DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

Interim Final 2/5/99

RCRA Corrective Action
Environmental Indicator (EI) RCRIS code (CA725)

Current Human Exposures Under Control

Facility Name:	Former Tecumseh Products Company Site
Facility Address:	100 East Patterson Street; Tecumseh, Michigan
Facility EPA ID #:	MID-005-049-440

1. Has **all** available relevant/significant information on known and reasonably suspected releases to soil, groundwater, surface water/sediments, and air, subject to RCRA Corrective Action (e.g., from Solid Waste Management Units (SWMU), Regulated Units (RU), and Areas of Concern (AOC)), been **considered** in this EI determination?

   _X_ If yes - check here and continue with #2 below.

   ____ If no - re-evaluate existing data, or

   ____ if data are not available skip to #6 and enter"IN" (more information needed) status code.

BACKGROUND

Definition of Environmental Indicators (for the RCRA Corrective Action)

Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment. The two EI developed to-date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for non-human (ecological) receptors is intended to be developed in the future.

Definition of "Current Human Exposures Under Control" EI

A positive "Current Human Exposures Under Control" EI determination ("YE" status code) indicates that there are no "unacceptable" human exposures to "contamination" (i.e., contaminants in concentrations in excess of appropriate risk-based levels) that can be reasonably expected under current land- and groundwater-use conditions (for all "contamination" subject to RCRA corrective action at or from the identified facility (i.e., site-wide)).

Relationship of EI to Final Remedies

While Final remedies remain the long-term objective of the RCRA Corrective Action program the EI are near-term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993, GPRA). The "Current Human Exposures Under Control" EI are for reasonably expected human exposures under current land- and groundwater-use conditions ONLY, and do not consider potential future land- or groundwater-use conditions or ecological receptors. The RCRA Corrective Action program's overall mission to protect human health and the environment requires that Final remedies address these issues (i.e., potential future human exposure scenarios, future land and groundwater uses, and ecological receptors).

Duration / Applicability of EI Determinations

EI Determinations status codes should remain in RCRIS national database ONLY as long as they remain true (i.e., RCRIS status codes must be changed when the regulatory authorities become aware of contrary information).

2. Are groundwater, soil, surface water, sediments, or air **media** known or reasonably suspected to be **"contaminated"**[1] above appropriately protective risk-based "levels" (applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action (from SWMUs, RUs or AOCs)?

	Yes	No	?	Rationale / Key Contaminants
Groundwater	X			See Groundwater section in Rational below.
Air (indoors)[2]	X			See Indoor Air section in Rational below.
Surface Soil (e.g., <2 ft)		X		See Surface Soil section in Rational below.
Surface Water		X		See Surface Water section in Rational below.
Sediment		X		See Sediment section in Rational below.
Subsurf. Soil (e.g., >2 ft)		X		See Subsurface Soil section in Rational below.
Air (outdoors)		X		See Outdoor Air section in Rational below.

_____ If no (for all media) - skip to #6, and enter "YE," status code after providing or citing appropriate "levels," and referencing sufficient supporting documentation demonstrating that these "levels" are not exceeded.

__X__ If yes (for any media) - continue after identifying key contaminants in each "contaminated" medium, citing appropriate "levels" (or provide an explanation for the determination that the medium could pose an unacceptable risk), and referencing supporting documentation.

_____ If unknown (for any media) - skip to #6 and enter "IN" status code.

Rationale and Reference(s):

INTRODUCTION
The former Tecumseh Products Company (TPC) site in Tecumseh, Michigan is a former manufacturing facility. TPC operations focused on the production and reconditioning of compressors and condensing units for refrigeration and air conditioning units. Volatile organic compounds (VOCs), particularly chlorinated VOCs (CVOCs) were used during site operations.

In 2008, a Phase I Environmental Site Assessment (ESA) was conducted as part of the sale of the property. The Phase I ESA Report recommended that a Phase II Subsurface Investigation be conducted to address the identified recognized environmental conditions. A Phase II ESA was performed between December 2008 and January 2009. The data collected during the Phase II ESA identified CVOCs as the primary constituents of concern at the site.

