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

REPLY TO THE ATTENTION OF:

August 5, 2020

**SPECIAL NOTICE LETTER**
**URGENT LEGAL MATTER**
**PROMPT REPLY NECESSARY**
**VIA FEDEX**

**CT Corporation System for**
**MAHLE Behr Dayton LLC**
**4400 Easton Commons Way, Suite 125**
**Columbus, OH 43219**

Re: Special Notice Letter for the Behr Dayton Thermal Products VOC Plume Site in Dayton, Ohio

Dear Sir or Madam:

By this letter, the U.S. Environmental Protection Agency is notifying you of your potential responsibility under Section 107(a) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or Superfund), 42 U.S.C. § 9607(a), for the cleanup of the Behr Dayton Thermal Products VOC Plume Site (the Site), located in Dayton, Ohio, including all costs incurred by EPA in responding to releases at the Site. EPA is contacting you in an attempt to resolve your responsibility for past costs and the interim remedy at the Site.

**Background**

Based on an extensive review of records related to the release and/or disposal of hazardous substances at the Site, EPA identified you as one of approximately nine potentially responsible parties (PRPs) that contributed hazardous substances to the Site. Under the federal Superfund law, you and the other PRPs at the Site are responsible for the costs of cleaning up the Site. EPA has selected a cleanup approach (formally known as a remedial action) for the Site, which is described in a document called an Interim Record of Decision (ROD) issued by EPA on September 26, 2019.

**Special Notice and Negotiation Moratorium**

EPA has determined that use of the special notice procedures set forth in Section 122(e) of CERCLA, 42 U.S.C. § 9622(e), may facilitate a settlement between you, other PRPs, and EPA for implementation of the response action. Under Section 122(e), this letter triggers a 60-day moratorium on certain EPA response activities at the Site. During this 60-day moratorium, EPA will not begin response action at the Site; however, EPA reserves the right to take action at the Site at any time should a significant threat to the human health or the environment arise.

During this 60-day period, you and the other PRPs are invited to participate in formal negotiations with EPA in an effort to reach a settlement to conduct or finance the response action at the Site. The 60-day negotiation period ends 63 days from the date EPA issues this letter. The 60-day negotiation moratorium will be extended for an additional 60 days if the PRPs provide EPA with a "good faith offer" to conduct or finance the response action and reimburse EPA for its costs incurred to date. If EPA determines that your proposal is not a "good faith offer," you will be notified in writing of EPA's decision to end the moratorium. If the moratorium is extended for an additional 60 days, negotiations will conclude 60 days from the 63rd day specified above. If settlement is reached between EPA and the PRPs within the 120-day negotiation moratorium, the settlement will be embodied in a Consent Decree for Remedial Design/Remedial Action. Upon approval by EPA and the U.S. Department of Justice (DOJ), the Consent Decree will be lodged in federal court.

If a "good faith offer" is not received within 63 days from the date EPA issues this letter, or a timely settlement cannot be reached, EPA may take appropriate action at the Site, which may include either of the following options: (1) EPA may fund the remedial action and pursue a cost recovery claim under Section 107 of CERCLA against you and/or the other PRPs; or (2) EPA may issue a Unilateral Administrative Order (UAO) to you and/or the other PRPs under Section 106(a) of CERCLA, 42 U.S.C. § 9606, requiring you or them to perform the work described in the Interim ROD. If the recipients of a UAO refuse to comply with the UAO, EPA may pursue civil litigation against the recipients to require compliance.

Pursuant to the Superfund Reforms announced on October 2, 1995, when EPA enters into future remedial design/remedial action (RD/RA) settlements, EPA intends to compensate settlors for a portion of the shares specifically attributable to insolvent and defunct PRPs (orphan share), if any. At this Site, EPA does not believe that there are any PRPs who are insolvent or defunct and, therefore, this reform is not applicable. If you, either individually or with other PRPs, enter into an RD/RA settlement with EPA and provide sufficient information about the existence, liability, and relative shares of responsibility of insolvent and defunct PRPs, EPA will analyze the information and determine whether to consider the shares of these parties in the amount of EPA's past costs and future oversight costs to recover in such settlement.

**Good Faith Offer**

A proposed Consent Decree is enclosed to assist you in developing a "good faith offer."[1] As indicated, the 60-day negotiation moratorium triggered by this letter is extended for 60 days if the PRPs submit a "good faith offer" to EPA. A "good faith offer" to conduct or finance the remedial action is a written proposal that demonstrates your qualifications and willingness to perform such work and includes the following elements:

- A statement of your willingness and financial ability to implement the requirements of the Interim ROD and proposed Consent Decree and that provides a sufficient basis for further negotiation;

- A demonstration of your technical capability to carry out the remedial action, including identification of the firm(s) that may actually conduct the work or a description of the process that will be undertaken to select the firm(s);

- A detailed statement of work or work plan identifying how you intend to proceed with the remedial action;

- A statement of your willingness to reimburse EPA for costs EPA will incur in overseeing your implementation of the remedial action;

- A response to the proposed Consent Decree. If your offer contemplates modifications to the Consent Decree, please make revisions or edits to the Consent Decree and submit a version showing your proposed modifications to it;

- A list identifying each party on whose behalf the offer is being made, including name, address, and telephone number of each party;

- The name, address, and phone number of the party who will represent you in negotiations; and

[1] This draft Consent Decree is not currently binding on EPA and is subject to revision and approval by EPA and DOJ. It is based on the model RD/RA Consent Decree, which is available at https://cfpub.epa.gov/compliance/models/view.cfm?model_ID=81.

- A redline/strikeout version of the draft Consent Decree in Microsoft Word.

**Demand for Reimbursement of Costs**

With this letter, EPA demands that you reimburse EPA for its costs incurred to-date, and encourages you to voluntarily negotiate a Consent Decree, under which you and other PRPs agree to perform the RD/RA.

In accordance with Section 104 of CERCLA, 42 U.S.C. § 9604, EPA has already taken certain response actions and incurred certain costs in response to conditions at the Site. These response actions include but are not limited to expenditures for investigation, planning, removal action, response oversight, and enforcement activities. EPA is seeking to recover from you and other PRPs at the Site its response costs and all the interest authorized to be recovered under Section 107(a) of CERCLA. To date, the approximate total response costs identified through April 30, 2020, for the Site are $10,326,575.62. Under Section 107(a) of CERCLA, EPA hereby makes a demand for payment from you and other PRPs for the above amount plus all interest authorized to be recovered under Section 107(a). A summary of these costs is enclosed as Enclosure C.

While this letter demands that you reimburse EPA for all funds spent or to be spent at the Site, EPA is aware that the financial ability of some PRPs to contribute toward payment of response costs at the Site may be substantially limited. If you believe, and can document, that you fall within this category, please contact Maria Gonzalez, Associate Regional Counsel, for information on "Ability to Pay Settlements." In response, you will receive a package of information about such settlements and a form to fill out with information about your finances, and you will be asked to submit financial records including federal tax returns. If EPA concludes that you have a legitimate inability to pay the full amount, EPA may offer a schedule for payment over time or a reduction in the total amount demanded from you.

Some or all of the costs associated with this notice may be covered by current or past insurance policies issued to you. Most insurance policies will require that you timely notify your carrier(s) of a claim against you. To evaluate whether you should notify your insurance carrier(s) of this demand, you may wish to review current and past policies, beginning with the date of your first contact with the Behr Dayton Thermal Products VOC Plume Site, up to the present. Coverage depends on many factors, such as the language of the particular policy and state law.

In the event that you file for protection in a bankruptcy court, you must include EPA as creditor, because EPA has a potential claim against you. EPA reserves the right to file a proof of claim or application for reimbursement of administrative expenses.

**PRP Steering Committee**

To assist PRPs in negotiating with EPA concerning this matter, EPA is attaching to this letter a list of the names and addresses of other PRPs to whom it is sending this Notice.

EPA recommends that all PRPs meet to select a steering committee responsible for representing the group's interests. EPA recognizes that the allocation of responsibility among PRPs may be difficult. If PRPs are unable to reach consensus among themselves, we encourage the use of the services of a neutral third party to help allocate responsibility. Third parties are available to facilitate negotiations. At the PRPs' request, EPA will provide a list of experienced third-party mediators, or help arrange for a mediator.

**Administrative Record**

In accordance with Section 113 of CERCLA, 42 U.S.C. § 9613, EPA has established an Administrative Record containing the documents that serve as the basis for EPA's selection of the appropriate response action for the Site. This Administrative Record is available online at www.epa.gov/superfund/behr-dayton-thermal for the public's inspection and comment. The Administrative Record is also available for inspection and comment at the Superfund Records Center, EPA Region 5, located at 77 West Jackson Boulevard, Chicago, Illinois, 60604. You may wish to review the Administrative Record to assist you in responding to this letter, but your review should not delay such response beyond the 60-day period provided by CERCLA.

**PRP Response and EPA Contact Person**

You are encouraged to contact EPA within 14 days to indicate your willingness to participate in future negotiations concerning this Site. You may respond individually or through a steering committee if such a committee has been formed. If EPA does not receive a timely response, EPA will assume that you do not wish to negotiate a resolution of your liabilities in connection with the Site, and that you have declined any involvement in performing the response activities.

Your response to this Special Notice Letter and the demand for costs included herein, including written proposals to perform the remedial action selected for the Site, should be sent to:

Mike Rafati, Enforcement Specialist
U.S. Environmental Protection Agency, Region 5
Superfund Division – Emergency Response Branch 2
Enforcement Support Section, SE-5J
77 West Jackson Boulevard
Chicago, Illinois 60604-3590

The factual and legal discussions in this letter are intended solely to provide notice and information, and such discussions are not to be construed as a final EPA position on any matter set forth herein. Due to the seriousness of the environmental and legal problems posed by the conditions at the Site, EPA urges that you give immediate attention and prompt response to this letter.

In addition, EPA has notified the Federal Natural Resource Trustee of its intention to perform or enter into negotiations for the performance of response actions at the Site. [2]

[2] The natural resource trustees are government agencies that have been given the authority to assess the injury to natural resources caused by the release of hazardous substances and to seek the restoration, replacement, or

**Resources and Information for Small Businesses**

As you may be aware, on January 11, 2002, President Bush signed into law the "Small Business Liability Relief and Brownfields Revitalization Act" (SBLRBRA). This Act contains several exemptions and defenses to CERCLA liability, which we suggest that all parties evaluate. You may download a copy of the law at http://www.gpo.gov/fdsys/pkg/PLAW-107publ118/pdf/PLAW-107publ118.pdf and review EPA guidances regarding these exemptions at http://cfpub.epa.gov/compliance/resources/policies/cleanup/superfund/.

In addition, if you are a "service station dealer" who accepts used oil for recycling, you may qualify for an exemption from liability under Section 114(c) of CERCLA. EPA guidance regarding this exemption can be found on the Agency's website at http://www2.epa.gov/enforcement/guidance-superfunds-service-station-dealers-exemption . If you believe you may qualify for the exemption, please contact Erik Hardin, Remedial Project Manager, at (312) 886-2402 or at hardin.erik@epa.gov to request an application/information request specifically designed for service station dealers.

EPA has created a number of helpful resources for small businesses. EPA has established the National Compliance Assistance Clearinghouse as well as Compliance Assistance Centers which offer various forms of resources to small businesses. You may inquire about these resources at http://www2.epa.gov/compliance/compliance-assistance-centers. In addition, information on contacting EPA's Small Business Ombudsman is available at http://www.epa.gov/sbo. Finally, EPA has developed a fact sheet about the Small Business Regulatory Enforcement Fairness Act (SBREFA) and information on resources for small businesses, which is enclosed with this letter and available on the Agency's website at http://www2.epa.gov/compliance/small-business-resources-information-sheet.

If you have any questions regarding the technical aspects of this letter, please contact Erik Hardin, Remedial Project Manager, at (312) 886-2402 or at hardin.erik@epa.gov. If you have an attorney handling your legal matters, please direct his or her questions to Maria Gonzalez, Associate Regional Counsel, at (312) 886-6630 or at gonzalez.maria@epa.gov. If you have any other questions regarding this letter, you may contact Mike Rafati, Enforcement Specialist, at (312) 886-0390 or at rafati.mike@epa.gov.

If you are unable to respond in a timely fashion because of impacts related to the COVID-19 pandemic, please submit a written extension request via email to Maria and Mike, explaining the specific impacts on your ability to respond.

**Initial Discussions to Expedite Negotiations**

To expedite our discussions in this matter, EPA proposes an introductory phone conference with all recipients of this letter. EPA plans to provide proposed meeting times within fifteen days after

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acquisition of equivalent natural resources. The Federal Natural Resource Trustees include the Departments of Agriculture, Commerce, Defense, Energy, and Interior. In addition, States and Tribes are Natural Resource Trustees.

EPA issues this letter. The introductory call shall have no effect on the deadlines discussed above.

My staff and I look forward to working with you during the coming months.

Sincerely,

8/5/2020

X Joan Tanaka

Joan Tanaka, Chief
Remedial Response Branch 1
Signed by: Environmental Protection Agency

Enclosures:

A. Draft Consent Decree
B. September 26, 2019 Interim Record of Decision
C. Summary of Past Costs
D. Draft Statement of Work
E. Addressee List
F. Small Business Regulatory Enforcement Fairness Act Fact Sheet

cc: Lila C. Jones, DOJ
Lindy Nelson, DOI
Brian Tucker, Ohio EPA
Leslie Williams, Ohio EPA
Charles T. Wehland
Christopher Jones
Timothy Hoffman
Diana R. Christy
E. Chase Dressman
Steven C. Nadeau
Angelique Strong Marks

bcc: Erik Hardin, RPM (SR-6J)
Maria Gonzalez, ORC (C-14J)
Mike Rafati, ESS (SE-5J)
Carolyn Bohlen, ESS (SE-5J)
Gerri Pete, ESS (SE-5J)
John Maritote, ERS4 (SE-5J)
Rick Hackley, PAAS (MF-10J)
Todd Quesada, RMD (SRC-7J)

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF OHIO
WESTERN DIVISION

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UNITED STATES OF AMERICA

Plaintiffs,

Civil Action No. _____

v.

MAHLE Behr Dayton Thermal LLC,
Gem City Chemicals, Inc.,
Aramark Uniform and Career Apparel LLC,
DAP Products Inc., La Mirada Products Co., Inc.
Gayston Corp., Hohman Plating and Mfg., LLC,
Electro Polish Co., and MLC, Inc.,

Defendants.
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - x

# REMEDIAL DESIGN/REMEDIAL ACTION

# CONSENT DECREE

## TABLE OF CONTENTS

# I. BACKGROUND

A. The United States of America ("United States"), on behalf of the Administrator of the United States Environmental Protection Agency (EPA), filed a complaint in this matter pursuant to Sections 106 and 107 of the Comprehensive Environmental Response, Compensation, and Liability Act, as amended (CERCLA), 42 U.S.C. §§ 9606 and 9607.

B. The United States in its complaint seeks, *inter alia*: (1) reimbursement of costs incurred by EPA and the Department of Justice (DOJ) for response actions at the Behr-Dayton Thermal Systems VOC Plume Superfund Site in Dayton, Ohio ("Site"), together with accrued interest; and (2) performance of response actions by the defendants at the Site consistent with the National Contingency Plan, 40 C.F.R. Part 300 (NCP).

C. In accordance with the NCP and Section 121(f)(1)(F) of CERCLA, 42 U.S.C. § 9621(f)(1)(F), EPA notified the State of Ohio (the "State") on or about December 2, 2019, of negotiations with potentially responsible parties (PRPs) regarding the implementation of the remedial design and remedial action (RD/RA) for the Site, and EPA has provided the State with an opportunity to participate in such negotiations and be a party to this Consent Decree (CD).

D. In accordance with Section 122(j)(1) of CERCLA, 42 U.S.C. § 9622(j)(1), EPA notified the Ohio Environmental Protection Agency and the Department of Interior on or about December 2, 2019, of negotiations with PRPs regarding the release of hazardous substances that may have resulted in injury to the natural resources under federal trusteeship and encouraged the trustee(s) to participate in the negotiation of this CD.

E. The defendants that have entered into this CD ("Settling Defendants" or "SDs") do not admit any liability to Plaintiff arising out of the transactions or occurrences alleged in the complaint, nor do they acknowledge that the release or threatened release of hazardous substances at or from the Site constitutes an imminent and substantial endangerment to the public health or welfare or the environment.

F. Pursuant to Section 105 of CERCLA, 42 U.S.C. § 9605, EPA placed the Site on the National Priorities List (NPL), set forth at 40 C.F.R. Part 300, Appendix B, by publication in the Federal Register on April 9, 2009, 74 Fed. Reg. 16126.

G. In response to a release or a substantial threat of a release of a hazardous substance(s) at or from the Site, EPA commenced in June, 2011, a Remedial Investigation and Feasibility Study (RI/FS) for the Site pursuant to 40 C.F.R. § 300.430.

H. EPA completed a Remedial Investigation (RI) Report in November, 2017, and EPA completed a Focused Feasibility Study (FFS) Report in May, 2018.

I. Pursuant to Section 117 of CERCLA, 42 U.S.C. § 9617, EPA published notice of the completion of the FFS and of the proposed plan for remedial action on September 5, 2018, in a major local newspaper of general circulation. EPA provided an opportunity for written and oral comments from the public on the proposed plan for remedial action. A copy of the transcript of the public meeting is available to the public as part of the administrative record upon which the Regional Administrator or Regional delegatee, if any, EPA Region 5, based the selection of the response action.

J. The decision by EPA on the remedial action to be implemented at the Site is embodied in a Interim Record of Decision (ROD), executed on September 26, 2019, on which the State has given its concurrence. The ROD includes a responsiveness summary to the public comments. Notice of the final plan was published in accordance with Section 117(b) of CERCLA, 42 U.S.C. § 9617(b).

K. Based on the information presently available to EPA, EPA believes that the Work will be properly and promptly conducted by SDs if conducted in accordance with this CD and its appendices.

M. Solely for the purposes of Section 113(j) of CERCLA, 42 U.S.C. § 9613(j), the remedy set forth in the ROD and the Work to be performed by SDs shall constitute a response action taken or ordered by the President for which judicial review shall be limited to the administrative record.

N. The Parties recognize, and the Court by entering this CD finds, that this CD has been negotiated by the Parties in good faith and implementation of this CD will expedite the cleanup of the Site and will avoid prolonged and complicated litigation between the Parties, and that this CD is fair, reasonable, and in the public interest.

NOW, THEREFORE, it is hereby Ordered, Adjudged, and Decreed:

## II. JURISDICTION

1. This Court has jurisdiction over the subject matter of this action pursuant to 28 U.S.C. §§ 1331 and 1345, and 42 U.S.C. §§ 9606, 9607, and 9613(b). This Court also has personal jurisdiction over SDs. Solely for the purposes of this CD and the underlying complaint, SDs waive all objections and defenses that they may have to jurisdiction of the Court or to venue in this District. SDs shall not challenge the terms of this CD or this Court's jurisdiction to enter and enforce this CD.

## III. PARTIES BOUND

2. This CD is binding upon the United States and upon SDs and their successors, and assigns. Any change in ownership or corporate or other legal status of a SD including, but not limited to, any transfer of assets or real or personal property, shall in no way alter such SD's responsibilities under this CD.

3. SDs shall provide a copy of this CD to each contractor hired to perform the Work and to each person representing any SD with respect to the Site or the Work, and shall condition all contracts entered into hereunder upon performance of the Work in conformity with the terms of this CD. SDs or their contractors shall provide written notice of the CD to all subcontractors hired to perform any portion of the Work. SDs shall nonetheless be responsible for ensuring that their contractors and subcontractors perform the Work in accordance with the terms of this CD. With regard to the activities undertaken pursuant to this CD, each contractor and subcontractor shall be deemed to be in a contractual relationship with SDs within the meaning of Section 107(b)(3) of CERCLA, 42 U.S.C. § 9607(b)(3).

## IV. DEFINITIONS

4. Unless otherwise expressly provided in this CD, terms used in this CD that are defined in CERCLA or in regulations promulgated under CERCLA shall have the meaning assigned to them in CERCLA or in such regulations. Whenever terms listed below are used in this CD or its appendices, the following definitions shall apply solely for purposes of this CD:

"Affected Property" shall mean all real property at the Site and any other real property where EPA determines, at any time, that access, land, water, or other resource use restrictions, and/or Institutional Controls are needed to implement the Remedial Action, including, but not limited to, the following properties: 1600 Webster Street, 1287 Air City Avenue, 1200 Webster Street, 220 Janney Road, 55 Janney Road, 814 Hillrose Avenue, and 529 Hunter Avenue in Dayton, Ohio.

"CERCLA" shall mean the Comprehensive Environmental Response, Compensation, and Liability Act, as amended, 42 U.S.C. §§ 9601-9675.

"Consent Decree" or "CD" shall mean this consent decree and all appendices attached hereto (listed in Section XXII). In the event of conflict between this CD and any appendix, this CD shall control.

"Day" or "day" shall mean a calendar day. In computing any period of time under this CD, where the last day would fall on a Saturday, Sunday, or federal or State holiday, the period shall run until the close of business of the next working day.

"DOJ" shall mean the United States Department of Justice and its successor departments, agencies, or instrumentalities.

"Effective Date" shall mean the date upon which the approval of this CD is recorded on the Court's docket.

"EPA" shall mean the United States Environmental Protection Agency and its successor departments, agencies, or instrumentalities.

"EPA Hazardous Substance Superfund" shall mean the Hazardous Substance Superfund established by the Internal Revenue Code, 26 U.S.C. § 9507.

"Ohio EPA" shall mean the Ohio Environmental Protection Agency and any successor departments or agencies of the State.

"Future Response Costs" shall mean all costs, including, but not limited to, direct and indirect costs, that the United States incurs in reviewing or developing deliverables submitted pursuant to this CD, in overseeing implementation of the Work, or otherwise implementing, overseeing, or enforcing this CD, including, but not limited to, payroll costs, contractor costs, travel costs, laboratory costs, the costs incurred pursuant to ¶ 11 (Emergencies and Releases), ¶ 12 (Community Involvement) (including the costs of any technical assistance grant under Section 117(e) of CERCLA, 42 U.S.C. § 9617(e)), ¶ 27 (Access to Financial Assurance), Section VII (Remedy Review), Section VIII (Property Requirements) (including the cost of attorney time and any monies paid to secure or enforce access or land, water, or other resource use restrictions and/or to secure, implement, monitor, maintain, or enforce Institutional Controls

including the amount of just compensation), and Section XIII (Dispute Resolution), and all litigation costs. Future Response Costs shall also include all Interim Response Costs, all Interest on those Past Response Costs SDs have agreed to pay under this CD that has accrued pursuant to 42 U.S.C. § 9607(a) during the period from April 30, 2020, to the Effective Date, and Agency for Toxic Substances and Disease Registry (ATSDR) costs regarding the Site.

"Institutional Controls" or "ICs" shall mean Proprietary Controls and state or local laws, regulations, ordinances, zoning restrictions, or other governmental controls or notices that: (a) limit land, water, or other resource use to minimize the potential for human exposure to Waste Material at or in connection with the Site; (b) limit land, water, or other resource use to implement, ensure non-interference with, or ensure the protectiveness of the RA; and/or (c) provide information intended to modify or guide human behavior at or in connection with the Site.

"Interim Response Costs" shall mean all costs, including, but not limited to, direct and indirect costs, (a) paid by the United States in connection with the Site between April 30, 2020 and the Effective Date, or (b) incurred prior to the Effective Date but paid after that date.

"Interest" shall mean interest at the rate specified for interest on investments of the EPA Hazardous Substance Superfund, compounded annually on October 1 of each year, in accordance with 42 U.S.C. § 9607(a). The applicable rate of interest shall be the rate in effect at the time the interest accrues. The rate of interest is subject to change on October 1 of each year. Rates are available online at https://www.epa.gov/superfund/superfund-interest-rates.

"The Behr-Dayton Thermal Systems VOC Plume Site Special Account" shall mean the special account, within the EPA Hazardous Substance Superfund, established for the Site by EPA pursuant to Section 122(b)(3) of CERCLA, 42 U.S.C. § 9622(b)(3), and the settlement dated June 8, 2010, between the Liquidation Trust and United States the United States entered on October 21, 2010, in In re Old CARCO (f/k/a Chrylser LLC), Case No. 09-50002(AJG), in the United States Bankruptcy Court for the Southern District of New York .

"National Contingency Plan" or "NCP" shall mean the National Oil and Hazardous Substances Pollution Contingency Plan promulgated pursuant to Section 105 of CERCLA, 42 U.S.C. § 9605, codified at 40 C.F.R. Part 300, and any amendments thereto.

"Non-Settling Owner" shall mean any person, other than a SD, that owns or controls any Affected Property. The clause "Non-Settling Owner's Affected Property" means Affected Property owned or controlled by Non-Settling Owner.

"Operation and Maintenance" or "O&M" shall mean all activities required to operate, maintain, and monitor the effectiveness of the RA as specified in the SOW or any EPA-approved O&M Plan.

"Owner SD" shall mean any SD that owns or controls any Affected Property, including a) MAHLE Behr Dayton Thermal LLC (MAHLE), b) Gem City Chemicals, Inc. (Gem City); c) Aramark Uniform and Career Apparel LLC (Aramark); d) DAP Products, Inc.(DAP); e) Gayston Corporation (Gayston); f) Hohman Plating and Mfg. LLC; and g) MLC, Inc. The clause "Owner SD's Affected Property" means Affected Property owned or controlled by Owner SD.

"Paragraph" or "¶" shall mean a portion of this CD identified by an Arabic numeral or an upper or lower case letter.

"Parties" shall mean the United States and SDs.

"Past Response Costs" shall mean all costs, including, but not limited to, direct and indirect costs, that the United States paid at or in connection with the Site through April 30, 2020, plus Interest on all such costs that has accrued pursuant to 42 U.S.C. § 9607(a) through such date.

"Performance Standards" or "PS" shall mean the cleanup levels and other measures of achievement of the remedial action objectives, as set forth in the ROD.

"Plaintiff" shall mean the United States.

"Proprietary Controls" shall mean easements or covenants running with the land that (a) limit land, water, or other resource use and/or provide access rights and (b) are created pursuant to common law or statutory law by an instrument that is recorded in the appropriate land records office.

"RCRA" shall mean the Solid Waste Disposal Act, as amended, 42 U.S.C. §§ 6901-6992 (also known as the Resource Conservation and Recovery Act).

"Record of Decision" or "ROD" shall mean the EPA Interim Record of Decision relating to the Site signed on September 26, 2019, by the Regional Administrator, EPA Region 5, or his/her delegate, and all attachments thereto. The ROD is attached as Appendix A.

"Remedial Action" or "RA" shall mean the remedial action selected in the ROD.

"Remedial Design" or "RD" shall mean those activities to be undertaken by SDs to develop final plans and specifications for the RA as stated in the SOW.

"Section" shall mean a portion of this CD identified by a Roman numeral.

"Settling Defendants" or "SDs" shall mean those Parties identified in Appendix D.

