



1540 Eisenhower Place
Ann Arbor, MI 48108

734.971.7080 PHONE
734.971.9022 FAX

www.TRCSolutions.com

January 15, 2016

Mr. Joseph Kelly
Project Manager
USEPA, Region 5
77 West Jackson Boulevard
LU-9J
Chicago, IL 60604-3590

Subject: **RCRA 3008(h) Administrative Order on Consent (RCRA-05-2010-0012) –
Tecumseh Products Company
Fourth Quarter 2015 Progress Report – MID 005-049-440**

Dear Mr. Kelly:

Pursuant to Section VI of the above referenced Administrative Order on Consent (Consent Order) effective March 29, 2010, TRC Environmental Corporation (TRC), on behalf of the Respondent Tecumseh Products Company (TPC), submits this Fourth Quarter 2015 Progress Report. This report describes activities related to the Consent Order completed by TPC during the fourth quarter 2015 and planned for completion in the near future. The organization of this document includes, as major headings, the items required under Sections V through VIII of the Consent Order.

V. Project Manager

- The TPC Project Manager is Graham Crockford of TRC.
- The USEPA Project Manager is Joseph Kelly.

VI. Work to be Performed – Remedial Investigation Report and Environmental Indicators Reports

1. A description of activities related to the completion of the Remedial Investigation (RI) Report and the Environmental Indicator (EI) Reports:
 - **Investigation Activities**
 - **Characterize Releases at or from the Facility** – The findings of source area investigation activities completed through August 2012 are documented in the September 2012 Remedial Investigation and Groundwater Environmental Indicator Report (2012 RI/EI Report). A Supplemental Groundwater Investigation Workplan was submitted and

implemented during the first quarter 2013. A technical memorandum documenting the findings of those investigation activities was submitted as an attachment to the Second Quarter 2013 Progress Report. A passive soil gas (PSG) survey was completed through the central and southern portion of the former TPC building during the third quarter 2013. A Technical Memorandum which summarizes the findings of the 2013 PSG survey was included as an appendix to the First Quarter 2014 Progress Report. In April 2014 a supplemental PSG survey was conducted by TRC to further evaluate certain discrete areas requested by USEPA, including the former engineering area, drum storage areas, tank area, areas adjacent to railroad spurs where loading and unloading may have occurred, and the area east/southeast of the southern portion of the building where a number of outbuildings and two hazardous waste storage areas were located. A technical memorandum which summarized the findings of the 2014 PSG survey was submitted to USEPA in June 2014. A source area membrane interface probe (MIP) investigation was conducted between June 2014 and July 2014. MIP data were submitted to USEPA as they became available. TRC submitted the MIP Investigation Report and Workplan for High Resolution Site Characterization on December 31, 2014. The Revised MIP Investigation Report and Workplan for High Resolution Site Characterization was submitted on April 30, 2015 (HRSC Workplan). Field activities described in the HRSC Workplan were completed between April 2015 and June 2015. Preliminary data were reported to USEPA as they became available. On July 31, 2015 the Supplement to Remedial Investigation and Environmental Indicator Report was submitted to USEPA. That Supplement included tabulated soil and groundwater data, soil boring logs and laboratory reports from the HRSC Investigation. A comprehensive evaluation of HRSC data collected during the April through June 2015 investigation activities was completed by TRC. The findings of that data evaluation are documented in the 2015 High Resolution Site Characterization Report and Updated Conceptual Site Model (2015 CSM Report), which was included in the Third Quarter 2015 Progress Report. That Report includes a description of refinements made to the conceptual site model as they pertain to site geology/hydrogeology and to the extent/distribution of contaminants. That Report also includes a description of planned environmental work to support risk assessment, development of the Final Corrective Measures Proposal, and long-term monitoring.

