Approved

Enbridge Line 6B MP 608
Marshall, MI Pipeline Release

Remedial Investigation Work Plan for
Kalamazoo River (MP 11.00 to Morrow Lake Dam)

Prepared for Michigan Department of Environmental Quality

Enbridge Energy, Limited Partnership

Originally Submitted: February 7, 2012

Approved: March 8, 2012

Approved

Approved

FIGURES

Approved

LIST OF ACRONYMS

COC	Chain of Custody
Enbridge	Enbridge Energy, Limited Partnership
DRO	Diesel Range Organics
GRO	Gasoline Range Organics
GPS	Global Positioning System
I	Island
LDB	Left Descending Bank
Line 6B	The pipeline owned by Enbridge Energy, Limited Partnership that runs just south of Marshall, Michigan
MDEQ	Michigan Department of Environmental Quality
MDEQ Order	Administrative Consent Order and Partial Settlement Agreement entered *In the Matter of Enbridge Energy Partners, L.P., and Enbridge Energy, Limited Partnership*, proceedings under the Michigan Natural Resources and Environmental Protection Act, 1994 PA 451, as amended, MCL 324.101 et seq. signed November 1, 2010
MP	Mile Post
NFA	No Further Action
ORO	Oil Range Organics
OSCAR	Outstanding Site Characterization and Reconciliation
Part 201	Part 201 of Michigan's Act 451 of 1994 as amended
PNAs	Polynuclear Aromatic Hydrocarbons
PVC	Polyvinyl Chloride
QAPP	Quality Assurance Project Plan
RDB	Right Descending Bank
RI	Remedial Investigation
SCAT	Shoreline Cleanup Assessment Technique
SOP	Standard Operating Procedure
SORT	Shoreline and Overbank Reassessment Technique
TPH	Total Petroleum Hydrocarbons
USCS	Unified Soil Classification System
U.S. EPA	United States Environmental Protection Agency
UV	Ultraviolet
VOCs	Volatile Organic Compounds

Approved

1.0 INTRODUCTION

On July 26, 2010, Enbridge Energy, Limited Partnership (Enbridge) discovered a release of crude oil from the pipeline owned by Enbridge that runs just south of Marshall, Michigan (Line 6B) in the vicinity of its pump station. The crude oil was released below grade level via a break in Line 6B, emerged onto the ground surface, flowed over land following the natural topography downhill and into Talmadge Creek, and proceeded to flow downstream into the Kalamazoo River. Following the release, Enbridge performed response activities under the direction of the United States Environmental Protection Agency (U.S. EPA) and the Michigan Department of Environmental Quality (MDEQ) to remove oil from the system and respond to the release.

During the Spring of 2011, as a continuation of the response activities, Shoreline and Overbank Reassessment Technique (SORT) teams surveyed the shoreline and overbank of Talmadge Creek and the Kalamazoo River by boat and/or foot to visually identify the degree and characteristics of surface conditions and delineated the impacts by creating polygons, lines, or points utilizing a Global Positioning System (GPS) unit with sub-meter accuracy. Cleanup of some of these sites was completed throughout Summer 2011 using approved toolbox methods.

This Remedial Investigation (RI) work plan has been developed to encompass the overbank area of the Kalamazoo River from Mile Post (MP) 11.00 to Morrow Lake Dam (approximately MP 39.90) (*Figure 1*). The purpose of this work plan is to describe the general procedures to be used to complete the characterization of all potentially impacted media including soil, sediment, surface water, and groundwater quality of all overbank areas within the inundation boundary representing all areas potentially affected by the Line 6B release. This area includes remaining SORT locations, previously uninvestigated Shoreline Cleanup Assessment Technique (SCAT) locations, unverified excavation/oil removal areas, overbank locations adjacent to nearshore submerged oil areas, and locations within the inundation model line adjacent to this section of the Kalamazoo River. Information obtained from these activities will be used to prepare a remedial investigation report for the Kalamazoo River from MP 11.00 to Morrow Lake Dam. This report will compare analytical results to Part 201 of Michigan's Act 451 of 1994, as amended (Part 201) Cleanup Criteria, and propose additional investigation and/or response activities as necessary.