"Site" shall mean the Behr-Dayton Thermal Systems VOC Plume Superfund Site, encompassing approximately 360 acres, including contamination at and/or from the following properties 1600 Webster Street, 1287 Air City Avenue, 1200 Webster Street, 220 Janney Road, 55 Janney Road, 814 Hillrose Avenue, and 529 Hunter Avenue in Dayton, Montgomery County, Ohio, and depicted generally on the map attached as Appendix C.

"State" shall mean the State of Ohio.

"Statement of Work" or "SOW" shall mean the document describing the activities SDs must perform to implement the RD, the RA, and O&M regarding the Site, which is attached as Appendix B.

"Supervising Contractor" shall mean the principal contractor retained by SDs to supervise and direct the implementation of the Work under this CD.

"Transfer" shall mean to sell, assign, convey, lease, mortgage, or grant a security interest in, or where used as a noun, a sale, assignment, conveyance, or other disposition of any interest by operation of law or otherwise.

"United States" shall mean the United States of America and each department, agency, and instrumentality of the United States, including EPA.

"Waste Material" shall mean (1) any "hazardous substance" under Section 101(14) of CERCLA, 42 U.S.C. § 9601(14); (2) any pollutant or contaminant under Section 101(33) of CERCLA, 42 U.S.C. § 9601(33); (3) any "solid waste" under Section 1004(27) of RCRA, 42 U.S.C.§ 6903(27); and (4) any "hazardous waste" under Ohio Admin. Code §§ 3745-50-10(A)(48) and 3745-51-03.

"Work" shall mean all activities and obligations SDs are required to perform under this CD, except the activities required under Section XIX (Retention of Records).

## V. GENERAL PROVISIONS

5. **Objectives of the Parties**. The objectives of the Parties in entering into this CD are to protect public health or welfare or the environment by the design and implementation of response actions at the Site by SDs, to pay response costs of Plaintiff, and to resolve the claims of Plaintiff against SDs as provided in this CD.

6. **Commitments by SDs**

a. SDs shall finance and perform the Work in accordance with this CD and all deliverables developed by SDs and approved or modified by EPA pursuant to this CD. SDs shall pay the United States for its response costs as provided in this CD.

b. SDs' obligations to finance and perform the Work, including obligations to pay amounts due under this CD, are joint and several. In the event of the insolvency of any SD or the failure by any SD to implement any requirement of this CD, the remaining SDs shall complete all such requirements.

7. **Compliance with Applicable Law**. Nothing in this CD limits SDs' obligations to comply with the requirements of all applicable federal and state laws and regulations. SDs must also comply with all applicable or relevant and appropriate requirements of all federal and state environmental laws as set forth in the ROD and the SOW. The activities conducted pursuant to this CD, if approved by EPA, shall be deemed to be consistent with the NCP as provided in Section 300.700(c)(3)(ii) of the NCP.

8. **Permits**

a. As provided in Section 121(e) of CERCLA, 42 U.S.C. § 9621(e), and Section 300.400(e) of the NCP, no permit shall be required for any portion of the Work conducted entirely on-site (i.e., within the areal extent of contamination or in very close proximity to the contamination and necessary for implementation of the Work). Where any portion of the Work that is not on-site requires a federal or state permit or approval, SDs shall submit timely and complete applications and take all other actions necessary to obtain all such permits or approvals.

b. SDs may seek relief under the provisions of Section XII (Force Majeure) for any delay in the performance of the Work resulting from a failure to obtain, or a delay in obtaining, any permit or approval referenced in ¶ 8.a and required for the Work, provided that they have submitted timely and complete applications and taken all other actions necessary to obtain all such permits or approvals.

c. This CD is not, and shall not be construed to be, a permit issued pursuant to any federal or state statute or regulation.

## VI. PERFORMANCE OF THE WORK

9. **Coordination and Supervision**

a. **Project Coordinators**

(1) SDs' Project Coordinator must have sufficient technical expertise to coordinate the Work. SDs' Project Coordinator may not be an attorney representing any SD in this matter and may not act as the Supervising Contractor. SDs' Project Coordinator may assign other representatives, including other contractors, to assist in coordinating the Work.

(2) EPA shall designate and notify the SDs of EPA's Project Coordinator[s] and Alternate Project Coordinator[s]. EPA may designate other representatives, which may include its employees, contractors and/or consultants, to oversee the Work. EPA's Project Coordinator/Alternate Project Coordinator will have the same authority as a remedial project manager and/or an on-scene coordinator, as described in the NCP. This includes the authority to halt the Work and/or to conduct or direct any necessary response action when he or she determines that conditions at the Site constitute an emergency or may present an immediate threat to public health or welfare or the environment due to a release or threatened release of Waste Material.

(3) SDs' Project Coordinators shall meet with EPA's Project Coordinator[s] at least monthly.

b. **Supervising Contractor**. SDs' proposed Supervising Contractor must have sufficient technical expertise to supervise the Work and a quality assurance system that complies with ANSI/ASQC E4-2004, Quality Systems for Environmental Data and Technology Programs: Requirements with Guidance for Use (American National Standard).

c. **Procedures for Disapproval/Notice to Proceed**

(1) SDs shall designate, and notify EPA, within 10 days after the Effective Date, of the name[s], title[s], contact information, and qualifications of the SDs' proposed Project Coordinator and Supervising Contractor, whose qualifications shall be subject to EPA's review for verification based on objective assessment criteria (e.g., experience, capacity, technical expertise) and do not have a conflict of interest with respect to the project.

(2) EPA, after a reasonable opportunity for review and comment by the State, shall issue notices of disapproval and/or authorizations to proceed regarding the proposed Project Coordinator and Supervising Contractor, as applicable. If EPA issues a notice of disapproval, SDs shall, within 30 days, submit to EPA a list of supplemental proposed Project Coordinators and/or Supervising Contractors, as applicable, including a description of the qualifications of each. EPA shall issue a notice of disapproval or authorization to proceed regarding each supplemental proposed coordinator and/or contractor. SDs may select any coordinator/contractor covered by an authorization to proceed and shall, within 21 days, notify EPA of SDs' selection.

(3) SDs may change their Project Coordinator and/or Supervising Contractor, as applicable, by following the procedures of ¶¶ 9.c(1) and 9.c(2).

10. **Performance of Work in Accordance with SOW**. SDs shall: (a) develop the RD; (b) perform the RA; and (c) operate, maintain, and monitor the effectiveness of the RA; all in accordance with the SOW and all EPA-approved, conditionally-approved, or modified deliverables as required by the SOW. All deliverables required to be submitted for approval under the CD or SOW shall be subject to approval by EPA in accordance with ¶ [**6.6**] (Approval of Deliverables) of the SOW.

11. **Emergencies and Releases**. SDs shall comply with the emergency and release response and reporting requirements under ¶ [**4.3**] (Emergency Response and Reporting) of the SOW. Subject to Section XV (Covenants by Plaintiff), nothing in this CD, including ¶ [**4.3**] of the SOW, limits any authority of Plaintiff: (a) to take all appropriate action to protect human health and the environment or to prevent, abate, respond to, or minimize an actual or threatened release of Waste Material on, at, or from the Site, or (b) to direct or order such action, or seek an order from the Court, to protect human health and the environment or to prevent, abate, respond to, or minimize an actual or threatened release of Waste Material on, at, or from the Site. If, due to SDs' failure to take appropriate response action under ¶ [**4.3**] of the SOW, EPA takes such action instead, SDs shall reimburse EPA under Section X (Payments for Response Costs) for all costs of the response action.

12. **Community Involvement**. If requested by EPA, SDs shall conduct community involvement activities under EPA's oversight as provided for in, and in accordance with, Section [**2**] (Community Involvement) of the SOW. Such activities may include, but are not limited to, designation of a Community Involvement Coordinator. Costs incurred by the United States under this Section constitute Future Response Costs to be reimbursed under Section X (Payments for Response Costs).

13. **Modification of SOW or Related Deliverables**

a. If EPA determines that it is necessary to modify the work specified in the SOW and/or in deliverables developed under the SOW in order to achieve and/or maintain the Performance Standards or to carry out and maintain the effectiveness of the RA, and such modification is consistent with the Scope of the Remedy set forth in ¶ [**1.3**] of the SOW, then EPA may notify SDs of such modification. If SDs object to the modification they may, within 30 days after EPA's notification, seek dispute resolution under Section XIII.

b. The SOW and/or related work plans shall be modified: (1) in accordance with the modification issued by EPA; or (2) if SDs invoke dispute resolution, in accordance with the final resolution of the dispute. The modification shall be incorporated into and enforceable under this CD, and SDs shall implement all work required by such modification. SDs shall incorporate the modification into the deliverable required under the SOW, as appropriate.

c. Nothing in this Paragraph shall be construed to limit EPA's authority to require performance of further response actions as otherwise provided in this CD.

14. Nothing in this CD, the SOW, or any deliverable required under the SOW constitutes a warranty or representation of any kind by Plaintiff[s] that compliance with the work requirements set forth in the SOW or related deliverable will achieve the Performance Standards.

## VII. REMEDY REVIEW

15. **Periodic Review**. SDs shall conduct, in accordance with ¶ [**4.7**] (Periodic Review Support Plan) of the SOW, studies and investigations to support EPA's reviews under Section 121(c) of CERCLA, 42 U.S.C. § 9621(c), and applicable regulations, of whether the RA is protective of human health and the environment.

## VIII. PROPERTY REQUIREMENTS

16. **Agreements Regarding Access and Non-Interference.** SDs shall, with respect to any Non-Settling Owner's Affected Property, use best efforts to secure from such Non-Settling Owner an agreement, enforceable by SDs and by Plaintiff, providing that such Non-Settling Owner, and Owner SD shall, with respect to Owner SD's Affected Property: (i) provide Plaintiff and the other SDs, and their representatives, contractors, and subcontractors with access at all reasonable times to such Affected Property to conduct any activity regarding the CD, including those listed in ¶ 16.a (Access Requirements); and (ii) refrain from using such Affected Property in any manner that EPA determines will pose an unacceptable risk to human health or to the environment due to exposure to Waste Material, or interfere with or adversely affect the implementation, integrity, or protectiveness of the Remedial Action. SDs shall provide a copy of such access agreement(s) to EPA and the State.

a. **Access Requirements**. The following is a list of activities for which access is required regarding the Affected Property:

(1) Monitoring the Work;

(2) Verifying any data or information submitted to the United States;

(3) Conducting investigations regarding contamination at or near the Site;

(4) Obtaining samples;

(5) Assessing the need for, planning, or implementing additional response actions at or near the Site;

(6) Assessing implementation of quality assurance and quality control practices as defined in the approved construction quality assurance quality control plan as provided in the SOW;

(7) Implementing the Work pursuant to the conditions set forth in ¶ 66 (Work Takeover);

(8) Inspecting and copying records, operating logs, contracts, or other documents maintained or generated by SDs or their agents, consistent with Section XVIII (Access to Information);

(9) Assessing SDs' compliance with the CD;

(10) Determining whether the Affected Property is being used in a manner that is prohibited or restricted, or that may need to be prohibited or restricted under the CD; and

(11) Implementing, monitoring, maintaining, reporting on, and enforcing any land, water, or other resource use restrictions.

17. **Best Efforts**. As used in this Section, "best efforts" means the efforts that a reasonable person in the position of SDs would use so as to achieve the goal in a timely manner, including the cost of employing professional assistance and the payment of reasonable sums of money to secure access and/or use restriction agreements. If SDs are unable to accomplish what is required through "best efforts" in a timely manner, they shall notify the United States [EPA], and include a description of the steps taken to comply with the requirements. If the United States deems it appropriate, it may assist SDs, or take independent action, in obtaining such access and/or use restrictions. All costs incurred by the United States in providing such assistance or taking such action, including the cost of attorney time and the amount of monetary consideration or just compensation paid, constitute Future Response Costs to be reimbursed under Section X (Payments for Response Costs).

18. If EPA determines in a decision document prepared in accordance with the NCP that Institutional Controls in the form of state or local laws, regulations, ordinances, zoning restrictions, or other governmental controls or notices are needed, SDs shall cooperate with EPA's efforts to secure and ensure compliance with such Institutional Controls.

19. **Notice to Successors-in-Title**

a. Owner SD shall, within 15 days after the Effective Date, submit for EPA approval a notice to be filed regarding Owner SD's Affected Property in the appropriate land records. The notice must: (1) include a proper legal description of the Affected Property; (2) provide notice to all successors-in-title: (i) that the Affected Property is part of, or related to, the Site; (ii) that EPA has selected a remedy for the Site; and (iii) that potentially responsible parties have entered into a CD requiring implementation of such remedy; and (3) identify the U.S. District Court in which the CD was filed, the name and civil action number of this case, and the date the CD was entered by the Court. Owner SD shall record the notice within 10 days after EPA's approval of the notice and submit to EPA, within 10 days thereafter, a certified copy of the recorded notice.

b. Owner SD shall, prior to entering into a contract to Transfer Owner SD's Affected Property, or 60 days prior to Transferring Owner SD's Affected Property, whichever is earlier:

(1) Notify the proposed transferee that EPA has selected a remedy regarding the Site, that potentially responsible parties have entered into a Consent Decree requiring implementation of such remedy, and that the United States District Court has entered the CD (identifying the name and civil action number of this case and the date the CD was entered by the Court); and

(2) Notify EPA and the State of the name and address of the proposed transferee and provide EPA and the State with a copy of the notice that it provided to the proposed transferee.

20. In the event of any Transfer of the Affected Property, unless the United States otherwise consents in writing, SDs shall continue to comply with their obligations under the CD, including their obligation to secure access and ensure compliance with any land, water, or other resource use restrictions regarding the Affected Property.

21. Notwithstanding any provision of the CD, Plaintiff retains all of its access authorities and rights, as well as all of its rights to require land, water, or other resource use restrictions and Institutional Controls, including enforcement authorities related thereto, under CERCLA, RCRA, and any other applicable statute or regulations.

## IX. FINANCIAL ASSURANCE

22. In order to ensure completion of the Work, SDs shall secure financial assurance, initially in the amount of $18,100,000 ("Estimated Cost of the Work"), for the benefit of EPA. The financial assurance must be one or more of the mechanisms listed below, in a form substantially identical to the relevant sample documents available from EPA or under the "Financial Assurance - Settlements" category on the Cleanup Enforcement Model Language and Sample Documents Database at https://cfpub.epa.gov/compliance/models/, and satisfactory to EPA. SDs may use multiple mechanisms if they are limited to surety bonds guaranteeing payment, letters of credit, trust funds, and/or insurance policies.

a. A surety bond guaranteeing payment and/or performance of the Work that is issued by a surety company among those listed as acceptable sureties on federal bonds as set forth in Circular 570 of the U.S. Department of the Treasury;

b. An irrevocable letter of credit, payable to or at the direction of EPA, that is issued by an entity that has the authority to issue letters of credit and whose letter-of-credit operations are regulated and examined by a federal or state agency;

c. A trust fund established for the benefit of EPA that is administered by a trustee that has the authority to act as a trustee and whose trust operations are regulated and examined by a federal or state agency;

d. A policy of insurance that provides EPA with acceptable rights as a beneficiary thereof and that is issued by an insurance carrier that has the authority to issue

insurance policies in the applicable jurisdiction(s) and whose insurance operations are regulated and examined by a federal or state agency;

e. A demonstration by a SD that it meets the relevant test criteria of ¶ 23, accompanied by a standby funding commitment, which obligates the affected SD to pay funds to or at the direction of EPA, up to the amount financially assured through the use of this demonstration in the event of a Work Takeover; or

f. A guarantee to fund or perform the Work executed in favor of EPA by a company: (1) that is a direct or indirect parent company of a SD or has a "substantial business relationship" (as defined in 40 C.F.R. § 264.141(h)) with a SD; and (2) can demonstrate to EPA's satisfaction that it meets the financial test criteria of ¶ 24.

23. SDs have selected, and EPA has found satisfactory, a [**insert type**] as an initial form of financial assurance. Within 30 days after the Effective Date, SDs shall secure all executed and/or otherwise finalized mechanisms or other documents consistent with the EPA-approved form of financial assurance and shall submit such mechanisms and documents to the Dale Meyer, Regional Comptroller, Mail Code MF-10J, Resource Management Division, U.S. EPA Region 5, 77 West Jackson Blvd., Chicago, Illinois 60604, with a copy to Justin Abrams, Accountant, Program Accounting and Analysis Section, Mail Code MF-10J, Resource Management Divison, U.S. EPA Region 5, 77 West Jackson Blvd., Chicago, Illinois 60604, and to the United States, and to EPA as specified in Section XX (Notices and Submissions).

24. SDs seeking to provide financial assurance by means of a demonstration or guarantee under ¶ 22.e or 22.f, must, within 30 days of the Effective Date:

a. Demonstrate that:

(1) the affected SD or guarantor has:

i. Two of the following three ratios: a ratio of total liabilities to net worth less than 2.0; a ratio of the sum of net income plus depreciation, depletion, and amortization to total liabilities greater than 0.1; and a ratio of current assets to current liabilities greater than 1.5; and

ii. Net working capital and tangible net worth each at least six times the sum of the Estimated Cost of the Work and the amounts, if any, of other federal, state, or tribal environmental obligations financially assured through the use of a financial test or guarantee; and

iii. Tangible net worth of at least $10 million; and

iv. Assets located in the United States amounting to at least 90 percent of total assets or at least six times the sum of the Estimated Cost of the Work and the amounts, if any, of other federal, state, or tribal environmental obligations financially assured through the use of a financial test or guarantee; or

(2) The affected SD or guarantor has:

i. A current rating for its senior unsecured debt of AAA, AA, A, or BBB as issued by Standard and Poor's or Aaa, Aa, A or Baa as issued by Moody's; and

ii. Tangible net worth at least six times the sum of the Estimated Cost of the Work and the amounts, if any, of other federal, state, or tribal environmental obligations financially assured through the use of a financial test or guarantee; and

iii. Tangible net worth of at least $10 million; and

iv. Assets located in the United States amounting to at least 90 percent of total assets or at least six times the sum of the Estimated Cost of the Work and the amounts, if any, of other federal, state, or tribal environmental obligations financially assured through the use of a financial test or guarantee; and

b. Submit to EPA for the affected SD or guarantor: (1) a copy of an independent certified public accountant's report of the entity's financial statements for the latest completed fiscal year, which must not express an adverse opinion or disclaimer of opinion; and (2) a letter from its chief financial officer and a report from an independent certified public accountant substantially identical to the sample letter and reports available from EPA or under the "Financial Assurance - Settlements" subject list category on the Cleanup Enforcement Model Language and Sample Documents Database at https://cfpub.epa.gov/compliance/models/.

25. SDs providing financial assurance by means of a demonstration or guarantee under ¶ 22.e or 22.f must also:

a. Annually resubmit the documents described in ¶ 24.b within 90 days after the close of the affected Respondent's or guarantor's fiscal year;

b. Notify EPA within 30 days after the affected Respondent or guarantor determines that it no longer satisfies the relevant financial test criteria and requirements set forth in this Section; and

c. Provide to EPA, within 30 days of EPA's request, reports of the financial condition of the affected Respondent or guarantor in addition to those specified in ¶ 24.b; EPA may make such a request at any time based on a belief that the affected Respondent or guarantor may no longer meet the financial test requirements of this Section.

26. SDs shall diligently monitor the adequacy of the financial assurance. If any SD becomes aware of any information indicating that the financial assurance provided under this Section is inadequate or otherwise no longer satisfies the requirements of this Section, such SD shall notify EPA of such information within 7 days. If EPA determines that the financial assurance provided under this Section is inadequate or otherwise no longer satisfies the requirements of this Section, EPA will notify the affected SD of such determination. SDs shall,

within 30 days after notifying EPA or receiving notice from EPA under this Paragraph, secure and submit to EPA for approval a proposal for a revised or alternative financial assurance mechanism that satisfies the requirements of this Section. EPA may extend this deadline for such time as is reasonably necessary for the affected SD, in the exercise of due diligence, to secure and submit to EPA a proposal for a revised or alternative financial assurance mechanism, not to exceed 60 days. SDs shall follow the procedures of ¶ 28 (Modification of Financial Assurance) in seeking approval of, and submitting documentation for, the revised or alternative financial assurance mechanism. SDs' inability to secure financial assurance in accordance with this Section does not excuse performance of any other obligation under this Settlement.

27. **Access to Financial Assurance**

a. If EPA issues a notice of implementation of a Work Takeover under ¶ 66.b, then, in accordance with any applicable financial assurance mechanism and/or related standby funding commitment, EPA is entitled to: (1) the performance of the Work; and/or (2) require that any funds guaranteed be paid in accordance with ¶ 27.d.

b. If EPA is notified by the issuer of a financial assurance mechanism that it intends to cancel the mechanism, and the affected SD fails to provide an alternative financial assurance mechanism in accordance with this Section at least 30 days prior to the cancellation date, the funds guaranteed under such mechanism must be paid prior to cancellation in accordance with ¶ 27.d.

c. If, upon issuance of a notice of implementation of a Work Takeover under ¶ 66.b, either: (1) EPA is unable for any reason to promptly secure the resources guaranteed under any applicable financial assurance mechanism [and/or related standby funding commitment], whether in cash or in kind, to continue and complete the Work; or (2) the financial assurance is a demonstration or guarantee under ¶ 22.e or 22.f, then EPA is entitled to demand an amount, as determined by EPA, sufficient to cover the cost of the remaining Work to be performed. SDs shall, within 30 days of such demand, pay the amount demanded as directed by EPA.

d. Any amounts required to be paid under this ¶ 27 shall be, as directed by EPA: (i) paid to EPA in order to facilitate the completion of the Work by EPA, the State, or by another person; or (ii) deposited into an interest-bearing account, established at a duly chartered bank or trust company that is insured by the FDIC, in order to facilitate the completion of the Work by another person. If payment is made to EPA, EPA may deposit the payment into the EPA Hazardous Substance Superfund or into the Behr-Dayton Thermal Systems VOC Plume Site Special Account within the EPA Hazardous Substance Superfund to be retained and used to conduct or finance response actions at or in connection with the Site, or to be transferred by EPA to the EPA Hazardous Substance Superfund.

e. All EPA Work Takeover costs not paid under this ¶ 27 must be reimbursed as Future Response Costs under Section X (Payments for Response Costs).

28. **Modification of Amount, Form, or Terms of Financial Assurance**. SDs may submit, on any anniversary of the Effective Date or at any other time agreed to by the Parties, a request to reduce the amount, or change the form or terms, of the financial assurance mechanism. Any such request must be submitted to EPA in accordance with ¶ 23, and must include an

estimate of the cost of the remaining Work, an explanation of the bases for the cost calculation, and a description of the proposed changes, if any, to the form or terms of the financial assurance. EPA will notify SDs of its decision to approve or disapprove a requested reduction or change pursuant to this Paragraph. SDs may reduce the amount of the financial assurance mechanism only in accordance with: (a) EPA's approval; or (b) if there is a dispute, the agreement, final administrative decision, or final judicial decision resolving such dispute under Section XIII (Dispute Resolution). SDs may change the form or terms of the financial assurance mechanism only in accordance with EPA's approval. Any decision made by EPA on a request submitted under this Paragraph to change the form or terms of a financial assurance mechanism shall not be subject to challenge by SDs pursuant to the dispute resolution provisions of this CD or in any other forum. Within 30 days after receipt of EPA's approval of, or the agreement or decision resolving a dispute relating to, the requested modifications pursuant to this Paragraph, SDs shall submit to EPA documentation of the reduced, revised, or alternative financial assurance mechanism in accordance with ¶ 23.

29. **Release, Cancellation, or Discontinuation of Financial Assurance**. SDs may release, cancel, or discontinue any financial assurance provided under this Section only: (a) if EPA issues a Certification of Work Completion under ¶ [**4.8**] (Certification of Work Completion) of the SOW; (b) in accordance with EPA's approval of such release, cancellation, or discontinuation; or (c) if there is a dispute regarding the release, cancellation, or discontinuance of any financial assurance, in accordance with the agreement, final administrative decision, or final judicial decision resolving such dispute under Section XIII (Dispute Resolution).

## X. PAYMENTS FOR RESPONSE COSTS

30. **Payment by SDs for United States Past Response Costs**.

a. Within 30 days after the Effective Date, SDs shall pay to EPA $10,326,575.62 in payment for Past Response Costs. Payment shall be made in accordance with ¶ 32.a (instructions for past response cost payments).

b. **Deposit of Past Response Costs Payment**. The total amount to be paid by Setting Defendants pursuant to ¶ 30.a shall be deposited by EPA in the Behr-Dayton Thermal Systems VOC Plume Site Special Account to be retained and used to conduct or finance response actions at or in connection with the Site, or to be transferred by EPA to the EPA Hazardous Substance Superfund.

31. **Payments by SDs for Future Response Costs**. SDs shall pay to EPA all Future Response Costs not inconsistent with the NCP.

a. **Periodic Bills**. On a periodic basis, EPA will send SDs a bill requiring payment that includes an Itemized Cost Summary, which includes direct and indirect costs incurred by EPA, its contractors, subcontractors, and DOJ. SDs shall make all payments within 30 days after SDs' receipt of each bill requiring payment, except as otherwise provided in ¶ 33, in accordance with ¶ 32.b (instructions for future response cost payments).

b. **Deposit of Future Response Costs Payments**. The total amount to be paid by SDs pursuant to ¶ 31.a (Periodic Bills) shall be deposited by EPA in the Behr-Dayton

Thermal Systems VOC Plume Site Special Account to be retained and used to conduct or finance response actions at or in connection with the Site, or to be transferred by EPA to the EPA Hazardous Substance Superfund, provided, however, that EPA may deposit a Future Response Costs payment directly into the EPA Hazardous Substance Superfund if, at the time the payment is received, EPA estimates that the Behr-Dayton Thermal Systems VOC Plume Site Special Account balance is sufficient to address currently anticipated future response actions to be conducted or financed by EPA at or in connection with the Site. Any decision by EPA to deposit a Future Response Costs payment directly into the EPA Hazardous Substance Superfund for this reason shall not be subject to challenge by SDs pursuant to the dispute resolution provisions of this CD or in any other forum.

32. **Payment Instructions for SDs**

a. **Past Response Costs Payments and Future Response Costs Prepayments**.

(1) The Financial Litigation Unit (FLU) of the United States Attorney's Office for the Southern District of Ohio shall provide SDs, in accordance with ¶ 87, with instructions regarding making payments to DOJ on behalf of EPA after the Effective Date. The instructions must include a Consolidated Debt Collection System (CDCS) number to identify payments made under this CD.

(2) For all payments subject to this ¶ 32.a, SDs shall make such payment by Fedwire Electronic Funds Transfer (EFT) to the U.S. DOJ account, in accordance with the instructions provided under ¶ 32.a(1), and including references to the CDCS Number, Site/Spill ID Number B5FH, and DJ Number 90-11-3-09743/1.

(3) For each payment made under this ¶ 32.a, SDs shall send notices, including references to the CDCS, Site/Spill ID, and DJ numbers, to the United States, EPA, and the EPA Cincinnati Finance Center, all in accordance with ¶ 87.

b. **Future Response Costs Payments and Stipulated Penalties Payment Instructions**. For all payments subject to this ¶ 32.b, SDs shall make such payments by Fedwire EFT in accordance with the instructions below. Each payment shall include a reference to the Site/Spill ID and DJ numbers.

