4-Bromofluorobenzene	*46.0*			*ug/L*	*50.0*		*92.1*	*80-120*			
Surrogate: Dibromofluoromethane	*47.5*			*ug/L*	*50.0*		*95.1*	*80-120*			
Surrogate: Toluene-d8	*47.2*			*ug/L*	*50.0*		*94.5*	*80-120*			
LCS (B5A1616-BS1)					Prepared & Analyzed: 01/15/15						
Benzene	48.2			ug/L	50.0		96.5	80-120			
Surrogate: 4-Bromofluorobenzene	*46.8*			*ug/L*	*50.0*		*93.5*	*80-120*			
Surrogate: Dibromofluoromethane	*47.6*			*ug/L*	*50.0*		*95.3*	*80-120*			
Surrogate: Toluene-d8	*47.2*			*ug/L*	*50.0*		*94.3*	*80-120*			
Matrix Spike (B5A1616-MS1)		**Source: 1500075-01**			Prepared & Analyzed: 01/15/15						
Benzene	48.9			ug/L	50.0	<	97.7	80-120			
Surrogate: 4-Bromofluorobenzene	*47.6*			*ug/L*	*50.0*		*95.1*	*80-120*			
Surrogate: Dibromofluoromethane	*48.2*			*ug/L*	*50.0*		*96.3*	*80-120*			
Surrogate: Toluene-d8	*46.9*			*ug/L*	*50.0*		*93.8*	*80-120*			
Matrix Spike Dup (B5A1616-MSD1)		**Source: 1500075-01**			Prepared & Analyzed: 01/15/15						
Benzene	48.4			ug/L	50.0	<	96.8	80-120	1.00	20	
Surrogate: 4-Bromofluorobenzene	*46.6*			*ug/L*	*50.0*		*93.3*	*80-120*			
Surrogate: Dibromofluoromethane	*47.5*			*ug/L*	*50.0*		*95.1*	*80-120*			
Surrogate: Toluene-d8	*46.8*			*ug/L*	*50.0*		*93.5*	*80-120*			

LEGEND
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Fax: 651-642-1239

Barr Engineering Co.	Project:	49161301	
4700 W 77th St	Project Number:	49161301.00 100 001	Work Order #: 1500075
Minneapolis, MN 55435	Project Manager:	Mr. James E. Taraldsen	Date Reported: 01/16/15

Notes and Definitions

<	Less than value listed
dry	Sample results reported on a dry weight basis
NA	Not applicable. The %RPD is not calculated from values less than the reporting limit.
MDL	Method Detection Limit
RL	Reporting Limit
RPD	Relative Percent Difference
LCS	Laboratory Control Spike = Blank Spike (BS) = Laboratory Fortified Blank (LFB)
MS	Matrix Spike = Laboratory Fortified Matrix (LFM)