- **Define Appropriate Screening Criteria** – Screening criteria are described in detail in the 2012 RI/EI Report and the 2013 Supplement to the Current Human Exposures Under Control Environmental Indicator Report. Screening criteria include:
 - Generic Michigan Department of Environmental Quality (MDEQ) Part 201 Cleanup Criteria;
 - MDEQ Screening levels for the volatilization to indoor air migration pathway, as documented in the 2013 MDEQ *Guidance Document for the Vapor Intrusion Pathway*;



- MDEQ Rule 57 Surface Water Quality Values; and
- A site-specific groundwater contact criterion for trichloroethene (TCE) which reflects the 2011 revisions to TCE toxicity data.

Preparation of a pathway evaluation is underway. Where concentrations exceed generic screening levels, risk assessment/evaluation may include the development of site-specific screening criteria and/or site-specific remedial goals. This pathway evaluation will be included in the Final Corrective Measures Proposal which is due to USEPA on January 31, 2016.

- **Define Any Unacceptable Risks to Human Health** – The 2011 Current Human Exposures Under Control Environmental Indicator Report (2011 EI Report) provided the required demonstration of current human exposures to affected media under control. In September 2013 the Supplement to the Current Human Exposures Under Control Environmental Indicator Report (2013 Supplemental EI Report) was prepared and submitted to address USEPA comments (provided between December 2011 and October 2012) and to provide additional data and documentation verifying the 2011 EI Report. USEPA provided comments on the 2013 Supplemental EI Report on January 31, 2014. During the May 2014 project meeting with USEPA, TPC agreed to attempt (contingent on owner agreement) to further verify this assessment at nine residential properties north of the site and one non-residential property southeast of the site. During the third quarter 2014, TPC was able to complete indoor air sampling (5 total) and/or sub-slab depressurization/ventilation (SSDV) system installation (5 total) at each of the nine residential properties. No indoor air criteria exceedances were found.

Following extended discussion, the owner of a non-residential property southeast of the site agreed to allow the installation of soil gas sample points at each corner of the main (occupied) building on that property. Soil gas sample points were installed in late September 2014, and the initial sample event was completed in October 2014 as documented in the October 30, 2014 letter report to the property owner. Soil gas sample results from the November 2014 soil gas sample event confirm the initial sample results. A sub-slab soil gas sample point was installed in the northeast corner of the industrial building located on that property in February 2015, and an initial sample event was completed in March 2015. Sample results from June 2015 indicate the TCE concentration at this location periodically exceeds the generic non-residential sub-slab soil gas screening level (SGSL). As described in the June 2015 *OSWER Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway for Subsurface Vapor Sources to Indoor Air* (OSWER Publication 9200.2-154), this SGSL is dependent on building volume, the air exchange rate, and slab construction. A building specific attenuation factor was calculated which indicates that soil gas concentrations are acceptable. On September 18, 2015, USEPA requested that a single indoor air sampling event be completed to verify



this calculation. An indoor air sample was collected in October 2015. Those sampling data confirm that indoor air concentrations are below non-residential indoor air screening levels for all constituents of concern (COCs).

Based on recent data from soil gas sample point SG-20, TPC completed indoor sampling at the four residential properties near this location in May 2015. Sample results were reported to homeowners and USEPA as they became available. TCE, the constituent of concern that prompted this testing, was not detected at any of the indoor air samples.

Results of the HRSC Investigation were used to prepare a figure illustrating the extent of volatile organic compounds (VOCs) in shallow groundwater above MDEQ groundwater screening levels for vapor intrusion (GWSLs) (Figure 14 in the 2015 CSM Report). Soil gas sampling has been completed throughout this area. At soil gas monitoring locations where soil gas data have exceeded residential SGSLS, indoor air sampling and/or installation of a mitigation system has been completed as described above. An additional indoor air sampling event is scheduled to be completed in January at those residential properties north and west of the site where a SSDV system has not been installed, that are also located within 100 feet of the extent of VOCs in shallow groundwater above GWSLs.