Federal Reserve Bank of New York
ABA: 021030004
Account: 68010727
SWIFT address: FRNYUS33
Field Tag 4200: D 68010727 Environmental Protection Agency

c. **Notice of Payment**. For each payment made under ¶ 32, SDs shall send notices, including references to the CDCS, Site ID B5FH, and DJ numbers, to the United States, EPA, and the EPA Cincinnati Finance Center, all in accordance with ¶ 87.

33. **Contesting Future Response Costs**. SDs may submit a Notice of Dispute, initiating the procedures of Section XIII (Dispute Resolution), regarding any Future Response Costs billed under ¶ 31 (Payments by SDs for Future Response Costs) if they determine that EPA has made a mathematical error or included a cost item that is not within the definition of Future Response Costs, or if they believe EPA incurred excess costs as a direct result of an EPA action that was inconsistent with a specific provision or provisions of the NCP. Such Notice of Dispute shall be submitted in writing within 30 days after receipt of the bill and must be sent to the United States pursuant to Section XX (Notices and Submissions). Such Notice of Dispute shall specifically identify the contested Future Response Costs and the basis for objection. If SDs submit a Notice of Dispute, SDs shall within the 30-day period, also as a requirement for initiating the dispute, (a) pay all uncontested Future Response Costs to the United States, and (b) establish, in a duly chartered bank or trust company, an interest-bearing escrow account that is insured by the Federal Deposit Insurance Corporation (FDIC), and remit to that escrow account funds equivalent to the amount of the contested Future Response Costs. SDs shall send to the United States, as provided in Section XX (Notices and Submissions), a copy of the transmittal letter and check paying the uncontested Future Response Costs, and a copy of the correspondence that establishes and funds the escrow account, including, but not limited to, information containing the identity of the bank and bank account under which the escrow account is established as well as a bank statement showing the initial balance of the escrow account. If the United States prevails in the dispute, SDs shall pay the sums due (with accrued interest) to the United States within 7 days after the resolution of the dispute. If SDs prevail concerning any aspect of the contested costs, SDs shall pay that portion of the costs (plus associated accrued interest) for which they did not prevail to the United States within 7 days after the resolution of the dispute. SDs shall be disbursed any balance of the escrow account. All payments to the United States under this Paragraph shall be made in accordance with ¶¶ 32.b (instructions for future response cost payments). The dispute resolution procedures set forth in this Paragraph in conjunction with the procedures set forth in Section XIII (Dispute Resolution) shall be the exclusive mechanisms for resolving disputes regarding SDs' obligation to reimburse the United States for its Future Response Costs.

34. **Interest**. In the event that any payment for Past Response Costs or for Future Response Costs required under this Section is not made by the date required, SDs shall pay Interest on the unpaid balance. The Interest on Past Response Costs shall begin to accrue on the Effective Date. The Interest on Future Response Costs shall begin to accrue on the date of the bill. The Interest shall accrue through the date of SDs' payment. Payments of Interest made under this Paragraph shall be in addition to such other remedies or sanctions available to Plaintiff by virtue of SDs' failure to make timely payments under this Section including, but not limited to, payment of stipulated penalties pursuant to Section XIV (Stipulated Penalties).

## XI. INDEMNIFICATION AND INSURANCE

35. **SDs' Indemnification of the United States**

a. The United States does not assume any liability by entering into this CD or by virtue of any designation of SDs as EPA's authorized representatives under Section 104(e) of CERCLA, 42 U.S.C. § 9604(e). SDs shall indemnify, save, and hold harmless the United States and its officials, agents, employees, contractors, subcontractors, and representatives for or from any and all claims or causes of action arising from, or on account of, negligent or other

wrongful acts or omissions of SDs, their officers, directors, employees, agents, contractors, subcontractors, and any persons acting on SDs' behalf or under their control, in carrying out activities pursuant to this CD, including, but not limited to, any claims arising from any designation of SDs as EPA's authorized representatives under Section 104(e) of CERCLA. Further, SDs agree to pay the United States all costs it incurs including, but not limited to, attorneys' fees and other expenses of litigation and settlement arising from, or on account of, claims made against the United States based on negligent or other wrongful acts or omissions of SDs, their officers, directors, employees, agents, contractors, subcontractors, and any persons acting on their behalf or under their control, in carrying out activities pursuant to this CD. The United States shall not be held out as a party to any contract entered into by or on behalf of SDs in carrying out activities pursuant to this CD. Neither SDs nor any such contractor shall be considered an agent of the United States.

b. The United States shall give SDs notice of any claim for which the United States plans to seek indemnification pursuant to this ¶ 35, and shall consult with SDs prior to settling such claim.

36. SDs covenant not to sue and agree not to assert any claims or causes of action against the United States for damages or reimbursement or for set-off of any payments made or to be made to the United States, arising from or on account of any contract, agreement, or arrangement between any one or more of SDs and any person for performance of work on or relating to the Site, including, but not limited to, claims on account of construction delays. In addition, SDs shall indemnify, save and hold harmless the United States with respect to any and all claims for damages or reimbursement arising from or on account of any contract, agreement, or arrangement between any one or more of SDs and any person for performance of Work on or relating to the Site, including, but not limited to, claims on account of construction delays.

37. **Insurance**. No later than 15 days before commencing any on-site Work, SDs shall secure, and shall maintain until the first anniversary after the RA has been performed in accordance with this CD and the Performance Standards have been achieved commercial general liability insurance with limits of liability of $1 million per occurrence, automobile liability insurance with limits of liability of $1 million per accident, and umbrella liability insurance with limits of liability of $5 million in excess of the required commercial general liability and automobile liability limits, naming the United States as an additional insured with respect to all liability arising out of the activities performed by or on behalf of SDs pursuant to this CD. In addition, for the duration of this CD, SDs shall satisfy, or shall ensure that their contractors or subcontractors satisfy, all applicable laws and regulations regarding the provision of worker's compensation insurance for all persons performing the Work on behalf of SDs in furtherance of this CD. Prior to commencement of the Work, SDs shall provide to EPA certificates of such insurance and a copy of each insurance policy. SDs shall resubmit such certificates and copies of policies each year on the anniversary of the Effective Date. If SDs demonstrate by evidence satisfactory to EPA that any contractor or subcontractor maintains insurance equivalent to that described above, or insurance covering the same risks but in a lesser amount, then, with respect to that contractor or subcontractor, SDs need provide only that portion of the insurance described above that is not maintained by the contractor or subcontractor. SDs shall ensure that all submittals to EPA under this Paragraph identify the Behr-Dayton Thermal Systems VOC Plume Site, Dayton, Ohio and the civil action number of this case.

## XII. FORCE MAJEURE

38. "Force majeure," for purposes of this CD, is defined as any event arising from causes beyond the control of SDs, of any entity controlled by SDs, or of SDs' contractors that delays or prevents the performance of any obligation under this CD despite SDs' best efforts to fulfill the obligation. The requirement that SDs exercise "best efforts to fulfill the obligation" includes using best efforts to anticipate any potential force majeure and best efforts to address the effects of any potential force majeure (a) as it is occurring and (b) following the potential force majeure such that the delay and any adverse effects of the delay are minimized to the greatest extent possible. "Force majeure" does not include financial inability to complete the Work or a failure to achieve the Performance Standards.

39. If any event occurs or has occurred that may delay the performance of any obligation under this CD for which SDs intend or may intend to assert a claim of force majeure, SDs shall notify EPA's Project Coordinator orally or, in his or her absence, EPA's Alternate Project Coordinator or, in the event both of EPA's designated representatives are unavailable, the Director of the Superfund & Emergency Management Division, EPA Region 5, within 24 hours of when SDs first knew that the event might cause a delay. Within 7 days thereafter, SDs shall provide in writing to EPA an explanation and description of the reasons for the delay; the anticipated duration of the delay; all actions taken or to be taken to prevent or minimize the delay; a schedule for implementation of any measures to be taken to prevent or mitigate the delay or the effect of the delay; SDs' rationale for attributing such delay to a force majeure; and a statement as to whether, in the opinion of SDs, such event may cause or contribute to an endangerment to public health or welfare, or the environment. SDs shall include with any notice all available documentation supporting their claim that the delay was attributable to a force majeure. SDs shall be deemed to know of any circumstance of which SDs, any entity controlled by SDs, or SDs' contractors or subcontractors knew or should have known. Failure to comply with the above requirements regarding an event shall preclude SDs from asserting any claim of force majeure regarding that event, provided, however, that if EPA, despite the late or incomplete notice, is able to assess to its satisfaction whether the event is a force majeure under ¶ 38 and whether SDs have exercised their best efforts under ¶ 38, EPA may, in its unreviewable discretion, excuse in writing SDs' failure to submit timely or complete notices under this Paragraph.

40. If EPA agrees that the delay or anticipated delay is attributable to a force majeure, the time for performance of the obligations under this CD that are affected by the force majeure will be extended by EPA for such time as is necessary to complete those obligations. An extension of the time for performance of the obligations affected by the force majeure shall not, of itself, extend the time for performance of any other obligation. If EPA does not agree that the delay or anticipated delay has been or will be caused by a force majeure, EPA will notify SDs in writing of its decision. If EPA agrees that the delay is attributable to a force majeure, EPA will notify SDs in writing of the length of the extension, if any, for performance of the obligations affected by the force majeure.

41. If SDs elect to invoke the dispute resolution procedures set forth in Section XIII (Dispute Resolution) regarding EPA's decision, they shall do so no later than 15 days after receipt of EPA's notice. In any such proceeding, SDs shall have the burden of demonstrating by a preponderance of the evidence that the delay or anticipated delay has been or will be caused by

a force majeure, that the duration of the delay or the extension sought was or will be warranted under the circumstances, that best efforts were exercised to avoid and mitigate the effects of the delay, and that SDs complied with the requirements of ¶¶ 38 and 39. If SDs carry this burden, the delay at issue shall be deemed not to be a violation by SDs of the affected obligation of this CD identified to EPA and the Court.

42. The failure by EPA to timely complete any obligation under the CD or under the SOW is not a violation of the CD, provided, however, that if such failure prevents SDs from meeting one or more deadlines in the SOW, SDs may seek relief under this Section.

## XIII. DISPUTE RESOLUTION

43. Unless otherwise expressly provided for in this CD, the dispute resolution procedures of this Section shall be the exclusive mechanism to resolve disputes under this CD. However, the procedures set forth in this Section shall not apply to actions by the United States to enforce obligations of SDs that have not been disputed in accordance with this Section.

44. A dispute shall be considered to have arisen when one party sends the other parties a written Notice of Dispute. Any dispute regarding this CD shall in the first instance be the subject of informal negotiations between the parties to the dispute. The period for informal negotiations shall not exceed 20 days from the time the dispute arises, unless it is modified by written agreement of the parties to the dispute.

45. **Statements of Position**

a. In the event that the parties cannot resolve a dispute by informal negotiations under the preceding Paragraph, then the position advanced by EPA shall be considered binding unless, within 20 days after the conclusion of the informal negotiation period, SDs invoke the formal dispute resolution procedures of this Section by serving on the United States a written Statement of Position on the matter in dispute, including, but not limited to, any factual data, analysis, or opinion supporting that position and any supporting documentation relied upon by SDs. The Statement of Position shall specify SDs' position as to whether formal dispute resolution should proceed under ¶ 46 (Record Review) or ¶ 47.

b. Within 20 days after receipt of SDs' Statement of Position, EPA will serve on SDs its Statement of Position, including, but not limited to, any factual data, analysis, or opinion supporting that position and all supporting documentation relied upon by EPA. EPA's Statement of Position shall include a statement as to whether formal dispute resolution should proceed under ¶ 46 (Record Review) or 47. Within 15 days after receipt of EPA's Statement of Position, SDs may submit a Reply.

c. If there is disagreement between EPA and SDs as to whether dispute resolution should proceed under ¶ 46 (Record Review) or 47, the parties to the dispute shall follow the procedures set forth in the Paragraph determined by EPA to be applicable. However, if SDs ultimately appeal to the Court to resolve the dispute, the Court shall determine which Paragraph is applicable in accordance with the standards of applicability set forth in ¶¶ 46 and 47.

46. **Record Review**. Formal dispute resolution for disputes pertaining to the selection or adequacy of any response action and all other disputes that are accorded review on the

administrative record under applicable principles of administrative law shall be conducted pursuant to the procedures set forth in this Paragraph. For purposes of this Paragraph, the adequacy of any response action includes, without limitation, the adequacy or appropriateness of plans, procedures to implement plans, or any other items requiring approval by EPA under this CD, and the adequacy of the performance of response actions taken pursuant to this CD. SDs shall not challenge, using the dispute resolution procedures under Section XIII or judicially, EPA's remedial action selection embodied in the ROD.

a. An administrative record of the dispute shall be maintained by EPA and shall contain all statements of position, including supporting documentation, submitted pursuant to this Section. Where appropriate, EPA may allow submission of supplemental statements of position by the parties to the dispute.

b. The Director of the Superfund & Emergency Management Division, EPA Region 5, will issue a final administrative decision resolving the dispute based on the administrative record described in ¶ 46.a. This decision shall be binding upon SDs, subject only to the right to seek judicial review pursuant to ¶¶ 46.c and 46.d.

c. Any administrative decision made by EPA pursuant to ¶ 46.b shall be reviewable by this Court, provided that a motion for judicial review of the decision is filed by SDs with the Court and served on all Parties within 10 days after receipt of EPA's decision. The motion shall include a description of the matter in dispute, the efforts made by the parties to resolve it, the relief requested, and the schedule, if any, within which the dispute must be resolved to ensure orderly implementation of this CD. The United States may file a response to SDs' motion.

d. In proceedings on any dispute governed by this Paragraph, SDs shall have the burden of demonstrating that the decision of the Superfund & Emergency Management Director is arbitrary and capricious or otherwise not in accordance with law. Judicial review of EPA's decision shall be on the administrative record compiled pursuant to ¶ 46.a.

47. Formal dispute resolution for disputes that neither pertain to the selection or adequacy of any response action nor are otherwise accorded review on the administrative record under applicable principles of administrative law, shall be governed by this Paragraph.

a. The Director of the of the Superfund & Emergency Management Division, EPA Region 5, will issue a final decision resolving the dispute based on the statements of position and reply, if any, served under ¶ 45. The Superfund & Emergency Management Director's decision shall be binding on SDs unless, within 10 days after receipt of the decision, SDs file with the Court and serve on the parties a motion for judicial review of the decision setting forth the matter in dispute, the efforts made by the parties to resolve it, the relief requested, and the schedule, if any, within which the dispute must be resolved to ensure orderly implementation of the CD. The United States may file a response to SDs' motion.

b. Notwithstanding ¶ M (CERCLA § 113(j) record review of ROD and Work) of Section I (Background), judicial review of any dispute governed by this Paragraph shall be governed by applicable principles of law.

48. The invocation of formal dispute resolution procedures under this Section does not extend, postpone, or affect in any way any obligation of SDs under this CD, except as provided in ¶ 33 (Contesting Future Response Costs), as agreed by EPA, or as determined by the Court. Stipulated penalties with respect to the disputed matter shall continue to accrue, but payment shall be stayed pending resolution of the dispute, as provided in ¶ 56. Notwithstanding the stay of payment, stipulated penalties shall accrue from the first day of noncompliance with any applicable provision of this CD. In the event that SDs do not prevail on the disputed issue, stipulated penalties shall be assessed and paid as provided in Section XIV (Stipulated Penalties).

## XIV. STIPULATED PENALTIES

49. SDs shall be liable to the United States for stipulated penalties in the amounts set forth in ¶¶ 50.a and 51 for failure to comply with the obligations specified in ¶¶ 50.b and 51, unless excused under Section XII (Force Majeure). "Comply" as used in the previous sentence includes compliance by SDs with all applicable requirements of this CD, within the deadlines established under this CD. If an initially submitted or resubmitted deliverable contains a material defect, and the deliverable is disapproved or modified by EPA under ¶ [**6.6(a)**] (Initial Submissions) or [**6.6(b)**] (Resubmissions) of the SOW due to such material defect, then the material defect shall constitute a lack of compliance for purposes of this Paragraph.

50. **Stipulated Penalty Amounts - Payments, Financial Assurance, Major Deliverables, and Other Milestones**

a. The following stipulated penalties shall accrue per violation per day for any noncompliance identified in ¶ 50.b:

| Period of Noncompliance | Penalty Per Violation Per Day |
|---|---|
| 1st through 14th day | $3,000 |
| 15th through 30th day | $5,000 |
| 31st day and beyond | $10,000 |

b. **Obligations**

(1) Payment of any amount due under Section X(Payments for Response Costs).

(2) Establish and maintain financial assurance in accordance with Section IX (Financial Assurance).

(3) Establish an escrow account to hold any disputed Future Response Costs under ¶ 33 (Contesting Future Response Costs).

(4) Establish and maintain insurance in accordance with ¶ 37.

(5) Designate Project Coordinator(s) and Supervision Contractor(s) in accordance with ¶ 9.c

(6) Submit RD Work Plan

(7) Submit Pre-Design Investigation Work Plan

(8) Submit Final (100%) RD

(9) Award RA contract(s)

(10) Initiate Construction of RA

(11) Complete RA Construction

(12) Submit Work Completion Report.

51. **Stipulated Penalty Amounts – Other Deliverables**. The following stipulated penalties shall accrue per violation per day for failure to submit timely or adequate deliverables pursuant to the CD other than those specified in Paragraph 50.b:

| Period of Noncompliance | Penalty Per Violation Per Day |
|---|---|
| 1st through 14th day | $1,500 |
| 15th through 30th day | $3,000 |
| 31st day and beyond | $6,000 |

52. In the event that EPA assumes performance of a portion or all of the Work pursuant to ¶ 66 (Work Takeover), SDs shall be liable for a stipulated penalty in the amount of $4,525,000. Stipulated penalties under this Paragraph are in addition to the remedies available under ¶¶ 27 (Access to Financial Assurance) and 66 (Work Takeover).

53. All penalties shall begin to accrue on the day after the complete performance is due or the day a violation occurs and shall continue to accrue through the final day of the correction of the noncompliance or completion of the activity. However, stipulated penalties shall not accrue: (a) with respect to a deficient submission under ¶ [**6.6**] (Approval of Deliverables) of the SOW, during the period, if any, beginning on the 31st day after EPA's receipt of such submission until the date that EPA notifies SDs of any deficiency; (b) with respect to a decision by the Director of the Superfund & Emergency Management Division, EPA Region 5, under ¶ 46.b or 47.a of Section XIII (Dispute Resolution), during the period, if any, beginning on the 21st day after the date that SDs' reply to EPA's Statement of Position is received until the date that the Director issues a final decision regarding such dispute; or (c) with respect to judicial review by this Court of any dispute under Section XIII (Dispute Resolution), during the period, if any, beginning on the 31st day after the Court's receipt of the final submission regarding the dispute until the date that the Court issues a final decision regarding such dispute. Nothing in this CD shall prevent the simultaneous accrual of separate penalties for separate violations of this CD.

54. Following EPA's determination that SDs have failed to comply with a requirement of this CD, EPA may give SDs written notification of the same and describe the noncompliance. EPA may send SDs a written demand for payment of the penalties. However, penalties shall accrue as provided in the preceding Paragraph regardless of whether EPA has notified SDs of a violation.

55. All penalties accruing under this Section shall be due and payable to the United States within 30 days after SDs' receipt from EPA of a demand for payment of the penalties, unless SDs invoke the Dispute Resolution procedures under Section XIII (Dispute Resolution) within the 30-day period. All payments to the United States under this Section shall indicate that

the payment is for stipulated penalties and shall be made in accordance with ¶ 32.b (instructions for future response cost payments).

56. Penalties shall continue to accrue as provided in ¶ 53 during any dispute resolution period, but need not be paid until the following:

a. If the dispute is resolved by agreement of the parties or by a decision of EPA that is not appealed to this Court, accrued penalties determined to be owed shall be paid to EPA within 15 days after the agreement or the receipt of EPA's decision or order;

b. If the dispute is appealed to this Court and the United States prevails in whole or in part, SDs shall pay all accrued penalties determined by the Court to be owed to EPA within 60 days after receipt of the Court's decision or order, except as provided in ¶ 56.c;

c. If the District Court's decision is appealed by any Party, SDs shall pay all accrued penalties determined by the District Court to be owed to the United States into an interest-bearing escrow account, established at a duly chartered bank or trust company that is insured by the FDIC, within 60 days after receipt of the Court's decision or order. Penalties shall be paid into this account as they continue to accrue, at least every 60 days. Within 15 days after receipt of the final appellate court decision, the escrow agent shall pay the balance of the account to EPA or to SDs to the extent that they prevail.

57. If SDs fail to pay stipulated penalties when due, SDs shall pay Interest on the unpaid stipulated penalties as follows: (a) if SDs have timely invoked dispute resolution such that the obligation to pay stipulated penalties has been stayed pending the outcome of dispute resolution, Interest shall accrue from the date stipulated penalties are due pursuant to ¶ 56 until the date of payment; and (b) if SDs fail to timely invoke dispute resolution, Interest shall accrue from the date of demand under ¶ 55 until the date of payment. If SDs fail to pay stipulated penalties and Interest when due, the United States may institute proceedings to collect the penalties and Interest.

58. The payment of penalties and Interest, if any, shall not alter in any way SDs' obligation to complete the performance of the Work required under this CD.

59. Nothing in this CD shall be construed as prohibiting, altering, or in any way limiting the ability of the United States to seek any other remedies or sanctions available by virtue of SDs' violation of this CD or of the statutes and regulations upon which it is based, including, but not limited to, penalties pursuant to Section 122(*l*) of CERCLA, 42 U.S.C. § 9622(*l*), provided, however, that the United States shall not seek civil penalties pursuant to Section 122(*l*) of CERCLA for any violation for which a stipulated penalty is provided in this CD, except in the case of a willful violation of this CD.

60. Notwithstanding any other provision of this Section, the United States may, in its unreviewable discretion, waive any portion of stipulated penalties that have accrued pursuant to this CD.

## XV. COVENANTS BY PLAINTIFF

61. **Covenants for SDs by United States**

Except as provided in ¶ 65 (General Reservations of Rights), the United States covenants not to sue or to take administrative action against SDs pursuant to Sections 106 and 107(a) of CERCLA for the Work, Past Response Costs, and Future Response Costs. These covenants shall take effect upon the Effective Date. These covenants are conditioned upon the satisfactory performance by SDs of their obligations under this CD. These covenants extend only to SDs and do not extend to any other person.

62. **United States' Pre-Certification Reservations**. Notwithstanding any other provision of this CD, the United States reserves, and this CD is without prejudice to, the right to institute proceedings in this action or in a new action, and/or to issue an administrative order, seeking to compel SDs to perform further response actions relating to the Site and/or to pay the United States for additional costs of response if, (a) prior to Certification of RA Completion, (1) conditions at the Site, previously unknown to EPA, are discovered, or (2) information, previously unknown to EPA, is received, in whole or in part, and (b) EPA determines that these previously unknown conditions or information together with any other relevant information indicates that the RA is not protective of human health or the environment.

63. **United States' Post-Certification Reservations**. Notwithstanding any other provision of this CD, the United States reserves, and this CD is without prejudice to, the right to institute proceedings in this action or in a new action, and/or to issue an administrative order, seeking to compel SDs to perform further response actions relating to the Site and/or to pay the United States for additional costs of response if, (a) subsequent to Certification of RA Completion, (1) conditions at the Site, previously unknown to EPA, are discovered, or (2) information, previously unknown to EPA, is received, in whole or in part, and (b) EPA determines that these previously unknown conditions or this information together with other relevant information indicate that the RA is not protective of human health or the environment.

64. For purposes of ¶ 62 (United States' Pre-Certification Reservations), the information and the conditions known to EPA will include only that information and those conditions known to EPA as of the date the ROD was signed and set forth in the ROD for the Site and the administrative record supporting the ROD. For purposes of ¶ 63 (United States' Post-Certification Reservations), the information and the conditions known to EPA shall include only that information and those conditions known to EPA as of the date of Certification of RA Completion and set forth in the ROD, the administrative record supporting the ROD, the post-ROD administrative record, or in any information received by EPA pursuant to the requirements of this CD prior to Certification of RA Completion.

65. **General Reservations of Rights**. The United States reserves, and this CD is without prejudice to, all rights against SDs with respect to all matters not expressly included within Plaintiff's covenants. Notwithstanding any other provision of this CD, the United States reserves all rights against SDs with respect to:

a. liability for failure by SDs to meet a requirement of this CD;

b. liability arising from the past, present, or future disposal, release, or threat of release of Waste Material outside of the Site;

c. liability based on the ownership of the Site by SDs when such ownership commences after signature of this CD by SDs;

d. liability based on the operation of the Site by SDs when such operation commences after signature of this CD by SDs and does not arise solely from SDs' performance of the Work;

e. liability based on SDs' transportation, treatment, storage, or disposal, or arrangement for transportation, treatment, storage, or disposal of Waste Material at or in connection with the Site, other than as provided in the ROD, the Work, or otherwise ordered by EPA, after signature of this CD by SDs;

f. liability for damages for injury to, destruction of, or loss of natural resources, and for the costs of any natural resource damage assessments;

g. criminal liability;

h. liability for violations of federal or state law that occur during or after implementation of the Work; and

i. liability, prior to achievement of Performance Standards, for additional response actions that EPA determines are necessary to achieve and maintain Performance Standards or to carry out and maintain the effectiveness of the remedy set forth in the ROD, but that cannot be required pursuant to ¶ 13 (Modification of SOW or Related Deliverables);

j. liability for additional operable units at the Site or the final response action;

k. liability for costs that the United States will incur regarding the Site but that are not within the definition of Future Response Costs;

l. Liability for costs incurred or to be incurred by ATSDR regarding the Site.

66. **Work Takeover**

a. In the event EPA determines that SDs: (1) have ceased implementation of any portion of the Work; (2) are seriously or repeatedly deficient or late in their performance of the Work; or (3) are implementing the Work in a manner that may cause an endangerment to human health or the environment, EPA may issue a written notice ("Work Takeover Notice") to SDs. Any Work Takeover Notice issued by EPA will specify the grounds upon which such notice was issued and will provide SDs a period of 10 days within which to remedy the circumstances giving rise to EPA's issuance of such notice.

b. If, after expiration of the 10-day notice period specified in ¶ 66.a, SDs have not remedied to EPA's satisfaction the circumstances giving rise to EPA's issuance of the relevant Work Takeover Notice, EPA may at any time thereafter assume the performance of all or any portion(s) of the Work as EPA deems necessary ("Work Takeover"). EPA will notify SDs in writing (which writing may be electronic) if EPA determines that implementation of a Work Takeover is warranted under this ¶ 66.b. Funding of Work Takeover costs is addressed under ¶ 27 (Access to Financial Assurance).

c. SDs may invoke the procedures set forth in ¶ 46 (Record Review), to dispute EPA's implementation of a Work Takeover under ¶ 66.b. However, notwithstanding SDs' invocation of such dispute resolution procedures, and during the pendency of any such

dispute, EPA may in its sole discretion commence and continue a Work Takeover under ¶ 66.b until the earlier of (1) the date that SDs remedy, to EPA's satisfaction, the circumstances giving rise to EPA's issuance of the relevant Work Takeover Notice, or (2) the date that a final decision is rendered in accordance with ¶ 46 (Record Review) requiring EPA to terminate such Work Takeover.