Existing information used for the development of this work plan included:

- Information obtained during implementation of the RI work plans for upstream sections of the Kalamazoo River (Enbridge, 2011a, 2012a, and 2012b) including refinement of the sampling methods and procedures,
- SCAT activities that were performed in and along the Kalamazoo River in 2010,
- 2010 and 2011 response activities that were performed in and along the Kalamazoo River,
- SORT 2011 and Outstanding Site Characterization and Reconciliation (OSCAR) activities, and
- Information contained in the *Conceptual Site Model* (Enbridge, 2011b).

The proposed investigation activities in this work plan are being performed for the MDEQ under the Administrative Consent Order and Partial Settlement Agreement entered *In the Matter of Enbridge Energy Partners, L.P., and Enbridge Energy, Limited Partnership*, proceedings under the Michigan Natural Resources and Environmental Protection Act, 1994 PA 451, as amended, MCL 324.101 et seq. signed November 1, 2010 (MDEQ Order).

1.1 Objective

The objective of this work plan is to gather sufficient information to complete the definition of the nature and extent of remaining petroleum impacts from the release of crude oil from Line 6B. Information collected will be used to identify exposure pathways, evaluate the risk to human health and the environment posed by remaining residual oil impact in this section of the overbank area, assist in the characterization and evaluation of the ecological sensitivity of this section of the Kalamazoo River, and assess compliance with Part 201 rules and regulations.

1.2 Remedial Investigation Field Approach

Implementation of the RI will be completed on the Left Descending and Right Descending Banks (LDB and RDB, respectively) and Islands (I) of the Kalamazoo River, from MP 11.00 to Morrow Lake Dam. Work components in the field will include the following tasks:

- Use of GPS to locate pre-determined sample locations,
- Visual identification and location of remaining residual oil impact (i.e., tar patties, staining, etc.),

- Drilling of soil borings at pre-determined and field-selected locations,
- Installation and development of temporary monitoring wells,
- Collection of soil, sediment, surface water, and groundwater samples for laboratory analysis, and
- Removal of temporary wells and abandonment of soil borings.

If winter conditions (e.g. snow cover, ice) limit the ability of field personnel to safely and sufficiently sample and characterize a proposed boring location then that location will be revisited when conditions allow as necessary. The following paragraphs present the anticipated sequencing of field activities, the organization of RI sampling teams, media to be sampled, and sampling methods.

Field work will be generally sequenced at each of the proposed boring locations shown on *Figure 2* as follows:

1. Delineation of areas of suspected residual oil impacts in the river bank, sediments, and overbank and areas of previous investigations where analytical results exceeded Part 201 criteria, relying on historic information (SCAT, SORT, and OSCAR observations, decommissioning samples, previous RI activities, and all other relevant information) and visual observations of current field conditions,
2. Installation of soil borings, collection of soil cores, core logging, and soil sample collection,
3. Installation of sediment borings, collection of sediment cores, sediment core logging, and sediment collection, if necessary. Areas inundated sufficiently throughout the year to support aquatic biota will be classified as ‘sediments’,
4. Use of GPS units to collect horizontal coordinates of all field-selected boring locations.
5. Collection of surface water samples, if applicable,
6. Installation of temporary monitoring wells, well purging, and low-flow groundwater sample collection, and
7. Temporary well removal and soil boring abandonment.

The RI will be conducted using a team approach in which teams will be assigned specific subsections of the investigation area. Team organization and responsibilities include:

- Team Lead/Geologist: Supervises field work at site, directs team, makes field decisions, measures settled core recovery, and logs soil/sediment cores.
- Yuma Operator: Locates pre-determined soil boring locations, captures geo-reference (horizontal coordinates) data of pre-determined and field-selected borings, and takes photographs (general locations and cores).
- Coring Team: Utilizes equipment to collect soil cores and measures field core recovery.
- Core Preparer/Sampler: Retrieves core from Coring Team, cuts core, collects field ultraviolet (UV) light screen info, collects appropriate samples from core for laboratory analysis, and collects surface water samples, if necessary.
- Groundwater Sampler: Measures depth to groundwater in temporary monitoring wells, and completes groundwater sampling utilizing low-flow techniques.

