Enbridge Line 6B MP 608 Pipeline Release
Marshall, Michigan
Source Contamination Removal and Verification Summary Report
Talmadge Creek Section Alpha
Stationing 00+00R to 00-50R

Enbridge Energy
September 25, 2010

Talmadge Creek Source Contamination Removal and Verification Summary Report

Section Alpha – Stationing (00+00R to 00-50R)

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 Alpha (Stationing right bank of Talmadge Creek: 00+00R to 00-50R).

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 4 as described in the table below.

Section Number	Stationing
Alpha	Right Bank: 00+00R to 00-50R

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 435 - 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.

A deviation from the above noted methods was also established. This deviation is noted as "Special Condition EPA Approval" in this report, and was established because no EPA methods were applicable for certain clearance areas due to site specific conditions. EPA approval was obtained for each clearance area where a special condition was encountered.

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;
- 1,3,5-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 1321-5-10-001) pursuant to §311(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 435 (for Method A);
    - Photoionization detector (PID) headspace (for Method A);
    - 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.

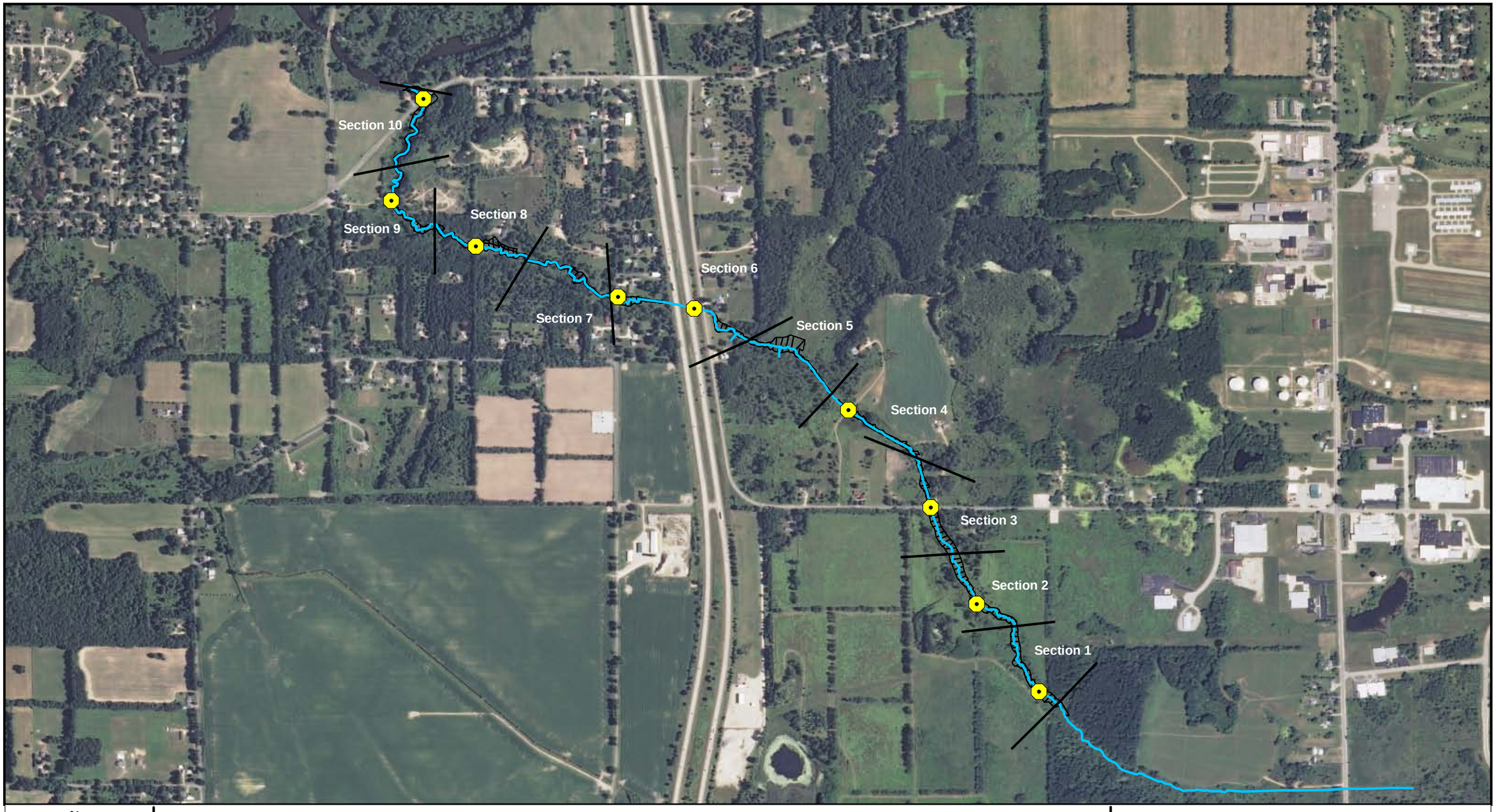
Table

Talmadge Creek Source Contamination Removal and Verification Summary Table: Section Alpha