Following receipt of the Draft Phase II ESA in February 2009, TPC began to investigate soil and groundwater conditions at the site and surrounding area. In September 2009 a Current Conditions Report (CCR) was submitted to the USEPA for review and on March 29, 2010 the RCRA 3008(h) Administrative Order on Consent (RCRA-05-2010-0012) for the Site (MID-005-049-440) was executed (the "AOC").

(continued in Section 2 - Media on the attached sheets)

Footnotes:

[1] "Contamination" and "contaminated" describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriately protective risk-based "levels" (for the media, that identify risks within the acceptable risk range).

[2] Recent evidence (from the Colorado Dept. of Public Health and Environment, and others) suggest that unacceptable indoor air concentrations are more common in structures above groundwater with volatile contaminants than previously believed. This is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration necessary to be reasonably certain that indoor air (in structures located above (and adjacent to) groundwater with volatile contaminants) does not present unacceptable risks.

3. Are there **complete pathways** between "contamination" and human receptors such that exposures can be reasonably expected under the current (land- and groundwater-use) conditions?

Summary Exposure Pathway Evaluation Table

	Potential **Human Receptors** (Under Current Conditions)						
Contaminated Media	Residents	Workers	Day-Care	Construction	Trespassers	Recreation	Food[3]
Groundwater	No	No	No	No			No
Air (indoors)	Yes	Yes	No				
Soil (surface, e.g., <2 ft)		~~X~~					
Surface Water			~~X~~				
Sediment							
Soil (subsurface e.g., >2 ft)					~~X~~		
Air (outdoors)						~~X~~	

Instructions for Summary Exposure Pathway Evaluation Table:

1. Strike-out specific Media including Human Receptors' spaces for Media which are not "contaminated") as identified in #2 above.

2. enter "yes" or "no" for potential "completeness" under each "Contaminated" Media -- Human Receptor combination (Pathway).

Note: In order to focus the evaluation to the most probable combinations some potential "Contaminated" Media - Human Receptor combinations (Pathways) do not have check spaces ("___"). While these combinations may not be probable in most situations they may be possible in some settings and should be added as necessary.

____ If no (pathways are not complete for any contaminated media-receptor combination) - skip to #6, and enter "YE" status code, after explaining and/or referencing condition(s) in-place, whether natural or man-made, preventing a complete exposure pathway from each contaminated medium (e.g., use optional Pathway Evaluation Work Sheet to analyze major pathways).

__X__ If yes (pathways are complete for any "Contaminated" Media - Human Receptor combination) - continue after providing supporting explanation.

____ If unknown (for any "Contaminated" Media - Human Receptor combination) - skip to #6 and enter "IN" status code

Rationale and Reference(s):

See discussion in Section 2.

[3] Indirect Pathway/Receptor (e.g., vegetables, fruits, crops, meat and dairy products, fish, shellfish, etc.)

4 Can the **exposures** from any of the complete pathways identified in #3 be reasonably expected to be **"significant"**[4] (i.e., potentially "unacceptable" because exposures can be reasonably expected to be: 1) greater in magnitude (intensity, frequency and/or duration) than assumed in the derivation of the acceptable "levels" (used to identify the "contamination"); or 2) the combination of exposure magnitude (perhaps even though low) and contaminant concentrations (which may be substantially above the acceptable "levels") could result in greater than acceptable risks)?

__X__ If no (exposures can not be reasonably expected to be significant (i.e., potentially "unacceptable") for any complete exposure pathway) - skip to #6 and enter "YE" status code after explaining and/or referencing documentation justifying why the exposures (from each of the complete pathways) to "contamination" (identified in #3) are not expected to be "significant."

_____ If yes (exposures could be reasonably expected to be "significant" (i.e., potentially "unacceptable") for any complete exposure pathway) - continue after providing a description (of each potentially "unacceptable" exposure pathway) and explaining and/or referencing documentation justifying why the exposures (from each of the remaining complete pathways) to "contamination" (identified in #3) are not expected to be "significant."