Actual team responsibilities will be dependent on field conditions and at the discretion of the Team Lead/Geologist. All team activities will be coordinated with MDEQ personnel to allow for oversight and the collection of split samples.

Activities and observations made by each team will be thoroughly documented in log books, field forms, and/or electronic capture. Field sampling locations will be geo-referenced for incorporation into the comprehensive Geographic Information System that exists for this project.

2.0 REMEDIAL INVESTIGATION OF MEDIA

This section describes the methods and approaches that will be used to collect representative samples from soil, sediment, surface water, and groundwater. For this RI, investigation methods will include visual observation of the soil cores, field screening, and quantitative analysis. Samples will be collected using *Standard Operating Procedures (*SOP*s)* provided in the *Sampling and Analysis Plan* (Enbridge, 2011c) and the *Quality Assurance Project Plan* (QAPP) (Enbridge, 2011d). Additional investigative approaches (e.g., test pits, trenches, larger soil borings, etc.) will be considered as warranted by field conditions and results. If necessary, an addendum to this work plan will be prepared and submitted for approval that will detail the locations and additional procedures to be utilized.

2.1 Soil Boring Installation

Initial soil borings will be drilled at pre-determined locations in the investigation area where an observance of residual oil was documented by SORT teams or where other historic information (SCAT, March 2011 assessment, etc.) represents a concern (*Figure 2*). Soil borings will also be advanced as directed by the Team Lead, with the intent of selecting locations most likely to be impacted by the oil.

The purpose of the soil investigation is to complete the characterization of all potential overbank areas within the inundation boundary representing all areas potentially affected by the Line 6B release. This will include remaining SORT locations, previously uninvestigated Shoreline Cleanup Assessment Technique (SCAT) locations, unverified excavation/oil removal areas, overbank locations adjacent to nearshore submerged oil areas, and locations within the inundation model line adjacent to this section of the Kalamazoo River.

Where residual oil was not observed historically or during the SCAT or SORT processes, boring locations are proposed within the inundation model line at a frequency of one boring per 300 feet (including previous remedial investigation areas) from MP 11.00 to the Morrow Lake Delta. Boring locations are proposed within the inundation model line at a frequency of one boring per 500 feet (including previous remedial investigation areas) from Morrow Lake Delta to the Morrow Lake Dam. Additional soil borings in areas where no visual surface impacts are or were observed will be conducted at a later date pending receipt and evaluation of analytical results.

Soil borings are proposed in each of the SORT features located along this section of river and around Morrow Lake. Additionally, borings are proposed at overbank locations adjacent to nearshore submerged oil areas.

Soil borings are not proposed at sites which have been investigated under separate work plans and include:

- High Priority OSCAR sites,
- Previous RI investigations,
- Legacy Project sites,
- Park Assessment sites, and
- Demobilization sites.

Data gaps recognized through implementation of these investigations and by the evaluation of field observations and analytical results from this and previous investigations will be further investigated during this RI. Interim data packages for individual or grouped Enbridge owned properties, other individual or grouped parcels, or river sections maybe presented to the MDEQ for discussion and clarification. Information collected during previous investigations at these locations will be incorporated into No Further Action (NFA) Reports. The NFA Reports will include specific properties and/or segments of the Kalamazoo River mutually agreed upon by Enbridge and MDEQ.

Proposed soil boring locations are presented in *Figure 2*. The spacing between soil borings for characterizing petroleum impacts will be dependent on field conditions and decided in the field by the Team Lead/Geologist. Field decisions on soil boring locations will be biased toward visual observations of residual oil, areas with the potential for residual oil impact, and areas of previous investigations.

