US ERA ARCHIVE DOCUMENT

Enbridge Line 6B MP 608 Pipeline Release
Marshall, Michigan
Source Contamination Removal and Verification Summary Report
Talmadge Creek Section 9
Stationing 85+00L to 95+00L and 82+50R to 92+00R

Enbridge Energy September 25, 2010

#### Talmadge Creek Source Contamination Removal and Verification Summary Report

Section 9 of 10 - Stationing (85+00L to 95+00L) and (82+50R to 92+00R)

#### Overview

The Enbridge Source Area Response Plan (SAR) and Sampling and Analysis Plan (SAP), dated 2 August 2010, revised 17 August 2010 was developed to prescribe response activities related to a release of crude oil from Enbridge Energy, Limited Partnership's Line 6B MP 608 pipeline in Marshall, Michigan. A detailed and defined approach to identify and complete source removal was subsequently developed and presented in the 13 September 2010 Supplement to Source Area Response Plan Approach for Source Contamination Removal, Verification and Backfill, Talmadge Creek, Enbridge Line 6B MP 608, and the Notice of Approval of Modification dated 14 September 2010. This report presents the results of the implementation of that approach for Section 9 of 10 (Stationing left bank of Talmadge Creek: 85+00L to 95+00L and Stationing right bank of Talmadge Creek: 82+50R to 92+00R).

#### **Supplemental SAR Objectives**

The following remedial objectives were identified to develop guidelines and procedures to remove the source area contamination from Talmadge Creek:

- Remove free oil from the banks of Talmadge Creek;
- Stabilize the existing creek bed;
- Identify that adjacent up bank areas are not a source of free oil.

To meet these objectives, the response actions included the completion of the following activities along Talmadge Creek:

- Site clearing and grubbing of trees and vegetation to allow access road construction and implementation of free oil removal activities;
- Construction of temporary access roads into the affected area;
- Construction of flumes along Talmadge Creek to recover free oil;
- Oil and water recovery and subsequent disposal;
- Installation and maintenance of absorbent booms along Talmadge Creek;
- Soil removal, staging, and bulking of crude oil-impacted soil with eventual characterization, transport, and offsite disposal;
- Storm water management and erosion control;

• Interim source area restoration under guidance of Michigan Department of Natural Resources and Environment (MDNRE).

#### **Section Location**

For efficiency and clarity in implementation and reporting, Divisions A and B of Talmadge Creek were divided into 10 sections as illustrated in Figure 1. Each section was subsequently divided into approximately 20, 50-foot linear clearance areas (stationing) on both the left and right banks of Talmadge Creek as illustrated in Figure 2, (left and right banks oriented facing downstream). This summary report addresses Section 9 as described in the table below.

| Section Number | Stationing  |
|----------------|---|
| 9              | Left Bank: 85+00L to 95+00L<br>Right Bank: 82+50R to 92+00R |

#### **Section Excavation Methods and Clearance Metrics**

Three methods for determining the vertical limit of excavation were developed and identified as A, B, or C. These three methods are defined as:

- A No visible free oil and the clearance area passed the 40 CFR Appendix 1 to Subpart
  A of Part 4105 Static Sheen Test. A test pit was then constructed and inspected by the
  United States Environmental Protection Agency (U.S. EPA) representative after 6 hours.
  If free oil was observed in the 6-hour test pit, additional excavation was completed until
  clearance was obtained via method A, B, or C. If free oil was not observed, backfilling
  was completed.
- B The vertical limit was reached due to groundwater (excavation proceeded vertically at least 6-inches into groundwater). No 6-hour test pit was required for clearance.
- C The vertical limit was reached due to the silt/clay confining layer. No 6-hour test pit was required for clearance.

In addition, an approximately 2-foot wide 48-hour observation pit/trench was installed along the wall of the excavation boundary and remained open for a minimum of 48 hours to allow the EPA representative to observe potential accumulation of free oil. If oil was observed, an evaluation of the source was conducted and an XTex curtain was installed to separate the impacted area from the clean area. If no oil was observed, or the barrier curtain was installed, backfilling proceeded.

#### Soil Sampling and Analysis

Soil samples were collected from the area of excavation and analyzed pursuant to MDNRE approved work plans for the following analytical parameters:

- Total Petroleum Hydrocarbons (TPH):
  - Gasoline Range Organics (GRO);
  - Diesel Range Organics (DRO);

- Oil Range Organics (ORO);
- Benzene;
- Toluene;
- Ethylbenzene;
- Xylenes;
- Polynuclear Aromatics (PNAs);
- 1,2,4-Trimethlybenzene;
- 1,10,5-Trimethylbenzene;
- Barium;
- Nickel;
- Vanadium;
- Iron.

The analytical results will be evaluated as part of future assessment and remediation activities.

#### **Deviations from SAP**

No deviations from the SAP were noted in this Section.

#### Conclusion

All completed work for this section met the U.S. EPA metrics in compliance with the SAR and the Supplement to the SAR. No additional cleanup is required to fulfill the U.S. EPA's requirements pursuant to the Removal Administrative Order issued by U.S. EPA on July 27, 2010 (Docket No. CWA 11021-5-10-001) pursuant to §1011(c) of the Clean Water Act.

#### **Supporting Documentation**

The following documentation is included as attachments to this document:

- Location maps indentifying the subject section (Figures 1 and 2);
- Photographs;
- Field notes;
- A table summarizing the following information:

- Identification of final EPA clearance method used to dictate vertical limit (A, B, or C);
- Free oil observed (for Method A);
- Odor (for Method A);
- Sheen test per 40 CFR Appendix 1 to Subpart A of Part 4105 (for Method A);
- Photoionization detector (PID) headspace (for Method A);
- o Installation date and time of 6-hour test pit;
- EPA representative sign-off and approval of backfilling;
- Installation date and time of 48-hour observation pit/trench;
- 48-hour observation.

## Talmadge Creek Source Contamination Removal and Verification Summary Table: Section 9

| Division | Section Number | Station<br>Number | Creek Bank (L/R) | Final EPA Clearance<br>Method<br>(A, B, C) | Free Oil Observed<br>(Y/N) | Odor (Y/N) | 40 CFR Sheen Test<br>Sheen Observed (Y/N) | PID Headspace<br>(ppm) | Installation Date of 6-<br>hour Test Pit | Installation Time of 6-<br>hour Test Pit | Method A 6-hour<br>Test Pit EPA<br>Representative<br>Sign-off<br>(Y/N) | Installation Date of 48-<br>hour Observation<br>Trench/Pit | Installation Time of 48-<br>hour Observation<br>Trench/Pit | 48-hour Observation<br>Completed (Y/N) |
|----------|----------------|-------------------|------------------|--|----------------------------|------------|---|------------------------|--|--|--|--|--|--|
| B4       | 9              | 85+00L - 85+50L   | L                | Α  | N                          | N          | N   | 2.6                    | 9/15/2010                                | 1555                                     | Υ  | 9/15/2010  | 1555   | Υ                                      |
| B4       | 9              | 85+50L - 86+00L   | L                | Α  | N                          | N          | N   | 3.1                    | 9/15/2010                                | 1545                                     | Υ  | 9/15/2010  | 1545   | Υ                                      |
| B4       | 9              | 86+00L - 86+50L   | L                | Α  | N                          | N          | N   | 1.8                    | 9/18/2010                                | 1810                                     | Υ  | 9/18/2010  | 1810   | Υ                                      |
| B4       | 9              | 86+50L - 87+00L   | L                | Α  | N                          | N          | N   | 2.6                    | 9/21/2010                                | 1700                                     | Υ  | 9/21/2010  | 1700   | Υ                                      |
| B4       | 9              | 87+00L - 87+50L   | L                | Α  | N                          | N          | N   | 1.7                    | 9/18/2010                                | 1630                                     | Υ  | 9/18/2010  | 1630   | Υ                                      |
| B4       | 9              | 87+50L - 88+00L   | L                | Α  | N                          | N          | N   | 1.4                    | 9/17/2010                                | 1810                                     | Υ  | 9/17/2010  | 1725   | Υ                                      |
| B4       | 9              | 88+00L - 88+50L   | L                | Α  | N                          | N          | N   | 1.7                    | 9/17/2010                                | 1720                                     | Υ  | 9/17/2010  | 1725   | Υ                                      |
| В4       | 9              | 88+50L - 89+00L   | L                | Α  | N                          | N          | N   | 2.4                    | 9/15/2010                                | 1355                                     | Υ  | 9/18/2010  | 1515   | Υ                                      |
| B4       | 9              | 89+00L - 89+50L   | L                | Α  | N                          | N          | N   | 2.1                    | 9/15/2010                                | 1320                                     | Υ  | 9/15/2010  | 1320   | Υ                                      |
| B4       | 9              | 89+50L - 90+00L   | L                | Α  | N                          | N          | N   | 5.0                    | 9/15/2010                                | 1129                                     | Υ  | 9/15/2010  | 1129   | Υ                                      |
| В4       | 9              | 90+00L - 90+50L   | L                | Α  | N                          | N          | N   | 2.3                    | 9/15/2010                                | 1109                                     | Υ  | 9/15/2010  | 1109   | Υ                                      |
| В4       | 9              | 90+50L - 91+00L   | L                | Α  | N                          | N          | N   | 1.2                    | 9/15/2010                                | 1019                                     | Υ  | 9/15/2010  | 1019   | Υ                                      |
| В4       | 9              | 91+00L - 91+50L   | L                | Α  | N                          | N          | N   | 0.3                    | 9/15/2010                                | 1028                                     | Υ  | 9/15/2010  | 1028   | Υ                                      |
| B4       | 9              | 91+50L - 92+00L   | L                | Α  | N                          | N          | N   | 0.0                    | 9/15/2010                                | 1000                                     | Υ  | 9/15/2010  | 1000   | Υ                                      |
| В4       | 9              | 92+00L - 92+50L   | L                | Α  | N                          | N          | N   | 0.0                    | 9/15/2010                                | 0955                                     | Υ  | 9/15/2010  | 0955   | Υ                                      |
| В4       | 9              | 92+50L - 93+00L   | L                | Α  | N                          | N          | N   | 0.0                    | 9/15/2010                                | 0905                                     | Υ  | 9/15/2010  | 0910   | Υ                                      |
| В4       | 9              | 93+00L - 93+50L   | L                | Α  | N                          | N          | N   | NR                     | 9/15/2010                                | 0856                                     | Υ  | 9/15/2010  | 0901   | Υ                                      |
| В4       | 9              | 93+50L - 94+00L   | L                | Α  | N                          | N          | N   | 0.5                    | 9/14/2010                                | 1803                                     | Υ  | 9/14/2010  | 1807   | Υ                                      |
| B4       | 9              | 94+00L - 94+50L   | L                | Α  | N                          | N          | N   | 0.3                    | 9/14/2010                                | 1755                                     | Υ  | 9/14/2010  | 1759   | Υ                                      |
| В4       | 9              | 94+50L - 95+00L   | L                | Α  | N                          | N          | N   | NR                     | 9/14/2010                                | 1729                                     | Υ  | 9/14/2010  | 1729   | Υ                                      |