_____ If unknown (for any complete pathway) - skip to #6 and enter "IN" status code

Rationale and Reference(s):

See discussion in Section 2.

[4] If there is any question on whether the identified exposures are "significant" (i.e., potentially "unacceptable") consult a human health Risk Assessment specialist with appropriate education, training and experience.

5 Can the "significant" **exposures** (identified in #4) be shown to be within **acceptable** limits?

_____ If yes (all "significant" exposures have been shown to be within acceptable limits) - continue and enter "YE" after summarizing and referencing documentation justifying why all "significant" exposures to "contamination" are within acceptable limits (e.g., a site-specific Human Health Risk Assessment).

_____ If no (there are current exposures that can be reasonably expected to be "unacceptable")- continue and enter "NO" status code after providing a description of each potentially "unacceptable" exposure.

_____ If unknown (for any potentially "unacceptable" exposure) - continue and enter "IN" status code

Rationale and Reference(s):

6. Check the appropriate RCRIS status codes for the Current Human Exposures Under Control EI event code (CA725), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (and attach appropriate supporting documentation as well as a map of the facility):

__X__ YE - Yes, "Current Human Exposures Under Control" has been verified. Based on a review of the information contained in this EI Determination, "Current Human Exposures" are expected to be "Under Control" at the _____ _____ facility, EPA ID #_____, located at _____ under current and reasonably expected conditions. This determination will be re-evaluated when the Agency/State becomes aware of significant changes at the facility.

____ NO - "Current Human Exposures" are NOT "Under Control."

____ IN - More information is needed to make a determination.

Completed by (signature)_____ Date _____
(print)_____
(title)_____

Supervisor (signature)_____ Date _____
(print)_____
(title)_____
(EPA Region or State)_____

Locations where References may be found:

_____
_____
_____
_____
_____

Contact telephone and e-mail numbers

(name) _____
(phone #) _____
(e-mail) _____

FINAL NOTE: THE HUMAN EXPOSURES EI IS A QUALITATIVE SCREENING OF EXPOSURES AND THE DETERMINATIONS WITHIN THIS DOCUMENT SHOULD NOT BE USED AS THE SOLE BASIS FOR RESTRICTING THE SCOPE OF MORE DETAILED (E.G., SITE-SPECIFIC) ASSESSMENTS OF RISK.

Documentation of Environmental Indicator Determination

Former Tecumseh Products Company Site
100 East Patterson Street, Tecumseh, Michigan

Rationale and References
Section 2 Media (Continued from page 2)

Since that time TPC has been working cooperatively with USEPA to complete investigation activities and remedial activities pursuant to Section VI, Work to be Performed, of the AOC. Paragraph 13(a) of the AOC requires TPC to submit an "Environmental Indicators Report" demonstrating that "All current human exposures to contamination at or from the facility are under control. That is, significant or unacceptable exposures do not exsit for all media known or reasonably suspected to be contaminated with hazardous wastes or hazardous constituents above risk–based levels, for which there are complete pathways between contamination and human receptors." Paragraph 10 of the AOC requires TPC to perform the Work in compliance with, among other cited authority sources, the "Documentation of Environmental Indicator Determination Guidance" which was obtained via the EPA website at www.epa.gov/osw/hazard/correctiveaction/eis/, and which provides for the use of this Form CA725. In addition to this Form CA725, and in accordance with the AOC, TPC has also prepared and submitted, concurrently with this Form CA725, a separate report entitled "Current Human Exposures Under Control Environmental Indicator Report ("EI Report") which provides additional detail, documentation and support for the determination that current human exposures to contamination at or from the facility are under control, as required by the AOC. The EI Report includes text, tables, and figures which concisely summarize relevant site conditions, environmental work related to the Determination, and applicable data collected in support of the Determination. Appendix A of the EI Report provides a list and description of project documents related to the Determination.