2.1.1 Soil Coring

Soil cores will be collected utilizing direct push sampling method by a track mounted or marsh buggy Geoprobe® drilling rig, a hand probe, or other similar device. The drilling method for each location is dependent on access and site conditions, and will be completed in accordance with *SOPs EN-301* and *EN-305* (Enbridge, 2011c). Soil cores will be collected in 4-foot long intervals to the desired termination depth. The termination depth for each soil boring will be at a depth sufficient to define the vertical extent of contamination. Soil borings will be advanced to 1 foot below observed petroleum impact, 1 foot below the observed depth of water saturation, or to refusal. If visual or analytical data indicate that impact extends below the termination of the boring, alternate soil boring advancement techniques may be implemented to achieve the objectives of vertical delineation. This includes the possibility of advancing the boring into bedrock as necessary.

The depth of 1 foot below the water table is based on the elevation at the time of core collection. Terminal depth can be adjusted based on field observations of adjacent river height, comparison to historical boring information, or Kalamazoo River gage station data.

2.1.2 Soil Logging and Screening

After the soil core is removed from the borehole, it will be opened, visually evaluated, viewed under UV light within a darkroom, measured for recovery, and then logged using the Unified Soil

Classification System (USCS) by the Team Lead/Geologist. Discrete soil samples will be collected from each core for subsequent laboratory analysis from the interval with the greatest potential for petroleum hydrocarbon impact. Soil samples will be collected as soon as possible following core opening and visual and UV light evaluations.

The observations made during this process for the presence of petroleum hydrocarbon impacts, UV fluorescence, and lithology will be recorded and the real-time data will be used to assist the Team Lead/Geologist in determining if further advancement of the soil boring is required or additional borings are required to achieve the RI objectives and lateral delineation. Lateral delineation will continue until the area is sufficiently characterized. If analytical results indicate further delineation is required, additional samples will be collected.

2.1.3 Soil Sampling for Analysis

Up to three soil samples will be collected for chemical analysis from each field sampling location. As a general guideline, samples will be collected as follows:

- One sample will be collected from above the water table that shows the highest potential for petroleum hydrocarbon impact (visual or UV observation). If no petroleum hydrocarbon impact is observed, the sample will be collected from the interval just above the water table or from an interval to be determined by the Team Lead/Geologist based on lithology, adjacent borings, etc.
- To define vertical extent, one sample, that shows no petroleum hydrocarbon impact (visual or UV observation) will be collected from the interval directly below the interval that exhibits the highest potential for impact.
- At the discretion of the Team Lead/Geologist, one sample may also be collected from below the water table for subsequent lab analysis.

Soil sampling will be conducted in accordance with *SOP EN-301* (Enbridge, 2011c) and the QAPP (Enbridge, 2011d).

2.1.4 Soil Analyses

Discrete soil samples will be collected from the core and sent to the laboratory for analysis. Soils will be analyzed for residual oil-related parameters including polynuclear aromatic hydrocarbons (PNAs), Total Petroleum Hydrocarbons (TPH) including Diesel Range Organics (DRO) and Oil Range Organics (ORO), and the select metals beryllium, molybdenum, nickel, and vanadium. Soil samples collected between MP 11.00 to MP 14.00 will also be analyzed for

volatile organic compounds (VOCs) per the MDEQ letter dated February 9, 2012. Gasoline Range Organics (GRO) have not been included in this work plan and will not be analyzed. Hold times and sample preservation methods will be followed as presented in the QAPP (Enbridge, 2011d). Additional analysis (such as synthetic precipitation leaching procedure analysis, organic carbon content, bulk density, etc.) may also be conducted as appropriate.

If free-phase oil is encountered below saturation then a sample will be collected for hydrocarbon characterization analysis (i.e. viscosity, density, etc.) to be used in mobility evaluation.

The soil samples will be transported under chain of custody (COC) control in accordance with *SOP EN-102* (Enbridge, 2011c) to ALS Laboratory Services in Holland, Michigan.

2.2 Groundwater

Groundwater will be sampled through the use of temporary monitoring wells. As temporary monitoring wells have a limited effectiveness in evaluating residual oil, as an additional investigative method, and if required, permanent monitoring wells will be installed once remedial actions are complete and appropriate locations identified. Exceedance of MDEQ groundwater cleanup criteria, visual and/or UV observations of residual oil below saturation, and observation of residual oil in the groundwater, if present, will be used to determine locations for permanent monitoring wells.