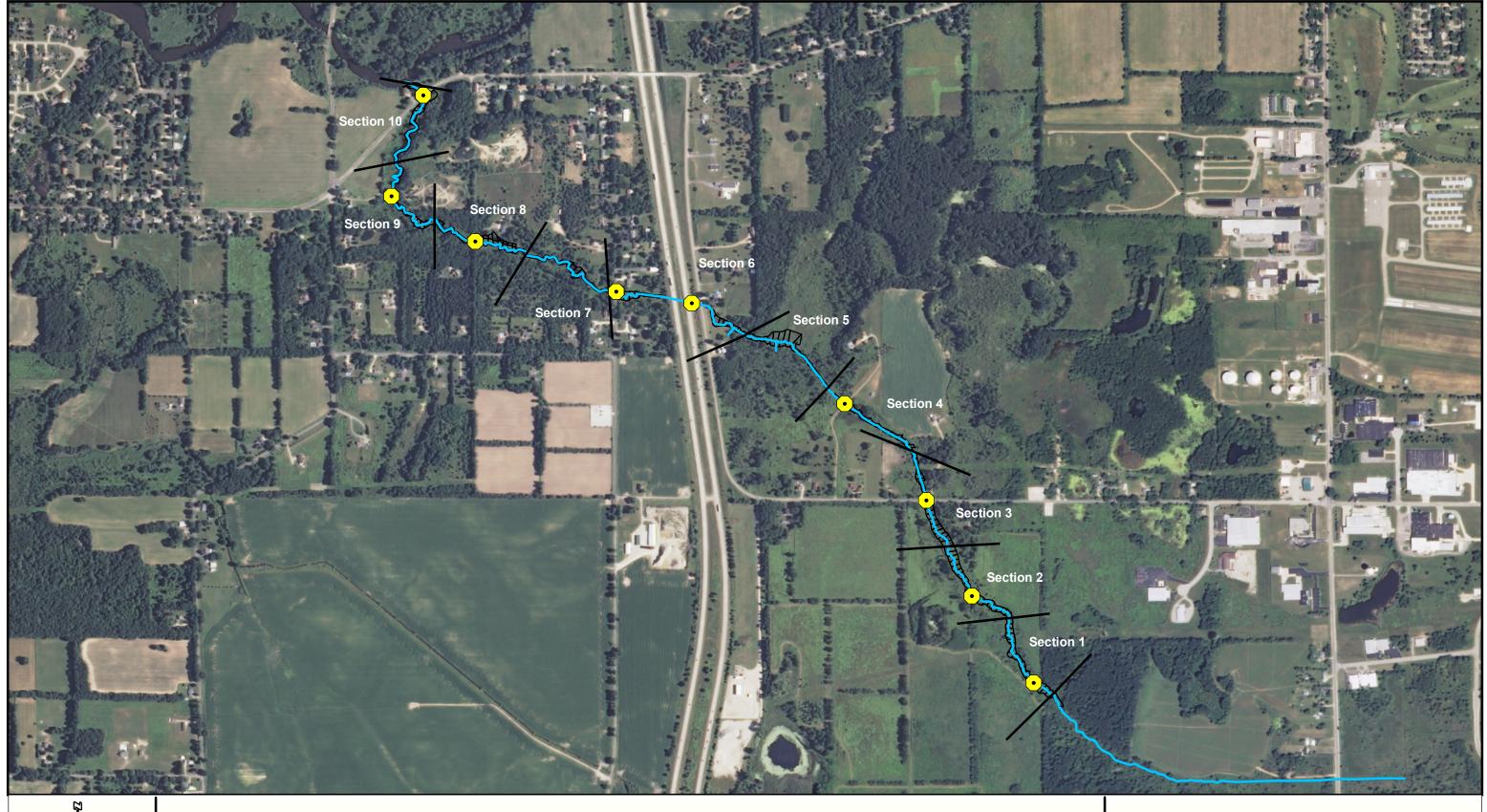
## Talmadge Creek Source Contamination Removal and Verification Summary Table: Section 9

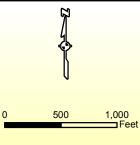
| Division | Section Number | Station<br>Number | Creek Bank (L/R) | Final EPA Clearance<br>Method<br>(A, B, C) | Free Oil Observed (Y/N) | Odor (Y/N) | 40 CFR Sheen Test<br>Sheen Observed (Y/N) | PID Headspace<br>(ppm) | Installation Date of 6-<br>hour Test Pit | Installation Time of 6-<br>hour Test Pit | Method A 6-hour<br>Test Pit EPA<br>Representative<br>Sign-off<br>(Y/N) | Installation Date of 48-<br>hour Observation<br>Trench/Pit | Installation Time of 48-<br>hour Observation<br>Trench/Pit | 48-hour Observation<br>Completed (Y/N) |
|----------|----------------|-------------------|------------------|--|-------------------------|------------|---|------------------------|--|--|--|--|--|--|
| B4       | 9              | 82+50R - 83+00R   | R                | Α  | N                       | N          | N   | 0.9                    | 9/17/2010                                | 0956                                     | Υ  | 9/17/2010  | 0956   | Υ                                      |
| B4       | 9              | 83+00R - 83+50R   | R                | Α  | N                       | N          | N   | 0.0                    | 9/13/2010                                | 1438                                     | Υ  | 9/13/2010  | 1442   | Υ                                      |
| B4       | 9              | 83+50R - 84+00R   | R                | Α  | N                       | N          | N   | 0.0                    | 9/13/2010                                | 1419                                     | Υ  | 9/13/2010  | 1423   | Υ                                      |
| B4       | 9              | 84+00R - 84+50R   | R                | Α  | N                       | N          | N   | 0.0                    | 9/13/2010                                | 1411                                     | Υ  | 9/13/2010  | 1415   | Υ                                      |
| B4       | 9              | 84+50R - 85+00R   | R                | Α  | N                       | N          | N   | 0.0                    | 9/13/2010                                | 1354                                     | Υ  | 9/13/2010  | 1358   | Υ                                      |
| B4       | 9              | 85+00R - 85+50R   | R                | Α  | N                       | Ν          | N   | 0.5                    | 9/15/2010                                | 1418                                     | Υ  | 9/15/2010  | 1418   | Υ                                      |
| В4       | 9              | 85+50R - 86+00R   | R                | Α  | N                       | N          | N   | 0.6                    | 9/15/2010                                | 1356                                     | Υ  | 9/15/2010  | 1400   | Υ                                      |
| В4       | 9              | 86+00R - 86+50R   | R                | Α  | N                       | N          | N   | 0.6                    | 9/15/2010                                | 1334                                     | Υ  | 9/15/2010  | 1334   | Υ                                      |
| В4       | 9              | 86+50R - 87+00R   | R                | Α  | N                       | N          | N   | 0.8                    | 9/15/2010                                | 1320                                     | Υ  | 9/15/2010  | 1325   | Υ                                      |
| В4       | 9              | 87+00R - 87+50R   | R                | Α  | N                       | N          | N   | 0.5                    | 9/15/2010                                | 1125                                     | Υ  | 9/15/2010  | 1125   | Υ                                      |
| В4       | 9              | 87+50R - 88+00R   | R                | Α  | N                       | N          | N   | 1.8                    | 9/15/2010                                | 1105                                     | Υ  | 9/15/2010  | 1105   | Υ                                      |
| В4       | 9              | 88+00R - 88+50R   | R                | Α  | N                       | N          | N   | 0.9                    | 9/15/2010                                | 0850                                     | Υ  | 9/15/2010  | 0850   | Υ                                      |
| В4       | 9              | 88+50R - 89+00R   | R                | Α  | N                       | N          | N   | 0.7                    | 9/15/2010                                | 0900                                     | Υ  | 9/15/2010  | 0900   | Υ                                      |
| В4       | 9              | 89+00R - 89+50R   | R                | А  | N                       | N          | N   | 1.3                    | 9/15/2010                                | 0910                                     | Υ  | 9/15/2010  | 0910   | Υ                                      |
| В4       | 9              | 89+50R - 90+00R   | R                | Α  | N                       | N          | N   | 0.9                    | 9/15/2010                                | 0923                                     | Υ  | 9/15/2010  | 0923   | Υ                                      |
| В4       | 9              | 90+00R - 90+50R   | R                | Α  | N                       | N          | N   | 1.6                    | 9/15/2010                                | 0936                                     | Υ  | 9/15/2010  | 0936   | Υ                                      |
| В4       | 9              | 90+50R - 91+00R   | R                | Α  | N                       | N          | N   | 1.6                    | 9/15/2010                                | 0950                                     | Υ  | 9/15/2010  | 0950   | Υ                                      |
| В4       | 9              | 91+00R - 91+50R   | R                | Α  | N                       | N          | N   | 0.8                    | 9/14/2010                                | 1731                                     | Υ  | 9/14/2010  | 1731   | Υ                                      |
| В4       | 9              | 91+50R - 92+00R   | R                | Α  | N                       | N          | N   | NR                     | 9/14/2010                                | 1725                                     | Υ  | 9/14/2010  | 1725   | Υ                                      |

