



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

REPLY TO THE ATTENTION OF:

LU-9J

MAR 26 2015

Jason Smith
Corporate Environmental Director
Tecumseh Products Company
2700 W. Wood Street
Paris, TN 38242

Re: *Revised MIP Investigation Report and Workplan for High Resolution Characterization*
Tecumseh Products Company, 100 East Patterson, Tecumseh, Michigan 49286
EPA ID#: MID005049440
AOC RCRA-05-2010-0012

Dear Mr. Smith:

Thank you for your submittal of the *Revised MIP Investigation Report and Workplan for High Resolution Characterization (Revised MIP Report and HRSC Workplan)*, dated March 11, 2015. We concur in general with the plan of action proposed, but remain concerned that as currently presented, the anticipated work will not resolve all of EPA's questions about the extent of contamination. Therefore, EPA is providing additional comments below to address this concern.

The U.S. Environmental Protection Agency (EPA) views the MIP work that Tecumseh Products Company (TPC) completed in June and July of 2014 as an initial step in addressing the numerous questions identified in EPA's January 31, 2014 letter regarding the magnitude and extent of contamination, and associated environmental indicator determinations made by TPC for the site (January 2014 letter). At this time, many of the questions EPA raised in the January 2014 letter remain unresolved, and the information gathered during the MIP investigation and provided in the *Revised MIP Report and HRSC Workplan* appears to confirm our earlier interpretations.

Workplan Comments

As a result of discussions during TPC's presentation of the MIP findings in October 23, 2014, TPC agreed to prepare a workplan for confirmation soil and groundwater sampling activities on-site at selected MIP locations, and at the off-site at HRSC groundwater sampling locations discussed during our May 12, 2014 meeting. EPA completed a review of the *Revised MIP Report and HRSC Workplan* and agrees with the majority of confirmation sampling activities proposed, with the following exceptions.

- EPA previously recommended by email on January 29, 2015 that TPC collect and analyze groundwater samples in three-foot intervals between 39' and 51' at MIP-66. EPA made this request to evaluate potential vinyl chloride contamination at this depth. Please include samples for VOCs from MIP-66 (at a minimum, 39'-42' and 42'-45') since the HRSC transect¹ for this area is not proposed in the workplan and analytical data is required based on the screening level MIP data.
- EPA notes that some intervals at MIP confirmation sampling locations are not specifically identified for USCS classification in Table 3 of the workplan, including MIP-40 (25'-30'), MIP-41 (25'-40'), MIP-35 (25'-40'), MIP-46 (25'-40'), MIP-38 (20'-35'), MIP-44 (25'-35'), MIP-55 (20'-30'), MIP-64 (25'-40'), MIP-05 (20'-45'), MIP-25 (25'-45'), MIP-30 (20'-40'), MIP-23 (15'-35'), MIP-50 (15'-35'). Please ensure that USCS classification is performed throughout the entire vertical profile for visual descriptions at each confirmation sampling boring including those depths/locations where the heaviest impacts were identified during the MIP investigation.
- EPA requests that the off-site high-resolution groundwater sampling transects target a minimum depth of 35 feet below surface grade (BSG) near B-19, 46 feet BSG near MW-24D and MW-12D, and 50 feet BSG near MIP-65, and that groundwater samples be collected throughout the entire water column, as identified in the correspondence summarizing our May 12, 2014 meeting¹. Sampling should not be terminated 2-feet into the clay at 24 feet BSG at MW-23 in this area, but should target the minimum depth of known contamination at B-35 at approximately 35 feet BSG, where contamination was found at the *apparent* basal clay (see comment below for further details regarding basal clay).
- EPA disagrees with the proposed approach for investigating the potential presence of dense non-aqueous phase liquid (DNAPL) at the basal clay in the southern source area at MIP-05 and MIP-25. EPA has explained to TPC on multiple occasions its expectations for this area, and identified a specific scope of work to investigate contaminant conditions at depth in the area. TPC agreed to complete the scope of work requested at MIP-03, but has proposed an alternative approach to the one EPA has requested for MIP-05 and MIP-25. TPC's goal should be to target a projected depth that ensures a 10-foot thickness of the basal clay downgradient from MIP-03 at MIP-05, and to locate the contamination identified at 47-48 feet in MIP-03 through laboratory analysis of samples collected at deeper intervals downgradient. EPA does not agree that visual confirmation of a 2-foot thickness of clay will be sufficient to guide sample selection because the migration path has not been determined, and contamination may be located below such clay lenses. The contamination needs to be delineated by drilling to depths greater than the previously identified contamination, and quantified by performing laboratory analytical testing. Co-located soil and groundwater samples are needed from this area to determine if contaminant mass transfer is occurring into the clay from DNAPL, or into the groundwater as a result of back-diffusion from the clay. If this work is not performed,