Division	Section Number	Station Number	Creek Bank (L/R)	Final EPA Clearance Method (A, B, C)	Free Oil Observed (Y/N)	Odor (Y/N)	40 CFR Sheen Test Sheen Observed (Y/N)	PID Headspace (ppm)	Installation Date of 6-hour Test Pit	Installation Time of 6-hour Test Pit	Method A 6-hour Test Pit EPA Representative Sign-off (Y/N)	Installation Date of 48-hour Observation Trench/Pit	Installation Time of 48-hour Observation Trench/Pit	48-hour Observation Completed (Y/N)
A4	α	00+00R - 00-50R	R	Special Condition EPA Approval								9/23/2010	NR	Y

See endnotes for description of notations

Figures



N

0 500 1,000 Feet

Legend

- Culverts
- Section Lines
- Talmadge Creek

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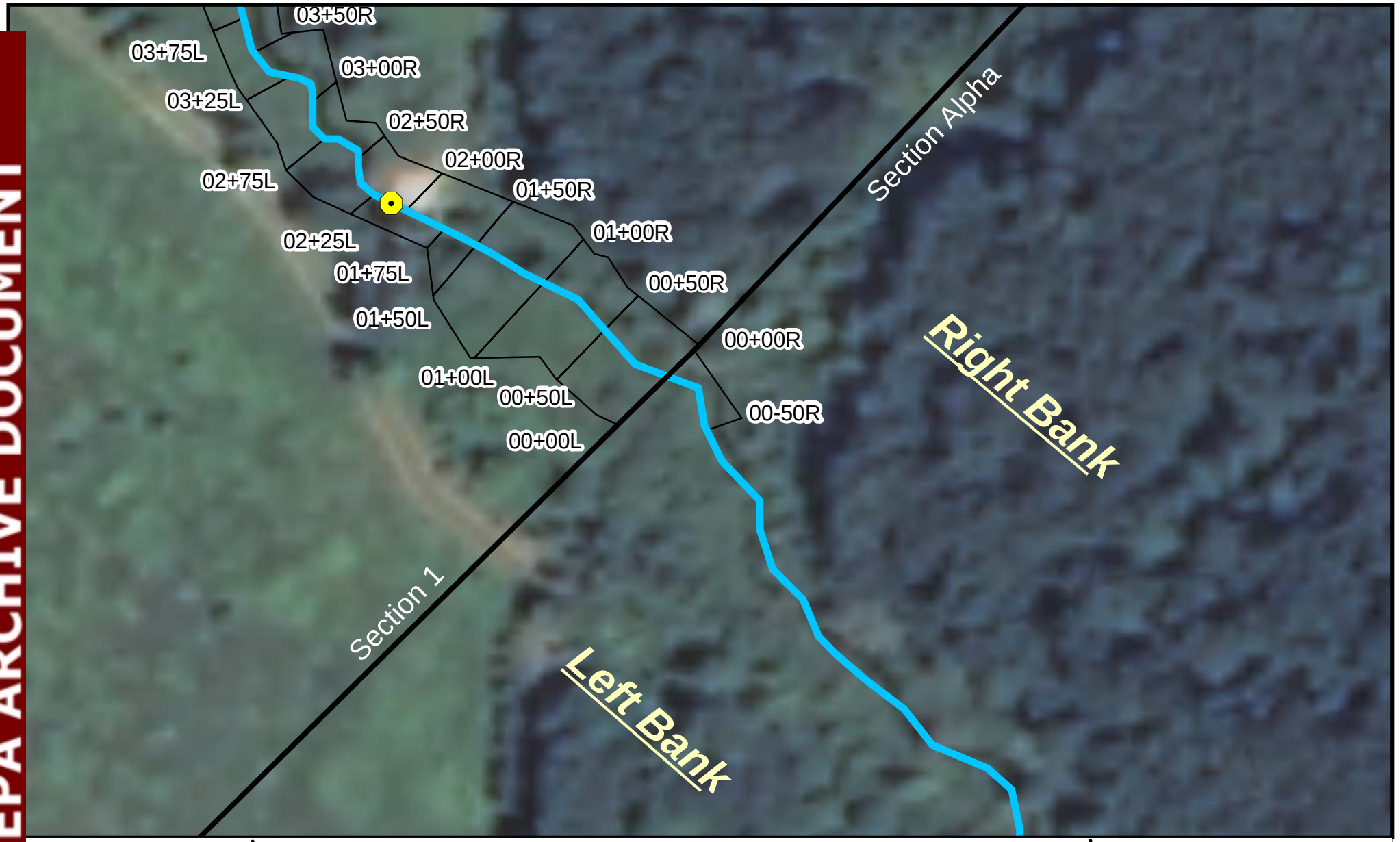
FIGURE 1
OVERALL SECTION LOCATION MAP
LINE 6B MP 608
MARSHALL, MICHIGAN