USEPA provided additional comment on the current and future human exposures evaluation during the December 8, 2015 project meeting and the December 14, 2015 conference call regarding the risk assessment. Considerate of those comments, preparation of an updated pathway evaluation and risk assessment for both current and future human exposures is underway and will be included in the Final Corrective Measures Proposal which is due to USEPA on January 31, 2016.

- **Define Any Unacceptable Risks to the Environment** – The potential for unacceptable risk to the environment related to the discharge of affected groundwater to nearby surface water and wetlands was evaluated in the 2012 RI/EI Report. This evaluation included the use of site-specific mixing zone-based GSI criteria. A supplemental investigation to address MDEQ comments on the Mixing-Zone Evaluation was completed in the wetlands east of MW-31 between November and December 2015. Results of those investigation activities are pending. Considerate of these data, the assessment of the GSI migration pathway will be updated. That assessment, including a Workplan for additional investigation activities, will be included in the Final Corrective Measures Proposal which is due to USEPA on January 31, 2016.
- **Determine the Stability of Contaminated Groundwater** – Pursuant to the Consent Order, the 2012 RI/EI Report was submitted in September 2012. A supplemental evaluation of groundwater stability was submitted to USEPA on July 31, 2015. Concentrations of VOCs are stable or decreasing at wells located within source area and



around the outer edge of the groundwater plume. However, due to increasing trends at a small number of wells located within the downgradient plume, USEPA contends the stability of contaminated groundwater has not been demonstrated to its satisfaction. As discussed during the December 8, 2015 project meeting, the Final Corrective Measures Proposal will include a recommendation for active groundwater treatment in areas of high groundwater contamination. The proposed corrective measures are expected to result in decreasing groundwater concentrations at downgradient monitoring locations to achieve remedial goals (RGs) which will be established in the Final Corrective Measures Proposal.

- **Response and Mitigation Measures** – Response and mitigation measures conducted through 2013 are documented in the 2011 EI Report, the 2012 RI/EI Report, and the 2013 Supplemental EI Report. These measures include:
 - A local groundwater use ordinance;
 - The decommissioning of private wells in the vicinity of affected groundwater;
 - A Declaration of Restrictive Covenant and License Agreement Regarding Environmental Work for the site;
 - Mitigation of on-site indoor air in areas that were occupied, or are expected to be occupied in the future, including:
 - Installation of a sub-slab depressurization/ventilation (SSDV) system in S-Building (the office area for the site manager)¹; and
 - Installation of a soil vapor extraction (SVE) system in P-Building.
 - Monitoring and mitigation of off-site indoor air, including:
 - Installation of a SSDV system at one residential property east of the site and five residential properties north of the site;
 - Completion of crawlspace sampling activities at four residential properties east of the site and one residential property north of the site;
 - Completion of indoor air sampling at three residential properties north of the site and four residential properties west of the site;
 - Installation of a permeable reactive barrier (PRB) downgradient of the southern source area to address the potential off-site vapor intrusion pathway, by treating

¹ At present, the building is no longer occupied by the site manager or any other regular employees. The site owner has disconnected electrical service. Consequently, this SSDV system is not, at present, operating.



shallow groundwater affected with chlorinated volatile organic compounds (CVOCs) before the groundwater migrates off-site; and

- Installation of a perimeter SVE system as described in the November 2013 Workplan to Install a Perimeter Soil Vapor Extraction System.²