Groundwater

Exposure to contaminated groundwater at or from the facility was evaluated as follows: Concentrations of VOCs in groundwater were compared to Michigan Part 201 drinking water

criteria and groundwater contact criteria. Tetrachloroethene (PCE), trichloroethene (TCE), 1,1-dichloroethene (1,1-DCE), cis-1,2-dichloroethene (cis-DCE), trans-1,2-dichloroethene (trans-DCE), vinyl chloride, 1,1,1-trichloroethane (TCA), 1,1-dichlorethane (1,1-DCA), ethyl benzene, toluene, total xylenes, and 1,-4-dioxane have been detected in groundwater above Michigan generic Part 201 drinking water criteria. No VOCs were detected above groundwater contact criteria. Therefore ingestion of affected groundwater is a relevant exposure pathway, contact with affected groundwater is not.

An extensive well survey was conducted in and around the area of affected water. Drinking water is supplied by the municipal water supply at all but four properties in the vicinity of affected groundwater. The four private wells currently in use as a primary (drinking water) source (307 Kilbuck Street, 607 Mohawk Street, 611 Mohawk Street, and 615 Mohawk Street) have been tested quarterly as part of the regular monitoring program, no VOCs have been detected in those private wells, and TPC has arranged to have all four wells plugged and the four properties connected to the municipal water supply system. Therefore, the ingestion of affected groundwater migration pathway is not complete for any of the receptors evaluated (residents, workers, daycare, or food). A Groundwater Use Ordinance was passed in June 2011. This ordinance prohibits new private water wells and requires the abandonment of existing private water supply wells within the vicinity of affected groundwater. TPC is working with the City of Tecumseh and private well owners to help facilitate compliance with the Ordinance. In sum, current human exposure to affected groundwater is under control. See Section 4 of the EI Report for additional details.

Indoor Air

TPC evaluated the potential for exposure to indoor air that may be affected by contamination at or from the facility. The potential for vapor intrusion to indoor air was evaluated in accordance with both current regulation and state and federal guidance. Current regulation includes federal OSHA permissible exposure limits (PELs) for indoor air in occupational settings and Michigan Part 201 generic soil and groundwater volatilization to indoor air inhalation (SVIIC and GVIIC) criteria (Michigan Administrative Code R 299.5714 and R 299.5724.) These generic criteria were supplemented, based on on site conditions, by making use of USEPA and MDEQ guidance and draft guidance, as appropriate, to assess the potential for vapor intrusion above risk-based screening criteria. Draft guidance includes the MDEQ Peer Review Draft of RRD Operational Memorandum No. 4: Site Characterization and Remediation Verification: Attachment 4 – Soil Gas and Indoor Air dated June 2008 (MDEQ Draft Guidance), and the USEPA 2002 Draft Guidance for Evaluating the Vapor Intrusion in Indoor Air Migration Pathway from Groundwater and Soils (Subsurface Vapor Intrusion Guidance) (2002 USEPA Draft Guidance).

As outlined in current draft guidance documents, the potential for vapor intrusion to indoor air was evaluated in a stepwise manner over a range of media. Soil data were compared to Michigan Part 201 generic SVIAIC, and groundwater data were compared to Michigan Part 201 generic GVIAIC and groundwater screening levels (GWSLs) calculated in accordance with

USEPA and MDEQ guidance documents. Where soil and/or groundwater data indicated the potential for vapor intrusion, soil gas samples were collected, and results were compared to soil gas screening levels (SGSLs). Finally where soil gas concentrations exceed SGSLs, indoor air samples were collected and/or a preemptive mitigation strategy was selected.

Indoor air screening criteria were calculated in accordance with MDEQ and USEPA Draft Guidance, using both residential (30 years, 350 days per year) and non-residential (25 years, 250 days per year) exposure scenarios and the most recent chemical specific toxicity values accepted and/or published by the USEPA at that time (February 2010). These indoor air screening criteria were used to calculate GWSLs and SGSLs for the site as described below.

GWSLs were calculated as recommended in the MDEQ and USEPA Draft Guidance documents using an attenuation factor of 0.001.

Non-residential sub-slab SGSLs were calculated using an attenuation factor of 0.02, as recommended in the MDEQ Draft Guidance.