¹ Summary of Additional Investigative Work to be Performed Following May 12, 2014 Meeting, dated June, 9, 2014, by EPA

EPA will continue to question the source characterization in this area. Please conduct the soil and groundwater testing requested by EPA on January 29, 2015 at MIP-05 and MIP-25, as the proposed plan for confirmation sampling dependent on the observed presence of only two feet of competent clay does not meet EPA's expectations for the following reasons:

- Laboratory data is needed from depths below the contamination identified at MIP-03 (47-48') to define the extent of this impact. Visual observations of clay will not justify the sampling depth because the migration path of contamination from MIP-03 is unknown.
- The interpreted depth of the clay varies by more than 10 feet in this area (see Figure 24², and Cross-Section B-B' in Figure 4³).
- The EC log for MIP-03⁴ shows a 2-foot clay layer at a depth of 47'-49', and a more permeable (sand) unit between 49' and 57'. TCE contamination is in contact with this clay lens, and the groundwater concentration has not yet been determined. A small ECD response observed in the lower permeable unit suggests the 2-foot clay may not be competent, and a larger ECD response was observed within apparent clay lenses between 46'-54' in MIP-25.
- East of MIP-03, a 10-foot thick clay layer is present at a similar elevation at MW-27, and the sand unit below the clay increases in thickness to 15-feet (see Cross-Section G-G' on Figure 5³).
- EPA interprets the *apparent* clay and deeper sand near MIP-03 as extending to MW-27, but the units have not been mapped due to the shallow termination depths of certain borings and lack of sampling on the adjacent properties. As a result, the migration path of the TCE found at MIP-03 (47-48') has not been determined, and the transmission of TCE to the deeper sand unit has not been fully evaluated with the closest well at this depth at MW-27D.
- Clay was encountered in B-14² at a similar elevation as the clay at MIP-03 and MW-27. The clay was interpreted to be the *apparent* basal clay, but the boring was terminated only 2-feet into the clay, leaving questions about the presence of a permeable sand beneath this clay and potential for contamination to have migrated into the underlying sand.
- Clay was not encountered at B-01/MW-1S through a depth of at least 50 feet², suggesting that this clay lens may be discontinuous in this area, and further complicating interpretations regarding the pathway of contaminant migration.
- TCE persists in soil gas at the southeast adjacent property even though TPC believed an SVE system at the site boundary would control soil vapors believed to be emanating from the north. By email on November 26, 2013, EPA informed TPC that the SVE system will not be effective if the source of elevated soil vapors on the southeast adjacent site was related to off-site groundwater contamination that had not

² Workplan Addendum to Install Additional PRB Performance Monitoring Wells at the Former Tecumseh Products Site, dated July 9, 2011, by RMT.

³ Second Quarter 2013 Progress Report, dated July 15, 2013, by TRC.

⁴ Revised MIP Investigation Report and Workplan for High Resolution Characterization, dated March 11, 2015, by TRC.

been characterized. The groundwater on the southeast adjacent site still remains uncharacterized, and soil gas persists off-site in spite of the SVE system.

Please proceed with the scope of work in the *Revised MIP Report and HRSC Workplan*, as amended by EPA's comments in this letter, including groundwater analyses for VOCs from the 47-50' and 50-53' at MIP-25, soils analysis for VOCs from 48.5-50.5', 50.5'-52.5', 52.5-54.5', 54.5-56.5', and 56.5-58.5' at MIP-05, and groundwater analyses for VOC analysis at the intervals at 48.5-51.5', 51.5-54.5', and 54.5-57.5' from MIP-05 to evaluate the presence of DNAPL near this area. Also, please contact me in advance of the proposed investigation schedule so that I can participate in field sampling activities at MIP-05 and MIP-50.

MIP Data Evaluation

EPA notes that the results of the MIP investigation, conducted by TPC at EPA's request, confirm EPA's long-standing position that TPC has not collected sufficient information to support its contention that the magnitude and extent of on-site and off-site contamination has been identified for purposes of evaluating risk or developing a Corrective Measures Proposal. Since 2010, and more recently in EPA's January 2014 letter, we have identified concerns regarding data gaps related to TPC's investigative efforts and it is clear from the results of the MIP investigation that the concerns expressed in the January 2014 letter are valid. Some of those concerns are outlined in greater detail below.