## Endnotes for Talmadge Creek Source Contamination Removal and Verification Summary Table

- NR Information not recorded on field log, however, U.S. EPA representative sign-off obtained.
- NA Metric not applicable to final site conditions after achieving 'B' or 'C' Method limits. Site conditions prior to achieving final excavation limits were recorded on field notes.
- ND Not Detected
- PID Photoionization detector
- ppm Parts per million

# **Figures**

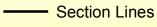




## Legend



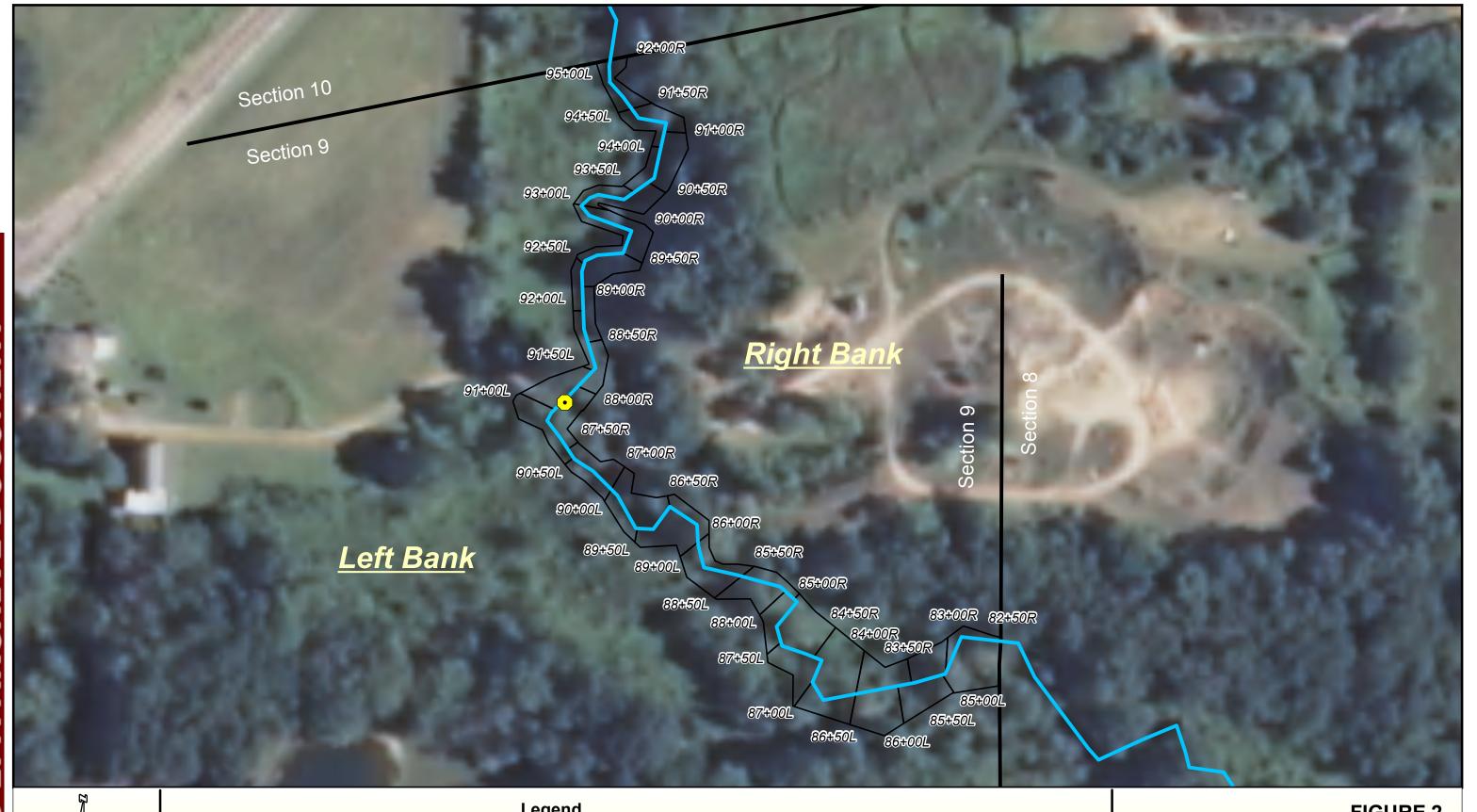
Culverts



Talmadge Creek

FIGURE 1 **OVERALL SECTION LOCATION MAP LINE 6B MP 608** MARSHALL, MICHIGAN

SEPTEMBER, 2010



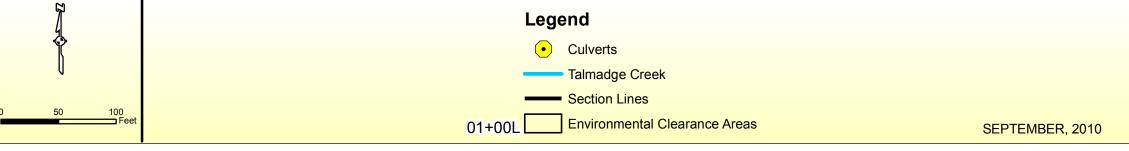


FIGURE 2
SECTION 9 STATION LOCATIONS
TALMADGE CREEK
LINE 6B MP 608
MARSHALL, MICHIGAN

# **Field Photographs**



85+00L - 85+50L: Looking across Talmadge Creek (September 22, 2010)



85+50L - 86+00L: Looking toward Talmadge Creek (September 23, 2010)



86+00L - 86+50L: Looking downstream (September 23, 2010)



86+50L – 87+00L: Looking downstream (September 21, 2010)



87+00L – 87+50L: Looking downstream with mat road over creek in foreground (September 23, 2010)



87+50L - 88+00L: Looking downstream (September 23, 2010)



88+00L - 88+50L: Looking toward Talmadge Creek (September 23, 2010)



88+50L - 89+00L: Looking toward Talmadge Creek (September 23, 2010)



89+00L - 89+50L: Looking across Talmadge Creek (September 23, 2010)



89+50L – 90+00L: Looking across Talmadge Creek (September 23, 2010)



90+00L - 90+50L: Looking across Talmadge Creek (September 23, 2010)



90+50L - 91+00L: Looking across Talmadge Creek (September 23, 2010)



91+00L - 91+50L: Looking downstream (September 14, 2010)



91+50L - 92+00L: Looking downstream (September 14, 2010)



92+00L - 92+50L: Looking upstream (September 15, 2010)



92+50L - 93+00L: Looking downstream (September 15, 2010)



93+00L – 93+50L: Looking toward Talmadge Creek at 6-hour test pit (September 15, 2010)



93+50L - 94+00L: Looking toward Talmadge Creek (September 14, 2010)



94+00L - 94+50L: Looking upstream (September 14, 2010)



94+50L - 95+00L: Looking upstream (September 14, 2010)



82+50R - 83+00R: Looking downstream (September 13, 2010)



83+00R - 83+50R: Looking downstream (September 13, 2010)



83+50R - 84+00R: Looking upstream (September 13, 2010)



84+00R - 84+50R: Looking downstream (September 13, 2010)



84+50R - 85+00R: Looking toward Talmadge Creek (September 13, 2010)



85+00R - 85+50R: Looking upstream (September 15, 2010)



85+50R - 86+00R: Looking downstream (September 15, 2010)



86+00R - 86+50R: Looking downstream (September 15, 2010)



86+50R - 87+00R: Looking toward Talmadge creek (September 15, 2010)



87+00R - 87+50R: Looking upstream (September 15, 2010)



87+50R - 88+00R: Looking upstream (September 15, 2010)



88+00R - 88+50R: Looking toward Talmadge Creek (September 23, 2010)



88+50R - 89+00R: Looking upstream (September 23, 2010)



89+00R - 89+50R: Looking downstream (September 23, 2010)



89+50R - 90+00R: Looking toward Talmadge Creek (September 23, 2010)



90+00R - 90+50R: Looking toward Talmadge Creek (September 23, 2010)



90+50R - 91+00R: Looking downstream (September 23, 2010)



91+00R - 91+50R: Looking downstream (September 24, 2010)



91+50R - 92+00R: Looking downstream (September 24, 2010)

# **Field Notes**

| STOCK to \$515 0   | Backfill Approvai   | EPA Enbridge   |               | 9,69,6                   |  |  |  |   |
|--|---|--|---------------|--------------------------|--|--|--|---|
| Date: 9-15-19 Completed By: P. 5 + 6 hev-  | Time of Tranch 48-hour Follow-up inspection Observations and Time (If Applicable) | W 6.11.9 W   | deeper wy pit | test fort , take plasto  |  |  |  |   |
| Deline Release   | Tim.  | 2.6 1555 Mrs   | 3 9 7.        | odel Moticed coming from |  |  |  |   |
| Project Number: Marshall Line 68 MP608 Pigeline Release Project Number: 22131003 | Used to Indicate Photo ID Free Phase Oil Odor?  Vertical Observed Observed        | THE SECOND SECON | segion test   | de la confluta pit       |  |  |  | (1) Depth of Contamination (A) Groundwater (C) Confining Layer (C) (2) None (N) Light (L), Moderate (M), Strong (S) PID readouts in ppm above background ND ** No Detection |

