

US EPA ARCHIVE DOCUMENT

U.S. ENVIRONMENTAL PROTECTION AGENCY  
POLLUTION/SITUATION REPORT  
Kalamazoo River/Enbridge Spill - Removal POLREP-SITREP



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
Region V



**Subject:** SITREP #19  
Kalamazoo River/Enbridge Spill  
Z5JS  
Marshall, MI  
Latitude: 42.2395273 Longitude: -84.9662018

**To:** Lt. Paul Baker, Kalamazoo County Sheriff's Office  
James Rutherford, Calhoun County Public Health  
Durk Dunham, Calhoun County Emergency Management  
F/LT Bonnie Kanicki-Wilson, Michigan State Police, Emergency Mgt.  
Gregory Danneffel, MDNRE

Mike McKenzie, City of Battle Creek  
 Leon Zupan, Enbridge  
 Susan Hedman, U.S. EPA Regional Administrator  
 Rebecca Humphries, MDNRE  
 Jim Sygo, MDNRE  
 Connie Gibson, Calhoun County Sheriffs Office  
 Cheryl Vosburg, City of Marshall  
 David Chung, U.S. EPA  
 Jason El-Zein, U.S. EPA  
 Duty Officer, NRC  
 Michael Chezik, U.S. Department of Interior  
 Linda Nachowicz, U.S. EPA  
 OSLTF USCG, USCG  
 Jill Slaght, 7th District of Michigan  
 Ken Brock, 7th District of Michigan  
 Bruce Vanotteren, MDNRE  
 Brian Pierzina, PHMSA Central Region  
 Thomas Hemminger, USCG Grand Haven  
 Ronna Beckmann, U.S. EPA  
 CAPT Stephen Torpey, USCG  
 Scott Corbin, Allegan County EMA Director

**From:** Ralph Dollhopf, U.S. EPA Incident Commander  
 Stephen Wolfe, U.S. EPA On-Scene Coordinator  
 Jeffrey Kimble, U.S. EPA Deputy Incident Commander  
 Mark Durno, U.S. EPA Deputy Incident Commander

**Date:** 08/13/10

**Reporting Period:** 1900 hours 08/12/10 to 1900 hours 08/13/10

**1. Introduction**

**1.1 Background**

**1.1.1 Site History**

**Background Information**

<b>Site Number:</b> Z5JS	<b>Contract Number:</b>
<b>D.O. Number:</b>	<b>Action Memo Date:</b>
<b>Response Authority:</b> OPA	<b>Response Type:</b> Emergency
<b>Response Lead:</b> PRP	<b>Incident Category:</b> Removal Assessment
<b>NPL Status:</b> Non NPL	<b>Operable Unit:</b>
<b>Mobilization Date:</b> 7/26/2010	<b>Start Date:</b> 7/26/2010
<b>Demob Date:</b>	<b>Completion Date:</b>
<b>CERCLIS ID:</b>	<b>RCRIS ID:</b>
<b>ERNS No.:</b>	<b>State Notification:</b>
<b>FPN#:</b> E10527	<b>Reimbursable Account</b>

### **1.1.2 Incident Category**

Emergency Response -- Pipeline Rupture

### **1.1.3 Site Description**

A 30-inch pipeline ruptured, releasing crude oil (NRC report of 19,500 barrels) into a culvert leading to Talmadge Creek. Talmadge Creek is a tributary to the Kalamazoo River. The response site is along Talmadge Creek and the Kalamazoo River running from Marshall, Michigan, to downstream of Battle Creek, Michigan. The Kalamazoo River is bordered by marshland and developed properties for the approximate 30-mile stretch of the response site.

### **1.1.4 Preliminary Removal Assessment/Removal Site Inspection Results**

Approximately 30 miles of the Kalamazoo River have been impacted. The Kalamazoo River experienced flooding before and after the spill. The river levels have fallen and stranded oil in some backwaters and wetlands. Talmadge Creek has been boomed off at the confluence to the Kalamazoo River. Containment and absorbent boom has been deployed along the Kalamazoo River and Talmadge Creek. Containment and absorbent boom have also been deployed in Morrow Lake.

### **1.1.5 Enforcement Activities, Identity of Potentially Responsible Parties**

Enbridge is the RP.