■ **Reporting and Summary of Work Completed**

- **Environmental Indicators Report: Current Human Exposures Under Control** – TRC submitted the 2011 EI Report to USEPA on September 29, 2011. USEPA provided TPC with comments regarding the 2011 EI Report on December 5, 2011. TPC responded to USEPA comments on December 19, 2011. On December 28, 2011, USEPA proposed an extension for USEPA to complete the CA-725 Form until December 12, 2012, so that confirmation indoor air/crawlspace sampling data from the residential properties east of the site (610 Mohawk, 704 Mohawk, 502 Mohawk, 505 South Maumee Street, and 507 South Maumee Street) could be evaluated by USEPA. This work was completed as intended during the fourth quarter 2012. However, during an October 29-30, 2012 project meeting, USEPA requested additional work, which TPC set forth in a Technical Memorandum dated December 5, 2012 and Revised December 19, 2012. Those action items included:
 - Table summaries related to the conceptual site model (included in the Fourth Quarter 2012 Quarterly Progress Report); and
 - Four consecutive soil gas sample events at soil gas monitoring locations north and west of the site after SVE system installation (through second quarter 2013), in order to further document the effectiveness of the SVE system.

On March 6, 2013, USEPA extended the date for the Current Human Exposures Demonstration to September 30, 2013 to allow TPC to complete the above described work. Consistent with this extension, the 2013 Supplemental EI Report was submitted to USEPA on September 30, 2013. USEPA provided comments on the 2013 Supplemental EI Report on January 31, 2014. During the May 2014 project meeting with USEPA, TPC agreed to attempt (contingent on owner agreement) to further verify this assessment at nine residential properties north of the site and at one non-residential property southeast of the site. As described above, initial assessment and/or mitigation was completed at each property in 2014.

Data collection to ensure that current and future human exposures remain under control is ongoing. Preparation of an updated pathway evaluation and risk assessment for both

² Operation of the perimeter SVE system began on March 7, 2014, using a rental SVE blower unit. The permanent blower enclosure was installed on July 10, 2014.



current and future human exposures is underway and will be included in the Final Corrective Measures Proposal which is due to USEPA on January 31, 2016.

- **Environmental Indicators Report: Groundwater Stabilized** – TRC submitted the 2012 RI/EI Report to USEPA on September 28, 2012. During the October 29-30, 2012 project meeting, USEPA requested the following:
 - Additional sample events at monitoring wells where VOC concentration data exhibit relatively high standard deviation.
 - Preparation of a workplan to address USEPA comments regarding groundwater stability and remedial investigation activities. The Supplemental Groundwater Investigation Workplan for the Former Tecumseh Products Company Site in Tecumseh, Michigan was submitted and implemented during the first quarter 2013.
 - Installation of additional monitoring wells and subsequent monitoring at those locations in accordance with the Supplemental Groundwater Investigation Workplan.

On March 6, 2013, USEPA extended the date for the Remedial Investigation and Groundwater Environmental Indicator Determination to July 31, 2015. This extension allowed TPC to complete eight quarterly sample events prior to the submittal of a Supplement to the 2012 RI/EI Report at monitoring locations which were installed in March 2013. On July 31, 2015 the Supplement to Remedial Investigation and Environmental Indicator Report was submitted to USEPA, which included an assessment of groundwater stability at existing monitoring locations, including those installed in 2012.

The January 2014 USEPA comment letter regarding the 2013 Supplemental EI Report extended beyond the scope of current human exposures to provide additional comments on the remedial investigation and on groundwater stability. In 2014, additional on-site and perimeter investigation activities were completed, and a HRSC Workplan was prepared to address concerns raised in that comment letter and the subsequent May 2014 project meeting regarding the extent and stability of affected groundwater. Field activities described in the HRSC Workplan were completed between April 2015 and June 2015. Preliminary data were reported to USEPA as they became available. The findings of that data evaluation are documented in the 2015 CSM Report.

- **Remedial Investigation Report** – TRC submitted the Remedial Investigation Report with the 2012 RI/EI Report to USEPA on September 28, 2012. As described above, USEPA extended the date for the Remedial Investigation and Groundwater Environmental Indicator Determination to July 31, 2015. In 2014, USEPA requested that additional remedial investigation activities be completed for purposes of HRSC. Field activities described in the HRSC Workplan were completed between April 2015 and June 2015. Preliminary data were reported to USEPA as they became available. On July 31,



2015 the Supplement to Remedial Investigation and Environmental Indicator Report was submitted to USEPA which included tabulated soil and groundwater data, soil boring logs and laboratory reports from the HRSC Investigation. Since that time comprehensive evaluation of HRSC data collected during the April through June 2015 investigation activities was completed by TRC. The findings of that data evaluation are documented in the 2015 CSM which was included in the Third Quarter 2015 Progress Report.