85+50c to 86+00c Enbridge **Creek Section** Sackfill Approval EPA Completed By: Peter Stephunt 48-hour Follow-up Inspection Observations and Time (If Applicable) 8-18-13 000 Time of Trench Excavation to the sheen or 6-hour Follow-up Inspection Observations and Time (If Applicable) Sheen Ş conduct ShSI Time of Test Pit Dack R Headspace Marshall Line 6B MP608 Pipeline Release E Sauple Sheen Test Rainbow Sheen Observed Comes 7 e v 22131003 Odor SCORDE Free Phase Oil Observed to 2 2 Depth of Contamination (A) · besix Method
Used to
Indicate
Vertical
Unit<sup>2</sup>

Unit<sup>2</sup> 1530 · Collect -Shoon 3 1 1 2 4 g BhS1 21151 Project Number: 3 Project Name: Photo ID

Notes:

Groundwater (8)
Confining Layer (C)
None (N), Light (L), Moderate (M), Strong (S)
PID readousts in prim above background
ND × No Detection

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8600L to 86,50L Enbridge **Creek Section** place Sackfill Approval 7 Á Completed By: Pet Stephens ocker 48-hour Follow-up Inspection Observations and Time (If Applicable) (5:1/ colce/6 pains Date: 9-15-10 \$ mocherak 大いと 3 g Shaen Time of Trench Excavation there V 6-hour Follow-up Inspection Observations and Time (If Applicable) (5.41 exterior CRECK Contamination 000 Ursi ble Г Swing 3 (0/lac) Time of Test Pit 1 0 Sheen Yest
Rainbow Sheen
Observed ppm N L M S (V) N 22.6 -£ Marshall Line 68 MP608 Pipeline Release **back** SK4 (pms) Scrap 22131003 Comes SWER Odor 4:0 Confining Layer (C)
None (N), Light (L), Moderate (M), Strong (S)
PID readouts in ppm above background
ND = NO Detection র্ z Free Phase Oil Observed Coduct よれ シブ Depth of Contamination (A) Photo ID A B Method Used to Indicate Vertical Umht<sup>3</sup> Project Number: Project Name:  $\Xi$ 20 Photo ID

86+50L to 87,00L いんいんい Enbridge **Creek Section** Backfill Approval arts. Completed By: 16 te 5 tep Maris  $\bigwedge_{i}$ 18 8 000 St 48-hour Follow-up Inspection Observations and Time (If Applicable) (0.7) olego X5X Backway Date: 9-15-18 Sheen 100 atter 1700 たんべん Q Time of Trench Excavation bein ilosur to mat road ž Į 48 hr trench Corclass on ap S: 34 0/500 6-hour Follow-up Inspection Observations and Time (If Applicable) 3 くなら Pit Was installed instead of trench, completed Lia (2) Excovate and leave observation trout 48hr track Millid 1200 Place another silt Pena + clay Time of Test Pit 200 0 7 (N) 1 M S Y (N) 7 C Headspace tra undd Marshall Line 68 MP608 Pipeline Release Sheen Test Rainbow Sheen Observed SCral D 0000 contemunated soil Remove oil/demassor BackAll woughing ヹ on a 2 22131003 Odor2 ر. ت Q P Free Phase Oil Observed +Occurred 2007 Collect 33 Photo ID SOS <u>ن</u> لاگ Method Used to Indicate Vertical /Umlt³ 272 Project Number: Project Name: Photo ID

Notes:

Depth of Contamination (A) €

Groundwater (8)
Confining Layer (C)
None (N), Light (1), Moderate (M), Strong (5)
PID readoust in ppm above background
ND = No Detection T T

87+40L to 87+50r Enbridge **Creek Section** ara ٧ Sackfill Approval 5 Les 73 EPA Completed By: JELC STONEW なんな 48-hour Follow-up inspection. Observations and Time (If Applicable) J g Z Date: 9-15-19 ź while tri og mesent Bach Time of Trench Excevetion 2055 6C Ö 6-hour Follow-up inspection Observations and Time (# Applicable) 1 S been sheen Con structed 0 Ř bosstar 821 SIGMS P Time of Test Plt Scas Sonde 88 N N L M S Y N L V Headspace<sup>3</sup> ₽ďd Marshall Line 68 MP608 Pipeline Release Shean Test Rainbow Sheen Observed <u>\_g</u> Shorws 3 22131003 2202 Odor প্ৰ 5.7 Free Phase Oil Observed Dode Girc Depth of Contamination (A) Photo 1D 1455-89 U Method Used to Indicate Vertical Umit<sup>3</sup> Project Number: € Project Name: Photo ID Notes:

Groundwater (8)
Confining Layer (5)
None (N), Light (1), Moderate (M), Strong (5)
PID readouts in ppm above background
ND = No Detection

| Project Name: Marshall Line 68 MP608 Pipeline Release  | Date: 9/18/10  |                   | Creek Section                           |
|--|--|-------------------|---|
| Project Number: 22131003   | Completed By: LRIC Strikes 150   |                   | 105+28 a 00+28                          |
| Free Phase Oil Odor Rainbow Sheen Test Headspace Time of Shour Follow-up inspection Observations and Time Observed Observed Oppm Test Pit (If Appilcable)  | Time of French 48-hour Follow-up Inspection Observations and Time Excavation (If Applicable)   | Backfill Approval | proval                                  |
| 77.36 (20 c r (3) (1) LIMIS r (1) 1.7 (2) (2)  | CA:41 OLCIA  | EPA               | Enbridge                                |
| EEN TEST SAMPE COURTED ON 9/15/10. AREA PASSED SK  | N TEST PIT WAS LIST DUE (PREZIO  | OD HIEM OF WHE    | Rend Bridge                             |
| · HELLY SHEEL OBSTRUCK HOVE BLUK BRUK IDSE HETTER WITH KOAD WEELLED  | STALD  |                   |   |
| EXCHANTED 12-18 WOHES OF SOIL NEAR STREAM RAW AND WEATHURD TEST PIT.<br>BEENSE WESTALLWE TEST A SHEEN TEST SOIL SAMPLE WAS COLUMETED AT 16:20  | ٠/٢  |                   |   |
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| WAT POKIN BRINGE STREATES AROA   |  |                   |   |
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<sup>3</sup> 

Depth of Contamination (4)
Groundwater (8)
Confining Layer (C)
None (N), Light (L), Moderate (M), Strong (S)
PID readours in ppm above background
ND = No Detection 2 2

8750 to 89700L JUS 149,44 01.60 1 Enbridge **Creek Section** STrade anorch Sackfill Approval Las. a DS trian ΕΡΑ a Maticable Poaclway without 48-hour Follow-up Inspection Observations and Time (If Applicable) ०५०० क octo Xc from Completed By: 0 Stephen Date: 9-15-14 Product + PXC2757 Can イバイン # bridge is order to Prochucia Time of Trench Excavation 2Cre 101100 10001 6-hour Follow-up inspection Observations and Time (If Applicable) なよ 52/20 ofc/18-2000 Proceed to conduct shear test 1055ible 1:3 1.4 Colecto \$ Zez de ony thing Creek Time of Test Pit ano: d 987 1 Headspace<sup>3</sup> 186 de liote mdd Marshall Line 6B MP608 Pipeline Release Q 1 Spails who P Sheen Test Reinbow Sheen Observed z Sc. 18-12 Rading 87+5BL 22131003 not N L Odor Groundwater (8)
Comfining Layer (5)
None (M), Light (L), Moderate (M), Strong (5)
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ND w No Detection Ant 9000X Head soace Free Phase OII Observed z changing 28,100 ne cide Depth of Contamination (A) Coe k (> Bilate 3 Photo ID Method Used to Indicate Vertical Limit<sup>2</sup> A B C ( 144° 3 Project Number: Project Name: 77 Ξ Photo ID

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87450 to 80000 Enbridge Creek Section Backfill Approval " Due to Missuran in Russ, Ossewhan AT COOPERS SAME AS AT LOFFIND FOR BOYCOL TO 88450L. SAMBHE COSSEWATION FIT FOR ABEN CE STATES LANGE EXCAMPLES FRANCE IT WAS AT WATERS CONST ξPA 48-hour Follow-up Inspection Observations and Time (If Applicable) Completed By: Fig. Sc. ton 107 \*\* -EXCOVATED APPROXIMETER SIX TO EIGHT IMPRES OF SOIL PRIOR TO COLLECTION SHAPE FOR SHAPEN Date: 9/(7/10 Time of Trench Excavation ŧ 01-6-10 6-hour Follow-up Inspection Observations and Time (if Applicable) 1530 - HORAY SYCED MOTES ON INTER BRATE WITH WITHOUT ETNOT 18:10 Time of Test Pit Headspace<sup>3</sup> mdd Marshall Line 68 MP608 Pipeline Release (3) L M S V (N) 1.4 COURSIGHT SCHOOL FROM PETER STANDES Sheen Test Rainbow Sheen Observed SHOW SAND G CALGORN AT 18:00 87.50 to 88:004 NA MODERNAND. GREA FAILED SHEED TEST ON 9/17/10 22131003 -Signature (13/24/14/30) Odor<sup>2</sup> \*PHIDS THEN BY PHIDE STOLES  $\left(z\right)$ Free Phase Oil Observed Photo ID ∪ # (₹) Method Used to Indicate Vertical Limit Project Number: Photo ID \*\* Project Name: 137 8:00