67. Notwithstanding any other provision of this CD, the United States retains all authority and reserves all rights to take any and all response actions authorized by law.

## XVI. COVENANTS BY SDs

68. **Covenants by SDs**. Subject to the reservations in ¶ 70, SDs covenant not to sue and agree not to assert any claims or causes of action against the United States with respect to the Work, past response actions regarding the Site, Past Response Costs, Future Response Costs, and this CD, including, but not limited to:

a. any direct or indirect claim for reimbursement from the EPA Hazardous Substance Superfund through CERCLA §§ 106(b)(2), 107, 111, 112 or 113, or any other provision of law;

b. any claims under CERCLA §§ 107 or 113, RCRA Section 7002(a), 42 U.S.C. § 6972(a), or state law regarding the Work, past response actions regarding the Site, Past Response Costs, Future Response Costs, SDs' Past Response Costs, SDs' Future Response Costs, and this CD; or

c. any claims arising out of response actions at or in connection with the Site, including any claim under the United States Constitution, the Tucker Act, 28 U.S.C. § 1491, the Equal Access to Justice Act, 28 U.S.C. § 2412, or at common law.

69. Except as provided in ¶¶ 72 (Waiver of Claims by SDs) and 78 (Res Judicata and Other Defenses), the covenants in this Section shall not apply if the United States brings a cause of action or issues an order pursuant to any of the reservations in Section XV (Covenants by Plaintiff), other than in ¶¶ 65.a (claims for failure to meet a requirement of the CD), 65.g (criminal liability), and 65.h (violations of federal/state law during or after implementation of the Work), but only to the extent that SDs' claims arise from the same response action, response costs, or damages that the United States is seeking pursuant to the applicable reservation.

70. SDs reserve, and this CD is without prejudice to, claims against the United States, subject to the provisions of Chapter 171 of Title 28 of the United States Code, and brought pursuant to any statute other than CERCLA or RCRA and for which the waiver of sovereign immunity is found in a statute other than CERCLA or RCRA, for money damages for injury or loss of property or personal injury or death caused by the negligent or wrongful act or omission of any employee of the United States, as that term is defined in 28 U.S.C. § 2671, while acting within the scope of his or her office or employment under circumstances where the United States, if a private person, would be liable to the claimant in accordance with the law of the place where the act or omission occurred. However, the foregoing shall not include any claim based on EPA's selection of response actions, or the oversight or approval of SDs' deliverables or activities.

71. Nothing in this CD shall be deemed to constitute approval or preauthorization of a claim within the meaning of Section 111 of CERCLA, 42 U.S.C. § 9611, or 40 C.F.R. § 300.700(d).

72. **Waiver of Claims by SDs**

a. SDs agree not to assert any claims and to waive all claims or causes of action (including but not limited to claims or causes of action under Sections 107(a) and 113 of CERCLA) that they may have:

(1) **De Micromis Waiver**. For all matters relating to the Site against any person where the person's liability to SDs with respect to the Site is based solely on having arranged for disposal or treatment, or for transport for disposal or treatment, of hazardous substances at the Site, or having accepted for transport for disposal or treatment of hazardous substances at the Site, if all or part of the disposal, treatment, or transport occurred before April 1, 2001, and the total amount of material containing hazardous substances contributed by such person to the Site was less than 110 gallons of liquid materials or 200 pounds of solid materials;

(2) ***De Minimis*/Ability to Pay Waiver**. For response costs relating to the Site against any person that has entered or in the future enters into a final CERCLA § 122(g) *de minimis* settlement, or a final settlement based on limited ability to pay, with EPA with respect to the Site.

b. **Exceptions to Waivers**

(1) The waivers under this ¶ 72 shall not apply with respect to any defense, claim, or cause of action that a SD may have against any person otherwise covered by such waivers if such person asserts a claim or cause of action relating to the Site against such SD.

(2) The waiver under ¶ 72.a(1) (De Micromis Waiver) shall not apply to any claim or cause of action against any person otherwise covered by such waiver if EPA determines that: (i) the materials containing hazardous substances contributed to the Site by such person contributed significantly or could contribute significantly, either individually or in the aggregate, to the cost of the response action or natural resource restoration at the Site; or (ii) such person has failed to comply with any information request or administrative subpoena issued pursuant to Section 104(e) or 122(e)(3)(B) of CERCLA, 42 U.S.C. § 9604(e) or 9622(e)(3)(B), or Section 3007 of RCRA, 42 U.S.C. § 6927, or has impeded or is impeding, through action or inaction, the performance of a response action or natural resource restoration with respect to the Site; or if (iii) such person has been convicted of a criminal violation for the conduct to which the waiver would apply and that conviction has not been vitiated on appeal or otherwise.

## XVII. EFFECT OF SETTLEMENT; CONTRIBUTION

73. Except as provided in ¶ 72 (Waiver of Claims by SDs), nothing in this CD shall be construed to create any rights in, or grant any cause of action to, any person not a Party to this

CD. Except as provided in Section XVI (Covenants by SDs), each of the Parties expressly reserves any and all rights (including, but not limited to, pursuant to Section 113 of CERCLA, 42 U.S.C. § 9613), defenses, claims, demands, and causes of action that each Party may have with respect to any matter, transaction, or occurrence relating in any way to the Site against any person not a Party hereto. Nothing in this CD diminishes the right of the United States, pursuant to Section 113(f)(2) and (3) of CERCLA, 42 U.S.C. § 9613(f)(2)-(3), to pursue any such persons to obtain additional response costs or response action and to enter into settlements that give rise to contribution protection pursuant to Section 113(f)(2).

74. The Parties agree, and by entering this CD this Court finds, that this CD constitutes a judicially-approved settlement pursuant to which each SD has, as of the Effective Date, resolved liability to the United States within the meaning of Section 113(f)(2) of CERCLA, 42 U.S.C. § 9613(f)(2), and is entitled, as of the Effective Date, to protection from contribution actions or claims as provided by Section 113(f)(2) of CERCLA, or as may be otherwise provided by law, for the "matters addressed" in this CD. The "matters addressed" in this CD are the Work, Past Response Costs, and Future Response Costs.

75. The Parties further agree, and by entering this CD this Court finds, that the complaint filed by the United States in this action is a civil action within the meaning of Section 113(f)(1) of CERCLA, 42 U.S.C. § 9613(f)(1), and that this CD constitutes a judicially-approved settlement pursuant to which each Settling Defendant has, as of the Effective Date, resolved liability to the United States within the meaning of Section 113(f)(3)(B) of CERCLA, 42 U.S.C. § 9613(f)(3)(B).

76. Each SD shall, with respect to any suit or claim brought by it for matters related to this CD, notify the United States in writing no later than 60 days prior to the initiation of such suit or claim.

77. Each SD shall, with respect to any suit or claim brought against it for matters related to this CD, notify in writing the United States within 10 days after service of the complaint on such SD. In addition, each SD shall notify the United States within 10 days after service or receipt of any Motion for Summary Judgment and within 10 days after receipt of any order from a court setting a case for trial.

78. **Res Judicata and Other Defenses**. In any subsequent administrative or judicial proceeding initiated by the United States for injunctive relief, recovery of response costs, or other appropriate relief relating to the Site, SDs shall not assert, and may not maintain, any defense or claim based upon the principles of waiver, res judicata, collateral estoppel, issue preclusion, claim-splitting, or other defenses based upon any contention that the claims raised by the United States in the subsequent proceeding were or should have been brought in the instant case; provided, however, that nothing in this Paragraph affects the enforceability of the covenants not to sue set forth in Section XV (Covenants by Plaintiff).

## XVIII. ACCESS TO INFORMATION

79. SDs shall provide to EPA, upon request, copies of all records, reports, documents, and other information (including records, reports, documents, and other information in electronic form) (hereinafter referred to as "Records") within SDs' possession or control or that of their contractors or agents relating to activities at the Site or to the implementation of this CD,

including, but not limited to, sampling, analysis, chain of custody records, manifests, trucking logs, receipts, reports, sample traffic routing, correspondence, or other documents or information regarding the Work. SDs shall also make available to EPA, for purposes of investigation, information gathering, or testimony, their employees, agents, or representatives with knowledge of relevant facts concerning the performance of the Work.

80. **Privileged and Protected Claims**

a. SDs may assert that all or part of a Record requested by Plaintiff is privileged or protected as provided under federal law, in lieu of providing the Record, provided SDs comply with ¶ 80.b, and except as provided in ¶ 80.c.

b. If SDs assert a claim of privilege or protection, they shall provide Plaintiff with the following information regarding such Record: its title; its date; the name, title, affiliation (e.g., company or firm), and address of the author, of each addressee, and of each recipient; a description of the Record's contents; and the privilege or protection asserted. If a claim of privilege or protection applies only to a portion of a Record, SDs shall provide the Record to Plaintiff in redacted form to mask the privileged or protected portion only. SDs shall retain all Records that they claim to be privileged or protected until Plaintiff has had a reasonable opportunity to dispute the privilege or protection claim and any such dispute has been resolved in the SDs' favor.

c. SDs may make no claim of privilege or protection regarding: (1) any data regarding the Site, including, but not limited to, all sampling, analytical, monitoring, hydrogeologic, scientific, chemical, radiological or engineering data, or the portion of any other Record that evidences conditions at or around the Site; or (2) the portion of any Record that SDs are required to create or generate pursuant to this CD.

81. **Business Confidential Claims**. SDs may assert that all or part of a Record provided to Plaintiff under this Section or Section XIX (Retention of Records) is business confidential to the extent permitted by and in accordance with Section 104(e)(7) of CERCLA, 42 U.S.C. § 9604(e)(7), and 40 C.F.R. § 2.203(b). SDs shall segregate and clearly identify all Records or parts thereof submitted under this CD for which SDs assert business confidentiality claims. Records that SDs claim to be confidential business information will be afforded the protection specified in 40 C.F.R. Part 2, Subpart B. If no claim of confidentiality accompanies Records when they are submitted to EPA, or if EPA has notified SDs that the Records are not confidential under the standards of Section 104(e)(7) of CERCLA or 40 C.F.R. Part 2, Subpart B, the public may be given access to such Records without further notice to SDs.

82. If relevant to the proceeding, the Parties agree that validated sampling or monitoring data generated in accordance with the SOW and reviewed and approved by EPA shall be admissible as evidence, without objection, in any proceeding under this CD.

83. Notwithstanding any provision of this CD, Plaintiff retain all of its information gathering and inspection authorities and rights, including enforcement actions related thereto, under CERCLA, RCRA, and any other applicable statutes or regulations.

## XIX. RETENTION OF RECORDS

84. Until 10 years after EPA's Certification of Work Completion under ¶ [**4.8**] (Certification of Work Completion) of the SOW, each SD shall preserve and retain all non-identical copies of Records (including Records in electronic form) now in its possession or control or that come into its possession or control that relate in any manner to its liability under CERCLA with respect to the Site, provided, however, that SDs who are potentially liable as owners or operators of the Site must retain, in addition, all Records that relate to the liability of any other person under CERCLA with respect to the Site. Each SD must also retain, and instruct its contractors and agents to preserve, for the same period of time specified above all non-identical copies of the last draft or final version of any Records (including Records in electronic form) now in its possession or control or that come into its possession or control that relate in any manner to the performance of the Work, provided, however, that each SD (and its contractors and agents) must retain, in addition, copies of all data generated during the performance of the Work and not contained in the aforementioned Records required to be retained. Each of the above record retention requirements shall apply regardless of any corporate retention policy to the contrary.

85. At the conclusion of this record retention period, SDs shall notify the United States at least 90 days prior to the destruction of any such Records, and, upon request by the United States, and except as provided in ¶ 80 (Privileged and Protected Claims), SDs shall deliver any such Records to EPA.

86. Each SD certifies individually that, to the best of its knowledge and belief, after thorough inquiry, it has not altered, mutilated, discarded, destroyed, or otherwise disposed of any Records (other than identical copies) relating to its potential liability regarding the Site since notification of potential liability by the United States or the State and that it has fully complied with any and all EPA and State requests for information regarding the Site pursuant to Sections 104(e) and 122(e)(3)(B) of CERCLA, 42 U.S.C. §§ 9604(e) and 9622(e)(3)(B), and Section 3007 of RCRA, 42 U.S.C. § 6927, and state law.

## XX. NOTICES AND SUBMISSIONS

87. All approvals, consents, deliverables, modifications, notices, notifications, objections, proposals, reports, and requests specified in this CD must be in writing unless otherwise specified. Whenever, under this CD, notice is required to be given, or a report or other document is required to be sent, by one Party to another, it must be directed to the person(s) specified below at the address(es) specified below. Any Party may change the person and/or address applicable to it by providing notice of such change to all Parties. All notices under this Section are effective upon receipt, unless otherwise specified. Notices required to be sent to EPA, and not to the United States, should not be sent to the DOJ. Except as otherwise provided, notice to a Party by email (if that option is provided below) or by regular mail in accordance with this Section satisfies any notice requirement of the CD regarding such Party.

| | |
|---|---|
| **As to the United States**: | EES Case Management Unit<br>U.S. Department of Justice<br>Environment and Natural Resources Division<br>P.O. Box 7611<br>Washington, D.C. 20044-7611<br>eescdcopy.enrd@usdoj.gov<br>Re: DJ # 90-11-3-09743/1 |
| **As to EPA**: | Douglas Ballotti<br>Director, Superfund & Emergency Management Division<br>U.S. Environmental Protection Agency<br>Region 5<br>77 W. Jackson Blvd.<br>Chicago, Illinois 60604<br>ballotti.douglas@epa.gov |
| **and**: | D. Erik Hardin<br>EPA Project Coordinator<br>U.S. Environmental Protection Agency<br>Region 5<br>77 W. Jackson Blvd.<br>Chicago, Illinois 60604<br>hardin.erik@epa.gov [email]<br>(312)886-2402 |
| **As to the Regional Financial Management Officer**: | Justin Abrams<br>Accountant<br>Finance Office<br>77 W. Jackson Blvd.<br>Chicago, Illinois 60604<br>abrams.justin@epa.gov |
| **At to EPA Cincinnati Finance Center**: | EPA Cincinnati Finance Center<br>26 W. Martin Luther King Drive<br>Cincinnati, Ohio 45268<br>cinwd_acctsreceivable@epa.gov |
| **As to the State**: | Leslie Williams<br>State Project Coordinator<br>Ohio EPA, Southwest District Office<br>Division of Environmental Response and Revitalization<br>401 East Fifth Street<br>Dayton, Ohio 45402<br>Leslie.Williams@epa.ohio.gov |

**As to SDs**: [name]
SDs' Project Coordinator
[address]
[email]
[phone]

## XXI. RETENTION OF JURISDICTION

88. This Court retains jurisdiction over both the subject matter of this CD and SDs for the duration of the performance of the terms and provisions of this CD for the purpose of enabling any of the Parties to apply to the Court at any time for such further order, direction, and relief as may be necessary or appropriate for the construction or modification of this CD, or to effectuate or enforce compliance with its terms, or to resolve disputes in accordance with Section XIII (Dispute Resolution).

## XXII. APPENDICES

89. The following appendices are attached to and incorporated into this CD:

"Appendix A" is the ROD.

"Appendix B" is the SOW.

"Appendix C" is the description and/or map of the Site.

"Appendix D" is the complete list of SDs.

## XXIII. MODIFICATION

90. Except as provided in ¶ 13 (Modification of SOW or Related Deliverables), material modifications to this CD, including the SOW, shall be in writing, signed by the United States and SDs, and shall be effective upon approval by the Court. Except as provided in ¶ 13, non-material modifications to this CD, including the SOW, shall be in writing and shall be effective when signed by duly authorized representatives of the United States and SDs. A modification to the SOW shall be considered material if it implements a ROD amendment that fundamentally alters the basic features of the selected remedy within the meaning of 40 C.F.R. § 300.435(c)(2)(ii). Before providing its approval to any modification to the SOW, the United States will provide the State with a reasonable opportunity to review and comment on the proposed modification.

91. Nothing in this CD shall be deemed to alter the Court's power to enforce, supervise, or approve modifications to this CD.

## XXIV. LODGING AND OPPORTUNITY FOR PUBLIC COMMENT

92. This CD shall be lodged with the Court for at least 30 days for public notice and comment in accordance with Section 122(d)(2) of CERCLA, 42 U.S.C. § 9622(d)(2), and 28 C.F.R. § 50.7. The United States reserves the right to withdraw or withhold its consent if the comments regarding the CD disclose facts or considerations that indicate that the CD is

inappropriate, improper, or inadequate. SDs consent to the entry of this CD without further notice.

93. If for any reason the Court should decline to approve this CD in the form presented, this agreement is voidable at the sole discretion of any Party and the terms of the agreement may not be used as evidence in any litigation between the Parties.

## XXV. SIGNATORIES/SERVICE

94. Each undersigned representative of a SD to this CD and the Assistant Attorney General for the Environment and Natural Resources Division of the Department of Justice certifies that he or she is fully authorized to enter into the terms and conditions of this CD and to execute and legally bind such Party to this document.

95. Each SD agrees not to oppose entry of this CD by this Court or to challenge any provision of this CD unless the United States has notified SDs in writing that it no longer supports entry of the CD.

96. Each SD shall identify, on the attached signature page, the name, address, and telephone number of an agent who is authorized to accept service of process by mail on behalf of that Party with respect to all matters arising under or relating to this CD. SDs agree to accept service in that manner and to waive the formal service requirements set forth in Rule 4 of the Federal Rules of Civil Procedure and any applicable local rules of this Court, including, but not limited to, service of a summons. SDs need not file an answer to the complaint in this action unless or until the Court expressly declines to enter this CD.

## XXVI. FINAL JUDGMENT

97. This CD and its appendices constitute the final, complete, and exclusive agreement and understanding among the Parties regarding the settlement embodied in the CD. The Parties acknowledge that there are no representations, agreements, or understandings relating to the settlement other than those expressly contained in this CD.

98. Upon entry of this CD by the Court, this CD shall constitute a final judgment between and among the United States and SDs. The Court enters this judgment as a final judgment under Fed. R. Civ. P. 54 and 58.

SO ORDERED THIS __ DAY OF _____, 2020.

_____

United States District Judge

Signature Page for CD regarding the Behr-Dayton Thermal Systems VOC Plume Superfund Site

**FOR THE UNITED STATES OF AMERICA:**

_____ _____

Dated

Jeffrey Bossert Clark
Assistant Attorney General
U.S. Department of Justice
Environment and Natural Resources Division
Washington, D.C. 20530

_____

Lila C. Jones
Trial Attorney
U.S. Department of Justice
Environment and Natural Resources Division
Environmental Enforcement Section
P.O. Box 7611
Washington, D.C. 20044-7611

_____

David DeVillers
United States Attorney
Southern District of Ohio

_____

[Name]
Assistant United States Attorney
Southern District of Ohio
Dayton Branch Office
U.S. District courthouse & Federal Building
200 W. Second Street, Suite 600
Dayton, OH 45402

Signature Page for CD regarding the Behr-Dayton Thermal Systems VOC Plume Superfund Site

_____

Kurt A, Thiede
Regional Administrator, Region 5
U.S. Environmental Protection Agency
77 W. Jackson Blvd.
Chicago, IL 60604

_____

Maria E. Gonzalez
Associate Regional Counsel
U.S. Environmental Protection Agency
Region 5
77 W. Jackson Blvd.
Chicago, IL 60604

Signature Page for CD regarding the Behr-Dayton Thermal Systems VOC Plume Superfund Site

Signature Page for CD regarding the Behr-Dayton Thermal Systems VOC Plume Superfund Site

**FOR _____:**
[Print name of Settling Defendant]

_____ _____

Dated Name (print):
Title:
Address:

Agent Authorized to Accept Service on Behalf of Above-signed Party:
Name (print): _____
Title: _____
Company: _____
Address: _____
_____
Phone: _____
email: _____

**NOTE: A separate signature page must be signed by each settlor.**

# Behr Dayton Thermal VOC Plume Superfund Site

Dayton, Montgomery County, Ohio

# Interim Record of Decision

U.S. Environmental Protection Agency, Region 5

77 West Jackson Boulevard
Chicago, IL 60604

September 2019

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## TABLE OF CONTENTS

**Section** **Page**

## FIGURES



## APPENDICES



## LIST OF ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| amsl | Above Mean Sea Level |
| AOC | Administrative Order on Consent |
| AOPC | Area of Potential Concern |
| Aramark | Aramark Uniform & Career Apparel, Inc. |
| ARARs | Applicable or Relevant and Appropriate Requirements |
| AS | Air Sparging |
| ASAOC | Administrative Settlement Agreement and Order on Consent |
| AS/SVE | Air Sparging with Soil Vapor Extraction |
| Behr Site | Behr Dayton Thermal VOC Plume Site |
| bgs | Below Ground Surface |
| BHHRA | Baseline Human Health Risk Assessment |
| CERCLA | Comprehensive Environmental Response, Compensation, and Liability Act of 1980 |
| C.F.R. | Code of Federal Regulations |
| cfs | Cubic Feet per Second |
| cis-1,2-DCE | cis-1,2-dichloroethylene |
| COCs | Contaminants of Concern |
| COPCs | Contaminants of Potential Concern |
| CSM | Conceptual Site Model |
| DNAPL | Dense Non-Aqueous Phase Liquid |
| EE/CA | Engineering Evaluation/Cost Analysis |
| EPA | U.S. Environmental Protection Agency |
| FFS | Focused Feasibility Study |
| Gem City | Gem City Chemicals, Inc. |
| GMBVAS | Great Miami Buried Valley Aquifer System |

| | |
|---|---|
| gpm | Gallons Per Minute |
| GSI | Groundwater Surface Water Interface |
| HDD | Horizontal Directionally Drilled |
| HI | Hazard Index |
| ISCO | In-situ Chemical Oxidation |
| MAHLE | MAHLE Behr Dayton Thermal LLC |
| MCL | Maximum Contaminant Level |
| mg/kg | Milligrams per Kilogram |
| mgd | Millions of Gallons of Water per Day |
| NCP | National Oil and Hazardous Substances Pollution Contingency Plan |
| NPDES | National Pollutant Discharge Elimination System |
| O&M | Operation and Maintenance |
| OAC | Ohio Administrative Code |
| Ohio EPA | Ohio Environmental Protection Agency |
| OSWER | Office of Solid Waste and Emergency Response |
| P&T | Pump and Treat |
| PAH | Polyaromatic Hydrocarbon |
| PCE | Tetrachloroethylene |
| PID | Photoionization Detector |
| POTW | Publicly-Owned Treatment Works |
| ppb | Parts Per Billion |
| ppbV | Parts Per Billion by Volume |
| PRP | Potentially Responsible Party |
| RAOs | Remedial Action Objectives |
| RI | Remedial Investigation |
| RI/FS | Remedial Investigation and Feasibility Study |
| ROD | Record of Decision |
| RSL | Regional Screening Level |
| scfm | Standard Cubic Feet per Minute |
| SDWA | Safe Drinking Water Act |
| Site | Behr Dayton Thermal VOC Plume Site |
| SLERA | Screening Level Ecological Risk Assessment |
| SVE | Soil Vapor Extraction |
| 1,1,1-TCA | 1,1,1-Trichloroethane |
| TCE | Trichloroethylene |
| UAO | Unilateral Administrative Order |
| UST | Underground Storage Tank |
| VC | Vinyl Chloride |
| VGAC | Vapor-Phase Granular Activated Carbon |
| VI | Vapor Intrusion |
| VIMS | Vapor Intrusion Mitigation Systems |
| VISL | Vapor Intrusion Screening Level |
| VOC | Volatile Organic Compound |

# INTERIM RECORD OF DECISION
# FOR
# BEHR DAYTON THERMAL VOC PLUME SUPERFUND SITE

## PART 1: THE DECLARATION

### *1.1 Site Name and Location*

The Behr Dayton Thermal VOC Plume Site (Behr Site or Site) is located within the City of Dayton, Montgomery County, Ohio, approximately 1.5 to 2 miles north of downtown Dayton. The Site's EPA identification number is OHN00051064.

### *1.2 Statement of Basis and Purpose*

This Interim Record of Decision (ROD) presents the Interim Remedy the U.S. Environmental Protection Agency (EPA) selected for the Behr Site. EPA selected the interim remedy in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986, and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This decision is based on the Administrative Record file for the Behr Site. The Administrative Record Index can be found in Appendix A.

The State of Ohio concurs with the Selected Interim Remedy. A letter of concurrence from the State of Ohio can be found in Appendix B.

### *1.3 Assessment of the Site*

The interim response action selected in this ROD is necessary to protect the public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment.

### *1.4 Description of the Selected Interim Remedy*

This Interim ROD addresses the central core of the groundwater plume and vapor intrusion associated with the entire groundwater plume at the Behr Site. This Interim ROD involves: 1) groundwater treatment in the core of the plume, defined as areas with trichloroethylene (TCE) concentrations greater than 500 parts per billion (ppb); and 2) vapor intrusion monitoring, mitigation, and maintenance. This interim remedy does not include treatment of soil contamination or the distal portions of the groundwater plume with TCE concentrations less than 500 ppb. EPA plans to address final remedies for soil contamination and the remaining portions of the groundwater plume in a future ROD after assessing the effectiveness of the interim action and collecting additional sampling data. The interim groundwater remedy EPA selects in this ROD is Alternative 3 (Air Sparging with Soil Vapor Extraction, or AS/SVE). The vapor intrusion remedy EPA selects in this ROD is to continue installing, operating, and maintaining vapor intrusion mitigation systems (VIMS) as required by an ongoing time-critical removal

action; enhance the frequency and extent of monitoring; and update the health-based action levels that trigger installation of a VIMS.

The major components of the interim remedy selected for the Behr Site (Alternative 3) include:

- Installing, operating, and maintaining an AS/SVE system with a zone of influence that covers no less than the portion of the groundwater plume at the Site consisting of 500 ppb or more of TCE;
- Sampling additional occupiable commercial, residential, and industrial buildings for potential vapor intrusion (VI) impacts, and resampling occupied buildings above the Site groundwater plume not previously identified as impacted by VI;
- Installing new VIMS for occupied commercial, residential, and industrial buildings impacted by VI above current health-based screening levels;
- Maintaining and monitoring new and existing VIMS and the soil vapor extraction (SVE) system located just south of the MAHLE facility that Chrysler installed in or about 2008 (the 2008 SVE); and
- Implementing institutional controls.

EPA defines principal threat wastes as those source materials considered highly toxic or highly mobile that generally cannot be reliably contained or that would present a significant risk to human health and the environment should exposure occur. EPA has not identified any principal threat wastes at the Behr Site.

## *1.5 Statutory Determinations*

The Selected Interim Remedy is protective of human health and the environment in the short term and is intended to provide adequate protection until a final Site-wide groundwater remedy is successfully implemented and achieves remedial action objectives (RAOs). It complies with federal and state requirements that are applicable or relevant and appropriate to this limited-scope action and is cost-effective. This interim action is consistent with the statutory mandate for the use of permanent solutions and alternative treatment (or resource recovery) technologies to the maximum extent practicable. This interim action utilizes treatment as a principal element of the remedy that will permanently and significantly reduce the toxicity, mobility, or volume of hazardous substances, pollutants, or contaminants.