USEPA provided additional comments on the remedial investigation activities during the December 8, 2015 project meeting and the December 14, 2015 conference call regarding the risk assessment. Considerate of those comments, workplans for supplemental soil and groundwater investigation activities will be included in the Final Corrective Measures Proposal which is due to USEPA on January 31, 2016.

2. A Summary of Activities during the Reporting Period

- October 2015 – The *2015 High Resolution Site Characterization Report and Updated Conceptual Site Model* was submitted to USEPA.
- October 2015 – The fourth quarter 2015 off-site soil gas sample event was completed.
- October 2015 – An indoor air sampling event was completed at the non-residential property located southeast of the site.
- October-November 2015 – Operation and maintenance of the Perimeter SVE system was completed, including air filter replacement and the collection of exhaust samples for VOCs analysis, to help determine the appropriate timeline for carbon change out.
- November 2015 – Operation and maintenance of the P-Building SVE system was completed, including the collection of exhaust samples for VOCs analysis, to help determine the appropriate timeline for carbon change out.
- November 2015 – Vacuum pressure and methane concentrations were measured at all PRB vent locations and at the two downgradient soil gas sample points (SG-02 and SG-03R).
- November-December 2015 – The fourth quarter groundwater sampling event was completed.
- November-December 2015 – A supplemental groundwater-surface water interface (GSI) investigation was completed, as proposed in the October 14, 2015 Technical Memorandum.
- December 2015 – Operation and maintenance of the P-Building SVE system was completed, including the collection of exhaust samples for VOCs analysis and carbon change out.
- December 2015 – Operation and maintenance of the Perimeter SVE system was completed, including carbon change out.
- December 2015 – Ongoing operation of the SSDV system at 704 Mohawk was verified.



- December 2015 – A supplemental HRSC investigation was completed in the vicinity of the tetrachloroethene (PCE) source area to support development of corrective measures as described in the November 12, 2015 Workplan.
- December 2015 – Met with USEPA in Chicago to discuss HRSC investigation results and the proposed final corrective measures;

3. A Summary of Contacts with Representatives of Local Community, Public Interest Groups, or State Government during the Reporting Period

- TRC communicated with MDEQ regarding GSI investigation activities and the ecological risk assessment.
- At the request of one property owner, TRC provided that owner with a copy of the Third Quarter 2015 Progress Report.
- TRC communicated with the Tecumseh District Library personnel in order to update the public repository at the Tecumseh District Library in October 2015.
- TRC communicated with an off-site property owner to coordinate GSI investigation activities.
- TPC communicated with the City of Tecumseh regarding ongoing environmental work and site redevelopment.
- TPC communicated with the owner of a non-residential property southeast of the site regarding the results of the third quarter soil gas sampling event, to coordinate indoor air sampling, and to report the results of the indoor air and fourth quarter soil gas sampling event.
- TPC and TRC communicated with the City of Tecumseh and the potential buyer regarding the status of the ongoing potential demolition, the proposed sale of the property, and redevelopment options for the site.
- TRC communicated with the City of Tecumseh Fire Department regarding fire watch activities to help ensure safe access to the building, as required by the City of Tecumseh.

4. A Summary of Problems and Potential Problems Encountered During the Reporting Period

- No new problems were noted during the fourth quarter 2015.

5. Action Taken to Rectify Problems Identified Above

- No new problems were noted during the third quarter 2015.

6. Changes in Personnel During Reporting Period

- No TPC/TRC project personnel have changed.