On July 27, 2010, EPA issued an Administrative Order under section 311(c) of the Clean Water Act to Enbridge. Enbridge is actively addressing all the deliverables of the Order including but not limited to: drafting an overall site work plan; health and safety plan; and sampling and analysis plan.

## **1.2 Incident Objectives and Command Emphasis**

### **Incident Objectives**

- 1) Ensure health and safety of the public and response & recovery personnel.
- 2) Maintain the isolation of Talmadge Creek and Kalamazoo River from the source area.
- 3) Contain and recover oil and contaminated vegetation in Talmadge Creek and Kalamazoo River.
- 4) Maintain effective unified communications with cooperating & assisting agencies and the public.
- 5) Perform remediation & restoration of all affected public & private areas of river & river systems.
- 6) Provide protection of environmentally and culturally sensitive areas including wildlife and historic properties.

- 7) Identify threatened species & continue to recover & rehabilitate injured wildlife.
- 8) Maintain Joint Information Center function.
- 9) Continue to collect, coordinate, manage and communicate environmental and public health data.
- 10) Obtain input from multi-agency Science Team to help establish protocols to guide cleanup of environmentally impacted areas.

### **Command Emphasis**

- 1) Enbridge to assume primary responsibility for planning cycle and IAP development by 8/16/10
  - Continue transition of EPA logistics/procurement functions to Enbridge;
  - Continue transition of IAP development from EPA to Enbridge; and
  - Monitor effectiveness of IAP briefing and use by Operations.
- 2) Concentrate resources for river, shore, and floodplain cleanup and sheen management in Division C.
- 3) Review SCAT recommendations with Science Team, with emphasis on Talmadge Creek and Division C, to coordinate near term cleanup effort.
- 4) Continue efforts to remove oil and contaminated soil from pipeline release zone.
- 5) Maintain continuous comprehensive on-water/analytical sheen monitoring, sediment investigation, reporting and recovery at Morrow Lake.
- 6) Continue to monitor overall effectiveness of community outreach.

### **1.3 Strategic Considerations**

- 1) Continue orderly shift of operational planning to Enbridge.
- 2) Continue systematic operational ramp-up in Division C.
- 3) Provide health agencies with final data for evacuation/relocation closure.

## **2. Current Activities**

### **2.1 Operations Section**

#### **2.1.1 Narrative**

The response site extends from the pipeline break to the dam at the end of Morrow Lake. The response has been divided into two branches: River Branch East and River Branch West. These branches have been geographically divided into five Divisions, A through E, with Division A starting at the pipeline break and Division E ending at the western edge of Morrow Lake (see attached figure). The East Branch includes Divisions A and B and the West Branch includes Divisions C, D and E. Each Division is further broken down into control points that are denoted by division letter then control point number (i.e. C3 refers to control point three within Division C).

## **Division A**

### **EPA**

EPA observed the completion of pipeline weld testing and recovery of water and oil from the excavated pipeline trench. EPA observed vacuum trucks removing residual oily water from the impacted wetland area. EPA observed bank excavation activities and the placement of contaminated soils onto staging pads prior to off-site disposal.

START collected Tedlar bag air samples in Division A.

U.S. EPA and START conducted air monitoring for VOCs, LEL, H<sub>2</sub>S, and benzene. The highest benzene reading reported was 0.1 ppm. U.S. EPA and START conducted turbidity monitoring in Talmadge Creek during bank excavation.

### **Enbridge**

Enbridge conducted oil collection at the release site with vacuum tankers and removed contaminated soil to the containment and disposal site. Enbridge continued implementation of the pipe cut-out and repair plan. Cleanup activities were conducted starting at Talmadge Creek and working downstream, scraping oiled vegetation and surface soils with an excavator in accordance with SCAT recommendations. Enbridge continued chipping and clearing activities and installed silt fence along Talmadge Creek.

## **Division B**

### **EPA**

EPA observed brush cutting and excavation work in Talmadge Creek between locations B2 and B3. EPA observed the placement of additional swamp mats for access to Talmadge Creek. EPA observed skimming operations at locations B1.5, B2, B3, B4, B4.7 and B5, and noted that leaf blowers were being used to blow oil into the skimmer on an oiled pond in location B4. EPA observed boom and absorbent pad maintenance between locations B1.5 and B2, and observed oil being flushed out and collected in the wetland at location B3. Silt fences were installed along Talmadge Creek as necessary.