Non-residential deep SGSLs were calculated using a site-specific attenuation factor of 0.003. This site specific deep soil gas attenuation factor was calculated using the USEPA Johnson Ettinger Model Spreadsheet (v. 3.1). Model input parameters were consistent with the most conservative site geologic conditions observed in the vicinity of affected media.

There is a high degree of variability in the soil gas attenuation factors recommended for the calculation of residential deep SGSLs. TPC calculated conservative residential SGSLs using a wide range of attenuation factors. Residential SGSLs considered include:

- Residential SGSLs calculated using the site specific attenuation factor of 0.003, calculated as described above;
- Residential SGSLs calculated using the generic attenuation factor used in the 2002 USEPA guidance (0.01); and
- Residential SGSLs calculated using a generic attenuation factor of 0.1 as recommended by Project Manager Michelle Mullen of USEPA in a August 24, 2010 comment letter.

During this period of uncertainty in state and federal policy, TPC has undertaken significant efforts to understand the current state of the science in this rapidly developing field, and has employed a combination of conservative risk assessment procedures and aggressive mitigation strategies to address the potential vapor intrusion migration pathway. See Section 5.1 of the EI Report for additional details.

Site Indoor Air

Concentrations of COCs in on-site soil, groundwater and sub-slab soil gas were detected above risk-based screening levels. Consequently, indoor air samples were collected to evaluate risk directly. Indoor air concentrations were compared to OSHA PELs, the short-term (5-year) non-residential indoor air screening criteria and long-term non-residential (25-year) indoor air screening criteria.

- No CVOCs are present at a concentration greater than 1 percent of their respective OSHA PELs.
- No CVOCs are present at a concentration greater than the short-term (5-year), non-residential indoor air screening criterion.
- TCE and 1,1-DCA were detected above the long-term non-residential indoor air criteria calculated using a 1e-05 risk, but within the USEPA acceptable risk range of 1e-04 to 1e-06 for a long-term, non-residential exposure scenario.

For on-site indoor air exposure, there is only occupational exposure, no residential use. The site is currently occupied by approximately 30 TPC employees who will be relocated to a new facility by the end of November 2011 and by on-site security. A sub-slab depressurization/ventilation (SSDV) system is scheduled to be installed in S-Building which houses on-site security in October 2011. Other workers have been observed accessing the property with the apparent consent of Tecumseh Bakery, LLC (the property owner) or PatJim Holdings (the tenant of the entire facility) both of which are under the common control of James Appold. For example, Mr. Appold has apparently allowed Dave Roberts to store equipment in portions of the building, and TPC and TRC have observed Mr. Roberts and persons apparently working for Mr. Roberts in the building. TPC has prepared, and provided to counsel for Mr. Appold, an interim mitigation strategy, via HVAC controls, for P-Building the newest portion of the facility and the portion of the facility most likely to be occupied by new owners/occupants (March 25, 2010), as well as for the remainder of the facility (June 2010.) TPC has been advised that Dave Roberts is a prospective purchaser, and Lenawee Stamping is a prospective tenant. However, as of September 29, 2011, TPC has not received formal notice of a transfer to an operating business for the facility. The magnitude and duration of this temporary and occasional occupancy to on-site affected indoor air is therefore limited. In sum, current human exposure to on-site indoor air is under control. See Section 5.2 of the EI Report for additional details.

Site Indoor Air at Non Residential Properti

Concentrations of COCs in groundwater were not detected above generic non-residential GVIAIC, but were detected above calculated non-residential GWSLs along the northern perimeter of the site and at monitoring well MW-23 (vinyl chloride) and along the eastern perimeter of the site and at off-site monitoring well locations MW-21 and MW-31 downgradient of southern source area (TCE). The area within the extent of VOCs above GWSLs and a 100-foot buffer zone around this area were further evaluated to determine if indoor air is potentially affected by groundwater volatilization to indoor air.

Concentrations of COCs in perimeter and off-site soil gas were compared to OSHA PELs for indoor air and to non-residential deep SGSLs (calculated using the site-specific attenuation factor of 0.003).