2.2.1 Temporary Well Installation

Temporary monitoring wells will be constructed in select boreholes showing the greatest petroleum hydrocarbon impact. Samples will be collected from these temporary wells and analyzed to determine groundwater quality and potential impact from the residual oil.

The temporary wells will be constructed of 1-inch diameter, schedule 40 polyvinyl chloride (PVC) riser with 10-slot (0.010-inch) PVC well screen, and an end cap. The well screen will be set at the bottom of the borehole with the screen set to straddle the water table. If field conditions require, a sand pack may be placed around the screen and bentonite chips will extend from the top of the filter pack to ground surface to ensure that surface water is not entering the well through the screened interval.

Field procedures for temporary well installation will include:

- Measure the depth to groundwater in the borehole once the boring termination is reached,
- Assemble and install the temporary well so that the PVC screen straddles the water table. If depth to groundwater is less than 1 foot, the well screen will be set a minimum of 0.5 feet below ground surface,
- If necessary, place a sand/gravel pack in the annular space between screen and borehole to a level of approximately one to two feet above the top of screen. If the depth to groundwater is less than one foot below ground surface then a sand/gravel pack extending only several inches above the top of screen will be installed. A bentonite seal will be placed on top of the sand/gravel pack to grade, and
- Purge the temporary well until visibly clear of sediment or until dry. If a temporary well purges dry, the well will be allowed to recharge for 12 to 24 hours prior to groundwater sample collection.

Once groundwater samples are collected, the temporary wells will be removed and the borehole will be backfilled with bentonite pellets to the ground surface.

2.2.2 Groundwater Sampling for Analysis

Groundwater samples will be obtained utilizing low flow sampling methods in accordance with the *SOP EN-406* (Enbridge 2011c).

2.2.3 Groundwater Analysis

Groundwater samples will be transported under COC control to ALS Laboratory Services in Holland, Michigan. The samples will be analyzed for PNAs, TPH (DRO and ORO), and the select metals beryllium, molybdenum, nickel, and vanadium. The applicability of TPH sampling and analysis will be evaluated as the remedial investigation progresses. VOCs and GRO have not been included in this work plan. Hold times and sample preservation methods will be followed that are presented in the QAPP (Enbridge, 2011d).

If free-phase oil is encountered in the groundwater then a sample will be collected for hydrocarbon characterization analysis (i.e. viscosity, density, etc.) to be used in mobility evaluation.

2.3 Survey of Temporary Wells

The locations of all temporary wells will be recorded using the sub meter accuracy GPS unit. If deemed appropriate, temporary wells may be surveyed to the Michigan State Plane Coordinate System and the North American Datum 1983 international feet.

2.4 Surface Water

If ponded surface water is located within the suspected crude oil impacted area of a SORT polygon site or within the inundation model of a non-impacted site, surface water samples may be collected to evaluate surface water quality.

2.4.1 Surface Water Sampling

Sample locations will be determined in the field by the Team Lead/Geologist. Surface water sampling will be completed in accordance with *SOP EN-201* (Enbridge 2011c).

2.4.2 Surface Water Sample Analysis

Surface water samples will be analyzed for the same parameters proposed for groundwater sampling: PNAs, TPH (DRO and ORO), and the select metals beryllium, molybdenum, nickel, and vanadium. The applicability of TPH sampling and analysis will be evaluated as the remedial investigation progresses. VOCs and GRO have not been included in this work plan. Hold times and sample preservation methods will be followed that are presented in the QAPP (Enbridge, 2011d). Surface water samples will be transported under COC control (*SOP EN-102* (Enbridge 2011c)) to ALS Laboratory Services, Holland in Michigan.

2.5 Sediment

Samples collected from areas inundated sufficiently through the year to support aquatic biota will be classified as ‘sediments’ and compared to U.S. EPA Region 5 Ecological Screening Level and Threshold Effect Concentrations. If present within the crude oil impacted area of a SORT polygon, submerged or previously submerged sediments will be evaluated for the presence of crude oil impacts by collecting sediment samples for analysis.