Depth of Contamination (A) Ξ

Groundwater (B)
Confining Layer (C)
None (N), Light (L), Moderate (M), Strong (S)
PID readouts in ppm above background
ND = No Detection ව ව

| Creek Section                                       | Backfill Approval  | EPA                           |                        |  |  |       |  |  |
|---|--|-------------------------------|------------------------|--|--|-------|--|--|
| Date: 9-15-18 Completed By: Pote Stykens            | 48-hour Follow-up Inspection Observations and Time (If Applicable)   | the best of                   | car of Wan             |  |  |       |  |  |
|   | Time of Trench<br>Excavation   |                               | Brian 71<br>d, + taken | TOMOTION                               |  |       |  |  |
| Marshall Line 68 MP608 Pipeline Release<br>22131003 | Sheen Test Sheen Test Headspace <sup>3</sup> Time of 6-hour Follow-up Inspection Observations and Time Observed Dom Test Pit 6-hour Follow-up Inspection Observations and Time | Wetted a pool of free product | have the are clear boo | 166 16 16 16 16                        |  |       |  | (s)  |
| Marshall Un   | Photo ID Free Plase Oil Observed   | P(4.15.47~                    | CV Perry grace As to   |  |  |       |  | Depth of Contamination (A) Confining Layer (C) None (N), Light (L), Moderate (M), Strong (S) PID readouts in pirm above background ND = No Detection |
| Project Name:<br>Project Number:                    | Method Used to Used to Photo ID Indicate Vertical Limit <sup>2</sup>   | 1 A 8 G                       | CS /2007               | ************************************** |  | 46.40 |  | (3) (5)  |
| Project<br>Project                                  | 볿  | Notes:                        |                        |  |  |       |  |  |

| Project Name:  | Marshall Li   | ne 68 MP6                               | Marshall Line 68 MP608 Pipeline Release | ease                      |           |  |                                 | Date: 3/17/10  | Creek Section  |             |
|--|---|---|---|---------------------------|-----------|--|---------------------------------|--|--|-------------|
| Project Number:  |   | 22131003                                | 6003                                    |                           |           | ****   |                                 | Completed By: FRIC SEILM Dank  | 1000 to 2005   |             |
| Method Used to Used to Photo ID APP Vertical Limit*                | Free Phase Oil<br>Observed  | Odor²                                   | Sheen Test<br>Rainbow Sheen<br>Obsorved | Headspace <sup>3</sup> Ti | Time of 6 | 6-hour Follow-up inspection Observations and Time<br>(If Applicable)   | me Time of Trench<br>Excavation | 48-hour Follow-up Inspection Observations and Time<br>(If Applicable)  | Backfill Approval EPA Enbridge   |             |
| 1742 (BBC  | >   | S W S                                   | (Z)<br>>-                               | 1+                        | 525       | MD 5-15-10   | 2 17:25                         | 1560 0/100/100   |  |             |
| Notes:   |   |   |   |                           | }         |  |                                 |  |  |             |
| AREN FALLER SH   | SHEEN TEST ON   |   | 3/15/10                                 |                           |           |  |                                 |  |  | -           |
| STADYAN EXCAMPANCE   | 1 .   | Menny (6:00                             |   |                           | 1         |  |                                 |  |  | <del></del> |
|  | N. F. E.  |   |   | ] 🔎                       |           |  | ł                               |  |  | Τ           |
| 1  | ]   | I                                       |   |                           |           |  |                                 |  |  | Τ           |
| -4764 LOCATES 12   | CECUST CAT POWER  | 1 1 1 2 1 2 1 2 2 2 2 2 2 2 2 2 2 2 2 2 | ]                                       | Tion of                   | TA AUSA   | . Ransmer  | 57 Jun 292                      | 20 TE WATHERSON + THE TEST KINDSHI   | SIGN FIT STAIS   | П           |
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| (1) Depth of Contam<br>Groundwater (8)                             | Depth of Contamination (A) Groundwater (B)  |   |   |                           |           |  |                                 |  |  |             |
| Conming Layer (L) (2) None (N), Light (L), (3) PID readouts in opr | Continuig Layer (L.)  None (N.), Light (L.), Moderate (M.), Strong (S.)  PID readouts in ppm above background | trong (S)                               |   |                           |           |  |                                 |  |  |             |
|  | tection   |   |   |                           |           |  |                                 |  |  |             |

てとのと 8 STSEL to 897 ARC Enbridge **Creek Section** 11.00 Seckfill Approval OCK 5.0 10 S 625 EPA Completed By: P. Straheni (Sec. 48-hour Follow-up inspection Observations and Time (If Applicable) Chini check 070 the south 7 SURST. Date: 9.15-18 2055,66 Pich Ž, Time of Trench Excavation Ÿ, g Sections p 6-hour Follow-up Inspection Observations and Time (if Applicable) 01-17-10 ないら 130 イス " whire Ş for steern 03 50.12 Soi O Ras Time of Test Pit collections Handspace Marshall Line 68 MP608 Pipeline Release æ Sheen Yest Rainbow Sheen Observed in start 7 ナギ J 22131003 Odo Confining Layer (C)
None (NJ, light (L), Moderate (M), Strong (S)
PID readouts in ppm above background
ND = NO Detection 5000 495,25 Free Phase Oil Observed ż Depth of Contamination (A) > Cut trad SW Ole रू दे 3 Jam Photo ID 1 N C 1340. Method Used to Indicate Vertical Umit<sup>3</sup> 1326 1355 Project Number: Project Name: Ξ  $\widehat{\underline{\sigma}}\;\widehat{\underline{\sigma}}$ Photo 1D

| Creek Section<br>\$28+520 to \$37+002_              | Backfill Approval EPA Enbridge  | (F)                       | )                             | and the ments of impain   | So.   |                 | TED 47 14.10                            |                                      |                          |                                    |                            |  |   |  |  |  |
|---|---|---------------------------|-------------------------------|---|---|-----------------|---|--------------------------------------|--------------------------|------------------------------------|----------------------------|--|---|--|--|--|
| Date: 9/19/10<br>Completed By: 1272.c. 52.4.m.107   | h 48-haur Follow-up Inspection Observations and Time<br>(If Applicable)         | (2) Chi o 140)            | 174                           | WATER SON SON SON SON SON SON CONTRACT AT 10:15.                    | LUNIT WATER FROM ENTERIOR BBIGGE                  |                 | Sous Sandie For Science 185" Consideral | N OF 1942                            | FRI ST SYEDY             |                                    | WAN WAT HOOM TO SOUTH.     |  |   |  |  |  |
|   | Follow-up Inspection Observations and Time of Trench (if Applicable) Excavation | 20 de 19-10 SX 15         | OSSERVIA HETER YIS/10 EAST OF | WASHING AT OR SO, SOME  | SA 89450L 78 LIMIT WATER                          | 13:00 TO 14:00. | 425                                     | AND POWER WINTER SOUTH OF MIT PECKED | ROAN APPEARED TO BE FOR  | EASTERN FASTIN OF ASEA             | UE TO WHATE ENTERING (TENN |  | THE REAL PROPERTY AND ADDRESS OF THE PROPERTY ADDRESS OF THE PROPERTY AND ADDRESS OF THE PROPERTY ADDRESS OF THE PROPERTY AND ADDRESS OF THE PROPERTY |  |  |  |
| Marshall Line 6B MP608 Pipeline Release<br>22131003 | Sheen Text Headspace Time of 6-hour F<br>Observed ppm Test Pit                  | 1 M S Y (3) 1. B 27.5% (A | 04 9/15/10, Prosuce of        | MESSINAS OBIZO STATE DOSA DE TO | A COMPANY AND | HOMY SHEET FROM | OUT AREA WAS COUCELY RE-SOLDER          | SWITT STON STEWS                     | From www TR MAY          | 12-18 water of Son Scooper From En | ABOVE CROSK LINED. D.      |  |   |  |  | (8)  |
|   | Method Used to Indicate Photo ID Observed Unit <sup>1</sup>                     | (N) (N) (W) (W) (W)       | Parast Coustin                | CKCAMATALL  |   |                 | MARTER                                  | VATTER COLUMN RE-GNITTED             | - WATER EVIRENCE EXPENSE | APPROximaras 12-18 12455 G         | Parties is Excounted       | And the state of t | Ž   |  |  | (1) Depth of Contamination (A) Groundwater (B) Confining Layer (C) (2) None (N), Light (L), Moderate (M), Strong (S) (3) PID readoust in ppm above background MID No Proposition |
| Project Name:<br>Project Number:                    | Photo ID#   | 16:00                     | Notes: TEST                   | -5740 to 1  | Journal Strange                                   | - YAC T         | AFTER                                   | 11/4                                 | W                        | APPR                               | - WATER                    | ,  |   |  |  | (3) (3)  |

| Project Name: Marshall Line 6B MP608 Pipeline Release   | Date: 9-15-18   | Creek Section     |
|---|---|-------------------|
| 2.2.1.3.1003  |   | 89+00L to 89+50L  |
| Used to Photo ID Free Phase Oil Odor? Rainbow Sheen Pert Photo ID Observed | Time of Trench 48-hour Follow-up Inspection Observations and Time Excension (If Applicable) | Backfill Approval |
| 0 1325 V (  | 100 4505 W  | Enbridge          |
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| Depth of Contamination (A) Groundwater (B) Confining Layer (C)  |   |                   |
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9450 - 90 +0cl 98460L 10 87150L Enbridge Backfill Approval EPA 1 Gand Jack 01-61-6 48-hour Follow-up inspection Observations and Time (If Applicable) 19 Date: 9/15/10 Completed By: NGPTest Time of Trench Excavation 1503 11390re 6-bour Follow-up Inspection Observations and Time (If Applicable) @ DIMS V 8 5.0 1129 Dic Time of Test Pit buckit Headspace<sup>3</sup> Edd Marshall Line 6B MP608 Pipeline Release Sheen Test Rainbow Sheen Observed .) £ 22131003 +2Ker 4/2,m Odor Free Phase Oil Observed SAMOR Photo ID (A) Method Used to Indicate Vertical Unit<sup>§</sup> Shees Project Number: Project Name: Photo 10