- Concentrations of CVOCs in off-site soil gas are below OSHA PELs;
- Concentrations of CVOCs exceeded non-residential SGSLs at two locations (SG-01 and SG-02) downgradient of the southern source area; and
- The average concentration of CVOCs at soil gas sample locations are within the USEPA acceptable risk range of 1e-04 to 1e-06 for a long-term, non-residential exposure scenario.

In May 2011, TPC proactively installed a permeable reactive barrier (PRB) along the eastern perimeter of the site, downgradient of the apparent southern source area. This PRB is designed to treat shallow-CVOC affected groundwater before it migrates off-site, eliminating long-term and potential future exposure to affected indoor air. In sum, current human exposure to affected indoor air by off-site workers is under control. See Section 5.3 of the EI Report for additional details.

Site Indoor Air at Residential Properties

Concentrations of COCs in groundwater were not detected above generic residential GVIAIC, but were detected above calculated residential GWSLs along the northern perimeter of the site and at monitoring well MW-23 (vinyl chloride) and along the eastern perimeter of the site and at off-site monitoring well locations MW-21 (TCE), MW-22 (vinyl chloride), and MW-31 (TCE). The area within the extent of VOCs above residential GWSLs and a 100-foot buffer zone around this area were further evaluated to determine if indoor air is potentially affected by groundwater volatilization to indoor air.

Concentrations of COCs at soil gas sample locations (SG-03, SG-04, SG-08, SG-09, SG-10, SG-11, SG-12, SG-13, SG-14, SG-15, and SG-16), in the vicinity of residential properties, were compared to a range of residential deep SGSLs calculated, as described above, using attenuation factors ranging from 0.003 to 0.1.

- North of the site, CVOCs in off-site soil gas near residential properties north and northeast of the site were below all of the considered residential SGSLs for vapor intrusion. (Note that concentrations of PCE and TCE have exceeded the most conservative SGSLs (a = 0.1) at soil gas sample location SG-07 along the northern perimeter of the site. Based on these results, soil gas sample point SG-16 was installed adjacent to the residential properties on Ottawa Street to more directly assess risk in this area. Concentrations of CVOCS at SG-16 are below all of the SGSLs considered).
- Northeast of the site, the presence of shallow, perched groundwater has limited soil gas sample collection. However the perched groundwater and the intermediate clay layer below the perched groundwater are expected to act as a barrier to the migration of VOCs from affected groundwater to indoor air. Furthermore, vinyl chloride is the only COC in the area northeast of the site that has been detected above GWSLs in shallow groundwater. Vinyl chloride has not been detected in any

of the soil gas samples collected, including those along the northern perimeter of the site where vinyl chloride concentrations in shallow groundwater are highest.

– East of the site

  Concentrations of COCs at residential soil gas sample locations have not exceeded residential SGSLs calculated using the site-specific soil gas attenuation factor of 0.003.

  Concentrations of COCs at residential soil gas sample locations have not exceeded residential SGSLs calculated using the generic soil gas attenuation factor of 0.01.

  Concentrations of COCs at residential soil gas sample locations have exceeded the most conservative residential SGSLs calculated using the generic soil gas attenuation factor recommended in the August 24, 2010 USEPA Comment Letter (0.1) at two locations: SG-03 (PCE, cis-DCE and 1,1-DCA) and SG-09 (TCE).

Five residential properties are located in the area east of the site. The three residential properties closest to the site have crawlspaces which flood frequently with surface water. This surface water and the associated saturated, low-permeability surface soil create a barrier through which VOCs do not readily migrate. TPC has obtained an access agreement to collect crawlspace air samples in order to confirm that the inhalation of affected indoor air migration pathway is not complete at these locations.

At the two remaining residential properties east of the site, SSDV systems are scheduled to be installed in October 2011 (Workplans were submitted to USEPA for review in May 2011, TPC received comments from USEPA in August 2011, and submitted revised Workplans to USEPA in September 2011). Note that TPC has not collected any indoor air data from these locations directly. On September 13, 2011 USEPA provided data from samples collected by the residents at these locations. The indoor air samples from 610 Mohawk Street were non-detect, while the data from 704 Mohawk Street detected contaminants which may or may not have resulted from contaminated groundwater emanating from the former TPC facility, depending on possible background concentrations and VOC sources from within that house. In any event, regardless of source, TPC has obtained fully executed access agreements with the owners of the houses at 610 and 704 Mohawk Street, to install SSDV systems, and is scheduled to install those systems in October 2011.