2.5.1 Sediment Sample Locations

Sample locations will be selected during the RI based on field observations. Specific sediment coring locations will be determined in the field by the Team Lead/Geologist.

2.5.2 Sediment Coring

Sediment cores will be collected utilizing direct push sampling method by a track mounted or marsh buggy Geoprobe® drilling rig, a hand probe, or other method. The drilling method will be dependent on access and site conditions, and cores will be advanced in accordance with *SOPs EN-301* and *EN-305* (Enbridge 2011c). Sediment cores will be advanced in 4-foot long intervals to the desired termination depth. The termination depth for each sediment core will be at a depth sufficient to define the vertical extent of contamination. Sediment cores will be advanced to 1 foot below observed petroleum impact or to refusal. If visual or analytical data indicate that impact extends below the termination of the boring, alternate sediment core advancement techniques may be implemented to achieve the objectives of vertical delineation. This includes the possibility of advancing the boring into bedrock as necessary,

The depth of 1 foot below the water table is based on the elevation at the time of core collection. Terminal depth can be adjusted based on field observations of adjacent river height, comparison to historical boring information, or the local Kalamazoo River gage station data.

2.5.3 Sediment Logging and Screening

After the sediment core is removed from the borehole, it will be opened, visually assessed, viewed under UV light in a darkroom, measured for recovery/settling, and then logged using the USCS by the Team Lead/Geologist in accordance with *SOP EN-301* (Enbridge 2011c). Discrete sediment samples will be collected from each core for subsequent laboratory analysis from the interval with the greatest potential for petroleum hydrocarbon impact. Sediment samples will be collected as soon as possible following core opening and visual and UV light evaluations.

The observations made during this process for the presence of petroleum hydrocarbon impacts, fluorescence from UV light screening, and lithology will be recorded and the real-time data will be used to assist the Team Lead/Geologist in determining if further advancement of the sediment cores is required and/or if additional borings are required for lateral delineation. Lateral delineation will continue until the area/polygon is characterized. If analytical results indicate further delineation is required, additional samples will be collected.

2.5.4 Sediment Sampling for Analyses

As many as three sediment samples will be collected for chemical analysis from each field sampling location:

- One sample will be collected that shows the highest potential for petroleum hydrocarbon impact,
- To define vertical extent, one sample, that shows no petroleum hydrocarbon impact (visual or UV observation); will be collected from the interval directly below the interval that exhibits the highest potential for impact, and
- One additional sample may also be collected from the sediment core at a boring location with high potential for petroleum hydrocarbon impact at the discretion of the Team Lead/Geologist based on field observations of lithology, groundwater level, or adjacent impacts.

The selection of sampling locations may be modified in the field by the Team Lead/Geologist based on field observations of surface and subsurface conditions. Sampling for analysis will be conducted in accordance with *SOP EN-301* (Enbridge 2011c) and the QAPP (Enbridge, 2011d).

2.5.5 Sediment Analyses

Discrete samples will be collected from the sediment core and sent to the laboratory for analysis. Sediments will be analyzed for the same parameters proposed for soil sampling: PNAs, TPH (DRO and ORO), and the select metals beryllium, molybdenum, nickel, and vanadium. VOCs and GRO have not been included in this work plan. Hold times and sample preservation methods will be followed as presented in the QAPP (Enbridge, 2011d). Additional analysis (such as organic carbon content, bulk density, etc.) may also be conducted as appropriate.

If free-phase oil is encountered below saturation then a sample will be collected for hydrocarbon characterization analysis (i.e. viscosity, density, etc.) to be used in mobility evaluation.

3.0 DATA EVALUATION AND REPORTING

The results of the work specified in this work plan will be presented in NFA Reports as described in Part 201, Section 20114d and following the *Request for DEQ Review of No Further Action (NFA) Report* form. The components included, but not limited to, are; an introduction, objectives, methods, data results and evaluation, sample location map, cross sections (as

appropriate), soil boring logs with well construction details, sediment boring logs, groundwater sampling logs, figures showing extent of contamination (as appropriate), data tables, sample location coordinates, data interpretation, recommendations, and a summary and conclusions section.