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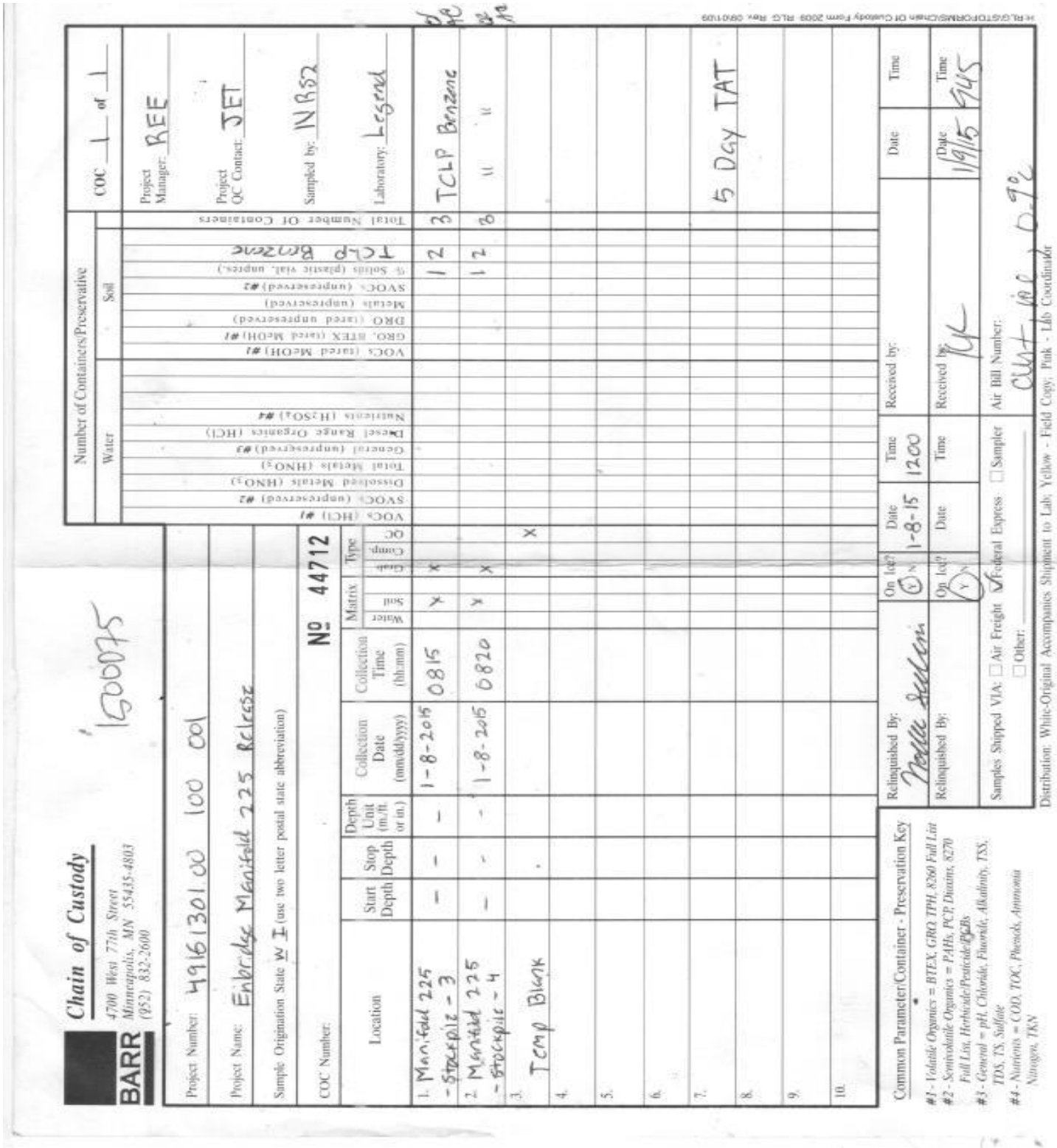

Chain of Custody

BARR
4700 West 77th Street
Minneapolis, MN 55435-4803
(952) 832-2600

1600075

COC 1 of 1

Project Number: 49161301 00 100 001
Project Name: Enbridge Manifold 225 Release
Sample Origination State: WI (use two letter postal state abbreviation)
COC Number: No 44712

Project Manager: REE
Project QC Contact: JET
Sampled by: INRS2
Laboratory: Legend

Location	Start Depth	Stop Depth	Depth Unit (m./ft. or in.)	Collection Date (mm/dd/yyyy)	Collection Time (hh:mm)	Matrix: Water	Matrix: Soil	Type: Grab	Type: Comp.	Type: QC	Number of Containers/Preservative: Water	Number of Containers/Preservative: Soil	Total Number Of Containers
1. Manifold 225 - Stockpile - 3	-	-	-	1-8-2015	0815		X	X				12	3
2. Manifold 225 - Stockpile - 4	-	-	-	1-8-2015	0820		X	X				12	3
3. Temp Blank										X			
4.													
5.													
6.													
7.													
8.													
9.													
10.													