- EPA noted⁵ that many wells appeared to be installed at depths that do not monitor the heaviest groundwater impacts. The attached MIP/ECD logs for MIP-10⁴ and MIP-64⁴ (see *Figures 1 and 2*) are provided as examples which show the depth of TCE contamination relative to the screened intervals based on the well installation diagrams for adjacent wells MW-33S⁶ and MW-2S⁶, confirming this interpretation.
- EPA noted⁵ that areas of heaviest groundwater contamination did not appear to have been characterized, and were not being monitored to evaluate exposure concerns or plume stability, as demonstrated in the attached (see *Figure 3*), which shows the location of permanent monitoring wells MW-35 and MW-21 relative to the contaminant plume located at MIP-19, MIP-23, MIP-49 and MIP-50⁴ in the south [plume truncated to the east due to a lack of data], and the location of permanent monitoring wells MW-4S/4I and MW-23 relative to the plume located at MIP 36 and MIP-55⁴ in the north [truncated off-site to the north due to a lack of data]. Also presented on the figure are locations for monitoring wells that EPA recommended by email on May 12, 2014 for purposes of monitoring the plumes, and the locations of current wells in the north that do not allow for an accurate interpretation of the increases at MW-23⁷.
- EPA noted⁵ that contamination appears to have migrated to depth, and may be moving in directions other than in the direction of groundwater flow⁵, remaining undefined in all directions. The MIP/ECD/FID logs for MIP-03, MIP-55, MIP-64, and MIP-66⁴ establish

⁵ *Response to Supplemental Human Health Environmental Indicator Report*, dated January 31, 2014, by EPA.

⁶ *Remedial Investigation and Groundwater Environmental Indicator Report*, dated September 28, 2012, by TRC.

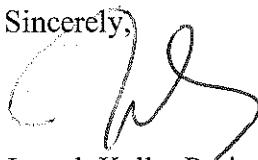
⁷ *Fourth Quarter 2014 Progress Report*, dated January 15, 2015, by TRC.

contamination near the deep clay at varying distances from the identified source areas, at similar depths as soil contamination at NS-18, NS-19, and NS-20⁶, and the recently identified soil contamination at MIP-03⁴, supporting this interpretation.

- TCE concentrations in MW-21 continue to increase⁷ and the MIP log for MIP-50 (28-38')⁴ detected a zone of heavy groundwater contamination at an elevation deeper than the PRB² (see *figure 4*). In a May 19, 2011 email to TPC, EPA expressed concerns that contamination may be flowing beneath the PRB and requested deep PRB wells for monitoring. TPC installed PRB-04S and PRB-08S in response, but the wells are positioned at the margins of the contaminant plume¹.
- TCE was found in the soil at 53,000 ug/kg at NS-18 (35')⁶ in 2012. MIP work identified TCE north of the site at MIP-58 (28-35')⁴ and MIP-64 (30'-35')⁴, which demonstrates that the heaviest contamination is not being monitored by well MW-23, installed at a depth of 17-22' BSG⁶. MW-23 now contains vinyl chloride at a concentration more than thirty times greater than the original concentration⁷, while heavier contamination originally found at B-35 (30'-34')⁶ remains unmonitored at a similar depth as the TCE found in NS-18, MIP-58, and MIP-64.

In that TPC has only collected screening level data to date, and it is unlikely that TPC will have sufficient time to collect the sufficient data necessary by July 15, 2015, TPC will not be able to persuasively demonstrate to EPA that it will be able to comply with the requirements of the Administrative Order on Consent (RCRA-05-2010-0012), requiring that TPC: (1) defines the nature and extent of releases of hazardous waste and hazardous constituents at or from the facility as required under Paragraph 11, (2) demonstrates that current human exposures at or from the facility are under control under Paragraph 13.a., and (3) demonstrates that migration of contaminated groundwater at or from the facility is stabilized under Paragraph 13.b. In light of the continuing concerns described above, EPA recommends that the parties schedule an in-person meeting to discuss how TPC intends to comply with the July 15, 2015 deadline for establishing that the migration of contaminated groundwater has stabilized. Please contact me at your earliest convenience with TPC's availability for the meeting.