N

0 55 110 Feet

Legend

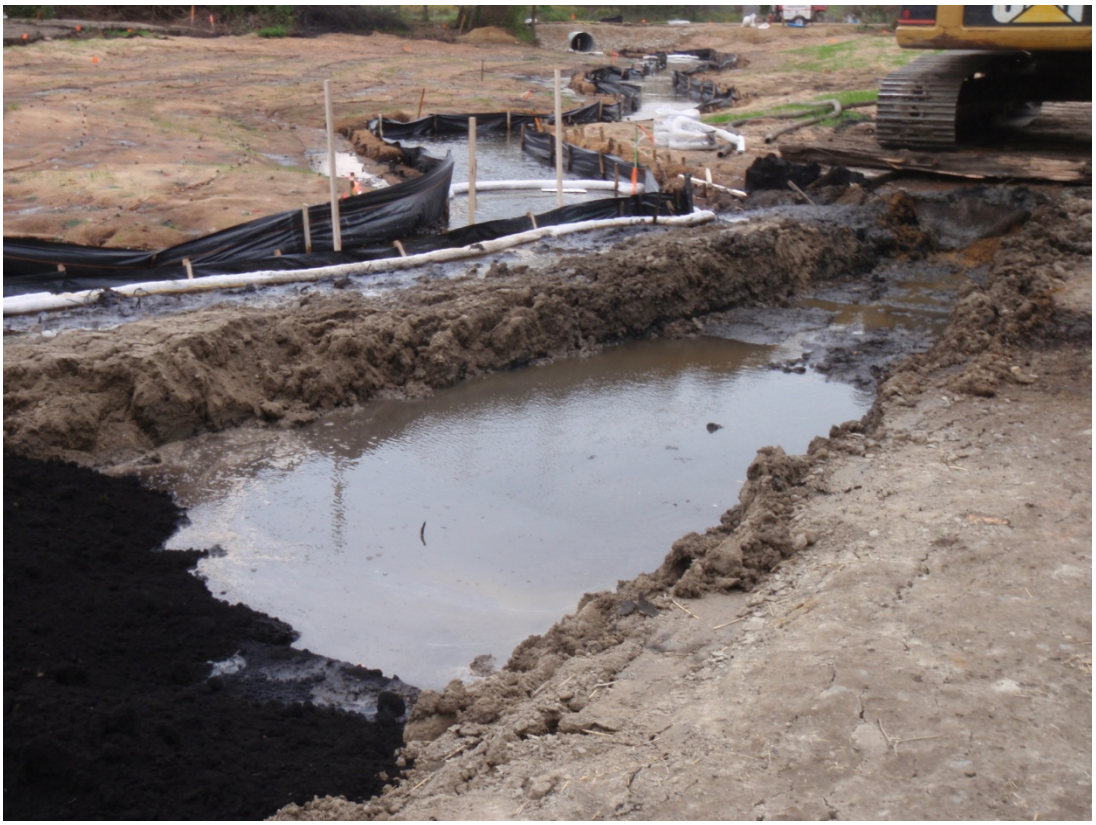
- Culverts
- Section Lines
- Talmadge Creek
- 01+00L Environmental Clearance Areas