The methods section will present methods used or refer to standard methods or methods previously approved for this project. Deviations from the work plan will be identified and reasons for the deviations will be presented. For example, sample locations may need to be adjusted based on field conditions. Deviations that require an addendum to the work plan (e.g. bedrock investigation) will be proposed to the MDEQ for approval prior to implementation. Generic Part 201 Residential Cleanup Criteria will be used to evaluate the unsaturated soil, surface water, and groundwater data. The residential criteria will be used as a baseline for evaluation and may not be appropriate cleanup criteria at select areas. The results of the sediment analysis will be compared to U.S. EPA Region 5 Tier 1 Ecological Screening levels as well as Tier 2 threshold, midlevel, and probable effect levels. These criteria/screening values will be included in the data tables and concentrations that exceed criteria will be identified.

The analytical data will be compiled and compared to relevant Part 201 or Part 31 criteria or screening levels. The risk to human health and the environment will be evaluated. The mobility and toxicity of any remaining residual oil will also be evaluated. Locations where criteria or screening levels are exceeded will be identified and exposure pathways with applicable criteria that are exceeded will also be identified. Response recommendations will be evaluated against the ecological sensitivity of the area. The data will be reviewed to identify data gaps. The laboratory data reports will be included as an attachment to the report in the form of a data disk.

4.0 SCHEDULE

Field activities will be scheduled upon MDEQ approval of the work plan and contingent on site conditions as well as on priorities. Dates for remedial investigation activities will be provided to the MDEQ to coordinate oversight activities. Completion of the proposed activities will ultimately be determined by weather and seasonal river conditions. Should weather or river conditions create an adverse obstacle to completion of the field activities, MDEQ will be notified of such conditions and their impact upon completion. When work activities are shut down due to weather or river conditions, activities will begin again following the site-specific health and safety procedures.

5.0 REFERENCES

Enbridge, 2011a. Enbridge Energy, Limited Partnership Line 6B Incident Marshall, Michigan; *Remedial Investigation Work Plan for Kalamazoo River from MP 2.25 to MP 3.14*, November 18, 2011.

Enbridge, 2011b. Enbridge Line 6B Marshall, MI Pipeline Release*; Conceptual Site Model,* July 8, 2011 (As Amended).