Sincerely,



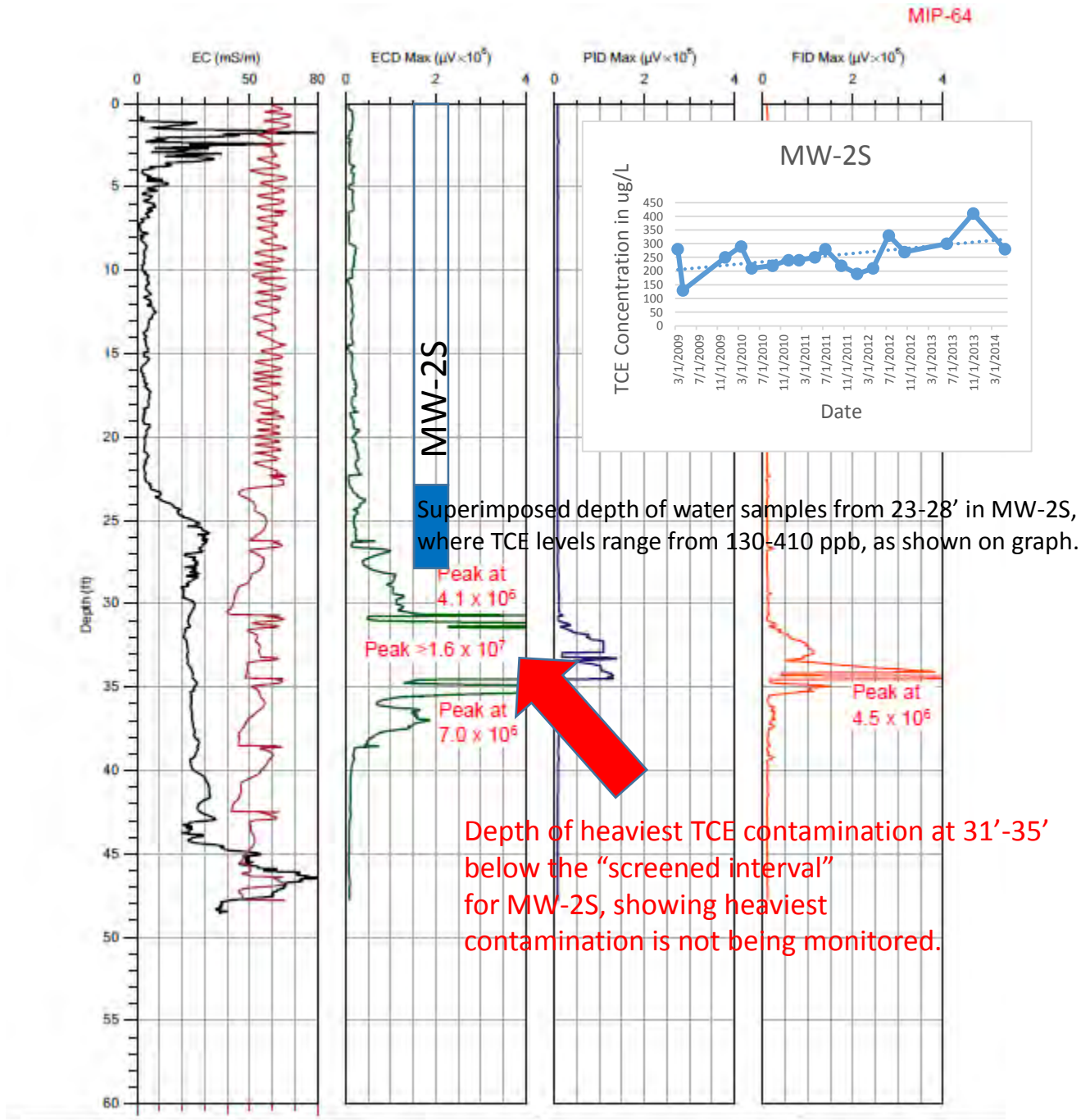
Joseph Kelly, Project Manager
Remediation and Reuse Branch

cc: Graham Crockford, Stacy Metz, TRC Environmental Corporation (TPC Project Manager)
Douglas McClure, Conlin, McKenney & Philbrick, PC
Tecumseh District Library – Public Repository

⁸ Construction Documentation Report, Permeable Reactive Barrier Downgradient of the Southern Source Area, dated February 20, 2012, by TRC.

bcc: Susan Perdomo, ORC C-14J
Joseph Kelly, LCD LU-9J
Mario Mangino, LCD LU-9J
Dan Mazur, LCD LU-9J
Colleen Olsberg, LCD LU-9J
Dave Petrovski, LCD LU-9J
Bhooma Sundar, LCD LU-9J