VOCs (HCl) #1
VOCs (unpreserved) #2
Dissolved Metals (HNO_3)
Total Metals (HNO_3)
General (unpreserved) #3
Diesel Range Organics (HCl)
Nutrients (H_2SO_4) #4
VOCs (Jared MeOH) #1
GRO, BTEX (Jared MeOH) #1
DRO (Jared unpreserved)
Metals (unpreserved)
SVOCs (unpreserved) #2
% Solids (plastic vial, unpres.)
TCLP Benzene

Relinquished By: Noelle Jackson — On Ice? (Y) N — Date 1-8-15 — Time 1200 — Received by:
Relinquished By: — On Ice? (Y) N — Date — Time — Received by:
Samples Shipped VIA: ☐ Air Freight ☑ Federal Express ☐ Sampler ☐ Other: — Air Bill Number: Client

Date — Time
Date 1/9/15 — Time 9:45

5 Day TAT

Common Parameter/Container - Preservation Key

#1 - Volatile Organics = BTEX, GRO, TPH, 8260 Full List
#2 - Semivolatile Organics = PAHs, PCP, Dioxins, 8270 Full List, Herbicide/Pesticide/PCBs
#3 - General = pH, Chloride, Fluoride, Alkalinity, TSS, TDS, TS, Sulfate
#4 - Nutrients = COD, TOC, Phenols, Ammonia Nitrogen, TKN

Distribution: White-Original Accompanies Shipment to Lab; Yellow - Field Copy; Pink - Lab Coordinator

Shamrock Landfill

Notification of Waste Acceptance

1/21/2015

CUSTOMER INFORMATION

EPA ID#:
Enbridge Superior Terminal
Manifold 225

Superior Terminal 141203
Superior, WI 54880
Contact: Alex Smith
Phone: (715) 398-4795

INVOICE INFORMATION

Bill #: 2133
Enbridge Pipelines Limited Partnership,
Accounts Payable

1100 Louisiana Ave, Ste 3300
Houston, TX 77002
Contact: Alex Smith
Phone: (715) 398-4795

Profile Sheet #:
Waste Stream #: CL15-0001
Waste Name: Crude Contaminated Soil Manifold 225

Thank you for selecting SHAMROCK LANDFILL for your waste management requirements. Your waste stream has been reviewed and is acceptable for management at our facility based on the information provided in the profile sheet number listed above and conditions below. Our facility has the necessary permits to allow the storage, treatment, or disposal of this waste. The above referenced acceptance number should be listed on all shipping documents and correspondence. Please retain these documents for your records and future reference.

To schedule a shipment, or should you have any questions, please contact the facility at (218) 878-0112.

ACCEPTANCE INFORMATION

The waste stream identified by the reference above is acceptable for disposal.
The anticipated frequency of shipment is 40 TONS / ONE TIME ONLY

This waste is acceptable for delivery beginning on 1/21/2015 thru 1/20/2017 at which time the material will need to be reanalyzed and recertified.

PCB Statement: The Minnesota Pollution Control Agency encourages generators of non-hazardous PCB waste to voluntarily manage the waste as hazardous waste or to seek an alternative to land disposal such as incineration

Spill Reporting Reminder: Proper County and MPCA spill reporting procedures must be followed.

Empty Container Statement: Each shipment containing empty containers must be accompanied with a completed 'EMPTY CONTAINER CERTIFICATION FORM'.

Free Liquid Statement: Free liquids will not be placed in cells at Shamrock Landfill. Free liquids must be solidified either prior to shipment to Shamrock Landfill or at Shamrock Landfill.

Shipping Requirements A NON-HAZARDOUS certificate is required to be on file, certifying the waste is non-hazardous as specified per 40 CFR 261.4. The shipment must be accompanied with an Shamrock Landfill manifest.