SEPTEMBER, 2010

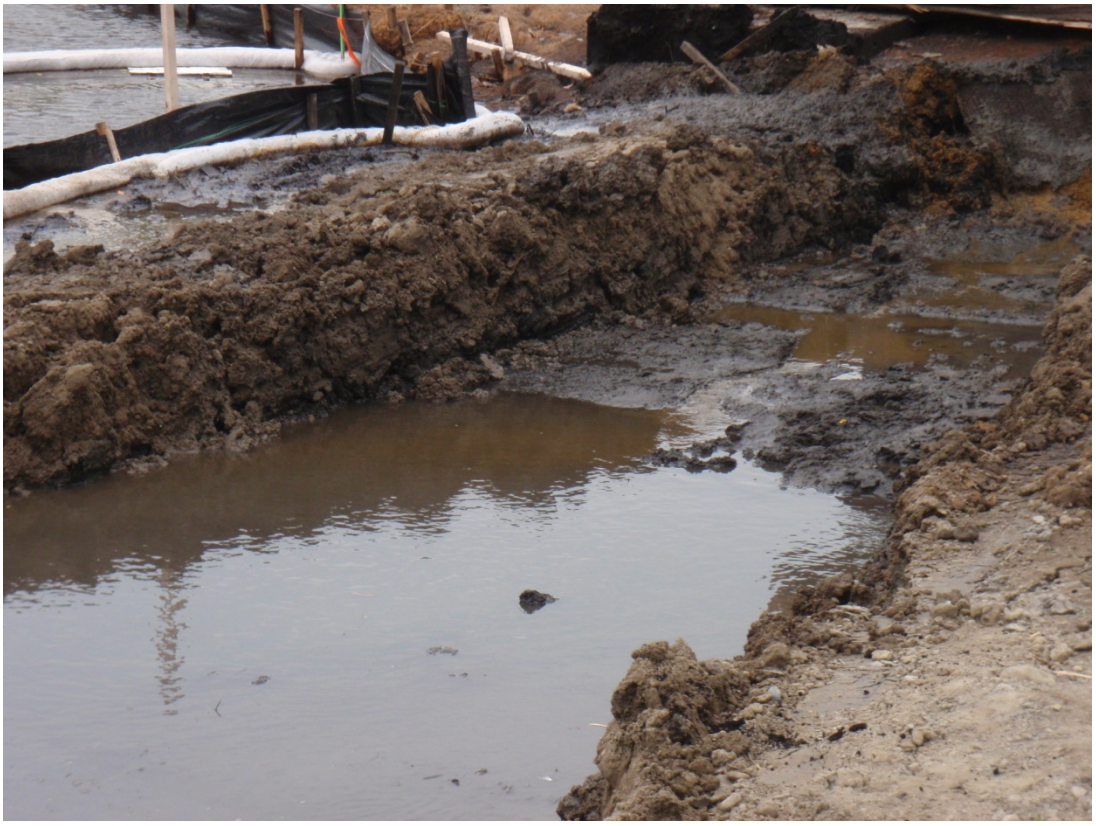
FIGURE 2
SECTION ALPHA
STATION LOCATIONS
TALMADGE CREEK
LINE 6B MP 608
MARSHALL, MICHIGAN

Field Photographs

Field Photographs – Section Alpha



00-50R – 00+00R: Looking downstream (September 25, 2010)



00-50R – 00+00R: Looking at test pit (September 25, 2010)

Field Notes

Project Name: Marshall Line 6B MP608 Pipeline Release

Project Number: 22131003

Date: 9/23/10

Completed By: NGP

Creek Section: 0+00R to 0-50R

Photo ID	Method Used to Indicate Vertical Limit[1]	Photo ID	Free Phase Oil Observed	Odor[2]	Sheen Test Rainbow Sheen Observed	Headspace[3] ppm	Time of Test Pit	6-hour Follow-up Inspection Observations and Time (If Applicable)	Time of Trench Excavation	48-hour Follow-up Inspection Observations and Time (If Applicable)	Backfill Approval	
											EPA	Enbridge
	A (B) C	0923	Y (N)	(N) L M S	Y (N)	—	—	NA	—	NA		

Notes: Started excavation at 1441 in area 0+00 to 0-50R in A4. PRAS-049 sample stake was removed for excavation. No sheen test was conducted prior to excavation. No visible free phase oil was presents. The section was taken down to groundwater between the clay berm and silt fence. 1548 product was identified in the excavation at the 0+00 to 0-25R area coming from the creek bank under the silt fence. Vac truck was brought in to start removing product from the excavation area. Steve Rankin gave approval to move the silt fence out in the creek, install a clay berm and remove the existing silt fence. 1647 - started removing contaminated silt with Vac truck in the creek side of the silt fence. 1921 removed the contaminated area. 2100 replaced clay on creek bank to stabilize the flow. 2153 - Due to expected overnight storms all JFNew, Weston and AECOM agreed to backfill the entire section with clay. This was intended to stabilize the area until such time that the proper back fill procedures can be taken.

9/24/10 0800 - started removal of area 0+00 - 0-50R down to ground water. 0858 - Took an extra 6 inches out of the area. (Photos #1 0923) - (0924 Photo #2): Both Photos of 0+00 - 0-50R once filling started. Photos taken looking west. 0916 Backfill approved by Weston. Area was backfilled up to clay berm. 1042 the area between the silt fence and clay berm was removed. 1115 Started removal of clay berm containment wall. JFNew completed backfill operations in the area.

D. Mallock

(1) Depth of Contamination (A)
Groundwater (B)
Confining Layer (C)

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

(3) PID readouts in ppm above background
ND = No Detection