Figure 1: MIP-64 Source Depth, and TCE Concentration Trend and Installation Depth of MW-2S

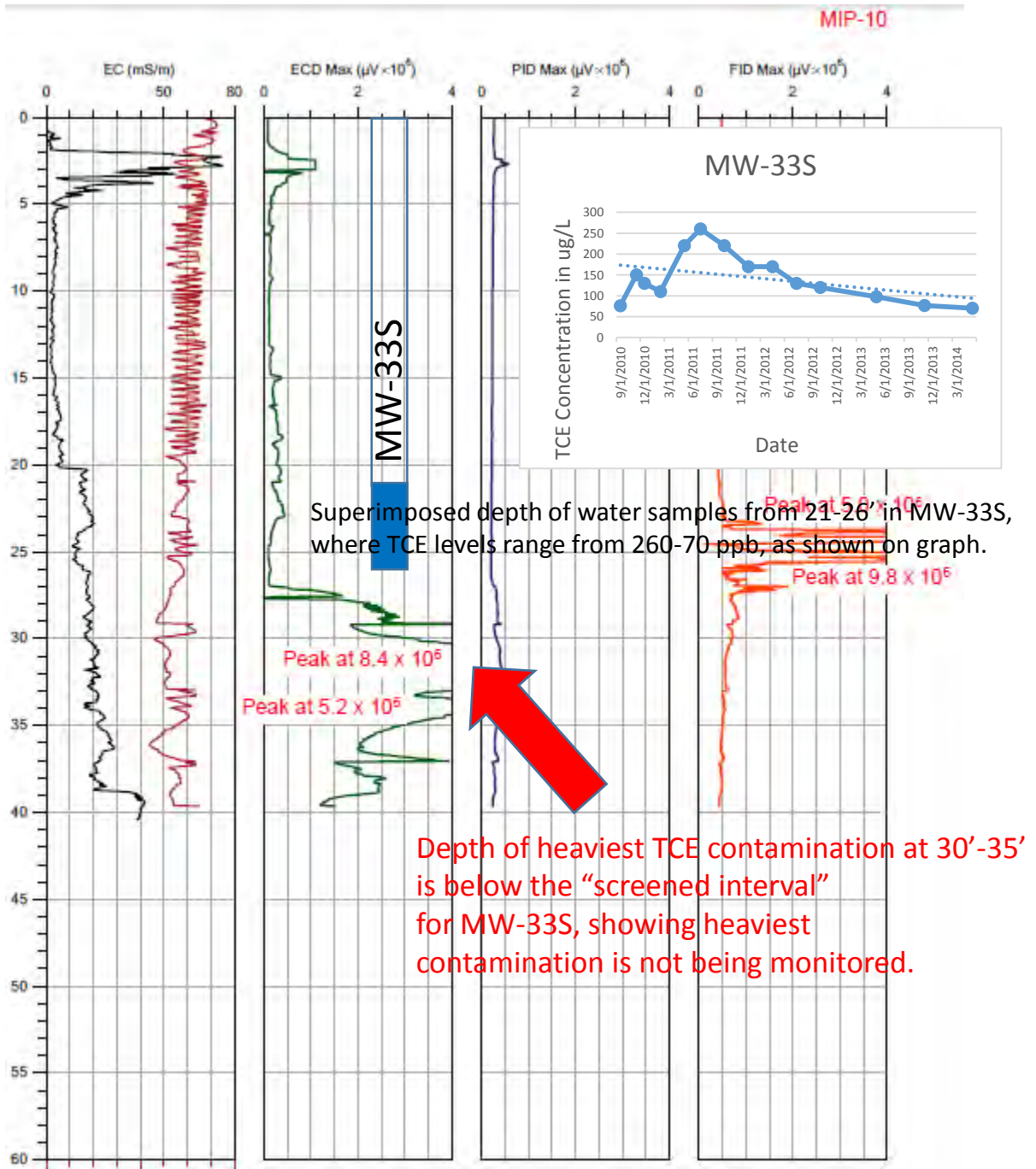


Data Sources:

TRC Environmental Corporation, Revised MIP Investigation Report and Workplan for High Resolution Characterization, dated March 11, 2015

TRC Environmental Corporation, Remedial Investigation and Groundwater Environmental Indicator Report, dated September 28, 2012

Figure 2: MIP-10 Source Depth, and TCE Concentration Trend and Installation Depth of MW-33S



Superimposed depth of water samples from 21-26' in MW-33S, where TCE levels range from 260-70 ppb, as shown on graph.