AUTHORIZATION

Approval:  Date: 1/21/15

P.O. Box 338 • Esko, MN 55733-0338
Main: 218.878.0112 • Fax: 218.879.2120

SKB CLOQUET

REPORT NAME: **Tons Each Load By WSID**
DESCRIPTION: **Tonnage for EACH LOAD, grouped by customer**
DATE RANGE: **01/01/2015 to 02/05/2015**
PRINTED ON (DATE): **Thursday, February 05, 2015**

ENB24
Enbridge Superior Terminal
Superior Terminal 141203
Superior WI 54880

LOAD #	MANIFEST	ARRIVED	WASTE STREAM	WASTE NAME	CELL	SPOT.	LIFT	TONS
28221 (A)	7753	1/27/2015	CL15-0001	Crude Contaminated Soil Manifold 2	2A	Y44	1190	11.46
28223 (A)	7751	1/27/2015	CL15-0001	Crude Contaminated Soil Manifold 2	2A	Y44	1190	14.25
28233 (A)	7750	1/27/2015	CL15-0001	Crude Contaminated Soil Manifold 2	2A	Y44	1190	13.63
28234 (A)	7759	1/27/2015	CL15-0001	Crude Contaminated Soil Manifold 2	2A	Y44	1190	12.23
				Total # of Loads: 4			**Total Tons:**	**51.57**

Grand Total (Tons): 51.57
Grand Total (Loads): 4

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engineering and environmental consultants

BARR

Technical Memorandum

To: Alex Smith, Enbridge Energy
From: Ryan Erickson and Greg Patten
Subject: Superior Terminal Manifold 225 Release Contaminated Soil Management
Date: January 26, 2015
Project: 49161301

On December 12, 2014, approximately 100 gallons of crude oil was released onto the ground surface from a 2-inch pipe on Manifold 225 during maintenance activities at the Superior Terminal. Enbridge personnel immediately responded to the release by plugging the pipe and initiating remedial response activities. Some of the released crude oil was recovered with a vacuum truck. The remaining product was recovered by excavating the crude oil contaminated soil from the release footprint. Approximately 50 cubic yards of contaminated soil was stockpiled in the Superior Terminal Soil Management Area (SMA) contaminated soil building (Photos 1, 2, and 3) until off-site disposal was approved. Enbridge requested that Barr assist with the coordination of the off-site management of crude oil.

On December 12, 2014, Barr collected two analytical soil grab samples *Manifold 225-Stockpile-1* and *Manifold 225-Stockpile-2* from the contaminated stockpile based on the Minnesota Pollution Control Agency (MPCA) Guidance Document (GD) 4-04 Section II.B.1 and the Shamrock Landfill waste characterization sampling requirements. The stockpile was generally homogenous due to soil excavation and transportation methods. The samples were submitted to Legend Technical Services in St. Paul, Minnesota for laboratory analysis of diesel range organics (DRO), benzene, toluene, ethyl benzene and xylenes (BTEX), and Toxicity Characteristic Leaching Procedure (TCLP) benzene. The laboratory report is provided in Attachment A.

The *Manifold 225-Stockpile-1* TCLP benzene concentration (0.67 mg/kg) exceeded the EPA hazardous waste criteria (0.50 mg/kg); however, the *Manifold 225-Stockpile-2* TCLP benzene concentration (0.12 mg/kg) did not exceed the EPA criteria. The average of the two samples was 0.395 mg/kg which is below the RCRA hazardous waste threshold. However, statistically, the averaged result did not meet the 90% upper confidence interval value, as required by the EPA and EPA SW-846 Chapter 9 which requires a 90 percent confidence interval. As a result, on January 8, 2015, Barr collected 2 additional TCLP benzene analytical samples, *Manifold 225-Stockpile-3* and *Manifold 225-Stockpile-4*, from the Manifold 225 stockpile and submitted them to Legend for analysis. The TCLP benzene concentrations for both soil samples were below method detection limits of 0.0048 mg/kg.

At a 90 percent confidence interval, it can be reported that the average of the soil samples was 0.4437 mg/kg which is below the RCRA hazardous waste threshold.

Attachment

Attachment 1 Waste Disposal Application and Laboratory Reports

Site Photos

Photo 1

Photo 2

Photo 1: Manifold 225 crude oil release contaminated soil stockpile in the Superior Terminal SMA building on December 12, 2014.
Photo 2: Manifold 225 crude oil release contaminated soil stockpile in the Superior Terminal SMA building on December 19, 2014.

Photo 3: Manifold 225 crude oil release contaminated soil stockpile in the Superior Terminal SMA building on December 19, 2014.