Because this remedy will result in hazardous substances, pollutants, or contaminants remaining on Site above levels that allow for unlimited use and unrestricted exposure, EPA plans to conduct a statutory review within five years after initiation of remedial action to ensure that the Selected Interim Remedy remains protective of human health and the environment. Review of this interim remedy will continue as EPA develops final remedial alternatives to address the Site-wide contamination.

## *1.6 ROD Data Certification Checklist*

The Decision Summary section of this Interim ROD includes the information listed below. Additional information can be found in the Administrative Record file for the Site.

| Information | ROD Section |
|---|---|
| Contaminants of concern (COCs) and their respective concentrations | 2.5.3 |
| Baseline risk represented by the COCs | 2.7.1 |
| Cleanup levels established for COCs and the basis for these levels | 2.8 |
| How source materials constituting principal threats are addressed<br>*(Note: no principal threat wastes have been identified at the Site)* | 2.11 |
| Current and reasonably anticipated future land use assumptions and current and potential future beneficial uses of groundwater used in the baseline risk assessment and Interim ROD | 2.6 |
| Estimated capital, annual operation and maintenance (O&M), and total present worth costs, discount rate, and the number of years over which the interim remedy cost estimates are projected | 2.9 |
| Key factor(s) that led to selecting the interim remedy | 2.12 |

## *1.7 Support Agency Acceptance*

The Ohio Environmental Protection Agency (Ohio EPA), as the support agency for the Behr Site, concurs with this Interim ROD. EPA has added the State's concurrence letter to the Administrative Record and includes it as Appendix B to this Interim ROD.

## *1.8 Authorizing Signature*

9/26/2019

X 

Douglas Ballotti, Director
Superfund & Emergency Management Divisi...
Signed by: DOUGLAS BALLOTTI

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# PART 2: DECISION SUMMARY

## 2.1 Site Name, Location, and Brief Description

The Site is located within the City of Dayton, Ohio, approximately 1.5 to 2 miles north of downtown Dayton in an area of mixed industrial, commercial, and residential land uses (see Figure 1). The Site includes the MAHLE Behr Dayton Thermal LLC (MAHLE) facility located at 1600 Webster Street (the MAHLE facility), Gem City Chemicals, Inc. (Gem City) located at 1287 Air City Avenue (the GEM City facility), Aramark Uniform & Career Apparel, Inc. (Aramark) located at 1200 Webster Street (the Aramark facility), and other areas where hazardous substances, pollutants, or contaminants from those properties or from former operations at those properties have or may come to be located.

More specifically, EPA defines the Site by the extent of the groundwater plume with contaminants that present unacceptable risks to human health. That plume is currently identified to encompass an area that extends from west of Ohio State Route 202 (Troy Street) to the boundaries of the Great Miami River to the north and west, to the confluence of the Great Miami and Mad Rivers to the southwest, and to the Mad River to the south. EPA continues to investigate other potential sources of contamination that could have contributed to the plume at the Site. However, this Interim Remedy focuses on a smaller area of the groundwater plume. It addresses a portion of the plume that extends to the south/southwest from the MAHLE facility.

## 2.2 Site History and Enforcement Activities

### *2.2.1 The MAHLE Facility*[1]

MAHLE is the current owner and operator of the MAHLE facility. EPA previously identified MAHLE as a potentially responsible party (PRP). The MAHLE facility manufactures sub-assemblies of vehicle heating, ventilation, and air conditioning equipment. Chrysler[2] owned and operated this facility from around 1936 until 2002, when it sold the facility to Behr Dayton Thermal LLC (now MAHLE Behr Dayton Thermal LLC). Historical manufacturing operations at the MAHLE facility involved the use of industrial solvent cleaners, including tetrachloroethylene (PCE), TCE, 1,1,1-trichloroethane (1,1,1-TCA), and sulfuric acid. Hazardous substances, including PCE and TCE, were released into the subsurface from the MAHLE facility. Soil investigations have identified PCE and TCE in the subsurface, and groundwater investigations have identified chlorinated solvents, including TCE, PCE, and 1,1,1-TCA, in the groundwater below the facility.

[1] Many Site documents refer to it as "the Behr facility." Behr Dayton Thermal Products LLC became MAHLE Behr Dayton in 2013, after MAHLE GmbH acquired a majority stake in the Behr Group.

[2] Throughout this interim ROD, "Chrysler" is used to describe the entity that previously owned the MAHLE facility. The detailed ownership history of the company commonly referred to as Chrysler is beyond the scope of this document; however, it is important to note that the current company operating under the name Chrysler is a different entity than the company known as Chrysler that previously owned and operated the MAHLE facility. More details of the ownership history of Chrysler can be found in the remedial investigation report.

Since the early 1990s, Chrysler documented groundwater contamination beneath the MAHLE facility. In the early 2000s, Chrysler began to design, install, and later operate on-site and off-site groundwater remediation systems. This included an on-site SVE system for the removal of volatile organic compound (VOC) contaminants from vadose zone soil in the southern portion of the facility. The SVE system began operating in October 2003 and continued to operate through December 2009. Additionally, Chrysler installed groundwater extraction wells to capture contaminated groundwater and injected a sodium lactate solution into the extracted groundwater before reinjecting it into the upper aquifer. The solution was added to promote the growth of anaerobic bacteria that break down chlorinated solvents. Chrysler operated this pump, treat, and reinject remedial groundwater system from June 2004 through December 2005.

In 2006, Chrysler signed an administrative order on consent (AOC) to conduct a time-critical removal action to abate vapor migration of hazardous substances from groundwater into buildings by installing and monitoring VIMS at affected residences and buildings. As part of this work, Chrysler also installed and operated an SVE system to the south of the MAHLE facility in 2008, to help prevent Site-related soil vapors[3] from entering homes and businesses located south of the facility (the 2008 SVE system). Chrysler began installing the 2008 SVE system in May 2008. The 2008 SVE system applies a vacuum to an area of the subsurface between 5 and 20 feet below ground surface (bgs) to remove vapor-phase contaminants.

After Chrysler filed for bankruptcy and stopped work under the 2006 AOC in 2009, EPA issued a unilateral administrative order (UAO) to Behr Dayton Thermal Products LLC to continue the removal action, including operation and maintenance (O&M) of the 2008 SVE system (the 2009 UAO). Behr Dayton Thermal Products LLC (now MAHLE) had participated in negotiations for, but did not sign, the 2006 AOC. It has since entered into an Administrative Settlement Agreement and Order on Consent (ASAOC) for an Engineering Evaluation/Cost Analysis (EE/CA) in 2013, and an ASAOC for a non-time-critical removal action in 2015. The EE/CA described a separate, non-time-critical removal action to address an area of impacted groundwater located at or near the southern boundary of the MAHLE facility. In January 2018, MAHLE began operating an AS and SVE[4] system to remove this groundwater contamination at the southern edge of its facility under the 2015 ASAOC.

### *2.2.2. The Aramark Facility*

Aramark operates an industrial laundry providing uniform cleaning services at the Aramark facility. EPA previously identified it as a PRP for this Site. Aramark is located within the central core of the groundwater plume associated with the Site. More specifically, Aramark's facility sits approximately 800 feet to the south (downgradient) of the Behr facility.

Aramark used PCE at this facility until 1987, when dry cleaning solvents and equipment, including a PCE storage tank located outside of the northeast corner of the building, were permanently removed. In December 1991, Aramark also removed two underground storage tanks (USTs) containing gasoline and fuel oil stored at its facility.

[3] These soil vapors have volatilized from the contaminated groundwater.

[4] This SVE system is in addition to the 2008 SVE system located south of the MAHLE facility. MAHLE continues to operate the 2008 SVE system as well.

During UST excavation activities, Aramark looked for potential soil contamination using visual inspection and a photoionization detector (PID). Although there were no visible signs of leakage from the tank or any associated piping, PID measurements indicated the presence of VOCs in soil surrounding the USTs. After soil samples from the bottom of the tank excavation areas revealed soil contamination, Aramark conducted a soil investigation and found soil impacted primarily from PCE to depths of 15 feet bgs at concentrations as high as 72 micrograms per kilogram (at 5 feet bgs). In 1992, Aramark installed four groundwater monitoring wells at the Site, each to an approximate depth of 28 feet bgs, and observed concentrations of PCE and TCE as high as 373 and 1,050 ppb in monitoring wells downgradient of the Aramark facility.

To reduce the potential for additional soil contamination leaching to the underlying groundwater, Aramark operated an AS/SVE system at its facility from September 25, 1996 until 2003.

### *2.2.3. The Gem City Facility*

The Gem City Facility is located nearly adjacent to the northeast portion of the MAHLE facility (separated by a railroad track and associated right-of-way). The Gem City facility lies upgradient from the MAHLE facility and is not located within the central core of the groundwater plume associated with the Site. EPA previously identified Gem City as a PRP at the Site.

Gem City, which has operated at the GEM City facility since 1969, manufactures custom molded urethane products and conducts bulk chemical distribution and prepackaging. This facility includes truck loading and unloading areas, a railroad spur, and chemical handling and storage areas. EPA environmental investigations at the Gem City facility have identified compounds in soil that include methylene chloride, PCE, TCE, 1,1,1-TCA, isopropyl alcohol, acetone, toluene, xylene, and methyl ethyl ketone.

In May 1986, Gem City removed 10 USTs that were grouped into the three areas at its facility. The USTs included two or three tanks used for fuel oil storage. The remaining tanks were used to store Stoddard (not chlorinated) solvents. Ohio EPA and EPA did not know the condition of these tanks during operation and removal, the specific products stored, or the removal procedures Gem City used. In 1987, Gem City collected 12 shallow soil samples from its facility with a backhoe. Some samples were found to contain concentrations of PCE as high as 554 milligrams per kilogram (mg/kg), TCE as high as 141 mg/kg, and 1,1,1-TCA as high as 14 mg/kg. Groundwater samples collected by Gem City from monitoring wells within the Gem City boundary between 1988 and 1993 showed concentrations of TCE as high as 597 ppb, PCE as high as 848 ppb, and 1,1,1-TCA as high as 1,830 ppb. The general areas showing contamination included a chemical pouring shed, a storage shed, a former aboveground storage tank area, and the general location of the USTs Gem City removed in 1986.

Ohio EPA became aware of the contamination in groundwater at the Gem City facility in 1989 during a regional investigation of the sources of VOC contamination in the Dayton Mad River Well Field. A numerical groundwater modeling study suggested that the leading edge of the groundwater plume from the Gem City facility would reach the Dayton Miami South Well Field within 3 years. Gem City installed an SVE system consisting of five SVE wells and a groundwater pump and treat (P&T) system consisting of an extraction well and an air stripper at

its facility without Ohio EPA oversight or formal approval. On July 6, 1992, Ohio EPA and Gem City entered into a Director's Final Findings and Orders, in which Gem City agreed to "prevent the further off-property migration of contaminants from the Facility."

EPA estimates the capture zone of the groundwater extraction well at the Gem City facility to be 300 feet. It reportedly underlies the entire actively-operated area at the facility and extends to or beyond the Gem City facility boundaries to the north and east. As of March 31, 2016, Gem City reported it had pumped approximately 4 billion gallons of water from the recovery well. Gem City reported that the SVE system, which operated for two years, removed an estimated 1,100 pounds of VOCs.

### *2.2.4. Vapor Intrusion*

In 2002, Chrysler notified Ohio EPA that the VOC plume from the MAHLE facility was migrating off site in the groundwater. The concentrations of chlorinated VOCs in the groundwater – specifically TCE, vinyl chloride (VC), and cis-1,2-dichloroethylene (cis-1,2-DCE) – exceeded the EPA Office of Solid Waste and Emergency Response (OSWER)[5] VI screening levels for these chemicals. This indicated additional investigation was needed to assess the potential risk to area residents due to VI.

By 2006, the reported concentrations of chlorinated VOCs detected in groundwater migrating off site from the MAHLE facility led to Ohio EPA concerns that vapor-phase chlorinated solvents could migrate from the groundwater and travel through the vadose zone as soil vapor and into homes and businesses in the neighborhood south of the MAHLE facility. In October 2006, Ohio EPA sampled the soil vapor in the residential area south of the MAHLE facility at seven locations at approximately 1 foot above the water table, which varies across the Site between approximately 17 and 25 feet bgs. Contaminant concentrations in these soil vapor samples significantly exceeded the EPA OSWER VI screening levels for chlorinated VOCs in soil vapor. The Ohio EPA sampling indicated TCE in soil vapor at concentrations up to 160,000 parts per billion by volume (ppbV), cis-1,2-DCE at concentrations up to 11,000 ppbV, and 1,1-DCE at concentrations up to 1,200 ppbV.

Based on the results of the soil vapor investigation south of the MAHLE facility, Ohio EPA formally requested assistance from the EPA Region 5 Emergency Response Branch in early November 2006 to conduct a time-critical VI investigation at the Site. EPA initiated an additional VI investigation by sampling sub-slab soil vapor and indoor air in the neighborhood south of the MAHLE facility in November 2006.

After reviewing the results of the sampling, EPA met with Chrysler and Behr Dayton Thermal LLC in November 2006 to discuss an AOC and establish the scope of work for a proposed removal action that focused on installing sub-slab VIMS in residences with indoor air TCE concentrations greater than 0.4 ppbV. On December 19, 2006, EPA executed an AOC with Chrysler to conduct a time-critical removal action.

[5] The EPA organizational unit formerly known as OSWER changed its name to the Office of Land and Emergency Management or OLEM in December 2015.

As indoor air and sub-slab sampling continued in 2007 and 2008, the VI investigation area increased to include most of the neighborhood south of the MAHLE facility extending to the Great Miami River.

Sampling conducted at two schools in the area, Kiser Elementary School and McGuffey School, in 2007, indicated elevated VOC concentrations at the McGuffey School, though not at Kiser Elementary. Chrysler installed a sub-slab soil VIMS at the McGuffey School, but indoor air levels remained above the screening level. The Dayton City School Board decided to relocate students from this school to another building outside the affected area. The McGuffey School was closed in August 2007 and eventually demolished in 2011.

From 2007 through 2009, Chrysler installed and maintained VIMS at many residential buildings (homes), along with commercial and industrial buildings, in proximity to and downgradient from the MAHLE facility under the 2006 AOC. In 2009, after Chrysler filed for bankruptcy and stopped work, EPA issued the 2009 UAO to Behr Dayton Thermal Products LLC, requiring it to take over the removal action work, which continues under the oversight of EPA. That work, among other things, involves obtaining access agreements for sampling, conducting additional baseline indoor air and sub-slab vapor sampling, installing VIMS, and inspecting, monitoring, and maintaining VIMS.

Available information to date indicates samples have been collected from more than 395 locations, and over 280 VIMS have been installed in over 240 homes and other buildings since 2007 as part of this removal action. Due to ongoing sampling of new properties as part of the time-critical removal action and O&M of existing VIMS, these numbers will vary over time.

The 2009 UAO also required Behr Dayton Thermal LLC to continue to operate the SVE system Chrysler installed in May 2008, in the neighborhood just downgradient (south) of the MAHLE facility, to mitigate soil vapors that lead to unacceptable VI exposures. The Ohio Department of Health reported that TCE levels were significantly reduced in samples from both indoor air and soil vapor in the nearby residential area after this SVE system started operating in July 2008.

### *2.2.5 RI/FS Notices and Superfund Listing*

EPA issued special notice letters to Behr Dayton Thermal LLC, Chrysler, Aramark, and Gem City in November 2007 to initiate negotiations to conduct a remedial investigation and feasibility study (RI/FS) at the Site, but EPA did not reach an agreement with the parties. EPA began conducting a fund-lead RI/FS in the summer of 2008. EPA proposed the Site to the National Priorities List in September 2008 and finalized the listing in April 2009.

## 2.3 Community Participation

EPA released the remedial investigation (RI) and focused feasibility study (FFS) Reports and Proposed Plan for the Behr Site to the public on September 5, 2018. These documents can be found with other pertinent documents in the Administrative Record file that can be accessed on EPA's web site for the Behr Site at www.epa.gov/superfund/behr-dayton-thermal. EPA also maintains the Administrative Record file at two public repositories: the EPA Region 5 Docket

Room, 77 West Jackson Boulevard (7th Floor) Chicago, Illinois; and the E.C. Doren Branch Library located at 359 Maryland Avenue in Dayton, Ohio. The Administrative Record Index (a list of documents found in the Administrative Record) is included as Appendix A of this Interim ROD.

EPA published a notice of the availability of these documents in the Dayton Daily News on September 4, 2018. EPA held a public comment period for the proposed plan for this interim action from September 5 to November 5, 2018.

EPA held a public meeting on September 20, 2018, to present the Proposed Plan to the community. A transcript from this meeting has been added to the Administrative Record file along with other comments received during the public comment period. At the Proposed Plan public meeting, representatives from EPA answered questions about the Site and the remedial alternatives. EPA also used this meeting to solicit formal comments on the Proposed Plan. EPA's responses to the comments received during the public comment period are provided in the Responsiveness Summary, which is in Part 3 of this Interim ROD.

## 2.4 Scope and Role of Response Action

This interim remedy addresses contaminated groundwater in the central core of the groundwater plume at the Behr Site and soil vapor throughout the entire site. The central core of the groundwater plume is more specifically defined as the portion with TCE concentrations of 500 ppb or greater. Figures 2, 3, and 4 depict the presently-known extent of the central core of the plume in the shallow, intermediate, and deep zones of the surficial aquifer, respectively. The central core portion of the plume contains approximately 75 percent of the groundwater contamination by mass despite only extending to about 20 percent of the aerial coverage of the plume. While EPA develops long-term cleanup options for soil contamination throughout the Site and groundwater contamination in the distal portions of the groundwater plume, EPA intends to implement the groundwater portion of this interim remedy at the central core of the groundwater plume and the soil vapor portion of this interim remedy (addressing VI) throughout the portion of the groundwater plume that exceeds vapor intrusion screening levels (VISLs). Figure 5 depicts the extent of the Site plume that exceeds the TCE VISL. EPA plans to select a final Site remedy that addresses soil contamination and the remaining portion of the groundwater plume in a future Proposed Plan and Record of Decision, after collecting additional groundwater data and assessing the effectiveness of the groundwater remedy implemented as a result of this Interim ROD.

## 2.5 Site Characteristics

### *2.5.1 Conceptual Site Model*

Figure 6 is a three-dimensional image of the conceptual site model (CSM) for the Site.

The groundwater contamination associated with the Site lies in the upper aquifer, which is separated from a deeper, lower aquifer, by a semi-continuous clay-rich basal till. Depth to groundwater in the upper aquifer is generally 15 to 20 feet bgs, which is lower than the bottom

elevation of adjacent rivers, indicating that these rivers are losing streams in the study area. Impacts to the upper aquifer occurred due to releases of chlorinated solvents as dense non-aqueous phase liquid (DNAPL) from the facilities associated with the Site. The DNAPL then migrated vertically to groundwater and through the three different portions (i.e., shallow, intermediate, and deep zones) of the upper aquifer.

Once dissolved in groundwater, the contaminants migrated laterally downgradient in the shallow and intermediate portions of the upper aquifer, primarily through advection. Lateral migration has resulted from both natural hydraulic gradients and anthropogenic pumping at municipal wellfields, dewatering systems, and localized remedial systems. EPA did not observe migration of contaminated groundwater associated with the Site to the lower aquifer, where pumping for the Dayton Miami South Well Field occurs, nor did it observe groundwater contamination from the Site migrating to the aerial vicinity of this well field in the surficial aquifer.

Elevated concentrations are still noted beneath the MAHLE facility, where some residual source material is thought to remain or remained until recently. However, EPA did not identify any residual DNAPL in soil or well borings that could act as an ongoing source to groundwater. The evaluation of the maximum concentrations of aqueous PCE and TCE indicate that only PCE is potentially present as residual DNAPL, and if so, lies near the location of wells BE-MW101D (deep portion of upper aquifer) and PZ-8I (intermediate portion of upper aquifer) beneath the MAHLE facility.

Though the RI found that groundwater contamination associated with the Site is not impacting municipal well fields and no other drinking water wells have been found at or near the Site, the contamination deters use of this portion of the aquifer as a potential source of drinking water. Also, if left untreated, some of the contaminated groundwater associated with the Site could eventually migrate to the lower aquifer to the northeast where the Dayton Miami South Wellfield sits. This interim action treats the central core of the groundwater plume where most of the contaminant mass is located, will significantly limit the spread of the plume, and will address much of the contamination that poses a threat to human receptors through the drinking water pathway. EPA plans to propose and select an additional groundwater remedy to restore the groundwater to drinking water quality after it collects and evaluates additional data.

Groundwater contaminants volatilize from the aquifer and migrate as vapors through the vadose zone to the indoor air of buildings at the Site. This interim remedial action will address VI threats in areas not previously addressed as part of the current removal action to address VI.

This interim action is meant to address the risk to human receptors through exposure to PCE and TCE in groundwater through two primary routes: (1) consumption of contaminated groundwater and (2) inhalation of vapors that migrate from the groundwater through the subsurface into the indoor air of buildings and homes. The potential receptors include current/future residents, industrial/commercial workers, and construction workers. VI mitigation activities will continue until contaminant concentrations in groundwater are reduced to levels that no longer pose a VI threat.

### *2.5.2 Geologic, Hydrogeologic, and Hydrologic Setting*

#### *2.5.2.1 Regional Geology*

The regional geology consists of portions of the Great Miami Buried Valley Aquifer System (GMBVAS). The GMBVAS stems from valleys cut into the bedrock (shale and limestone) by river and glacial erosion followed by filling with glacial deposits (clay/silt, sand, and gravel). In general, the bedrock valleys were eroded by stream flow and later filled with sand and gravel glacial outwash deposits, resulting in highly permeable buried valley aquifers. These buried valley aquifers have a predominant groundwater flow direction from north to south. The valley train deposits, in most places, are separated by clay-rich till zones into an upper sand and gravel unit and a lower sand and gravel unit. Bedrock in the area consists of a sequence of shale and limestone named the Richmond Group that is locally capped by the Brassfield Limestone.

As the glaciers melted and retreated, the water from the melting ice deposited vast quantities of sand and gravel (outwash). The outwash deposits in the Dayton area range in thickness from approximately 120 to 250 feet. The deposits are highly permeable. Therefore, they are used as municipal and industrial water sources.

#### *2.5.2.2 Regional Hydrogeology*

Groundwater in the Dayton area occurs within the upper and the lower sand and gravel (outwash) aquifers of the GMBVAS. The aquifers are contained horizontally and vertically within the low permeability bedrock valleys eroded into the Richmond Group. Regional groundwater in both aquifers flows toward the south, following the downgrade direction of the Deep Stage valley drainage system. The aquifers are separated vertically by a clay-rich till zone that occurs as an aerially extensive layer of till or as closely associated till lenses and masses.

The glacial deposits range in thickness from 150 to 250 feet. Each upper and lower sand and gravel aquifer ranges from approximately 30 to 100 feet thick. Water from the aquifers is pumped at the Dayton Mad River Well Field and Miami South Well Field[6], where high water levels are maintained by artificial recharge. The sand and gravel aquifers yield approximately between 500 gallons per minute (gpm) and 2,000 gpm based on actual city production well pumping rates.

Reports reviewed by EPA about the regional hydrogeology indicate that the non-continuous low-permeability clay-rich till that forms the base of the upper aquifer ranges in thickness from approximately 10 to 50 feet thick and occurs at depths ranging from 30 to 75 feet bgs, though EPA found this layer to be present at greater depths at the Site. Where it is present, it confines water in the lower aquifer. Recharge to the lower aquifer, in which most high-capacity production wells are screened, occurs largely by vertical leakage through the clay-rich basal till

[6] Only the Miami South Well Field is near the Site. It draws from the lower aquifer as opposed to the surficial aquifer where the groundwater plume associated with the Site is located. Site contamination has not been found in the lower aquifer, and only a small portion of the groundwater plume associated with the Site flows in the direction of the Miami South Well Field.

and from underflow. Where the clay-rich basal till is absent, the two aquifers are directly connected.

Groundwater recharge in the Dayton area occurs primarily as infiltration of stream flow through the streambed into the upper aquifer and secondarily as infiltration of precipitation and underflow within the lower aquifer. Thus, the availability of groundwater depends not only on the physical properties of the aquifers but also on the character of the surface water flow and the rate at which water can percolate through streambeds under various conditions. Anthropogenic activities such as river damming and groundwater pumping for municipal and industrial use impact these conditions.

#### *2.5.2.3 Site-Specific Geology*

The upper aquifer extends from the ground surface to the top of a clay-rich till that serves as a base for this aquifer, and ranges in thickness from approximately 60 to 100 feet. The upper aquifer is characterized using the Unified Soil Classification System as a well-graded gravel and medium to coarse sand with occasional isolated silt and clay till layers. Gravel and cobble zones also occur in the upper aquifer.

In addition to the clay-rich basal till, shallow silt and clay till is generally present as thin lenses or thicker block remnants deposited during different stages of glacial melt. The thickness of the shallower silt and clay till ranges from several feet to more than 30 feet. It is present at depths ranging from near surface to approximately 80 feet bgs. The shallower silt and clay till deposits are thinner and considerably less extensive than the clay-rich basal till that forms the base of the upper aquifer. The frequency of the shallow silt and clay till lenses and blocks increases toward the south and west of the investigation area.

The top of the clay-rich basal till that forms the bottom of the upper aquifer ranges in depth from approximately 60 to 100 feet bgs. Although this basal till is relatively extensive across the investigation area, it is absent in several boring logs (particularly, in the western portion of the investigation area). This unit generally consists of soft to firm gray silt and clay with medium to fine sand and trace gravel. It ranges in thickness from 1 to 45 feet. The top of this basal till ranges in elevation from 685 to 660 feet above mean sea level (amsl) in the RI area.

#### *2.5.2.4 Site-Specific Hydrogeology*

EPA focused the site-specific hydrogeology primarily on the upper aquifer where Site-related contamination is found. As can be seen in Figure 6, a clay-rich basal till generally separates the upper aquifer from the lower aquifer; however, this confining layer is semi-continuous in the study area since it was not identified in several of the borings located in the western portion of the RI area.

Groundwater flows primarily to the southwest towards Deeds Park but is impacted by groundwater extraction from the lower aquifer at the Dayton Miami South Well Field to the northeast, and from dewatering at two wells in the upper aquifer identified as the Eastern and

Western Keowee Street dewatering wells. In addition, there are localized influences across the study area that can be associated with groundwater remediation system pumping centers.

Hydraulic gradients in the upper aquifer vary considerably across the Site, with measured gradients ranging from 0.0002 ft/ft to 0.003 ft/ft. They are generally lowest in the northeast portions of the RI area and highest in the southwest. Data indicates there is not a significant vertical gradient. In 2014, groundwater elevations in the study area ranged from approximately 742 feet amsl to the east near the Mad River to approximately 721 feet amsl near the confluence of the rivers at Deeds Park.