Groundwater (8)
Confining Liver (7)
None (10), Light (1), Moderate (M), Strong (5)
PID readouts in ppm above background
ND = No Detection

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Depth of Contamination (A)

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90+504 10 90 40ch Water Enbridge Creek Section Backfill Approval dug to ground EPA 1031 48-hour Follow-up Inspection Observations and Time (If Applicable) Ž 1665 contron Completed By: N&P Date: 9/15/10 9-19-10 1109 01-6 Time of Trench Excavation of the creek. 6-hour Follow-up inspection Observations and Time (if Applicable) From the other side 1109 017 Time of Test Pit Headspace<sup>3</sup> (N) (M) L M S Y (N) 2.3 mdd Marshall Line 6B MP608 Pipeline Refease Sheen Test Rainbow Sheen Observed もってなって 22131003 Odor Depth of Contamination (4)
Groundwater (8)
Confining Layer (c)
Nome (M), Light (L), Moderate (M), Strong (5)
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back water near the 9100L states. No sheen. No abon Test pit Observed of 90+50L to 91+00L Enbridge Creek Section Backfill Approval €₽A Time of Trench 48-hour Follow-up Inspection Observations and Time Excavation (If Applicable) Completed By: N Co Date: 9/15/10 1000 1019 Wit 6-hour Follow-up Inspection Observations and Time (If Applicable) Sheen Test
Rainbow Sheen
Observed
ppm
Time of
Test Pit Marshall Line 68 MP608 Pipeline Release Water ground butter The back 22131003 Odor<sup>2</sup> 5 Free Phase OII Observed > 70 6 8 0 1022 Photo 1D Shren Samak Method Used to Indicate Vertical Umit<sup>1</sup> Project Number: Dit Project Name: Photo 1D

Groundwater [8]
Confining Layer (C)
None (N), Light (L), Moderate (M), Strong (S)
PID readouts in ppm above background
ND = No Detection

<u> 2</u>

Depth of Contamination (A)

705+16 a 00+16 Test/Observation pix-dus Creek Section Backfill Approvat EPA 123 Time of Trench 48-hour Follow-up Inspection Observations and Time Excavation (If Applicable) No odor. Date: 4/15/10 Completed By: N Cr No checo. 9-200 1028 at Oc Tikes 6-hour Follow-up Inspection Observations and Time (If Applicable) 60m/ 50 the sheer sumph V ( ( ) ( ) V ( ) ( ) ( ) V ( Time of Test Pit Headspace<sup>3</sup> Had Marshall Line 68 MP608 Pipeline Release Sheen Test Rainbow Sheen Observed 22131003 down to grand water Odor Coop Moore Free Phase Off Observed 9119110 Photo 1D ာ ရ (၆) Method Used to Indicate Vertical Limit<sup>1</sup> Z K Project Number: Project Name: Photo ID Notes:

Enbridge

Depth of Contamination (A) 3

Groundwater (8)
Confining Layer (C)
None (N), Light (!), Moderate (M), Strong (5)
PID readouts in ppm above background
ND = No Detection ව ව

91+50 to 42+004 Enbridge Creek Section Backfill Approvat ΕĐΑ 9.21-6 48-hour Follow-up inspection Observations and Time (If Applicable) Completed By: Elic Sauce 15 Date: 9//5/10 Time of Trench Excavation 6-hour Follow-up inspection Observations and Time (if Applicable) Time of Test Pit 10.50 0,0 Headspace<sup>5</sup> Edd Marshall Line 6B MP608 Pipeline Release Sheen Test Rainbow Sheen Observed **②** 22131003 NOTES EXCENTED USING MINICIPACINATES Odor<sup>2</sup> Depth of Contamination (4)
Groundwater (8)
Confining Layer (c)
None (N), Light (U), Moderate (M), Strong (5)
PID readouts in ppm above background
ND = No Detection Free Phase OII Observed Photo 10 ভ Method Used to Indicate Vertical Limit<sup>3</sup> Project Number: 95.96 246-215. E Project Name: Photo ID

92+00 to 92+501 Enbridge Creek Section Backfill Approval ΕΡΑ 48-hour follow-up inspection Observations and Time (if Applicable) 05-21-6 Completed By: CRC Summer Date: 4/15/10 Time of Trench Excavation 6-hour Follow-up Inspection Observations and Time (If Applicable) Time of 8:53 Sheen Tett
Rainbow Sheen
Observed ppm 9 Marshall Line 6B MP608 Pipeline Release 2 (N) (R) ( M | S | Y 22131003 Odo Depth of Contamination (A)
Groundwater (B)
Confining Lyer (C)
None (M), Light (L), Moderate (M), Strong (S)
PID readouts in ppm above background
ND = No Detection NORTH EXCANTRED LESS MISSIS EXCENTED. Free Phase Oil Observed > Photo (D Method Used to Indicate Vertical Umit<sup>3</sup> 93.94 BBC Project Number: Project Name: 3 Photo ID

| Project Name: Marshall Line 68 MP608 Pipeline Release  |   |
|--|---|
| Project Number: 22131003   | Date: Creek Section   |
| Method   | Completed By: 13 17 17 46 65/14 5/14:37 72+50 43400 L.                    |
| Photo ID Indicate Photo ID Observed Obs | nrch 48-hour Follow-up inspection Observations and Time Backfill Approval |
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| (1) Depth of Contamination (A)   |   |
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|--|--|---|--------|--|--|--|
| Project Name: Marshall Line 68 MP608 Pipeline Release Project Number: 22131003 | Photo ID   Indicate   Photo ID   Price Phase Oil   Odor* Rainbow Sheen Tost Pit   Photo ID   Indicate   Photo ID   Observed   Obse | Notes: Pto725 - 305 30-2 85-88  EL 120 9/10/10 - 75 | 71/12/ |  |  | (1) Depth of Contamination (4) Grounding Layer (5) Confining Layer (7) (2) None (N), Light (1,) Moderate (M), Strong (5) PID reactouts in ppm above background ND = No Detection |

Enbridge Backfill Approval ΕρΑ 48-hour Follow-up Inspection Observations and Time (If Applicable) (00) Excavation Time of Trench Page ( Beste 6-hour Follow-up Inspection Observations and Time (If Applicable) also be OP 1803 Time of Test Pit Completed 8y: 8 1731 TP WILL [ 6 о ?> Headspace<sup>3</sup> ELCC õ <u>}</u> **②** Sheen Test Rainbow Sheen <u>z</u>) ≻ comments Nowwen alendint wheel area. Observed > × × × N N N S N Odor<sup>2</sup> (z > **₽** ② ≻ Free Phase Oil Observed FILTED apply CTS B C V (A) 9/19/10 CTS Method Used to Indicate Vertical Limit<sup>3</sup> FILLED 9/19/10 Photo ID 93+80 98+304 9 1-20 Per 91+50 R 994+2010 994+504 PLT. Creek Section Comments

9 14 10

Date:

Marshall Line 68 MP608 Pipeline Release

22131003

Project Number: Project Name:

Depth of Contamination (A)

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Confining Layer (C) Groundwater (8)

None (N), Light (L), Moderate (M), Strong (S)

PID readouts in ppm above background

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ND = No Detection

Project Name:

Project Number:

Marshall Line 68 MP608 Pipeline Release

22131003

Date: 9-17-10 Completed By: PELS STOPHEW

8250 K-8399 R

|   | ,           |                       | <del>,</del> | ,                | · · · · · · · · · · · · · · · · · · · |   | ······     | ų  | <b>,</b> |   |  | , |           | , | <del>,</del>   | <del>,</del>                           | ·                 | <del>,,,,,</del>   | <del>,</del>    | <b>,</b>   | , |
|---|-------------|-----------------------|--------------|------------------|---------------------------------------|---|------------|----|----------|---|--|---|-----------|---|--|--|-------------------|--|-----------------|--|---|
| Backfill Approval   | Enbridge    |                       |              |                  |                                       |   |            |    |          |   |  |   |           |   |  |  |                   | The state of the s |                 |  |   |
| Backill   | EPA         | SS                    |              |                  |                                       |   |            |    |          |   |  |   |           |   |  |  |                   |  |                 |  |   |
| f<br>48-hour Follow-up Inspection Observations and Time<br>(If Applicable)                      |             | Jahn 174.10           |              |                  |                                       |   |            |    |          | - |  |   |           |   |  |  |                   |  |                 |  |   |
| Time of Trench<br>Excavation  |             |                       |              |                  |                                       |   |            |    |          |   |  |   |           |   |  |  |                   |  |                 |  |   |
| 6-hour Follow-up Inspection Ob  | 0,50        | 100 9-8-8             | test (       | FP odor or sheen | photo tohen                           |   |            |    |          |   |  |   |           |   |  |  |                   |  |                 | The state of the s |   |
| Sheen Test Headspace <sup>3</sup> Time of Odor <sup>2</sup> Rainbow Shenn Ppm Test Pit Observed |             | 1 1 M s r 0 6.9 10956 | Soil         | Signs of         | Kst oit                               |   | , W.W. (3) |    |          |   | TO POWER PROPERTY AND THE PROPERTY AND T |   | AAAAAAAAA |   | - Topic in the Control of the Contro | ************************************** |                   |  |                 |  |   |
| Free Phase Oil<br>Observed  | -           | <sup>2</sup>          | · - Colket   |                  | · complet                             | - | C-WC       | E. |          |   |  |   |           |   |  |  | - Pakkandahiranya |  |                 |  |   |
| Method<br>Used to<br>Indicate<br>Vertical   | LIMIT TIMES | B c 1004              | 0500         |                  | Ø956                                  |   |            |    |          |   |  |   |           |   |  |  |                   | ***************************************  | PART PART SALES |  |   |
| Photo ID  |             |                       | Notes:       |                  |                                       |   |            |    |          |   | The state of the s |   |           |   |  |  |                   |  |                 |  |   |