Depth of heaviest TCE contamination at 30'-35' is below the "screened interval" for MW-33S, showing heaviest contamination is not being monitored.

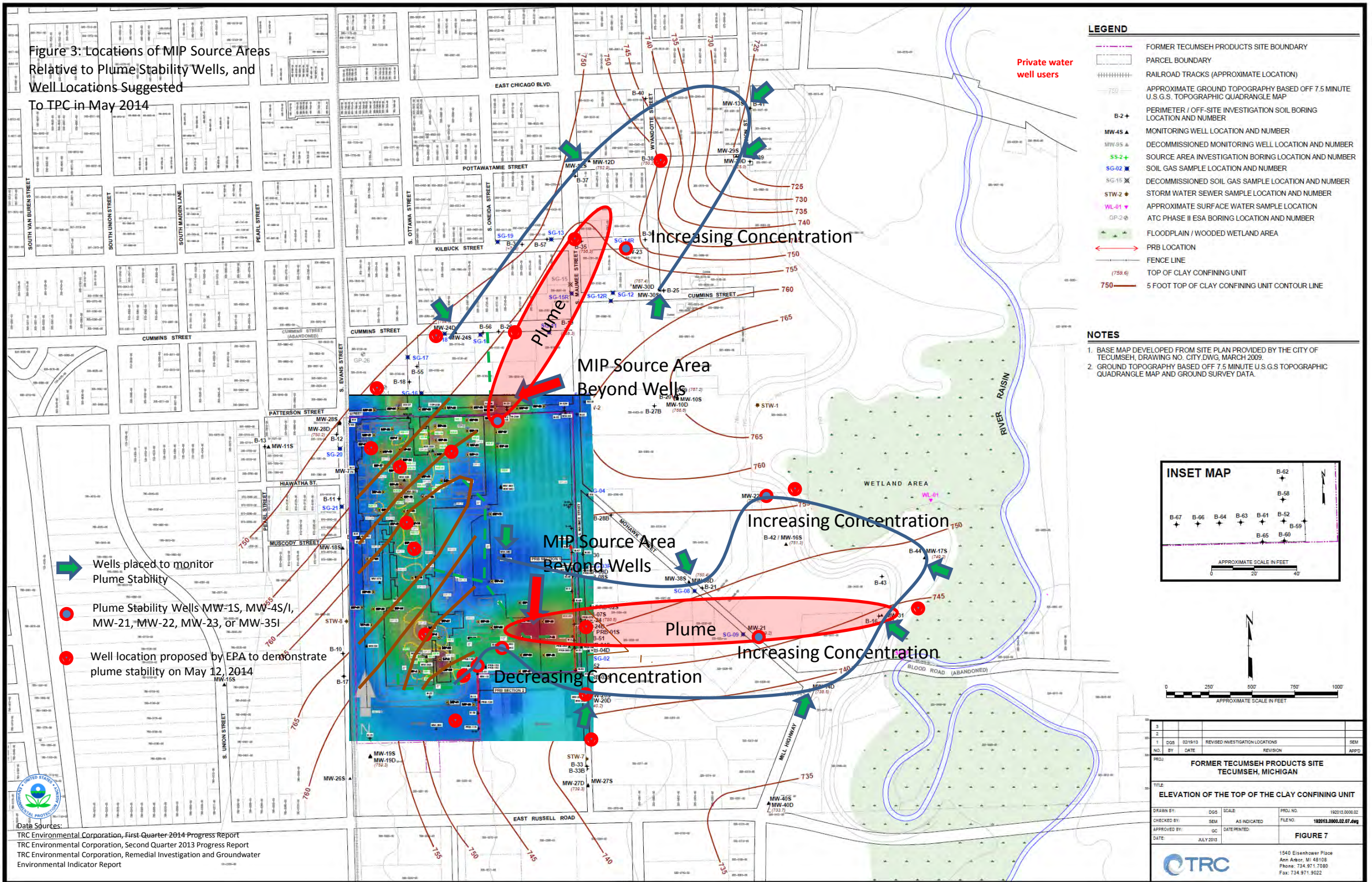


Data Sources:

TRC Environmental Corporation, Revised MIP Investigation Report and Workplan for High Resolution Characterization, dated March 11, 2015