Due to the aquifer thickness, EPA screened groundwater monitoring wells across three portions of the upper aquifer (shallow, intermediate, and deep), and reported the results of the RI separately for each of these layers.

#### *2.5.2.5 Site Hydrology*

Two major rivers, the Great Miami and the Mad Rivers, bound three sides of the Site, and groundwater generally flows towards their confluence (see Figure 1).

The Great Miami River discharge at river mile 80, located approximately one mile downstream of the Site, is reported to have an annual discharge ranging from 954 to 5,375 cubic feet per second (cfs), with an average of 2,674 cfs from 1974 through 2013. Based on river discharge, the Great Miami River carries the predominant flow of the river system, and this river is considered a losing stream under normal conditions.

The nearest active U.S. Geological Survey streamflow gauge on the Mad River is located approximately 4 miles upstream of Stanley Avenue. The annual average stream flow at this location, reported from 1974 to 2013, is 736 cfs. The Mad River is generally considered a losing stream, and its average annual discharge ranged from 369 to 1,333 cfs.

### *2.5.3 Summary of the Remedial Investigation*

EPA conducted an RI at the Site from August 2010 through March 2016. The discussion below summarizes the significant findings and conclusions from the RI site characterization activities. The November 2017 Final RI Report, which is included in the Administrative Record for the Site, provides additional detail about Site investigations.

#### *2.5.3.1 Groundwater*

The screening-level human health risk assessment EPA performed during Phase I RI activities identified three chlorinated VOCs – PCE, TCE, and VC – as the primary risk drivers in groundwater at the Site. The chemicals of potential concern (COPCs) EPA assessed in each portion of the upper aquifer included those chlorinated VOCs and another associated degradation product, cis-1,2-DCE, in addition to 1,1,1-TCA. Although other COPCs were identified in groundwater, EPA chose these five chlorinated VOCs for delineation because they extend furthest across the Site.

In the shallow portion of the upper aquifer, the plumes have migrated the furthest laterally (compared to the other portions), extending over the largest area. The highest concentrations of the PCE and TCE plumes are generally located beneath the MAHLE facility, along the southern boundary of the MAHLE facility extending downgradient, and downgradient of the Aramark facility. Degradation product plumes, cis-1,2-DCE and VC, and the 1,1,1-TCA plume are generally enclosed within the higher PCE and TCE concentration areas. All of the chlorinated VOCs, except TCE, are fully delineated in the shallow portion of the upper aquifer. Though TCE is not fully delineated downgradient adjacent to the rivers, its extent in the shallow portion of the upper aquifer is depicted in Figure 2.

In the intermediate portion of the upper aquifer, the plumes are less extensive than in the shallow portion and delineated within the study boundary. PCE and cis-1,2-DCE are each present beneath the MAHLE and Gem City facilities, downgradient of the MAHLE facility, and downgradient of Aramark. VC and 1,1,1-TCA are each present generally beneath the MAHLE facility. TCE is present over the largest extent in the intermediate portion of the upper aquifer, as shown in Figure 3. EPA generally identified the highest concentrations of the chlorinated VOCs in the intermediate portion of the upper aquifer.

In the deep portion of the upper aquifer, the plumes' extents are delineated. PCE, cis-1,2-DCE, and VC are present in the deep portion, generally beneath the MAHLE facility and downgradient of the Aramark facility. EPA did not identify any exceedances of 1,1,1-TCA in this portion of the upper aquifer. The relative concentration of TCE is lowest in the deep portion of the upper aquifer, as shown in Figure 4. Overall, the chlorinated VOC plumes decrease in size with depth and show limited lateral migration in this portion of the upper aquifer.

Releases from the facilities impacted the upper aquifer, but EPA did not find concentrations greater than screening levels in the lower aquifer, where the municipal wells are screened.

#### *2.5.3.2 Soil Vapor*

EPA has been addressing the VI pathway, a complete exposure pathway at the Site, under a removal action that began before the RI. As such, EPA did not completely evaluate the VI pathway in the RI. Instead, it demonstrated that the VI pathway is complete for the Site overall and that a quantitative risk to human health exists. In the RI, EPA compiled available indoor air and sub-slab soil vapor samples collected before VIMS were installed (i.e., samples indicative of the conditions that existed prior to any mitigation efforts) in residential and commercial buildings to document the potential risks associated with the VI exposure pathway. Additionally, EPA compared concentrations of chlorinated VOCs in groundwater to VISLs. EPA finds the previous removal actions (i.e., the time-critical removal action for VI that includes installation of VIMS and operating the 2008 SVE system, and the non-time-critical removal action that includes an AS/SVE system) are not adequately addressing all VI concerns in the long term. In this interim ROD, EPA is selecting a remedy that includes VI mitigation activities.

The RI delineated the current lateral extent of the area potentially impacted by VI (i.e., the VI area of potential concern [AOPC]) by comparing concentrations of the chlorinated VOCs in the

shallow groundwater interval to groundwater-to-indoor air VISLs. Because results show the highest concentrations and largest plume extent generally came from TCE, EPA used the shallow TCE groundwater concentrations to represent the AOPC (Figure 5). The AOPC adds a 100-foot buffer, referred to as the "initial lateral inclusion zone," outside the extent of TCE groundwater VISL concentrations to account for potential vapor migration from a vapor source.

EPA's June 2015 *OSWER Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air* (OSWER Publication 9200.2-154) (the VI Guidance) discusses using a 100-foot buffer to evaluate which buildings to include in VI investigations. (See the VI Guidance at p. 68.) This 100-foot buffer is also typically used to identify areas that generally warrant future assessment. EPA used the AOPC with 100-foot buffer data to support ongoing or additional activities that address the VI pathway in areas that have not previously been assessed for installation of VI mitigation systems. EPA has used these results to expand the number of properties to be sampled (and mitigated if necessary) for VI under the 2009 UAO.

#### *2.5.3.3 Soil*

To support the baseline human health risk assessment (BHHRA), EPA compared soil samples collected from 2011 (facility-focused sampling) through 2016 (confirmation facility and background sampling) to EPA's industrial regional screening levels (RSLs), the most likely future-use scenario of the three facilities. EPA also compared metals and polycyclic aromatic hydrocarbon (PAH) results to background concentrations, as both occur naturally. Also, PAHs frequently stem from various man-made sources such as street run-off. The following summarizes the soil results:

- Of the VOCs, TCE exceeded the industrial soil RSL only at the Gem City facility. In particular, TCE exceeded the industrial RSL at five locations across that property and is delineated laterally. One location reported TCE at concentrations greater than the RSL at depth, but four adjacent borings indicate vertical migration is limited in the area.
- Of the metals, only arsenic exceeded both its industrial soil RSL and background concentration at one location (at the Aramark facility). However, overall concentrations are similar to background and likely occur naturally.
- Of the PAHs, soil from only two locations exceeded the industrial RSL and background concentration (one at the Aramark facility and one at the Behr facility). However, the overall concentrations are similar to background and are likely present due to their ubiquity in the environment.

EPA compared soil concentrations of metals and PAHs to screening levels protective of groundwater (i.e., soil leaching). Results indicated little to no potential for these chemicals to impact groundwater. For this reason, and because these contaminants are not considered Site-related, they are not being addressed as part of this response action. This interim ROD selects an interim remedy to address the core of a chlorinated VOC groundwater plume and the resultant groundwater-driven VI issues across the entire groundwater plume. EPA plans to evaluate the Site-related soil impacts in a future sitewide feasibility study.

## 2.6 Current and Potential Future Land and Resource Uses

The Behr Site is composed of mixed residential, commercial, and industrial areas, and future land use is expected to remain the same. For the purposes of the future risk evaluation, EPA conservatively assumed that commercial and industrial properties might become residential. When it selects a remedial alternative for soil contamination at the Site, EPA may also include a requirement to put in place institutional controls that prevent certain contaminated properties on the Site from becoming residential.

All properties at the Behr Site are connected to the City of Dayton's municipal water supply. The City of Dayton operates two wellfields outside of but near the Behr Site: the Dayton Miami South Well Field located to the north across the Great Miami River, and the Dayton Mad River Well Field located to the southeast across the Mad River. The Dayton Mad River Well Field lies some two miles away and side-gradient from the groundwater plume associated with the Site. The Great Miami River Well Field lies one mile away and downgradient from the northern portion of the groundwater plume associated with the Site. Under the current hydrological conditions, neither well field is affected by contamination from the Site. Only the Great Miami River Well Field has the future potential to be influenced by the plume should conditions change (e.g., possibly through prolonged and serious droughts or significant changes in municipal pumping rates). However, this Well Field is downgradient from only a small portion of the plume. The contaminant concentrations in this portion of the plume are relatively low compared to the rest of the plume, and the wells in this Well Field are screened in a lower aquifer than the aquifer where the plume is located.

## 2.7 Summary of Site Risks

EPA performed a BHHRA and a screening level ecological risk assessment (SLERA) to assess risks posed by the Site in the absence of any remedial or other cleanup actions. Because this interim ROD addresses only groundwater contamination and VI, this section focuses on the risks posed by groundwater and soil vapor.

### *2.7.1 Summary of Human Health Risk Assessment*

Groundwater

The BHHRA presents the potential current and future risks to human health posed by residential use of contaminated groundwater (see Figure 7). The upper contaminated aquifer is not currently used as the municipal drinking water source or for private well drinking water. Although groundwater in the lower aquifer north of the MAHLE facility flows to the Dayton Miami South Well Field, EPA has not found Site-related contamination in the lower aquifer. The BHHRA assessed residential use of groundwater for hypothetical future use to support risk management decision-making. The BHHRA also assessed a scenario involving construction workers contacting shallow groundwater.

EPA identified multiple groundwater COPCs. TCE and PCE account for approximately 98 percent of the cumulative risk for a residential exposure scenario. The BHHRA evaluated data

collected between September 2011 and March 2016 from 449 samples from 282 locations. EPA evaluated data from two exposure areas, the core of the VOC plume and the plume fringe, separately. The core of the VOC plume includes areas where TCE or PCE concentrations exceed 500 ppb, which represents a concentration 100 times the federal maximum contaminant level (MCL) for TCE (which has an MCL of 5 ppb). EPA estimates the core of the VOC plume contains about 75 percent of the plume mass despite only composing 20 percent of the plume area. All other areas of groundwater with contaminant concentrations above the MCL are designated as the plume fringe.

The lifetime excess cancer risk for future residents exposed to contaminated groundwater via ingestion from the core of the VOC plume is 3 in 100, which expressed in scientific notation is 3E-2; and the non-cancer risk is a Hazard Index (HI) of 2,560. The cancer risk exceeds EPA's target risk range of between 1E-4 and 1E-6 and Ohio EPA's target risk level of 1E-5. The non-cancer risk exceeds an HI of 1 and is also unacceptable.

Future construction workers exposed to shallow groundwater from the core of the VOC plume through incidental ingestion and dermal contact have an increased lifetime risk of cancer of 3E-6 and a non-cancer risk with an HI of 18. The cancer risk falls within EPA's target risk range and Ohio EPA's target risk level. The non-cancer risk exceeds an HI of 1 and is unacceptable.

Soil Vapor

Table A-7 from the BHHRA is included as Appendix C and provides a summary of the VI comparison data EPA used to establish risk from soil vapor.

These comparison data provide a baseline assessment of potential risks and confirm that some residents and workers in homes and businesses located above the contaminated groundwater plume associated with the Site are exposed to indoor air above risk-based screening levels. This risk assessment uses updated values for assessing VI risk compared to the values that were set in the 2009 UAO to identify VI risk and trigger the need for VI mitigation.

### *2.7.2 Summary of Ecological Risk Assessment*

EPA conducted a SLERA to evaluate whether the groundwater contaminant plume poses a potentially unacceptable risk to ecological receptors. Because the Site is located in a heavily developed urban area, potential ecological receptors are limited. EPA did not identify any special habitats or endangered species threatened by Site contaminants.

In the SLERA, EPA identified potential ecological receptors at the Site only in the two rivers that border the Site. Further, EPA identified the groundwater surface water interface (GSI) pathway (contaminated groundwater migrating into the rivers) as the only potential ecological exposure pathway at the Site that needs to be evaluated. EPA evaluated the GSI pathway in the Great Miami and Mad Rivers based on the ratio of exposure concentrations to screening values, resulting in ecological hazard quotients. The SLERA concluded that VOCs in groundwater do not present unacceptable ecological risk to aquatic receptors and that no further ecological risk evaluation is warranted.

### *2.7.3 Basis for Taking Action*

The response action selected in this Interim ROD is necessary to protect the public health or welfare or the environment from the actual or threatened releases of hazardous substances to the environment. The interim action is intended to achieve a significant reduction of contaminant mass in the groundwater plume associated with the Behr Site while a final remedial solution for groundwater and soil contamination at the Site is being developed. The interim action is also intended to reduce or eliminate the risk posed by inhalation of COC vapors from subsurface soils via the vapor intrusion pathway.

## 2.8 Interim Remedial Action Objectives

Remedial action objectives provide a general description of what the cleanup will accomplish, and typically serve as the design basis for the remedial alternatives, which will be presented in the following section. EPA developed RAOs for the Site based on COCs, pathways, receptors, and an acceptable constituent level for each medium assuming future residential use of the Site.

EPA identified Interim RAOs for groundwater and soil vapor for the Behr Site based on the summary of receptor risks and hazards for the exposure scenarios presented in the BHHRA. EPA developed the following interim RAOs specific to this interim response action:

- Significantly reduce concentrations of groundwater COCs in the core of the VOC plume, as measured by asymptotic performance levels.
- Protect residents from ingestion exposure to COCs in groundwater at concentrations greater than their Safe Drinking Water Act (SDWA) MCLs.
- Protect construction workers from incidental ingestion and dermal contact that present an unacceptable risk.
- Protect residents and industrial workers from unacceptable inhalation exposure to COCs caused by VI.

## 2.9 Description of Interim Remedial Alternatives

Because EPA is currently addressing the VI pathway in a separate removal action, the FFS did not conduct an analysis of remedial options for addressing this pathway. The most common interim VI mitigation measure is a VIMS. A VIMS creates negative pressure below a building to greatly reduce the migration of vapors from the subsurface into a structure. Each alternative described below, except the no action alternative, includes evaluating VI risk for all buildings above the entire groundwater plume associated with the Site that is above the VISL and installing VIMSs as needed throughout the entire Site.

The discussion below summarizes the cleanup alternatives EPA considered for this interim response action. For each cost estimate, EPA assumed 30 years of O&M. It is important to note that the detailed description of each remedial alternative below includes assumptions – such as the number of wells, length of piping, system capacity, etc. – that were made in the FFS for cost-estimating purposes. The specific details of the Selected Interim Remedy will be determined

during the remedial design phase and may differ in certain non-substantive respects from the descriptions below.

### *2.9.1 Common Elements of Interim Remedial Alternatives*

All interim remedial alternatives, except the no action alternative, include the following common elements:

- Obtaining access to private properties and public rights-of-way;
- Sampling occupied buildings above the groundwater plume for potential VI;
- Installing additional VIMS where VI sampling results exceed current screening levels;
- Ensuring O&M of existing and newly-installed VIMS until VI risk is mitigated;
- Conducting routine surveying of home ownership so that existing VIMS are effective and potentially affected properties are sampled;
- Continued operation of the non-time-critical removal action AS and SVE systems, and integration of these systems with the interim remedial action; and
- Groundwater and VI sampling.

All interim remedial alternatives, except the no action alternative, will also require institutional controls, as follows:

- Prohibiting the installation of potable wells in groundwater above SDWA MCLs;
- Requiring construction of new structures for occupation overlying groundwater concentrations greater than VISLs to include protective measures, such as vapor barriers or sub-slab depressurization systems;
- Requiring that property owners be notified of potential vapor intrusion risks even if they deny sampling or VIMS installation;
- Restrictions to protect construction workers against exposures to contaminated groundwater from unacceptable ingestion or dermal exposures; and
- Proprietary controls on property as needed to protect remedy components.

### *2.9.2 Alternative 1 – No Action*

EPA is required to evaluate a "no action" alternative when considering potential remedial actions for a site. Based on the BHHRA, EPA expects that this alternative would allow residents and workers at the Site to be potentially exposed to Site-related contamination at concentrations that

represent a potential threat to human health. Specifically, if the no action alternative were selected, residents and workers could potentially be exposed to contaminated groundwater or soil vapors associated with the Site through consumption of groundwater from future drinking water wells, construction activities, or the VI pathway.

*Estimated Costs for Alternative 1*

| | |
|---|---|
| Capital Cost: | $0 |
| Annual O&M Cost: | $0 |
| Total O&M Cost: | $0 |
| Total Present Worth Cost: | $0 |

### *2.9.3 Alternative 2 – Pump and Treat*

P&T involves pumping contaminated groundwater to a treatment system to remove the contaminants and would likely produce relatively rapid initial reductions in groundwater concentrations.

Approximately six groundwater extraction wells would be needed to capture groundwater with VOC concentrations exceeding 500 ppb. The six wells would pump approximately 1.75 million gallons of water per day (mgd), an average of about 200 gallons per minute per extraction well. Subsurface piping would be used to convey the water to a centralized treatment system. Up to 9,500 feet of trenching would be required, and construction would be performed by a combination of jack-and-bore directional drilling and conventional right-of-way utility work. This alternative would require approximately 18,000 feet of dedicated subsurface high-density polyethylene conveyance piping to convey the influent from each extraction well to the treatment system. Pipe sizing would range from 4 to 6 inches in diameter, depending on the length of conveyance to the treatment system and the estimated head loss. Due to the relatively flat relief at the Site, and the availability of submersible well pumps to provide at least 150 feet of hydraulic head, no lift stations would be required.

The centralized treatment system would treat the influent with air stripping, which is a conventional treatment method for these relatively volatile COCs. The combined influent from the six extraction wells would be treated in a single process stream. Vapor-phase granular activated carbon (VGAC) would treat the off gas from the air strippers. The VGAC would be replaced routinely as the media becomes saturated with COCs. Based on estimated contaminant mass levels and VGAC adsorption efficiencies, the VGAC would be replaced approximately twice yearly. Spent carbon would be characterized and then transported to a licensed facility for appropriate disposal or regeneration.

A transfer pump would continuously convey treated groundwater to the Mad River for discharge. Initial information indicates that discharging 5 mgd of clean water to the Mad River could improve the river's aesthetic quality, particularly during low-flow seasons. EPA did not consider discharge to a publicly-owned treatment works (POTW) due to potential capacity issues and cost limitations, since the POTW would levy a fee based on the discharge rate. EPA assumes a five mgd discharge rate to a POTW to be cost-prohibitive as it anticipates costs would exceed $5 million in annual discharge fees alone.

The air stripping system would operate and comply with air chemical-specific applicable or relevant and appropriate requirements (ARARs). Ohio Admin. Code § 3745-15-05 provides a *de minimis* air contaminant source exemption from air permit requirements if hazardous air pollutant emissions do not have the potential to exceed 10 pounds per day or 1 ton per year. Though no permit would be required for on-site activities under CERCLA, regardless of the potential air emission rate, EPA expects the off-gas treatment system would discharge less than 10 pounds per day and 1 ton per year after the first five years of operation. Discharge to the Mad River would comply with the substantive National Pollutant Discharge Elimination System (NPDES) requirements. Construction of an outfall near the River would need to comply with the substantive requirements established under Clean Water Act Section 404 for the Mad River. Furthermore, based on Ohio Rev. Code § 6101.19, coordination with the Miami Conservancy District may also be required. Chemical additions may be necessary to prevent fouling of the air stripping treatment system and would have to comply with the substantive NPDES requirements.

The use of P&T at the Site may be complicated by the presence of inorganics such as iron, hardness (calcium and magnesium), and other constituents. Iron fouling, calcium scaling, and other effects can significantly hinder treatment efficiency and system uptime. Sequestering agents, anti-scaling reagents, chlorination, and other remedies could be incorporated into the treatment train to maintain system efficiency.

The P&T system would require approximately 10 years of operation to achieve the remedial goals in the core of the VOC plume, including semi-annual groundwater monitoring. Operation of the non-time-critical removal action AS and SVE system currently in place at the MAHLE facility would be redundant to the P&T system and would no longer be needed as part of this alternative. In contrast, the groundwater plume by Gem City would not be treated by Alternative 2 P&T. Therefore, the P&T system currently in place at Gem City would continue to operate as part of this remedy. Additionally, since P&T would not resolve the indoor air exposures, the VIMS would need to be operated and maintained throughout the operation of this remedy. EPA assumes a need to conduct VI work for 30 years before the VIMS are no longer needed, which would likely depend on a subsequent groundwater remedy beyond this interim remedial measure. EPA estimated O&M costs for the VIMS based on continued operation of approximately 120 existing and 40 new systems.

*Estimated Costs for Alternative 2*

| | |
|---|---|
| Capital Cost: | $6,000,000 |
| Annual O&M Cost: | $800,000 for the first 5 years, $790,000 for years 6 through 10, $330,000 for years 11 through 30 |
| Total O&M Cost (30 years): | $13,300,000 |
| Total Present Worth Cost: | $19,300,000 |

### *2.9.4 Alternative 3 – Air Sparging/Soil Vapor Extraction*

During air sparging, air is injected underground into the contaminated groundwater to strip the VOCs from the groundwater as vapor. The VOC gases then migrate above the water table where the soil vapor extraction system draws them from underground and releases them to the

atmosphere. AS/SVE treatment for the core of the VOC plume would likely yield relatively rapid initial reductions in groundwater concentrations of VOCs within the zone of influence of the system. A VGAC system would treat the extracted gases before they are released to the atmosphere. EPA estimates active treatment with AS/SVE would continue for 5 years in the core of the VOC plume to meet the RAO of significant reductions as measured by asymptotic performance levels.

Horizontal[7] directionally drilled (HDD) AS wells (drilling through the subsurface horizontally) would be installed to distribute air through the treatment area. Eight AS wells would be installed in seven transects using HDD techniques. The longer transects would contain multiple AS wells installed end to end to treat the entire length of the transect. The HDD AS wells would measure 3 to 4 inches in diameter, contain 200 to 1,200 feet of screen, and be placed perpendicular to the direction of groundwater flow. A single-ended installation method could be used for each HDD AS well, which would be installed to a depth of approximately 80 feet bgs to effectively treat the shallow and intermediate portion of the contaminated aquifer. Double-ended installation could also be an option. The angle of installation for HDD wells would be 4 feet horizontal for every vertical foot drilled. Therefore, an additional 320 feet of drilling would be required for each AS well to reach the required installation depth.

In addition, eight 4- to 6-inch-diameter HDD SVE wells would be installed near the AS wells to approximately 20 feet bgs using directional drilling techniques. To avoid low permeability zones when drilling/placing the HDD wells, additional borings would need to be drilled during the remedial design to identify locations of clay lenses along the designed alignments of the HDD AS wells.

An estimated 4,800 feet of conveyance pipe would be installed in approximately 2,100 feet of trench to connect the AS and SVE wells to three independent remediation compounds. Conveyance pipe would be sized according to expected flow rates: 3 to 4 inches for the AS lines and 6 to 8 inches for the SVE lines. Dedicated piping would convey air to or from the remediation compounds to the AS and SVE wells.

Each remediation compound would house compressors, blowers, and other equipment to service a portion of the AS and SVE wells and provide enough AS injection capacity to deliver up to 1,050 standard cubic feet per minute (scfm) of air flow (0.5 scfm per foot of screen) and an SVE capacity to extract up to 1,300 scfm. One 10,000-pound VGAC treatment unit would be needed at each remediation compound to treat the extracted soil vapors before discharging them to the atmosphere. Security fencing would need to be installed around each equipment compound.

EPA estimates the VIMS would need to be operated and maintained for 30 years. Eventual groundwater cleanup goals may be reached more quickly, and fewer VIMSs may be needed, with the AS/SVE remedy (Alternative 3) than the P&T remedy (Alternative 2).

[7] For costing and conceptual design purposes, EPA assumed that horizontal directional drilling would be used to implement this remedial alternative. Vertical AS wells could be used in lieu of HDD AS wells to meet the RAOs. However, EPA estimates that the use of vertical AS wells would be more complicated (primarily due to access issues) and costly (for example, considerably more conveyance piping).

Discharge from the VGAC units must comply with the substantive air permitting requirements of Ohio Admin. Code § 3745-15-05. In addition, this alternative would be required to comply with the substantive requirements of Ohio Admin. Code § 3745-34-11, which pertains to underground injection.

AS/SVE would not prevent further lateral or vertical migration of COCs outside the target treatment zone. The SVE system must be properly designed and operated to be effective and reliable, and any performance issues would need to be immediately addressed and mitigated when encountered.

EPA estimates the AS/SVE systems would continue to operate for up to 5 years to meet remedial goals in the core of the VOC plume. The AS/SVE system that MAHLE installed in 2017, as part of a non-time-critical removal action under the 2015 ASAOC, would also continue to operate along with the newly installed AS/SVE wells. The area influenced by the Gem City P&T system falls outside the active target treatment zone of the Alternative 3 AS/SVE system and also would continue to operate as part of this remedy.

*Estimated Costs for Alternative 3*

| | |
|---|---|
| Capital Cost: | $6,800,000 |
| Annual O&M Cost: | $830,000 for the first 3 years, $810,000 for years 4 and 5, $330,000 for years 6 through 30 |
| Total O&M Cost (30 years): | $11,300,000 |
| Total Present Worth Cost: | $18,100,000 |

### *2.9.5 Alternative 4 – In-Situ Chemical Oxidation via Direct Injection*

Alternative 4 uses in-situ chemical oxidation (ISCO) to oxidize VOCs within the core of the VOC plume. Contaminants would be oxidized into compounds that do not pose a threat to human health (like carbon dioxide and water). Key factors that influence the effectiveness of ISCO include total oxidant demand (the amount of treatment chemical needed to oxidize the groundwater contaminants) and contact between the groundwater contaminants and the oxidant. Based on Site conditions, permanganate would serve as the oxidant because it persists longer than other oxidants. Although the permanganate anion has less oxidizing potential than other oxidants such as hydrogen peroxide, persulfate, and ozone, it is still efficient and is kinetically favorable for TCE. The chemistry of permanganate is straightforward (no catalyst involved) and selective, and its tendency for higher persistence in the subsurface enables longer contact times and transport distances in the subsurface.

This alternative involves installing permanent injection wells to target the core of the VOC plume in the contaminated aquifer's shallow and intermediate zones. Injection wells would be installed using a modified grid pattern, with transects installed along existing road rights-of-way. EPA estimates that 1,290 injection wells on 30-foot centers along each transect to varying depths in the aquifer would be needed to target different depth intervals during injection events. Based on the target interval, injection wells would be installed in pairs or triplets as follows:

- Shallow zone only—a pair of injection wells screened from 20 to 35 feet bgs and 35 to 50 feet bgs.
- Intermediate zone only—a pair of injection wells screened from 35 to 50 feet bgs and 50 to 65 feet bgs.
- Shallow and intermediate zones—three injection wells screened from 20 to 35 feet bgs, 35 to 50 feet bgs, and 50 to 65 feet bgs.