Based on the risk assessment provided above, current human exposure to indoor air potentially affected by groundwater contamination migrating off site from the former TPC facility is under control. Moreover, TPC has also employed an aggressive groundwater mitigation strategy to address the potential vapor intrusion migration pathway. Concurrent with soil gas sampling activities, site inspections

and the development of Workplans to install SSDV systems, long-term and potential future exposures to affected off-site indoor air east of the site were addressed through interim remedial actions. In May 2011, TPC installed a PRB along the eastern property boundary in the vicinity of soil gas sample locations SG-01, SG-02, and SG-03. The purpose of the PRB is to eliminate the potential vapor intrusion pathway downgradient of the apparent southern source area by treating shallow CVOC-affected groundwater along the eastern (downgradient) property line before it migrates off site. See Section 5.4 of the EI Report for additional details.

Surface Soil

Concentrations of VOCs in soil were compared to Michigan generic Part 201 direct contact criteria. No exceedences were detected. Current human exposure to soil is under control. See Section 6 of the EI Report for additional details.

Surface Water

There is no on-site surface water; however the River Raisin located downgradient of the site is a discharge feature for storm water and groundwater. Concentrations of VOCs in storm water in the vicinity of the site, in surface water downgradient of the site, and in groundwater discharging to the river were compared to Michigan generic Part 201 drinking water criteria, Michigan Rule 57 non-drinking human non-cancer values, Rule 57 non-drinking human cancer values, and Part 201 groundwater contact criteria. No exceedences were detected in storm water discharging to the river or at surface water downgradient of the site. Groundwater downgradient of one monitoring well (MW-31) may be discharging to the River Raisin at concentrations above risk-based levels for drinking water. However, concentrations in groundwater will be diluted by the river. The concentration of TCE in the River Raisin was estimated by comparing the flow rate in the River Raisin to the discharge rate of affected groundwater into the river. The ratio of flow in the River Raisin relative to groundwater discharge is approximately 20,000:1. Given this mixing ratio, the TCE concentration in the River Raisin due to discharge from the former TPC site is estimated to be <<1.0 ug/L. In sum, surface water is not affected above risk-based screening levels, and current human exposure to surface water is under control. See Section 7 of the EI Report for additional details.

Michigan generic Part 201 direct contact criteria are the risk-based screening levels for sediment. There are no surface water bodies located at the former TPC site. The nearest surface water body, and associated sediment, is the River Raisin which is located approximately 1,500 to 2,500 feet downgradient of the site. VOCs in storm water or groundwater discharging through river sediment may be absorbed to river sediment. However, concentrations at storm water sample locations, the surface water sample location WL-01, and groundwater at monitoring wells along the downgradient perimeter of area affected by VOCs are much lower than both groundwater contact criteria and source area groundwater concentrations. Given that, even the highest measured concentrations of VOCs in the soil at on-site source areas do not exceed human-health based screening levels for soil and sediment the absorption of VOCs from affected water is

insufficient to affect sediment above screening levels. There is no mechanism for off-site sediment to be affected above appropriate risk-based levels. Current human exposure to sediment is under control. See Section 8 of the EI Report for additional details.

Surface Soil

Concentrations of VOCs in soil were compared to Michigan generic Part 201 direct contact criteria. No exceedences were detected. Current human exposure to soil is under control. See Section 9 of the EI Report for additional details.

Outdoor Air

Concentrations of VOCs in outdoor air were not measured directly. However source area indoor air concentrations are expected to be diluted significantly as VOCs migrate outdoors. Outdoor air is not expected to be affected above risk-based screening levels. Current human exposure to outdoor air is under control. See Section 10 of the EI Report for additional details.