USCG observed skimming operations, boom maintenance, and shoreline flushing at locations B5, B4, B3, B2, B4.5 and B4.7.

### **Enbridge**

Enbridge continued oil collection at boom containment sites and replaced contaminated boom as required. Enbridge placed swamp mat roads along Talmadge Creek downstream of US Highway 69. Crews worked on scraping oiled bank vegetation and soil on Talmadge Creek up to the Kalamazoo River and placed material in a containment site, in accordance with SCAT recommendations. Enbridge installed silt fence along Talmadge

Creek as required. Enbridge crews created Staging Area 4 between 15 ½ Mile Road and the Kalamazoo River.

### **Division C**

#### **EPA**

EPA observed boom decontamination and maintenance at location C0. EPA observed oil skimming and/or vacuuming operations at locations C1 and C6. Heavy oil was observed at locations C1, C1.1, and C6. At location C6, EPA observed crews collecting oiled debris from the river. Between locations C0.5 and C1.1, EPA observed the cutting and bagging of oiled vegetation by crews in 20 boats and the installation of snare boom. At location C1.1, EPA observed crews cleaning the shoreline, and observed crews in 7 boats washing the shoreline on both sides of the river. Crews were replacing boom at location C2 and cleaning the shoreline from land between locations C4.1 and C6.

USCG observed skimming operations, boom maintenance, shoreline flushing and vegetation removal at locations C6, C5, C4, C3, C2, C1 and C0.5.

#### **Enbridge**

Enbridge did not provide an update on operations in Division C during this reporting period.

### **Division D**

#### **EPA**

EPA observed skimming and vacuuming operations, removal of oiled debris from the river and boom maintenance at locations D0.5, D1, D2, D2.5, D3 and D5. EPA observed a crew installing five Gabion boxes filled with sorbent boom at location D1. The purpose of the Gabion boxes is to attempt to collect any subsurface dispersed oil or particulates moving downstream. One of the boxes had to be inspected because it might have been damaged. EPA noted that the crew requested a larger boat with a winch to install and remove Gabion boxes.

#### **Enbridge**

Enbridge did not provide an update on operations in Division D during this reporting period.

## **Division E**

### **EPA**

EPA observed boom maintenance operations at locations E2.5, E3 and E4. EPA observed air curtain and silt curtain operations at location E4. Sheen was observed at the east end of Morrow Lake. EPA observed that skimmer boats were deployed to collect the sheen.

### **Enbridge**

Enbridge did not provide an update on operations in Division E during this reporting period.

#### Morrow Lake Task Force

Enbridge did not provide an update on Morrow Lake Task Force operations during this reporting period.

### **Branch Operations**

EPA, USCG and Enbridge Operations have a Monitoring Branch, Wildlife Branch and Air Ops Branch that conduct activities in all Divisions.

#### Monitoring Branch

### **EPA**

A total of 46 air samples were reported as being collected and sent to the laboratory for analysis.

The GLNPO Mudpuppy collected sediment and surface water samples at stations 4, 5, 7, and 8 at Morrow Lake. At station 5, sheen was observed in the sediment sample.

### **Enbridge**

Enbridge planned to collect approximately 34 surface water samples, 7 potable water samples, 1 sediment sample, 15 24-hour grab air samples, 17 air mini-summa samples, 4 air grab samples and 4 passive dosimeter samples. Enbridge continued focused air sampling around the Baker Estates trailer park. Real-time air monitoring for benzene and VOCs continued.

#### Wildlife Branch

USFWS worked with the Wildlife Branch to address oil-impacted wildlife. The wildlife center continued to receive oiled animals collected along the Kalamazoo River. There

are 218 animals in live care, the majority of which are Canada Geese and turtles. A total of 69 animals have been rehabilitated and released.

Air Ops Branch

Enbridge conducted two over flights of the river.

Special Operations

Enbridge provided volume estimates of the soils processed at the soil containment area. A draft summary report was prepared detailing Enbridge’s waste handling and disposal procedures for liquid and solid waste.

**Boom Report**

Number of Locations	41
Boom Deployed (feet)	183,566

Note: Since the transition of EPA’s contractor’s to Enbridge at 1900 hrs on 08/12/10, all boom is now controlled by Enbridge. The values above were reported by EPA.