EPA estimates injection events would be performed annually for 5 years. Assuming a porosity of 0.3 and a permanganate natural oxidant demand of 2 grams per kilogram of soil, approximately 3.7 million gallons of 3 percent permanganate solution (915,000 pounds) would be injected into the injection wells per event. EPA assumes tanker trucks would deliver the premixed 3 percent permanganate solution to the Site and directly into the injection wells. This would prevent the need for a large staging area for mixing chemicals on site. Each injection event would take approximately 170 working days.

To monitor performance, groundwater samples would be collected semiannually for VOC analysis from monitoring wells that surround the active treatment area. Groundwater samples would be analyzed for metals due to the potential temporary mobilization of metals after injecting oxidant into the subsurface.

Prior to injecting chemicals into the subsurface, the remedy must meet the substantive requirements of Ohio Admin. Code § 3745-34-11, for an exemption for class V injection wells used for remediation.

Implementing this remedy poses several challenges. Distributing oxidant evenly through injections in the target treatment zone could be difficult, though proper pre-design investigations, design, and monitoring can alleviate this challenge. Permanganate is a strong oxidant and poses risks to site workers and potential nearby pedestrians during injection. However, if workers always wear appropriate personal protective equipment and work areas are barricaded appropriately, permanganate solution can be safely handled and injected by workers in the field. Engineering controls would be required to protect the environment from spills. There is a risk that injecting oxidant into the subsurface could potentially mobilize metals temporarily. Additionally, there is a risk as to how the public would perceive the purple permanganate solution being injected into the ground. Delivering a pre-mixed solution from tanker trucks would help lessen the visibility of the permanganate solution to the public.

The AS/SVE system, installed in 2017 as part of the non-time-critical removal action under the 2015 ASAOC, would be integrated into the treatment plan and continue to operate long term. ISCO injections would not be performed in the area that is influenced by the AS/SVE system. The area influenced by the Gem City P&T system falls outside the active target treatment zone of the ISCO treatment, so that P&T system would continue to operate. Additionally, the VIMS would be operated and maintained throughout the execution of this remedy, since ISCO would have no immediate effect on VI issues. EPA based O&M costs for the VIMS on continued operation of approximately 120 existing and 40 new systems.

During active treatment, annual expenses would include the oxidant, labor to inject the oxidant into the subsurface, performance monitoring, and preparation of monthly reports.

*Estimated Costs for Alternative 4*

| | |
|---|---|
| Capital Cost: | $8,300,000 |
| Annual O&M Cost: | $8,700,000 for the first 5 years, $330,000 for years 6 through 30. |
| Total O&M Cost (30 years): | $52,700,000 |
| Total Present Worth Cost: | $61,000,000 |

## 2.10 Summary of Comparative Analysis of Alternatives

Pursuant to the NCP, EPA uses nine criteria to evaluate the different remediation alternatives individually and against each other to select a remedy. The nine criteria can be subdivided into three categories: threshold criteria, primary balancing criteria, and modifying criteria. The threshold criteria are: overall protection of human health and the environment; and compliance with ARARs of environmental laws. These threshold criteria must be met for a remedial alternative to be eligible for selection. The primary balancing criteria are: long-term effectiveness and permanence; reduction of toxicity, mobility, or volume through treatment; short-term effectiveness; implementability; and cost. These are the technical criteria used as the basis for the detailed analysis. The modifying criteria are: state acceptance; and community acceptance. These criteria are assessed formally after the public comment period. Each of the nine criteria are briefly explained below.

Threshold Criteria

1. **Overall Protection of Human Health and the Environment** determines whether an alternative eliminates, reduces, or controls threats to public health and the environment through institutional controls, engineering controls, or treatment.

2. **Compliance with ARARS** evaluates whether the alternative meets federal and state environmental statutes, regulations, and other requirements that pertain to the Site, or whether a waiver is justified.

Primary Balancing Criteria

3. **Long-term Effectiveness and Permanence** considers the ability of an alternative to maintain protection of human health and the environment over time.

4. **Reduction of Toxicity, Mobility, or Volume Through Treatment** evaluates an alternative's use of treatment to reduce harmful effects of principal contaminants, their ability to move in the environment, and the amount of contamination present.

5. **Short-term Effectiveness** considers the length of time needed to implement an alternative and the risks the alternative poses to workers, residents, and the environment during implementation.

6. **Implementability** considers the technical and administrative feasibility of implementing the alternative, including factors such as the relative availability of goods and services.

7. **Cost** includes estimated capital and annual O&M costs, as well as present worth cost. Present worth costs are the total costs of an alternative over time in terms of today's dollar value. Cost estimates are expected to be accurate within a range of +50 to -30 percent.

Modifying Criteria

8. **State/Support Agency Acceptance** considers whether the state supports and/or accepts EPA's selected alternative.

9. **Community Acceptance** considers whether the local community supports and/or accepts EPA's selected alternative. Comments received during the public comment period on the Proposed Plan are an important indicator of community acceptance.

Provided below is a summary of the comparative analysis of alternatives. A more detailed analysis of each of the interim remedial alternatives can be found in the FFS.

### *2.10.1 Overall Protection of Human Health*

Alternative 1 (No Action) would provide no improvement over current conditions and no risk reduction, and therefore would not be protective of human health or the environment. Because Alternative 1 does not meet this threshold criterion and is therefore not eligible to be selected, this Interim ROD does not discuss it further.

EPA anticipates Alternatives 2 through 4 would all protect human health and the environment. EPA estimates all these Alternatives would require operation of VIMSs for 30 years. EPA estimates Alternative 2 would take 10 years to achieve the groundwater RAOs, and Alternatives 3 and 4 would take 5 years to achieve the groundwater RAOs.

Alternative 2 (P&T) is a proven method for groundwater remediation, especially in aquifers with high hydraulic conductivity and the relatively soluble contaminants present at the Site. P&T would reduce contaminant mass (rapidly at first) and exert hydraulic control in the target treatment zone but would not prevent further lateral or vertical migration of the core VOC plume. P&T is not expected to reduce the need for VIMS.

Alternative 3 (AS/SVE) would reduce contaminant mass (rapidly at first) by stripping the COCs from groundwater and capturing them with an SVE system. The captured air would be treated aboveground before it is discharged to the atmosphere. Like P&T, AS/SVE would not prevent further lateral or vertical migration of the plume. SVE could help mitigate VI issues and potentially reach VI RAOs more quickly, reducing the time the VIMS must continue to operate.

Alternative 4 (ISCO via direct injection) would oxidize contaminants to innocuous compounds like carbon dioxide and water. Like P&T and AS/SVE, ISCO would not prevent further lateral or vertical migration of the plume; however, because of oxidant drift from the target treatment zone,

some contaminant destruction would occur downgradient of the core VOC plume. ISCO is not expected to reduce the need for VIMS.

### *2.10.2 Compliance with Applicable or Relevant and Appropriate Requirements*

Appendix D provides a table listing the ARARs for the remedial alternatives that EPA assessed. In accordance with the NCP (40 C.F.R. § 300.430(f)(l)(ii)(C)(l)), interim actions such as this are not required to comply with all ARARs as long as the final remedial action at the Site will attain them; however, some ARARs still apply to this interim action. EPA believes that all ARARs can be adhered to in implementing Alternatives 2, 3, or 4, except that a final, sitewide remedy will likely be necessary for groundwater to meet the ultimate cleanup goals (MCLs) in a reasonable timeframe.

Alternative 2 (P&T) would comply with location-specific ARARs and action-specific ARARs including, but not limited to, well installation, prohibitions on polluting waters, treated water discharge, potential air emissions, and waste handling ARARs. The P&T remedy would comply with chemical-specific ARARs by removing contaminated groundwater from the aquifer and treating it before it is discharged to a surface water body.

Alternative 3 (AS/SVE) would comply with location-specific ARARs and action-specific ARARs including, but not limited to, well installation, Class V injection wells, subsurface injections, potential air emissions, and waste handling ARARs. The AS/SVE remedy would comply with chemical-specific ARARs by stripping the volatile COCs from groundwater using AS and removing the COCs from the subsurface using SVE. The COCs would be captured with carbon absorption to prevent their release into the atmosphere.

Alternative 4 (ISCO via direct injection) would comply with location-specific ARARs and action-specific ARARs, including well installation, Class V well, subsurface injection, and waste handling ARARs. The ISCO remedy would comply with chemical-specific ARARs by oxidizing the COCs in the groundwater into innocuous products.

### *2.10.3 Long-Term Effectiveness and Permanence*

Each of the remedial alternatives EPA evaluated are interim remedies, and EPA expects that additional remedial measures will likely be needed to address groundwater contamination after the interim remedial action achieves the interim groundwater RAOs.

Alternative 3 (AS/SVE) would better satisfy this criterion than Alternative 2 (P&T), as P&T is susceptible to fouling from naturally occurring minerals in groundwater and involves the pumping of a large volume of groundwater (more than 6 billion gallons). Each alternative would require the long-term operation of VIMS, but Alternative 3 has the potential to reduce the number of VIMS required in the long term as the SVE component could reduce soil gas concentrations. Conversely, there is a risk of Alternative 3 making the VI situation worse if the SVE system does not effectively capture all vapors generated from AS. Alternative 4 (ISCO) is the least reliable technology. It would be difficult to achieve sufficient contact of the oxidizer with the Site contaminants within the heterogeneous subsurface formation and would likely require multiple injection events to do so.

### *2.10.4 Reduction of Toxicity, Mobility, or Volume through Treatment*

Alternatives 2, 3, and 4 all utilize some form of treatment to reduce the toxicity, mobility or volume of the contamination. Alternative 4 best satisfies this criterion as ISCO permanently reduces toxicity, mobility and volume *in situ* by converting the contaminants to innocuous compounds. Each of the alternatives would be limited to the central core of the groundwater plume associated with the Site, but the oxidants used for Alternative 4 would have the potential to drift outside of the treatment area. Alternatives 2 and 3 rely on extraction and volatilization of contaminants, respectively, and treatment above ground. However, if the activated carbon is regenerated, the COCs would ultimately be destroyed while VGAC units are operated for either Alternative 2 or 3.

### *2.10.5 Short-Term Effectiveness*

Alternative 3 (AS/SVE) would best satisfy this criterion as it would involve the least amount of impacts to the community from construction and operation activities. Alternative 3 is also the only alternative that has the potential to reduce impacts from VI in the short term, and it best complements the ongoing non-time-critical removal action, which also comprises AS/SVE. Alternatives 2 (P&T) and 3 would require the installation of significant amounts of conveyance piping which would pose a risk to workers and the community. Alternatives 2 and 3 could also result in noises that disturb neighboring residents, though equipment could be designed to minimize these noises. In addition, Alternative 2 has the potential to generate odors that could be objectionable to neighboring residents. Alternative 4 (ISCO via direct injection) would satisfy this criterion the least because of risks and negative public perception associated with the significant amount of drilling and the subsurface injection of a purple liquid consisting of a strong oxidant. This could potentially not only disturb neighboring residents, but also deter commerce in the area during injection events.

### *2.10.6 Implementability*

Alternative 3 (AS/SVE) best satisfies this criterion as it entails the fewest implementation challenges. The total amount of initial construction is similar to Alternative 2, but Alternative 3 requires much less drilling than Alternative 4. Once constructed, O&M for Alternative 3 is simpler than that required for Alternatives 2 and 4. Alternative 3 does not involve the handling of chemicals.

Alternative 2 (P&T) entails managing a large volume of water. It would need to treat both this large volume of water and the vapors air stripping generates. Treatment would also be required to prevent fouling of the wells. Such treatment could be complicated, depending on the chemical additives required.

Alternative 4 (ISCO via direct injection) requires many annual visits handling dangerous chemicals. Though these dangers can be managed effectively with proper precautions, this would require navigating tanker trucks containing hazardous materials through relatively narrow residential streets. This alternative would also require drilling nearly 1,300 injection wells, which would require locating and obtaining access for all of these wells.

### *2.10.7 Cost*

The overall present net worth cost[8] is lowest for Alternative 3 at $18,100,000. The overall present net worth cost for Alternative 2 is similar at $19,300,000. Alternative 4's overall net present value is significantly higher at $61,000,000.

### *2.10.8 State/Support Agency Acceptance*

The State of Ohio concurs with this Interim ROD's selection of an interim action that includes Alternative 3, AS/SVE, as well as all other common elements listed above in Section 2.9.1, including continued VI sampling, maintenance, and monitoring. The State's concurrence letter has been added to the Administrative Record and is included as Appendix B of this Interim ROD.

### *2.10.9 Community Acceptance*

EPA did not receive any comments specifically objecting to or opposing the selection of the Preferred Alternative identified in the Proposed Plan, Alternative 3. EPA received some comments supporting the selection of Alternative 3 and several comments expressing a concern that the remedy be implemented as soon as possible. EPA also received numerous comments from MAHLE, many of which focused on investigative findings and design details.

EPA has provided responses to the comments it received on the Proposed Plan in the Responsiveness Summary section of this Interim ROD (Part 3).

## 2.11 Principal Threat Waste

The principal threat concept is applied to the characterization of "source material" at a Superfund site. Source material is material that includes or contains hazardous substances, pollutants or contaminants that act as a reservoir for migration of contaminants to groundwater, surface water or air, or acts as a source for direct exposure. EPA has defined principal threat wastes as those source materials considered to be highly toxic or highly mobile that generally cannot be reliably contained or would present a significant risk to human health or the environment should exposure occur. The NCP establishes an expectation that EPA will use treatment to address the principal threats posed at a site wherever practicable (40 C.F.R. § 300.430(a)(1)(iii)(A)). However, EPA has not identified any principal threat wastes at the Behr Site.

## 2.12 Selected Interim Remedy

### *2.12.1 Summary of the Rationale for the Selected Interim Remedy*

EPA has selected Alternative 3 (AS/SVE) as the Selected Interim Remedy as it best satisfies the evaluation criteria. Though no source materials constituting principal threats have been identified at the Site, the Selected Interim Remedy will achieve substantial risk reduction by reducing

[8] To calculate the present net worth of future costs, EPA used the discount factor identified by the Office of Management and Budget when EPA drafted the FFS, approximately 2%.

through treatment the toxicity, mobility, and volume of contamination in the most concentrated portion of the groundwater contaminant plume associated with the Site. EPA is selecting this alternative over the other alternatives evaluated because it is the most reliable and effective in the shorter-term at achieving Site-wide RAOs. It is also the most cost-effective of the active treatment alternatives evaluated. AS/SVE will meet remedial objectives more quickly than P&T. The Preferred Alternative complements the existing AS/SVE system at the MAHLE facility, reducing implementation costs, since that AS/SVE infrastructure is already in place to treat that portion of the central core of the Site groundwater plume. AS/SVE also has the best potential to reduce VI impacts and minimize the need for VIMS in both the short and long term.

### *2.12.2 Detailed Description of the Selected Interim Remedy*

The Selected Interim Remedy includes AS/SVE to address the central core of the VOC plume, institutional controls, and additional VI sampling, monitoring, and mitigation – namely, sampling occupiable buildings located above the entire Site groundwater plume that is above the VISL to identify unacceptable VI exposures, installing VIMSs as needed, and monitoring and maintaining all new and existing VIMS.

AS/SVE is an in-situ technology that injects air into the saturated zone to induce mass transfer (stripping) of VOCs dissolved in groundwater and uses SVE to capture the liberated VOCs. Alternative 3 uses AS/SVE technology to treat groundwater where TCE concentrations in groundwater exceed 500 µg/L. Based on previous experience using AS/SVE at sites with similar conditions, EPA estimates active treatment with AS/SVE will continue for 5 years in the 500-µg/L target treatment zone.

The required elements of the groundwater treatment portion of the Selected Interim Remedy include the following:

1) Install and operate a series of AS wells in a manner such that the collective zone of influence of these wells reduces COC concentrations in at least the entire central core of the plume (greater than 500 µg/L of TCE).
2) Install and operate a series of SVE wells that will capture and collect at least all soil vapors generated by the AS wells described in item 1, above.
3) Install and operate sufficient VGAC units to treat gases collected by the SVE wells described in item 2, above.
4) If EPA determines it can still achieve substantive groundwater contaminant reductions after it has met the shutdown criteria in the 2015 ASAOC, continue to operate (or restart operation of) the existing AS/SVE system installed in 2017 as part of the non-time-critical removal action.
5) Continue to operate all AS/SVE systems at the Site until EPA determines the systems are no longer achieving substantive reductions (as determined by asymptotic conditions).

6) Continue to operate the VGAC units described in item 3, above, until EPA deems it is no longer necessary (i.e., when potential air pollutant emissions are below thresholds that would trigger Ohio EPA air pollution operating permit requirements).

The following conceptual design details describe how this remedial alternative may be designed. Deviations from these design details are possible provided that the required elements of the AS and SVE system are met. The final details will be determined during the remedial design phase.

- Eight AS wells would be installed in seven transects using HDD drilling techniques. The longer transects would contain multiple AS wells installed end-to-end to provide treatment to the entire length of the transect. The HDD wells would be 3 to 4 inches in diameter, contain 200 to 1,200 feet of screen, and be placed perpendicular to the direction of groundwater flow. EPA assumed that a single-ended installation method would be used for each HDD AS well, which would be installed to a depth of approximately 80 feet bgs to effectively treat the shallow and intermediate target treatment zones. EPA also assumed the angle of installation for HDD wells would be 4 feet horizontal for every vertical foot drilled. Therefore, an additional 320 feet of drilling would be required for each AS well to reach the required installation depth.
- Eight 4- to 6-inch-diameter HDD SVE wells would be installed near the AS wells to approximately 20 feet bgs using directional drilling techniques.
- Figure 8 shows the conceptual layout of the proposed horizontal AS/SVE system, including the location of the non-time-critical removal action. The additional drilling length to get to the required depth is included in AS/SVE transects shown in the figure. Figure 9 shows a conceptual cross-section layout of a typical AS/SVE transect that includes multiple wells.
- Additional borings will need to be installed as part of the remedial design process to identify locations of clay lenses along the proposed alignments of the HDD AS wells. Findings from the investigation will be incorporated into the final design such that locations of HDD AS wells are positioned to avoid installation in low permeability zones.
- An estimated 4,800 feet of conveyance pipe would be installed in approximately 2,100 feet of trench to connect the AS and SVE wells to three independent remediation compounds. Conveyance pipe would be sized according to expected flow rates: 3 to 4 inches for the AS lines and 6 to 8 inches for the SVE lines.
- Trenching would be performed by a combination of jack-and-bore directional drilling (to pass under highways and other features impractical to disturb) and conventional right-of-way utility work.
- Dedicated piping would convey air to or from the remediation compounds to the AS and SVE wells.
- Figure 8 shows potential locations for the remediation compounds. Each compound would house compressors, blowers, and other equipment to service a portion of the AS and SVE wells and provide enough AS injection capacity to deliver up to 1,050 scfm of air flow (0.5 scfm per foot of screen) and an SVE capacity to extract up to 1,300 scfm. One 10,000-pound VGAC treatment unit would be needed at each remediation compound

to treat the extracted soil vapors before discharging to the atmosphere. Security fencing would need to be installed around each equipment compound.

The required elements of the VI portion of the Selected Interim Remedy will eventually replace the work described in the current Workplan for the 2009 UAO and will address the entire area potentially impacted by VI identified in Figure 5 of this Interim ROD. The required elements of the VI portion of the Selected Interim Remedy include the following:

1) Sampling additional occupiable commercial, residential, and industrial buildings for potential Site-related VI impacts not previously identified, and resampling occupied buildings above the Site groundwater plume that were assessed under previous Site efforts;
2) Installing new VIMS for occupiable commercial, residential, and industrial buildings above the Site groundwater plume impacted by VI above current health-based screening levels;
3) Continuing to operate the 2008 SVE system; and
4) Maintaining and monitoring new and existing Site related VIMS and the 2008 SVE system.

The VIMS will be operated and maintained throughout the execution of the AS/SVE system and longer until Site conditions no longer pose a vapor intrusion risk. It is possible that the SVE component may assist in reaching VI RAOs sooner. Therefore, EPA estimated O&M costs for the VIMS based on continuing operation of the approximately 120 existing and 20 new systems (as compared to 40 new VIMS for Alternative 2; fewer new VIMS are needed for the Selected Interim Remedy since the AS/SVE system is expected to support VI mitigation). Additional VI sampling of the structures may be required, as discussed previously. The Selected Interim Remedy will operate and comply with the substantive requirements of *Ohio Administrative Code (OAC) 3745-15-05*, which pertains to air permitting.

In addition, this AS/SVE alternative will operate and comply with the substantive requirements of *OAC 3745-34-11*, which pertain to underground injection. This may include preparing and submitting a work plan outlining the plans for injection activities and associated performance monitoring. Monthly status reports, including injection summaries and performance monitoring results, would be required.

EPA assumes the AS/SVE systems will continue to operate for up to 5 years to meet remedial goals in the 500-µg/L target treatment zones. The following list summarizes the routine annual O&M components:

- General system O&M, including equipment maintenance.
- Based on the mass of COCs present in groundwater, semiannual disposal and replacement of spent VGAC associated with the SVE treatment will be needed for the first 3 years of operation.
- Utility costs (electricity) to operate the AS/SVE equipment.

- Semiannual groundwater monitoring of newly installed and existing monitoring wells.
- Semiannual soil vapor monitoring from newly installed vapor monitoring points.
- Monthly performance monitoring reports will be submitted to the state underground injection control unit.
- Air sampling and associated reporting.

EPA assumes that some portion of the VIMS will continue to operate for an additional 25 years after the 5 years of active AS/SVE treatment, while the remainder of the groundwater plume attenuates to below levels which create a VI potential. The area influenced by the Gem City P&T system falls outside the active target treatment zone of the Alternative 3 AS/SVE system and is not addressed by this interim ROD.

The institutional controls portion of the Selected Interim Remedy will need to achieve the following:

1) A prohibition of the installation and use of potable wells in groundwater above SDWA MCLs.
2) A requirement that construction of new, occupiable structures overlying groundwater concentrations greater than VISLs include protective measures, such as vapor barriers or sub-slab depressurization systems.
3) A requirement to notify appropriate parties of the presence of potentially hazardous concentrations of subsurface vapors.
4) A requirement that building owners who did not grant access for testing or refused the installation of a mitigation system be made aware of the potential for vapor intrusion, steps they can take to reduce potential risks to building occupants, and who they should contact to grant access to their property.
5) Restrictions to protect construction workers against exposures to contaminated groundwater from unacceptable ingestion or dermal exposures.
6) Proprietary controls on property as needed to protect remedy components.

Based on the information available at this time, EPA finds that the Selected Interim Remedy meets the threshold criteria and provides the best balance of tradeoffs among the alternatives evaluated with respect to balancing and modifying criteria. EPA expects the Selected Interim Remedy to satisfy the following statutory requirements of CERCLA Section 121: (1) be protective of human health and the environment; (2) comply with ARARs; (3) be cost-effective; (4) utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable; and (5) satisfy the preference for treatment as a principal element.

### *2.12.3 Cost Estimate for Selected Interim Remedy*

EPA has summarized the cost estimate for the Selected Interim Remedy below and in Appendix E of this ROD. The cost estimate is based on the best available information regarding the

anticipated scope of the interim remedial action. Changes in the cost estimates are likely to occur as a result of new information and data collected during the engineering design of the interim remedy. Major changes may be documented in an appropriate future decision document (such as a memorandum in the Administrative Record file, an Explanation of Significant Differences, or a ROD amendment).

EPA estimates the present worth cost to implement Alternative 3 to be approximately $18 million. This estimate includes $6.8 million in capital costs with annual O&M costs of $830,000 for the first 3 years, $810,000 for years 4 and 5, and $330,000 for years 6 through 30. This estimate includes $330,000 annually for 30 years for ongoing vapor intrusion monitoring, mitigation, and maintenance. The actual costs of ongoing vapor intrusion work are likely to decrease with time as groundwater concentrations and the number of properties affected by vapor intrusion decrease.

### *2.12.4 Expected Outcomes of the Selected Interim Remedy*

At the completion of the interim remedy (Alternative 3), potential exposures due to ingestion of groundwater or inhalation of indoor air contaminated with soil vapors to current and future residents and industrial/commercial workers will be reduced through groundwater cleanup and vapor intrusion mitigation. This interim remedy will significantly reduce groundwater contamination. To completely eliminate the potential for unacceptable exposures to residents and workers from drinking contaminated groundwater and inhaling indoor air contaminated with soil vapors, however, EPA will likely need to select a future remedy involving additional groundwater treatment.

## 2.13 Statutory Determinations

Under CERCLA Section 121 and the NCP, the lead agency must select remedies that are protective of human health and the environment, comply with ARARs (unless a waiver is justified), are cost-effective, and utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. In addition, CERCLA includes a preference for remedies that employ treatment that permanently and significantly reduces the volume, toxicity, or mobility of hazardous substances as a principal element and a bias against off-site disposal of untreated wastes. The following sections discuss how the Selected Interim Remedy meets these statutory requirements.

### *2.13.1 Protection of Human Health and the Environment*

The Selected Interim Remedy, Alternative 3, will significantly reduce contaminant concentrations in the central core of the groundwater plume, which contains approximately 70 percent of the total contaminant mass at the Site. The vapor intrusion mitigation systems associated with this remedy will prevent Site-related contaminant vapors from accumulating in homes and businesses at concentrations which represent a threat to human health.

### *2.13.2 Compliance with Applicable or Relevant and Appropriate Requirements*

This Selected Interim Remedy will comply with all ARARs (see Appendix D).

### *2.13.3 Cost Effectiveness*

The Selected Interim Remedy is cost-effective and represents a reasonable value for the money to be spent. The NCP states that "a remedy shall be cost-effective if its costs are proportional to its overall effectiveness." (*See* the NCP at 40 C.F.R. § 300.430(f)(1)(ii)(D)). EPA evaluated cost-effectiveness by evaluating the overall effectiveness of those alternatives that satisfied the threshold criteria (*i.e.*, were both protective of human health and the environment and ARAR-compliant). EPA evaluated the overall effectiveness of the remedies by assessing the following three of the five balancing criteria: (1) long-term effectiveness and permanence; (2) reduction in toxicity, mobility, and volume through treatment; and (3) short-term effectiveness. EPA then compared the overall effectiveness to the costs to determine cost-effectiveness. EPA determined that the cost of the Selected Interim Remedy is proportional to its overall effectiveness, and hence considers the Selected Interim Remedy to be cost-effective.

EPA believes the Selected Interim Remedy's treatment of groundwater using AS/SVE (Alternative 3) will provide a better overall level of protection than Alternatives 2 and 4, and Alternative 3 costs significantly less than Alternative 4. EPA estimates the present worth of the Selected Interim Remedy to cost $18.1 million, where those of Alternatives 2 and 4 would cost $19.3 million and $61 million, respectively.

### *2.13.4 Utilization of Permanent Solutions and Alternative Treatment Technologies (or Resource Recovery Technologies) to the Maximum Extent Practicable*

EPA has determined that the Selected Interim Remedy represents the maximum extent to which permanent solutions and treatment technologies can be utilized in a practicable manner at the Site. Of those alternatives that are protective of human health and the environment and comply with ARARs, EPA has determined that the Selected Interim Remedy provides the best balance of trade-offs in terms of the five balancing criteria, while also considering the preference for treatment as a principal element, the bias against off-site treatment and disposal, and state and community acceptance.