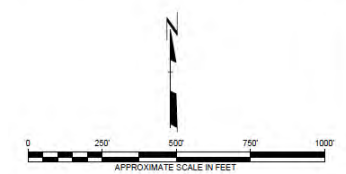
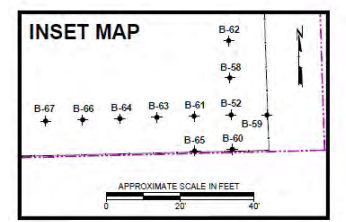
TRC Environmental Corporation, Remedial Investigation and Groundwater Environmental Indicator Report, dated September 28, 2012

Figure 3: Locations of MIP Source Areas Relative to Plume Stability Wells, and Well Locations Suggested To TPC in May 2014



- LEGEND**
- FORMER TECUMSEH PRODUCTS SITE BOUNDARY
 - PARCEL BOUNDARY
 - ||||| RAILROAD TRACKS (APPROXIMATE LOCATION)
 - 750 APPROXIMATE GROUND TOPOGRAPHY BASED OFF 7.5 MINUTE U.S.G.S. TOPOGRAPHIC QUADRANGLE MAP
 - B-2+ PERIMETER / OFF-SITE INVESTIGATION SOIL BORING LOCATION AND NUMBER
 - MW-4S MONITORING WELL LOCATION AND NUMBER
 - MW-9S DECOMMISSIONED MONITORING WELL LOCATION AND NUMBER
 - SS-2+ SOURCE AREA INVESTIGATION BORING LOCATION AND NUMBER
 - SG-02 SOIL GAS SAMPLE LOCATION AND NUMBER
 - SG-15 DECOMMISSIONED SOIL GAS SAMPLE LOCATION AND NUMBER
 - STW-2 STORM WATER SEWER SAMPLE LOCATION AND NUMBER
 - WL-01 APPROXIMATE SURFACE WATER SAMPLE LOCATION
 - GP-2 ATC PHASE II ESA BORING LOCATION AND NUMBER
 - WETLAND FLOODPLAIN / WOODED WETLAND AREA
 - PRB LOCATION
 - FENCE LINE
 - (758.6) TOP OF CLAY CONFINING UNIT
 - 750 5 FOOT TOP OF CLAY CONFINING UNIT CONTOUR LINE

- NOTES**
1. BASE MAP DEVELOPED FROM SITE PLAN PROVIDED BY THE CITY OF TECUMSEH, DRAWING NO. CITY.DWG, MARCH 2009.
 2. GROUND TOPOGRAPHY BASED OFF 7.5 MINUTE U.S.G.S TOPOGRAPHIC QUADRANGLE MAP AND GROUND SURVEY DATA.



NO.	DATE	REVISION	APPD.
1	02/16/13	REVISED INVESTIGATION LOCATIONS	SEM
<p>PROJECT: FORMER TECUMSEH PRODUCTS SITE TECUMSEH, MICHIGAN</p> <p>TITLE: ELEVATION OF THE TOP OF THE CLAY CONFINING UNIT</p>			
DRAWN BY:	DGS	SCALE:	PROJ. NO. 192013.0000.02
CHECKED BY:	SEM	AS INDICATED	FILE NO. 192013.0000.02.07.dwg
APPROVED BY:	GC	DATE PRINTED:	FIGURE 7
DATE:	JULY 2013		