**Waste Tracking**

Waste Stream	Quantity Shipped 8/12/2010*	Cumulative Quantity Shipped*
Soil <sup>1</sup>	1,144 yd <sup>3</sup>	4,104 yd <sup>3</sup>
Debris <sup>2</sup>	300 yd <sup>3</sup>	2,250 yd <sup>3</sup>
Untreated Water <sup>3</sup>	24,300 gallons	572,020 gallons**
Pre-treated Water <sup>4</sup>	142,700 gallons	683,100 gallons
Oily Water <sup>5</sup>	0 gallons	1,226,554 gallons

\* All values as reported by Enbridge.

\*\* The cumulative quantity for untreated water reflects revised totals for August 11, 2010.

1. Benzene-impacted soil is being sent to Envirosafe.
2. Roll-off boxes containing waste sorbents, boom, pads, plastic, PPE, and oiled vegetation and biomass are being sent to Michigan Disposal.
3. Untreated water (hazardous waste) is being sent to Dynecol.
4. Pre-treated water is being sent to the Battle Creek POTW.
5. Oily water is being sent to an RP facility in Griffith, Indiana.

**2.2 Planning Section**

The EU compiled comments from the Science Team on Enbridge’s revised *Source Area Remediation Plan* and *Remediation Plan for Downstream Impacted Areas* and delivered them to the EPA IC.

The EU presented an update of air, sediment, and surface water sampling to the UC.

The SCAT Team, with assistance from the ERT Alternative Countermeasures Expert, tested various oil cleaning methods for the shoreline in an impacted area of the Kalamazoo River. Enbridge and state representatives were present during the testing.

The DMU managed field and analytical data in the Scribe database, and added additional QA/QC measures to the database. The DMU established daily reporting queries of recently validated analytical data for the public website. The DMU added air sample results and operational data layers to the Google Earth file for display on the [www.epa.gov/enbridgespill/](http://www.epa.gov/enbridgespill/) website.

The Resource Unit completed the IAP for the Operational Period from August 14-15, 2010.

### **2.2.1 Anticipated Activities for Next Reporting Period**

In the next operational period, Operations anticipates performing the same activities as in the previous operational period.

### **2.2.2 Issues**

Replacement summa canisters for air sampling were deployed in multiple exposure units at 2300 hrs on August 12, 2010, due to regulator malfunction. The initial results from summa canister air samples deployed in Unit 10 and Unit 7 on August 11, 2010, indicate benzene levels less than 2 ppb; the results are being validated. The Public Health Unit continues to communicate with the EU about sample collection locations.

The Public Health Unit is working with Michigan Poison Control doctors and the Calhoun County Public Health Department medical officer to develop materials to assist local medical doctors in treating patients presenting with oil exposure related symptoms.

The MDCH Field Epidemiology Team conducted a health symptoms survey of the Squaw Creek community on August 12, 2010; surveys were completed at 70 of the approximately 120 homes in the community.

### **2.3 Logistics Section**

EPA Logistics met with Enbridge Logistics to evaluate new locations for the ICP, following the change in status of the State Farm/Mann Street location.

### **2.4 Finance Section**

The transition of EPA's four response contractors to Enbridge was completed at 1900 hrs on August 12, 2010.

The current NPFC issued ceiling (based on EPA requests) is \$11 million. Approximately 79 % of the ceiling has been spent through August 12, 2010, with a burn rate of \$297,568 per day. These cost summaries reflect only EPA expenditures for the incident.

	Est. Expended (\$)	Est. Burn Rate (\$)
EQM	1,267,393	20,000
LATA	1,451,396	0
ER LLC	819,692	0
ERRS Contractors	3,538,481	20,000
WESTON START	1,794,949	154,187
Federal & Other Agencies	2,360,971	123,381
Sub-Totals	7,694,401	297,568
Indirect Costs (12.6%)	969,495	37,494
Est Total Oil Spill	8,663,896	335,061

Note: Reported costs are through August 12, 2010.

### 2.5 Safety Officer

A worker in Division D, Staging Area 3, experience heat-related symptoms and an ambulance was dispatched to the site.