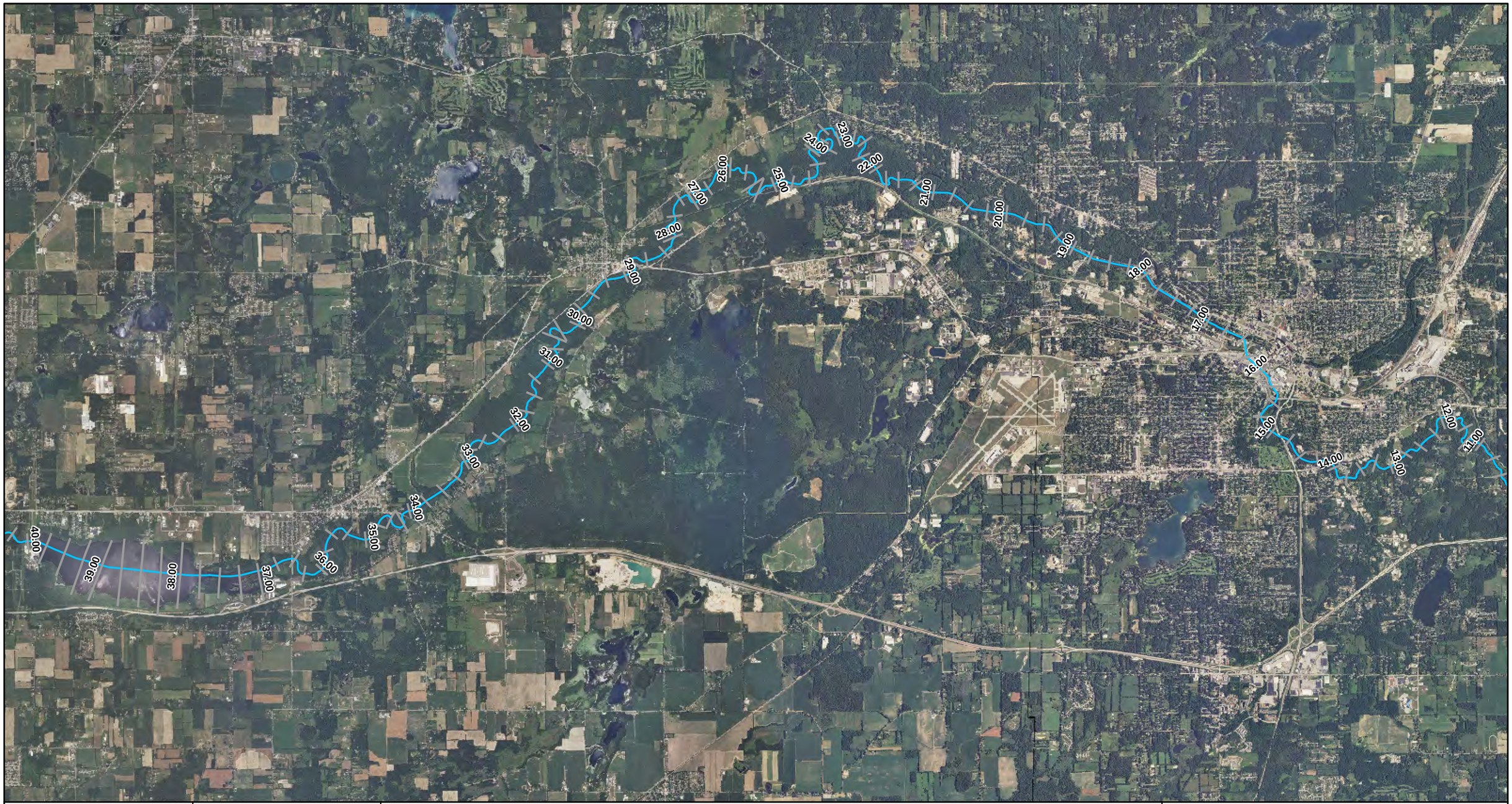
Enbridge, 2011c. Enbridge Line 6B MP 608 Release; Marshall, Michigan; *Sampling and Analysis Plan*. August 30, 2011.

Enbridge, 2011d. Enbridge Line 6B MP 608 Release; Marshall, Michigan; *Quality Assurance Project Plan*. August 19, 2011.

Enbridge, 2012a. Enbridge Line 6B Marshall, MI Pipeline Release; *Remedial Investigation Work Plan for Kalamazoo River (MP 3.14 to Ceresco Dam (MP 5.80)*, January 13, 2012.

Enbridge, 2012b. Enbridge Line 6B Marshall, MI Pipeline Release; *Remedial Investigation Work Plan for Kalamazoo River (MP 5.80 to MP 11.00)*, January 16, 2012.

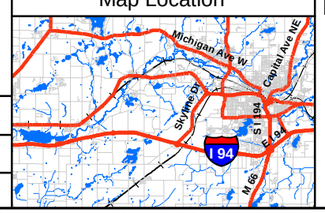
Figures



ENBRIDGE

Drawn:	NS	2/3/2012
Approved:	JK	2/3/2012
Project #:	60162778	

Map Location



Legend

- Kalamazoo River
- Quarter Mile Grid Segments

N

0 3,150 6,300 12,600

Scale in Feet

FIGURE 1
SITE LOCATION
KALAMAZOO RIVER REMEDIAL INVESTIGATION
MP 11.00 TO MORROW LAKE DAM

ENBRIDGE LINE 6B MP 608
MARSHALL, MI PIPELINE RELEASE
ENBRIDGE ENERGY, LIMITED PARTNERSHIP

Z:\Work\GIS\Kalamazoo_River_RI\MXDs\Workplans\MP_11_00_to_MP_40_00\120203_Fig_1_KRRI_MP11_00_to_MP_40_00_Site_Location.mxd

Aerial Photography Date: April 2011