7. Projected Work for the Next Reporting Period

- Complete and submit the Final Corrective Measures Proposal;
- Prepare and submit the 2016 Annually Adjusted Cost Estimate reflective of proposed final corrective measures;
- Evaluate results of GSI investigation activities and determine next steps;
- Evaluate investigation results from the tetrachloroethene source area investigation and incorporate data into Final Corrective Measures Proposal;
- Complete revisions to the exposure pathway evaluation and calculate remedial goals considerate of comments provided by USEPA on December 14, 2015;
- Complete an indoor air sampling event at residential properties north and west of the site;
- At the request of one homeowner, install a SSDV system in lieu of additional indoor air sampling at a residential property located west of the site;
- Continue routine perimeter SVE system operation and maintenance, including completion of carbon change out as needed;
- Continue routine P-Building SVE system operation and maintenance, including completion of carbon change out as needed;
- Complete the regular quarterly SSDV system inspection at the residential property located at 704 Mohawk;
- Collect gas composition readings at vents installed along the length of the PRB; and
- Pending USEPA agreement, begin field activities described in the Final Corrective Measures Proposal.

VI. Work to be Performed – Final Corrective Measures Proposal

Data collected as part of the RI investigations, as described previously in this progress report, will be used to develop the Final Corrective Measures Proposal. Submittal of the Final Corrective Measures Proposal is scheduled for January 31, 2016.

VI. Work to be Performed – Final Corrective Measures Implementation

Work related to the Final Corrective Measures Implementation will be initiated following USEPA's Final Decision.



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VI. Work to be Performed – Establish Public Repository of Information

TPC established a public repository in the City Clerk's office at City Hall in August 2010. To address USEPA comments, the public repository was relocated to the Tecumseh District Library in November 2011. A notice sheet has been posted on the bulletin board at the Tecumseh District Library which lists and briefly describes the documents included in the public repository. TPC updates the public repository as appropriate.

VII. Access

During the fourth quarter 2015, access agreements were obtained at two properties east and southeast of the southern plume area for the completion of additional HRSC borings, for the potential future installation of a monitoring well(s), and for ongoing routine monitoring of the proposed well(s). TPC is in the process of gaining access to properties northeast of the site to allow for the completion of additional groundwater profile borings and installation of monitoring wells to support the evaluation and monitoring of the proposed final corrective measures.

VIII. Cost Estimates and Assurances of Financial Responsibility

In accordance with the Consent Order, TPC submitted an annually updated cost estimate on January 30, 2015. The cost estimate was \$2,052,600. Based on questions from USEPA, clarifications to the cost estimate were submitted on March 2, 2015. In September 2014 a letter of credit for \$2,073,800 was issued; this letter of credit was renewed automatically in September 2015. Concurrent with submittal of the Final Corrective Measures Proposal, TRC will submit a revised cost estimate, reflective of the recommended corrective measures, by January 30, 2016.

If you have any questions regarding this progress report, or the attachments, please contact me at (734) 585-7813, or gcrockford@trcsolutions.com.

Sincerely,

TRC Environmental Corporation



Graham Crockford, C.P.G.
Project Manager



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cc: Susan Perdomo, USEPA
Michael Beedle, USEPA
Colleen Olsberg, USEPA
Bhooma Sundar, USEPA
David Petrovski, USEPA
Mario Mangino, USEPA
Daniel Mazur, USEPA
Carrie Williamson, Tecumseh Products Company
Chris DeWetter, Tecumseh Products Company
Jason Smith, Tecumseh Products Company
Douglas McClure, Conlin, McKenney & Philbrick, PC
Stacy Metz, TRC Environmental Corporation
Jason Miller, Great Lake Aerial Maintenance and Construction Co. Inc.
Dave Roberts, Tecumseh Food, Machinery & Engineering, LLC
Tecumseh District Library – Public Repository
Mary Speer, Resident