<sup>3</sup> 

Depth of Contamination (A)
Groundwater (B)
Confining Layer (C)
None (B), Light (L), Moderate (M), Strong (S)
PID readouts in ppm above background
ND = No Detection <u>a</u> <u>a</u>

|   | Time of 48-hour Follow-up Inspection Backfill Approval<br>Trench Observations and Time<br>Excavation (if Applicable) | 1495 MB 41824 ML  |        | 1423 What 9-16-73 ME                    | 1442 MW 9-6-10 10         |  |
|---|--|---|--------|---|---------------------------|--|
| Date: 9/13/10 Completed By: Roger Beck              | 6-hour Follow-up inspection<br>Time of Test Pit Observations and Time<br>(if Applicable)                             | All Mars.   |        | 1419 While                              | 1438 Whul                 |  |
| Marshall Line 6B MP508 Pipeline Release<br>22131003 | Free Sheen Test Headspace <sup>3</sup> Chserved Odor <sup>2</sup> Rainbow Ppm Sheen Observed Sheen Observed          | (3)<br>(3)<br>(4)<br>(5)<br>(7)<br>(8)<br>(8)<br>(9)<br>(1)<br>(9)<br>(1)<br>(1)<br>(1)<br>(1)<br>(1)<br>(1)<br>(1)<br>(1 |        | 0 O O O O O O O O O O O O O O O O O O O |                           |  |
| Project Number:                                     | Creek Section Photo ID Indicate Vertical Limit <sup>2</sup>  | 84400 8440 (A) B C  | CHINCH | 34502 of took (D B c                    | 837-20/2 to 83-50/2 (AB c |  |

(1)

Depth of Consamnation (A)
Groundwater (8)
Confining Layer (C)
None (M), Light (L), Moderate (M), Strong (S)
PID readouts in ppm above background
ND = No Detection

|  |        | Time of 48-hour Follow-up inspection Backfill Approval Trench Observations and Time Excavation (If Applicable) | EPA Enbridge                      | 1100 May 3-17-10 Ml |                                       | - Mar Riva Me                          |  | 1388             | J. W. W.                    |
|--|--------|--|-----------------------------------|---------------------|---------------------------------------|--|--|------------------|-----------------------------|
| Completed By: Road Road  |        | Test Rainbow Sheen Sheen Sheeved Time of Test Pit Observations and Time (If Applicable)                        | 8 V 3 0.0 1112 M                  |                     | 2                                     | ] ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ |  | 1 ( O O 6 1354 K | 1144<br>t visible - 11:32 - |
| Project Name. Narshall Une 68 MP608 Pipeline Release<br>Project Number: 22131003 | Method | Creek Section Photo ID Indicate Phase Oil Odor <sup>2</sup> Vertical Observed Limit <sup>2</sup>               | 100,000 100 1550 AD C V N N L M S | Соттепъ             | TOOSWALD POSTSOL (A) B) C Y N N L M S | 18-                                    |  | Comments         | 9-19-10-08- Fre Produce     |

Depth of Contemnation (4)
Groundwater (8)
Confining Layer (C)
None (M, Light (L), Moderate (M), Strong (5)
PID readouts in ppm above background
ND = No Detection

**6** 

84450K 10 8540CK Enbridge Creek Section Backfill Approval 1 48-hour follow-up inspection. Observations and Time (if Applicable) Date: \$ 123 110 Completed By: toward inspection Observations and Time (If Time of Trench Applicable)

Applicable) Vrsible The of chourse of Soft Sur Co Mars hall Line 68 MP608 Pipeline Release Sheen Yest Rainbow Sheen Observed 22131003 ogo O 1 z Free Phase Oil Observed Method
Used to
Indicate Photo 15
Vertical
Umit<sup>1</sup> 6/10 8 Failed Project Number: Project Name: Ci estoria

Depth of Contamination (4)
Goombeater (8)
Confined Leyer (1)
Nose (M), Light (1), Moderate (M), Strong (5)
Pip reddent is high above background
NO + No Detaction

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25+00 to 85+50 R Enbridge **Creek Section** Backfill Approval EPA 48-hour Follow-up Inspection Observations and Ilme
(If Applicable) Completed By: GRIC Science Date: 9/15/10 Time of Trench Excavation 6-hour Follow-up Inspection Observations and Time (If Applicable) Time of Test Pit 300 Sheen Test
Rainbow Sheen
Observed M L M S Y N Marshall Une 6B MP608 Pipeline Release 22131003 Odor Depth of Contamination (4)
Groundwater (8)
Confluing Layer (C)
None (M), Ught (L), Moderate (M), Strong (5)
PID readouts in ppm above background
ND × No Detection Free Phase Oil Observed (<u>z</u>) Method
Used to
Indicate Photo ID
Vertical
Limit<sup>3</sup> \ **\** \ **\** \ Project Number: Ξ Project Name: 107-108 Phoeb-1D

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25+50 to 26+0017 Enbride **Creek Section** Backfill Approvat EPA 48-hour Follow-up Inspection Observations and Time (If Applicable) Completed By: ERIC SCIEMIST a-()-0 12-18 Date: 9/15/10 Time of Trench Excevation 14:00 6-hour Follow-up Inspection Observations and Time (If Applicable) Time of Test Pit 356 Sheen Test
Rainbow Sheen
Observed
ppm 90 Marshall Line 6B MP608 Pipeline Release > 22131003 N) (N) (N) , ogo Free Phase Oil Observed Depth of Contamination (A) Photo ID Method Used to Indicate Vertical Limit<sup>1</sup> (A) roject Number: Ξ roject Name: 301-50; Photo 1D š

Groundwater (8)
Comfining Layer (C)
None (W), Light (L), Moderate (KS), Strong (S)
PID readouts in ppm above background
ND = No Detection

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Seron 10 86:50.75 Enbridge **Creek Section** Backfill Approval EPA 48-hour Follow-up Inspection Observations and Time (# Applicable) 9120 Completed By: GRic Sammist Date: 01/15/15 Time of Trench Excevation 6-hour Follow-up Inspection Observations and Time (If Applicable) 1616 Time of Sheen Test
Rainbow Sheen
Observed
Ppm N N L M S Y N O C Marshall Line 68 MP608 Pipeline Release 22131003 oqo, Depth of Contamination (A)
Groundwater (B)
Confining Layer (C)
None (N), Light (L), Moderate (M), Strong (S)
PIO readouts in ppm above background
ND = No Detection Free Phase Oil Observed Photo 10 Method Used to Indicate Vertical Umit<sup>‡</sup> (S) Project Number: Ξ 103-104 Photo ID

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Project Name:

O6+50 to 87+00R Enbridge Creek Section Backfill Approval EPA 48-hour Follow-up Inspection Observations and Time (if Applicable) Completed By: GRIS Schmish Date: 9/15/10 Time of Trench Excavation 3.25 6-hour Follow-up inspection Observations and Time (# Applicable) Time of Test Pit 5.20 သ () Marshall Line 68 MP508 Pipeline Release Sheen Test Rainbow Sheen Observed (Z) **5**-22131003 ν Σ (z) , 990 090 Depth of Contamination (4)
Groundwater (8)
Confining Layer (5)
None (M), Light (L), Moderate (M), Strong (5)
PID readoust in ppm above background
ND = No Detection Free Phase OII Observad (Z) Photo ID Method Used to Indicate Vertical Limit<sup>2</sup> (4) Project Number: Project Name: 101-102 3 Photo ID

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Notes

87+00 to 87+50R Enbridge **Creek Section** Backfill Approval EPA 9-19-10 48-hour Follow-up inspection Observations and Time (If Applicable) 5251 Completed By: ERK Scann T Date: 9/15/10 Time of Trench Excevation 01.01.0 6-hour Follow-up Inspection Observations and Time (If Applicable) 1619 Time of Test Pit : 23 Headspace<sup>3</sup> Marshail Line 68 MP608 Pipeline Release (N) L M S Y (N) (2.5 Sheen Test Rafnbow Sheen Observed 22131003 ~ 090 Depth of Contamination (A)
Groundwater (B)
Confining Layer (C)
None (N), Light (L), Moderate (M), Strong (S)
PID readouts in ppm above background
ND ~ No Octection Free Phase Off Observed (2) > Photo ID ن ه آ Method Used to Indicate Vertical Umit<sup>3</sup> Project Number: Project Name: ತ 99-100 Photo ID

Notes:

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|  | Backfili Approval  | EPA Enbridge              |                 |            |         |          | _  |          |      |
|--|--|---------------------------|-----------------|------------|---------|----------|--|----------|------|
|  | 48-hour Follow-up inspection<br>Observations and Time<br>(If Applicable) |                           | mini - excavatu |            |         |          |  |          |      |
|  | Time of<br>Trench<br>Excavation  |                           | 20 m            |            |         |          |  |          |      |
| 9 14 10<br>Roger Bec/2                             | 6-hour Follow-up Inspection<br>Observations and Time<br>(if Applicable)  | 162 Jest                  | excavitied us   |            |         |          |  |          |      |
| Date:<br>Completed By:                             | Time of Test Pit   | 510                       | Stort           | od.        |         |          |  |          |      |
| - "  | Headspace <sup>3</sup> .   |                           | , [e            | Lag.       |         |          |  |          |      |
|  | Sheen<br>Test<br>Rainbow<br>Sheen<br>Observed                            | 2                         | good ,          | a de       | z<br>>- |          | z<br>>   |          |      |
| ne Release   | Odor <sup>2</sup>  | N<br>N<br>(3)             | de OP           | of a Treat | S       |          | \ \times \times \ \ti |          |      |
| Marshall Une 68 MPGO8 Pipeline Release<br>22131003 | Free<br>Phase Oii<br>Observed  | 2                         | Low be OP.      | 4          | 2       |          | 2  |          |      |
| Marshall Line                                      | Method<br>Used to<br>Indicate<br>Vertical<br>Limit <sup>1</sup>          | U<br>8<br>( <u>\$</u> ) ~ | 8 4             | 1/cath     | A B     |          | A 8 C  |          | 7.00 |
|  | Photo ID   |                           | To Wil          | 1000       |         |          |  |          |      |
| Project Name:                                      | Creek Section  | 8<br>2<br>3               | Comments Limit  |            | ot .    | Comments | 2  | Comments |      |

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Depth of Contamnation (A)
Groundwater (B)
Confining Layer (C)
None (N), Light (L), Moderate (M), Strong (S)
PID readouts in ppm above background
ND = No Detection

8 B

Creek Section
2 74.50 SC. SC. SC. Enbridge Backfill Approval EPA 9-17-10 48-hour Follow-up inspection Observations and Time (If Applicable) Completed By: CiZiC Sitter Date: 0/15/10 Time of Trench Excevation 5-hour Follow-up inspection. Observations and Time (if Applicable) P-17-10 Time of Test Pit ä Sheen Test
Rainbow Sheen
Observed
ppm ري د . . . Marshall Line 68 MP608 Pipeline Release **(2)** > S N 1 22131003 NOTES - LXCAUATED USING MINI - EXCAUATED Odo Groundwater (8)
Confining tayer (C)
None (N), Light (L), Moderate (M), Strong (S)
PID readouts in ppm above background
ND = No Detection (2) Free Phase Oil Observed Depth of Contamination (A) Photo (D Method Used to Indicate Vertical Umit<sup>3</sup> <u>°</u> Project Number: Project Name: 3 Photo ID 97-48

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8840K to 88+50R One pit will be used for test pit and observetion pit and Enbridge Backfill Approvat EPA 48-hour Follow-up Inspection Observations and Time (if Applicable) Completed By: NGPTime of Tranch Excavation 080° che 6-hour Follow-up inspection. Observations and Time (if Applicable) bredonet Dil No sheen Test Pit ( ) ( ) × | ( ) ( ) mdd Sheen Test Rainbow Sheen Observed X 54+88 22131003 Odor Free Phase Oil Observed (<u>2</u> Sample taken near to grimbwhy. 1 6 8 3 3 A Method
Used to
Indicate Photo ID
Vertical
Limit<sup>1</sup> roject Number: Photo 1D

Depth of Contamination (A)
Groundwater (B)
Confluing Layer (C)
None (N), tight (L), Moderate (M), Strong (S)
PID readous in ppm above background
ND = No Detection

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Creek Section

Marshall Line 68 MP608 Pipeline Release

roject Name:

98400K De MSEd For Het pir and observation - Dura Enbridge **Creek Section** Sackfill Approval 人 及 ΕPA 48-bour Follow-up Inspection Observations and Time (If Applicable) 10900 of Filestock Completed By: NGP Time of Trench Excavation No oder One pit will 6-hour Follow-up inspaction Observations and Time (If Applicable) (1) Molmis " (1) C. 7 Dawass. Time of Test Pit Sheen Test Headspace<sup>3</sup>
Rainbow Sheen Pppm
Observed Marshall Line 68 MP608 Pipeline Release 48475R 22131003 Çopo, toker neur Frae Phase OII Observed 120 6 AC > grand 4060 - 80 Method Used to indicate Photo iD Vertical Umit<sup>2</sup> SAMOR roject Number: roject Name: Photo ID # **S** 

Groundwater (8)
Confining Layer (C)
None (4), Light (L), Moderate (M), Strong (S)
PID readouts in ppm above background
ND = No Detection

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Depth of Contamination (A)

89+006 Same been excavabed Enbridge Backfill Approval 21/2 777 EPA 48-hour Follow-up Inspection Observations and Time (If Applicable) 100011 Supply balen near 89+25R. No shear. No odor. Test pit duy is area that appeared 0910 onepit Diffelland Completed By: NOP Time of Trench Excevetion 6-hour Follow-up inspection Observations and Time (If Applicable) (31 Ms) v (3) 1,3 091000cp, - Westert Time of Test Pit Headspace<sup>3</sup> ωdd Sheen Test Rainbow Sheen Observed 22131003 Odor<sup>2</sup> **②** Free Phase OB Observed @ 1 CO 114 Photo 10 Method Used to Indicate Vertical Umit<sup>3</sup> Pradionally 'roject Number: Photo ID

Confining Layer (C)
None (N), Light (E), Moderate (M), Strong (S)
PID readouts in ppm above background
ND = No Detection

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Depth of Contamination (A) Groundwater (B)

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Creek Section 89+5C

Date: 9/15/10

Marshall Line 68 MP608 Pipeline Release

roject Name:

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87+50R to 90+00K Enbridge **Creek Section** Backfill Approval A EPA ground water. 48-hour Follow-up Inspection Observations and Time (If Applicable) Completed By: NGP 89+75R. No Sheen, No odor. Test/Observation pix day to Date: 9/15/10 Time of Trench Excavation 1200 873p 6-hour Follow-up inspection. Observations and Time (If Applicable) @ 0.4 09230m = 1/athe Time of Test Pit Sheen test Headspace Tainbow Sheen ppm T Marshall Line 6B MP608 Pipeline Release λ SW 1 QQ 22131003 ogo, (Z) Free Phase Oil Observed Nest > Sample Faken B c 0930 Photo ID Method Used to Indicate Vertical Umit<sup>1</sup> 'roject Number: 'roject Name: Photo (D

Depth of Contamination (4)
Groundwater (8)
Confining Layer (8)
Confining Layer (1), Moderate (M), Strong (5)
PID readouts in ppm above background
ND × No Detection

(2)

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90+60R to 90+50 R 10+OCK Enbridge **Creek Section** Backfill Approval point mean EPA to ground water out on a Time of Trench 48-hour Follow-up Inspection Observations and Time Excavation Completed By: NOP Date: 9/15/10 0936 61 6-hour Follow-up Inspection Observations and Time (If Applicable) JAM5 90+00 R-Stallen, Test/observation pit (N) (1) | N | Y | S | O 436 (2) Time of Test Pit Sheen Test Headspace<sup>3</sup>
Rainbow Sheen Ppm
Observed Marshall Line 6B MP608 Pipeline Release 22131003 Odor<sup>2</sup> Free Phase Oil Observed ر ر ر > Ta Kess Photo ID 4 4 60 3 a 6 Method Used to Indicate Vertical Umit 50mp Project Number: Project Name: Photo ID Notes:

Depth of Contamination (A) 3

Groundwater (8)
Confining Layer (C)
None (N), Light (!), Moderate (M), Strong (5)
PID readoust in ppm above background
ND = No Detection 3 3

90+50Rto 91+00R Enbridge **Creek Section** Backfill Approval down to ground water Nosheer. No oder EPA Time of Trench 48-hour Follow-up Inspection Observations and Time Excavation (If Applicable) Completed By: NOP Date: 9/15/10 0360 6-hour Follow-up Inspection Observations and Time (If Applicable) Sheer Sample Faken near 90+75R Station. Tool git duy V (N) (M 1 M s V (N) 1, 6 O450 6/2, Sheen Test Headspace TIme of Coserved Ppm Test Plt Marshall Line 68 MP608 Pipeline Release 22131003 27593 Odor Free Phase Oil Observed Method
Used to
Indicate Photo ID
Vertical
Umit<sup>1</sup> 75600 B Project Number: Project Name: Photo 1D Notes:

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Depth of Contamination (A)
Groundwater (B)
Confining Layer (C)
None (N), Light (L), Moderate (M), Strong (S)
PID readouts in ppm above background
ND = No Detection <u>3</u>

9/14/10

48-hour Follow-up Inspection Observations and Time (if Applicable) Excavation Time of Trench 6-hour Follow-up Inspection Observations and Time (If Applicable) Roger Bech Headspace | Time of Test Pit Date: Completed By: шdd Rainbow Sheen Observed Sheen Test Odor2 Marshall Line 68 MP608 Pipeline Release Free Phase Oif Observed 22131003 Method Used to indicate Vertical Umit<sup>1</sup>

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1200

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Photo (D

Creek Section

Project Number: Project Name.

Enbridge

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Backfill Approval

| also be OP,                                     | = 1 0 wilds 1 1 0 1739 12 12 10 10 000 000 000 000 000 000 000 | 6   V @ @1   W   1735   WES   MED 2.756 M |
|---|--|---|
| Comments Navord andwalled of FILLED 9/19/10 CJS |  |   |

Depth of Contamination (A)

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Groundwater (8)

Confining Layer (C)

None (N), Light (L), Moderate (M), Strong (S)
PID readouts in ppm above background
ND = No Detection