A worker at location B5 reported that he had developed heat rash over the past few days of work. The worker was given over-the-counter topical lotion from EMTs on site.

A worker in Division A was observed vomiting and experiencing dizziness. An ambulance was dispatched but no treatment provided. The worker was provided rest and was rotated to another position.

Four other incidents of heat stress were reported. This resulted in a 30-minute operational stand-down so that heat stress measures (e.g., signs and symptoms, work-rest cycles, hydration, etc.) could be reviewed with site personnel.

An airboat traveling at a slow speed flipped over on its side after the tail end made contact with part of a tree. No injuries resulted from the incident.

### 2.6 Liaison Officer

The LNO addressed Assisting and Cooperating Agency concerns about the transition from the emergency response phase to the remediation phase.

## 2.7 Information Officer

### 2.7.1 Public Information Officer

#### Oil Spill Response Hotline (888-363-8632)—Incoming Calls

<b>TOTAL CALLS:</b>	<b>3</b>
Calls were sent to:	
Enbridge	1
EPA	2

#### PIO Activities

A public meeting is scheduled for August 19, 2010, at the Kalamazoo County Expo Center/Fairgrounds located at 2900 Lake Street in Kalamazoo. The event will include an open house at 1800 hrs, public meeting at 1900 hrs, and an open house following the public meeting.

The [www.epa.gov/enbridgespill](http://www.epa.gov/enbridgespill) website was updated with new air, surface water and sediment data, and a new banner headline was added that better reflects the ongoing response.

## 2.9 Response Actions to Date

Recovery of oil and contaminated soil and debris continues. Containment boom, sorbent boom, skimming equipment, vacuum trucks and other equipment have been used to support oil collection and removal along Talmadge Creek and the Kalamazoo River. Contaminated soils are being excavated from Divisions A and B. Replacement of the damaged pipeline and stabilization of the excavation are progressing. Contaminated vegetation along the creek and river is being cleaned or removed to control sheen. Recovered materials are being handled on-site and prepared for off-site transport. Tanker trucks are transporting the recovered oil to a facility owned by the RP with available storage in Griffith, Indiana. Oil-contaminated soils and other materials are being transported off-site for disposal.

EPA, ERT, START and RP contractors, with the support of the ERT Mobile Lab and Michigan National Guard Civil Support Team, have monitored and sampled air quality along the river and throughout multiple residential areas. A heavy emphasis was placed on specific monitoring for benzene as it is a recognized contaminant of concern for this response.

Water samples were collected for analysis from surface water, river and lake water columns, and private drinking wells along the length of the impacted areas of the Kalamazoo River. Water samples also were collected downstream of the Morrow Lake Dam. Validated analytical sampling results are now being posted to the public incident website (<http://www.epa.gov/enbridgespill/data/datawater.html>).

Enbridge removed the affected area of pipe, followed the cut out/repair plan, and completed a pipe investigation (50 feet upstream and downstream of the cut points) on August 7, 2010. The affected length of pipe has been repaired but is not yet operational.

The voluntary evacuation issued by CCPH in consultation with MDCH and ATSDR remains in effect for several residences located immediately downstream of the spill site along Talmadge Creek, up to its confluence with the Kalamazoo River. This voluntary evacuation was based on review of air monitoring results for benzene around oil collection areas. Air monitoring and sampling of the affected area is being conducted to determine when re-occupancy can occur, in accordance with the re-occupancy strategy approved by the UC.

A Contingency Plan for Morrow Lake has been developed in case oil moves past the lake.

EPA has disapproved the following plans submitted by Enbridge: *Remediation Plan for Downstream Impacted Areas*, *Source Area Remediation Plan*, *Quality Assurance Project Plan* and *Sampling and Analysis Plan*. Revised versions of the plans submitted by Enbridge are under review.