TRC

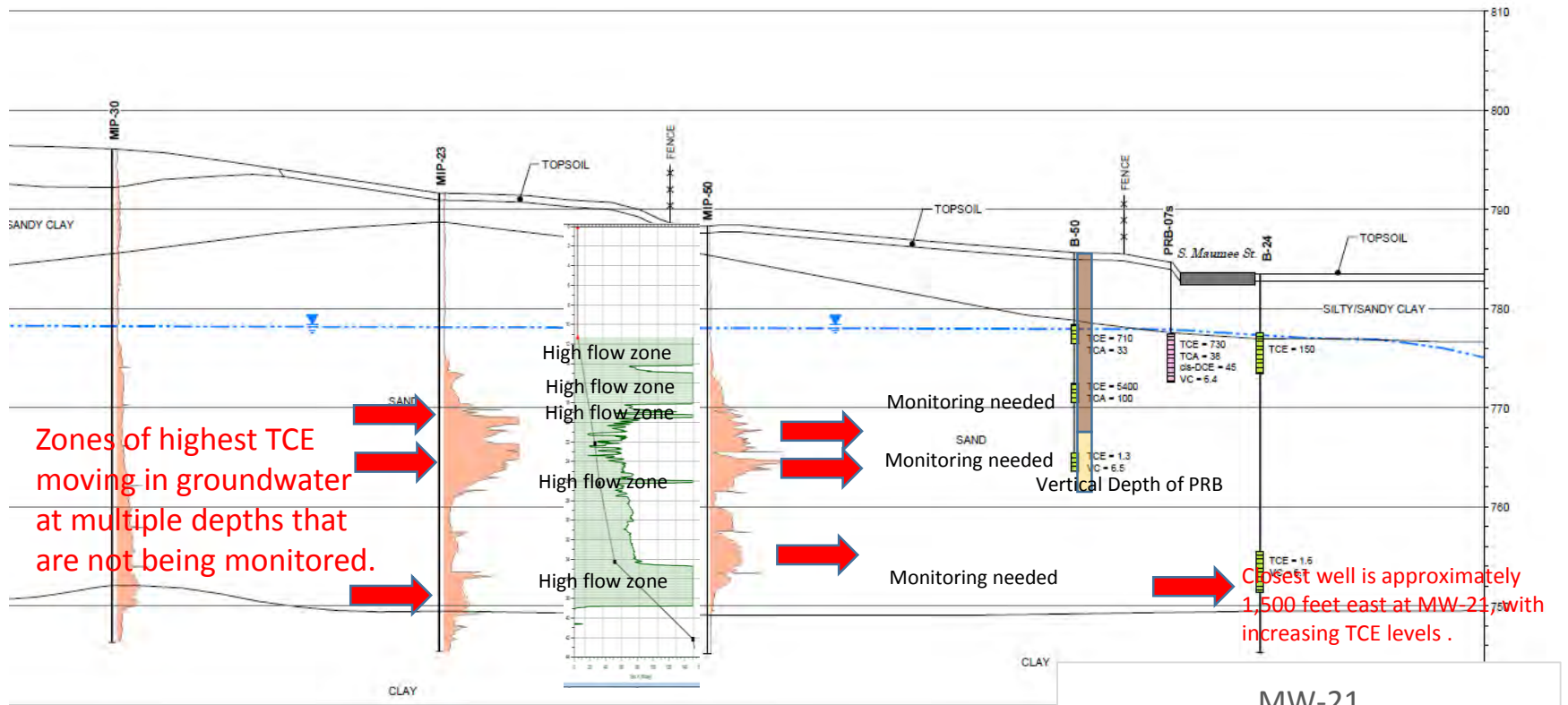
1540 Eisenhower Place
Ann Arbor, MI 48108
Phone: 734.971.7080
Fax: 734.971.9022

Date: 07/23/13
 Project: Former Tecumseh Products Site
 Drawing: Elevation of the Top of the Clay Confining Unit
 Scale: As Indicated
 Author: J. M. Smith
 Designer: J. M. Smith
 Checker: J. M. Smith
 Date: 07/23/13

Data Sources:

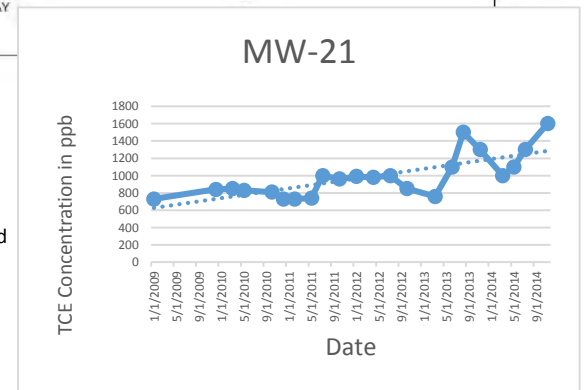
- TRC Environmental Corporation, First Quarter 2014 Progress Report
- TRC Environmental Corporation, Second Quarter 2013 Progress Report
- TRC Environmental Corporation, Remedial Investigation and Groundwater Environmental Indicator Report

Figure 4: Depth of TCE at MIP-50 and MIP-23, relative to depth of Permeable Reactive Barrier



Zones of highest TCE moving in groundwater at multiple depths that are not being monitored.

Closest well is approximately 1,500 feet east at MW-21, with increasing TCE levels.



Data Sources:

TRC Environmental Corporation, Revised MIP Investigation Report and Workplan for High Resolution Characterization, dated March 11, 2015

TRC Environmental Corporation, Construction Documentation Report, Permeable Reactive Barrier Downgradient of the Southern Source Area, dated February 20, 2012.