**3. Participating Entities**

**3.1 Unified Command**

U.S. EPA	Calhoun County Public Health Department
MDNRE	Calhoun County Emergency Management
Michigan State Police Emergency Management Division	Kalamazoo County Sheriff
City of Battle Creek	Enbridge (Responsible Party)

**3.2 Cooperating and Assisting Agencies**

**Cooperating Agencies**

51 <sup>st</sup> Civil Support Team Michigan National Guard	Calhoun County Commission
ATSDR	City of Kalamazoo
Allegan County Emergency Management	City of Marshall
American Red Cross	Emmett Township
Calhoun Conservation District	Federal Energy Regulatory Commission
	Fredonia Township

Kalamazoo County Office of Emergency Management  
 Kalamazoo River Watershed Council  
 Marshall Area Firefighters Ambulance Authority  
 Marshall Police Department  
 Marshall Township Government and Fire Department  
 Michigan Department of Agriculture  
 MDCH  
 MIOSHA

National Transportation Safety Board  
 Natural Resource Group  
 NOAA  
 Oakland County HAZMAT  
 OSHA  
 PHMSA  
 USCG  
 U.S. Department of the Interior/USGS  
 USFWS

**Congressional Presence**

State Representative Jase Bolger  
 State Representative Kate Segal  
 State Representative Ken Kurtz  
 State Representative Phil Browne  
 State Representative Phyllis Browne  
 State Representative Bob Geuck

State Representative Tanya Schuitmaker  
 State Senator Mike Nofs  
 U.S. Congressman Mark Schauer  
 U.S. Senator Carl Levin  
 U.S. Senator Debbie Stabenow

**4. Personnel On Site**

<b>Personnel</b>	<b>Numbers reported for 8/12/2010</b>
EPA	62
MDNRE	27
Michigan State Police	16
City of Battle Creek	2
CCPH	3
Calhoun County Sheriff	13
Kalamazoo County Sheriff	2
USCG	15
USFWS	13
ERRS	108
START	105
Enbridge	34
Enbridge Contractors	948
<b>Total</b>	<b>1348</b>

## 5. Definition of Terms

ATSDR	Agency for Toxic Substances and Disease Registry
CCPH	Calhoun County Public Health
CIC	Community Involvement Coordinator
DMU	Data Management Unit
EMT	Emergency Medical Technician
EPA	Environmental Protection Agency
ERRS	Emergency and Rapid Response Services
ERT	Emergency Response Team
EU	Environmental Unit
GLNPO	Great Lakes National Program Office
H <sub>2</sub> S	Hydrogen Sulfide
HASP	Health and Safety Plan
IAP	Incident Action Plan
ICP	Incident Command Post
JIC	Joint Information Center
LEL	Lower Explosive Limit
LNO	Liaison Officer
LSC	Logistics Section Chief
MDCH	Michigan Department of Community Health
MDNRE	Michigan Department of Natural Resources and Environment
MI	Michigan
MIOSHA	Michigan Occupational Safety and Health Administration
NRC	National Response Center
NOAA	National Oceanic and Atmospheric Administration
NPFC	National Pollution Fund Center
OSHA	Occupational Safety and Health Administration
PHMSA	Pipeline and Hazardous Materials Administration
PIO	Public Information Officer
PPE	Personal Protective Equipment
ppm	Parts Per Million
POTW	Publicly Owned Treatment Works
RP	Responsible Party
SCAT	Shoreline Contamination Assessment Team
START	Superfund Technical Assessment and Response Team
UC	Unified Command
USCG	United States Coast Guard
USDOT	United States Department of Transportation
U.S. EPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
yd <sup>3</sup>	Cubic Yards
VOCs	Volatile Organic Compounds

## **6.0 Source of Additional Information**

### **6.1 Additional Information**

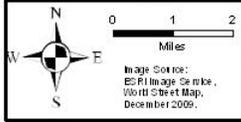
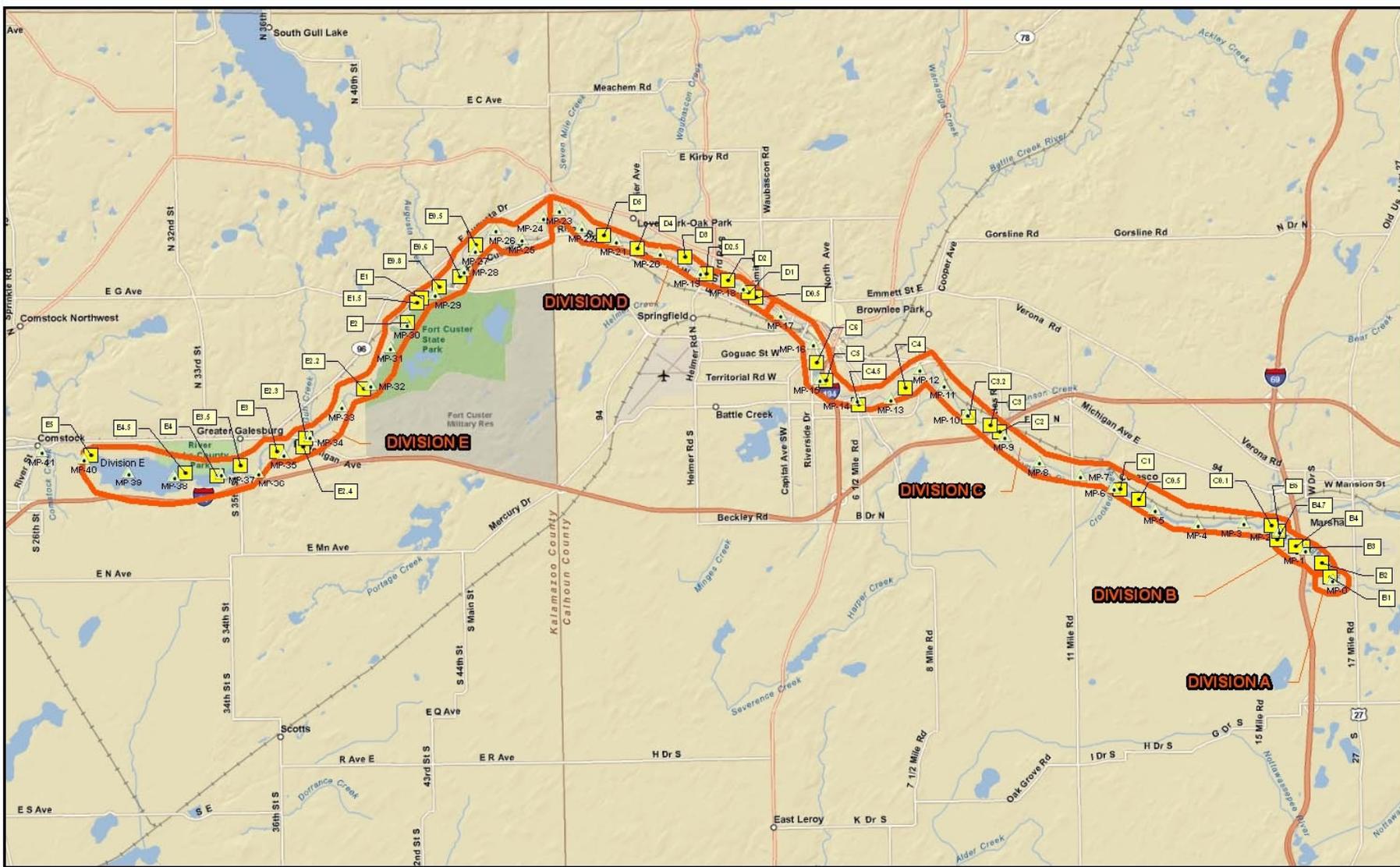
For additional information please refer to <http://www.epa.gov/enbridgespill.html>. For sampling analysis data, please see <http://www.epa.gov/enbridgespill/data/datawater.html>

### **6.2 Reporting Schedule**

SITREPs have been created daily and will continue until the UC establishes a different reporting schedule.

### **7.0 Situational Reference Materials**

See attached “Overview Map with Boom Locations and Divisions” map for more information.



- River Miles
- Boom Locations
- Division Boundary

**FOR OFFICIAL  
USE ONLY**

Prepared for:  
U.S. EPA REGION V  
Contract No.: EP-S5-06-04  
TDD: S05-0005-1007-030  
DCN: 1154-4D-AHMS



Prepared by:  
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Okemos, MI

OVERVIEW MAP WITH BOOM LOCATIONS AND DIVISIONS  
ENBRIDGE PIPELINE OIL SPILL  
MARSHALL, KALAMAZOO AND CALHOUN COUNTIES, MICHIGAN  
CREATED: AUGUST 13, 2010

File: V:\01-1.5\planning\epa\_share\gis\_data\Marshall\_Oil\_ER\GISMXD\0100813\Boom\_Locations\_Overview\_11X17\_20100813.mxd, 13-Aug-10 03:46, Dell