The Selected Interim Remedy, Alternative 3, achieves substantial risk and mass reduction through in-situ treatment of the central core groundwater plume. This interim remedy also addresses the potential for exposure to Site-related contaminants in indoor air from vapor intrusion. The vapor mitigation portion of this interim remedy does not treat the hazardous substances to reduce mobility, toxicity, or volume. There is no cost-effective, practicable treatment technology to address soil gas vapors that migrate into buildings, under the circumstances of this Site. The groundwater treatment portion of this interim remedy, however, addresses the source of these vapors through treatment.

### *2.13.5 Preference for Treatment as a Principal Element*

By treating the central core of the groundwater plume with AS and SVE, the Selected Interim Remedy satisfies the statutory preference for remedies that employ treatment as a principal element.

### *2.13.6 Five-Year Review Requirements*

CERCLA Section 121(c) and the NCP, at 40 C.F.R. §300.430(f)(5)(iii)(C), provide the statutory and legal bases for conducting five-year reviews. This remedy is expected to leave hazardous substances on-Site in the groundwater above levels that allow for unlimited use and unrestricted exposure. EPA will therefore conduct a statutory review every five years after initiation of the interim remedial action to ensure that the remedy is, or will be, protective of human health and the environment.

## 2.14 Documentation of Significant Changes

EPA released the Proposed Plan for this interim remedy at the Behr Site for public comment on September 5, 2018. The Proposed Plan identified the Preferred Interim Alternative of groundwater treatment of the central core of the Site groundwater plume with AS and SVE as well as vapor intrusion monitoring, mitigation, and maintenance Site-wide (Alternative 3). EPA reviewed all written and verbal comments submitted during the public comment period and determined that no significant changes to the remedy, as originally identified in the Proposed Plan, were necessary or appropriate.

# Part 3: Responsiveness Summary

This Responsiveness Summary documents public participation in the interim remedy selection process for the Behr Dayton Thermal VOC Plume Site. This section of the ROD summarizes comments EPA received during the public comment period, which ran from September 5, 2018 to November 5, 2018, and at the public meeting held on September 20, 2018. EPA's response (in italics) follows each comment.

## 3.1 Stakeholder Comments and Lead Agency Responses

1. Numerous commenters expressed support for the selection of Alternative 3 (AS/SVE), and no commenter opposed its selection.

   *EPA Response: EPA appreciates the comments in support of Alternative 3.*

2. Several commenters expressed concern that cleanup activities commence as quickly as possible.

   *EPA Response: It is EPA's intention to begin the cleanup as quickly as possible. However, EPA must complete all steps in the process governed by CERCLA and the NCP, including the steps that occur between remedy selection (this interim ROD) and implementation of the cleanup activities (the remedial action). EPA plans to allow time to negotiate with Site PRPs about undertaking or financing the remedy as set forth in those authorities. The Selected Interim Remedy will also require very involved design activities before it can be implemented, regardless of who conducts the cleanup.*

3. One commenter suggested the use of heat to enhance the volatilization of COCs from groundwater in the AS process.

   *EPA Response: This approach is typically used in source areas which have both impacted soil and groundwater. That is not the situation at the Behr Site. Further, the amount of energy required to heat the soil and groundwater in the target treatment zone indicates that such an approach is practical only in much smaller applications. EPA estimates that hundreds of millions of dollars would be spent on electricity costs alone to raise the subsurface temperature in the treatment zone. Moreover, injecting heat (in the form of steam) in the sandy subsurface of a residential area could pose significant risks.*

4. At least one commenter expressed concerns related to the location of the remediation compounds, including noise and security.

   *EPA Response: EPA notes this comment and recognizes that the AS/SVE is to be operated in a heavily residential area. EPA has located the AS/SVE in this area to address the risks there, as discussed in the ROD. The remedial design may consider how the remedy will be implemented in this area, including how to address noise and security concerns.*

5. One commenter suggested that the groundwater divide located somewhere northeast of the MAHLE facility needs to be better studied before a remedy can be selected.

   *EPA Response: EPA studied the groundwater divide during the RI and found that it is located outside of the target treatment area for the groundwater remedy selected in this interim ROD. Therefore, EPA finds it unnecessary to conduct additional studies on the groundwater divide before proceeding with this interim remedy. EPA will likely gather additional data regarding the groundwater divide before it selects a final remedy for the Site.*

6. One or more commenters expressed concern about depressed home values in the vicinity of the Site.

   *EPA Response: The Superfund program focuses on protecting the public health and welfare and the environment. Local governments or entities may have more experience in appraising property values in the vicinity and predicting how contamination may affect them. EPA is selecting this interim remedy to further the cleanup of the contamination at the Site. EPA anticipates that the cleanup activities will, in the long term, reduce the impact of contamination on properties in the vicinity of the Site.*

7. One or more commenters expressed concerns about health issues potentially caused by health exposures from the Site.

   *EPA Response: EPA conducted a thorough human health risk assessment (the BHHRA, which can be found in the AR). The only potentially existent route of exposure to Site contamination is through the vapor intrusion pathway. Data shows that this pathway can be effectively mitigated with VIMS. EPA encourages property owners in the vicinity of the Site to contact EPA if their property has not been sampled for potential VI concerns. EPA also encourages property owners to grant access to contractors tasked with conducting this sampling.*

8. One or more commenters expressed concern that VI sampling be provided to all buildings in the vicinity of the groundwater plume.

   *EPA Response: The remedy selected by this interim ROD includes continued VI investigation, mitigation, and monitoring throughout the entire plume. This may include re-visiting properties sampled previously or where owners previously denied access for sampling.*

9. One or more commenters requested that progress of the cleanup activities be regularly reported to the community.

   *EPA Response: EPA maintains communications with the community during CERCLA cleanups. Typically, EPA presents findings from a remedial cleanup action to a community when major milestones are achieved. EPA notes that some private residence information may be protected from public disclosure.*

*EPA can also provide periodic updates to community organizations or other groups, depending on schedule availability. EPA maintains a website for the Site at: www.epa.gov/superfund/behr-dayton-thermal. Community members can also contact EPA's community involvement coordinator directly with questions or concerns:*

*Heriberto León (SI-6J)*
*Community Involvement Coordinator*
*Region 5 EPA*
*77 West Jackson Boulevard*
*Chicago, IL 60604*
*leon.heriberto@epa.gov*
*(312) 886-6163*

*EPA also plans to periodically update the information at the following repository:*

*E.C. Doren Branch Library*
*359 Maryland Avenue*
*Dayton, Ohio 45404*

10. One commenter asked what pollutants were in the water and whether human or animal feces or farm runoff was impacting water.

    *EPA Response: Groundwater is the only water impacted by the Site. The primary pollutants are TCE and PCE, though some related chlorinated solvents, such as cis-1,2-DCE, VC, and 1,1,1-TCA, have also been detected. EPA has not found human or animal feces or farm runoff in the groundwater at the Site. EPA is not aware of any farming operations or septic systems in the vicinity of the Site.*

11. One commenter questioned why there were no plans to remove the liquid source material.

    *EPA Response: EPA determined that source material may exist or recently existed somewhere near the southern edge of the MAHLE facility. Finding the precise location of source material and/or removing it is often technically infeasible. One aim of the AS/SVE system at the southern edge of the MAHLE facility is to deplete any remaining source material so it no longer contributes to contaminant concentrations in the groundwater.*

12. One commenter suggested that sampling industrial properties for potential unacceptable VI exposures was inappropriate due to logistical challenges, including the use of solvents at the facility leading to false positive results.

    *EPA Response: EPA plans to have sampling teams identify and remove indoor sources of vapor forming chemicals, including chlorinated solvents, before taking samples, consistent with its Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air (OSWER Publication 9200.2-154) at https://www.epa.gov/sites/production/files/2015-09/documents/oswer-vapor-intrusion-*

*technical-guide-final.pdf (the 2015 VI Guidance). As mentioned in that guidance, OSHA levels were not intended to protect sensitive workers, may not incorporate the most recent toxicological data, and may differ from EPA derivations of toxicity values; and EPA does not recommend using them to support no-further action determinations for vapor intrusion in nonresidential buildings. (See the 2015 VI Guidance at pp. 128-129.) In addition, concurrent sub-slab sampling should be conducted to demonstrate a completed pathway leading to elevated indoor air concentrations.*

13. One commenter suggested that EPA use the same shutdown criteria to determine when to shut down the AS/SVE system under this interim remedial action as that used for the AS/SVE system being operated on the MAHLE facility under a non-time-critical removal action.

    *EPA Response: While EPA has not ruled out language that continues the AS/SVE until the rate of contaminant reductions reaches asymptotic conditions, like the criteria negotiated in the 2015 non-time-critical removal settlement, it reserves the right to consider current information and determine the appropriate criteria.*

14. One commenter suggested that EPA list the "upwards of 50" industrial properties within the vicinity of the Site rather than only listing the three facilities that EPA identified as potentially responsible parties. The commenter also took issue with the fact that EPA did not conduct sampling at all of the industrial properties within the vicinity of the Site.

    *EPA Response: Not every industrial property operating within the vicinity of the Site uses or has used TCE or PCE. EPA identified parties based on evidence of a release of the contaminants of concern at this Site. The Site was listed on the Superfund National Priorities List to address releases of VOCs in groundwater. While EPA has not limited its search to the parties it previously noticed, it has focused on properties from which there has been a release the Site addresses and considered evidence of such releases. EPA did not spend resources sampling every industrial property. As set forth in the NCP, the purpose of an RI is to collect data necessary to adequately characterize the site for the purpose of developing and evaluating effective remedial alternatives. See 40 C.F.R. § 300.430(d).*

15. One commenter noted that Chrysler operated a groundwater treatment system through 2009, rather than 2005 as described in the proposed plan.

    *EPA Response: Comment noted. This information has been corrected in the interim ROD.*

## 3.2 Comments on Supporting Documents and Lead Agency Responses

One commenter commented on the RI and FFS reports. Although it issued these reports prior to the Proposed Plan, EPA considered comments not only on the Proposed Plan but also on its supporting analysis and the information included in the repository, including the RI/FS. EPA summarizes those comments and responds to them below. The unedited comment letters can be found in the AR.

### *3.2.1. Comments on the RI:*

1. The commenter questioned the location of the groundwater divide which EPA, in the RI, determined extended from the MAHLE facility to the Northeast. Specifically, the commenter felt the groundwater divide was located further away from the MAHLE facility. The commenter also stated that it felt the RI inadequately investigated transient conditions that could affect the groundwater divide.

   *EPA Response: The groundwater divide would theoretically shift with changing hydrogeologic conditions and is not one definitive line. In fact, there is a general area of relatively flat contour (i.e. relatively stagnant contour) that shifts with time and changing conditions. The groundwater divide presented in the RI is based on the groundwater data gathered at that time. Regardless, the exact location of the divide is irrelevant to this selected remedy as the central core of the plume where the Interim Selected Remedy will be implemented does not include any areas northeast of the MAHLE or Gem City facilities, where the groundwater divide is generally agreed to be located.*

2. The commenter stated that the RI should be revised with an updated CSM based on current data, including a determination of other potential sources to the northeast.

   *EPA Response: EPA created the CSM based on the data available at that time. New data could always be gathered, and the CSM could always be updated. Regardless, the commenter's suggested changes to the CSM do not impact the remedy selection as the target treatment area doesn't change. That being said, additional data will be gathered in designing the selected remedy.*

   *The presence of any additional (historic) sources to the northeast would not impact the selection of the remedy.*

3. The commenter presented an alternate CSM that suggests the plume consists of 6 different plumes from 6 different facilities.

   *Regardless of whether the groundwater plume at the Site consists of 3 or 6 commingled plumes, the Selected Interim Remedy will address areas of TCE contamination greater than 500 ppb. In addition, EPA cannot attribute the source(s) of each portion of the contaminant plume. EPA continues to investigate other potential sources, but an alternate theory of 6 commingled plumes would not impact the selection of the remedy.*

4. The commenter also stated that its revised CSM should be used to better assess the VI pathway. The commenter further stated that the RI Report only used the "very conservative" VISL model with a 100-foot buffer and did not rely on any other type of model, such as the Johnson and Ettinger model.

   *EPA Response: EPA's VI Guidance recommends the use of a VISL with a 100-foot buffer, and groundwater data (used to model to VISLs) was the only site-wide and current information available. See the 2015 VI Guidance, at p. 68. Collecting sub-slab and soil gas data from the hundreds of sub-slab and exterior soil gas data points would have been more labor intensive than useful because those data points were not current, synoptic, or of a high enough density to cover the entire groundwater plume. EPA VI Guidance does not endorse relying on the Johnson and Ettinger model for this purpose at this time. It generally recommends assessing the vapor intrusion pathway by collecting, weighing, and evaluating multiple lines of evidence. Id. at p.1. Further, the Johnson and Ettinger model requires site-specific soil data, and EPA has not collected a sufficient amount of data to cover the entire Site.*

   *In the RI and BHHRA, EPA established that vapor intrusion is a completed pathway. The VISL for TCE was used to determine that all occupiable structures with possible unacceptable exposures from the VI pathway be given the opportunity to be sampled. EPA has not suggested using the VISL alone to determine which structures need VIMS. The remedy selected by this ROD simply requires that VIMS be installed on occupiable structures with unacceptable VI exposures. EPA reserves the right to determine which structures to investigate for VI using whatever means it deems technically sound. This might include the VISL, the Johnson and Ettinger model, some other methods, or combinations thereof.*

5. The commenter takes issue with the claim in the RI that the MAHLE facility is within the 5-year travel time of the Dayton Miami South Well Field.

   *EPA Response: It is possible that this statement was based on a previous map EPA obtained from the City of Dayton and that new data shows this now to be inaccurate. This issue can be revisited during additional investigative activities, but the selection of an interim remedy to address the central core of the plume is not impacted by the travel time to this or any wellfield.*

6. The commenter believes that an adequate number of water level measurements were not taken to complete the RI and select a remedy. The commenter also believes there were discrepancies in the data.

   *EPA Response: EPA gathered sufficient static water level measurements to complete the RI and select a remedy. Regardless of minor discrepancies that may exist, the groundwater contours generated by the static water level measurements EPA gathered were consistent with the City of Dayton's findings that groundwater generally migrates from the MAHLE facility to the south/southwest. This is where the target treatment area is located. Such discrepancies do not warrant delaying remedy selection and cleanup*

*activities to generate a potentially more precise CSM. Furthermore, EPA does not believe changes in the precision of the CSM would impact the remedy selection. EPA anticipates additional data gathering activities will be conducted to assist in finalizing details of the remedial design and expects that additional investigative activities will be needed to complete a final site-wide ROD.*

7. The commenter questions a number of details about the CSM and asserts that the groundwater contamination at the Site cannot reach the city's municipal production wells.

   *EPA Response: EPA does not concur with the assertion that the groundwater contamination cannot reach the city's municipal production wells.*

   *The deeper aquifer at the Site serves as the principal source of drinking water for the Region, including Greene County and the City of Dayton, and that city's municipal production wells draw from that aquifer. Indeed, EPA designated the Miami Valley Buried Aquifer a sole source aquifer on May 4, 1988. See 53 Fed. Reg. 15876 (1988). CERCLA Section 121(d)(2)(A)(i) and 40 C.F.R. § 300.430(e)(2)(i) require on-site remedies to attain legally applicable or relevant and appropriate standards or levels of control established under the Safe Drinking Water Act, among other requirements. Such standards are applicable or relevant and appropriate to remediation of groundwater that is or may be used as drinking water. See August 1988 CERCLA Compliance with Other Laws Manual (EPA/540/G-89-006), at p. 4-8.*

8. The commenter presents an argument that data suggest additional, historical sources of contamination have contributed to the plume. The commenter further suggests that the plume consists of numerous comingled plumes.

   *EPA Response: Though EPA continues to investigate other potential, historic sources of groundwater contamination that may contribute to the plume, EPA does not plan to delay remedy selection and cleanup activities to conduct an exhaustive search of potential sources in an area with a long and varied industrial history. In addition, several of the potential sources suggested by the commenter are outside of the treatment area targeted by this interim remedy. EPA has responded above to a comment suggesting multiple commingled plumes.*

9. The commenter makes the argument that contamination in the portion of the plume to the north of the MAHLE facility is not from the MAHLE facility and that MAHLE shouldn't be responsible for vapor intrusion activities in that area.

   *EPA Response: EPA does not have sufficient historical data to determine the validity of this assertion. However, this comment appears to be directed to enforcement activities rather than remedy selection. Although EPA has previously identified owner/operators of the MAHLE facility, among others, as PRPs at the Site under CERCLA Section 107(a), and provides background on some of the sources of the contamination the remedy addresses, the purpose of this Interim ROD is remedy selection and not an assessment of liability.*

10. The commenter discusses a number of details in the BHHRA which it feels over-estimate Site risks.

    *EPA Response: In its BHHRA, EPA determines that sufficient risk exists to human health such that remedial action is warranted. EPA notes that none of these comments suggest that sufficient risk is not present to compel the cleanup of the central core of the groundwater plume.*

    *EPA concurs with the commenter that the decision to install a VIMs at a property is not driven solely by data showing a risk at the upper end of EPA's risk range (i.e. the lowest risk of an adverse health effect).*

11. The commenter contends that the hydraulic interaction between the rivers and the groundwater plume was not adequately investigated.

    *EPA Response: The groundwater modeling EPA conducted under the RI suffices to select a remedy. Furthermore, the areas where the groundwater interacts with the rivers are not part of the target groundwater treatment area.*

12. The commenter asserted the RI did not adequately assess the impacts on groundwater levels of groundwater extraction and SVE being conducted in the vicinity of the Site.

    *EPA Response: In the RI, EPA conducted sufficient investigation to demonstrate a contaminant plume migrating to the south/southwest in the target treatment area and to select a remedy. This conclusion is consistent with data the City of Dayton gathered. Delaying the interim remedy selection and cleanup to fine tune these hydrogeological details is not warranted.*

13. The commenter states that vertical gradients should have been evaluated to better understand the interaction between the upper and lower aquifers.

    *EPA Response: The target groundwater treatment area is only located in the upper aquifer, and only the upper aquifer impacts VI. Therefore, the interaction between the upper and lower aquifers does not affect the selection of this remedy and further study is not warranted at this time.*

14. The commenter stated that there is relatively little data from wells located in the eastern portion of the Site.

    *EPA Response: EPA does not have as much data in the eastern portion of the plume as elsewhere; however, groundwater generally migrates away from this area (to the south/ southwest) and the eastern edge of the plume is relatively well-defined. EPA gathered sufficient data for this remedy evaluation and did not want to delay remedy selection and cleanup activities to further investigate this area.*

15. The commenter states that groundwater contamination from Gem City Chemical is commingled with the plume from historical operations at the MAHLE facility.

    *EPA Response: EPA has previously identified the Gem City Chemicals facility as a source at the Site. As noted above, however, this interim ROD focuses on remedy selection determination and the data that supports that determination.*

16. The commenter opines that areas of the distal, lower concentration plume to the west, northeast, southwest, and southeast are not adequately studied.

    *EPA Response: These areas are not part of the target treatment area for the groundwater remedy selected by this interim ROD. These areas may be addressed in a subsequent decision document, however, so additional data gathering activities may be conducted in the future.*

### *3.2.2 Comments on the FFS:*

1. The commenter points out that a significant amount of conveyance piping is required for all of the remedial alternatives except the no action alternative and that it was not clear in the FFS if all of these costs were considered.

   *EPA Response: This would compound issues with short-term effectiveness and implementability for almost any active treatment remedy that could be used at the Site. EPA understands that difficulties may be encountered when installing conveyance piping and provided an appropriate +50/-30 cost estimate in the FFS. As with all large construction projects, the remedy costs will be refined during the remedial design phase.*

2. The commenter stated that it is not clear whether costs for the continued use and expansion as necessary of VIMS are included in the remedial alternative cost estimates.

   *EPA Response: These costs are included in the cost estimates as described in Appendix C of the FFS.*

3. The commenter took issue with the use of "all" when EPA stated in the FFS that the "overall objective of the remedial screening is to identify 'all' potential treatment technologies and screen them based on technical implementability" because some treatment options were not described in the FFS.

   *EPA Response: EPA's process for evaluating remedial alternatives occurs in stages culminating in the FFS. The FFS includes a detailed evaluation of the alternatives that remained after the universe of remedial alternatives were screened in earlier steps (which are memorialized in technical memos found in the Administrative Record).*

4. The commenter noted that a 2% discount factor was used for calculating net present value but stated that the FFS did not mention how EPA arrived at this percentage.

*EPA Response: Rather than use the standard default discount factor of 7% for net present value calculations, EPA chose to use the discount factor that was identified by the Office of Management and Budget at the time EPA issued the FFS, which was approximately 2%. EPA used this discount factor for the net present value calculations for each alternative, so the value used has little impact on cost comparisons, and using any other discount factor would not have impacted EPA selection of an interim remedy. The use of a 2% discount factor results in higher estimated net present values than a 7% discount factor. However, the discount factor used for estimating remedy costs over time will not impact what is actually spent on the remedy or its present-day value.*

5. The commenter opined that the number and distribution of recovery, AS, and SVE wells EPA assumed would be needed for the P&T and AS/SVE remedies may not be sufficient for the target treatment areas.

   *EPA Response: Though EPA did not complete detailed modeling, it made design assumptions based on aquifer conditions as is appropriate for an FS-level evaluation. A more detailed analysis will be needed during the remedial design phase to determine the number of wells needed for the selected remedy.*

   *This comment questions the cost estimate as potentially low. However, cost was not the reason EPA selected AS/SVE over P&T. Cost contributed somewhat to the selection of AS/SVE over ISCO, but the additional costs of installing a few extra wells would not make a significant difference in the more than $40 million cost difference between these two remedies.*

6. The commenter points out that the FFS states the AS wells are to be installed approximately 80 ft bgs and SVE wells approximately 20 ft bgs, but the alternative schematic figure (Figure 4-3 of the FFS) only shows the depth of the AS wells at approximately 60 ft bgs and the SVE wells at approximately 10 ft bgs.

   *EPA Response: EPA notes these discrepancies with the conceptual figure but determines they have no bearing on the remedy selection. The actual installation depths of these wells will be established in the design phase, likely after gathering additional data.*

7. The commenter opines that the apparent shallower depth of the SVE wells may be problematic with respect to implementation/installation due to subsurface obstructions located in a largely residential area.

   *EPA Response: The FFS provides a conceptual design. The actual installation depths will be determined in the design phase after additional data are gathered.*

8. The commenter points out that the AS wells in the AS/SVE remedy are to be located beneath a fairly significant silt zone and that this could complicate air distribution in the subsurface. The commenter goes on to suggest it is important to allow for the use of vertical or horizontal drilling techniques, or a combination thereof. The commenter further suggests that the discussion of the use of horizontal drilling techniques in the FFS

unnecessarily restricts the use of alternative drilling techniques in the construction of the selected remedy.

*EPA Response: EPA assumed the wells in the AS/SVE remedy would be drilled using horizontal directional drilling for cost estimating and conceptual design purposes; however, the Interim ROD notes vertical AS wells could be used in lieu of horizontal wells, though EPA estimated their use would be more complicated (e.g. for access) and costly. As the Interim ROD mentions at 2.12.2, it provides conceptual design details that describe how the selected remedy may be implemented; but deviations are possible provided the required elements of the AS and SVE system are met.*

# FIGURES

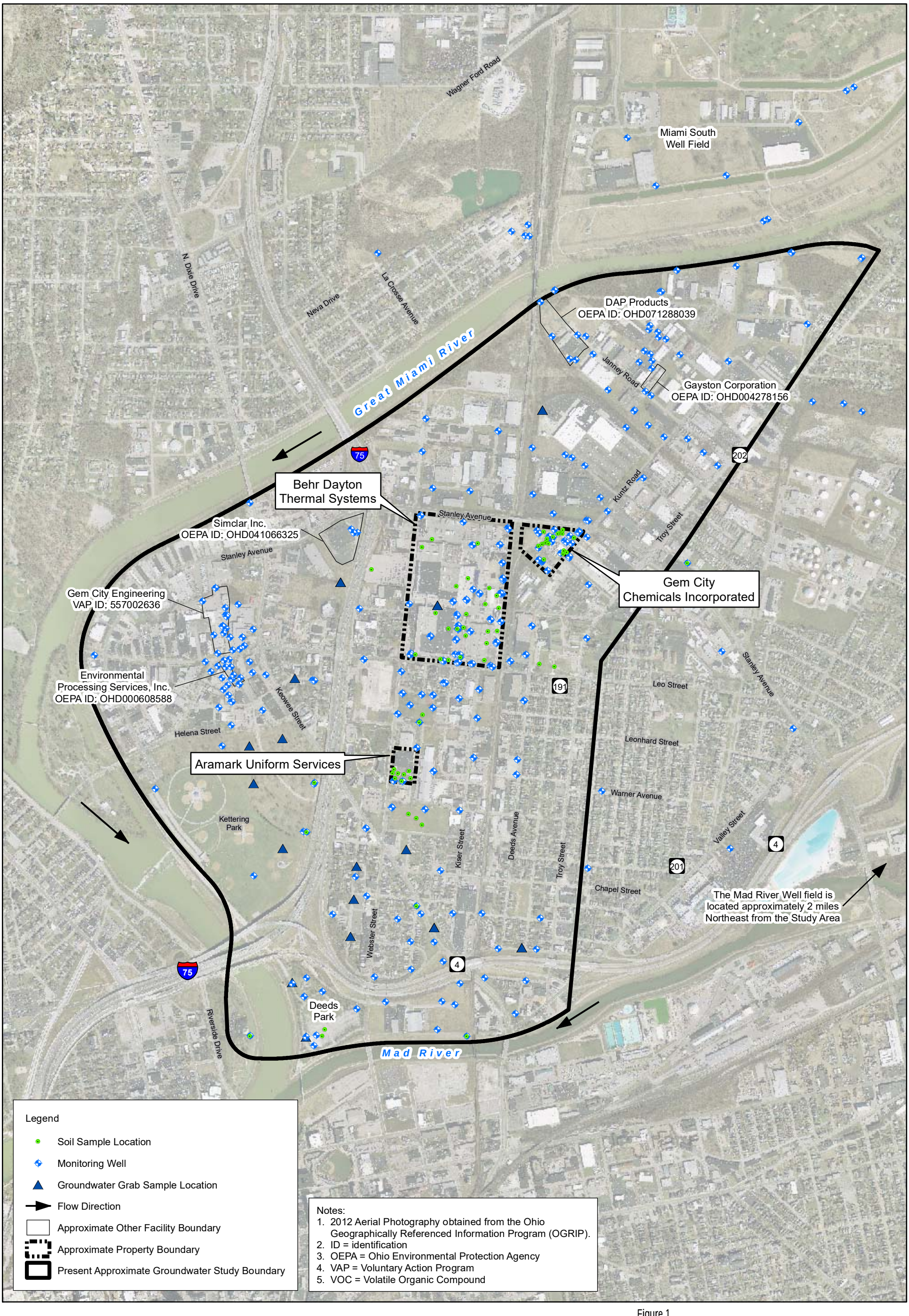
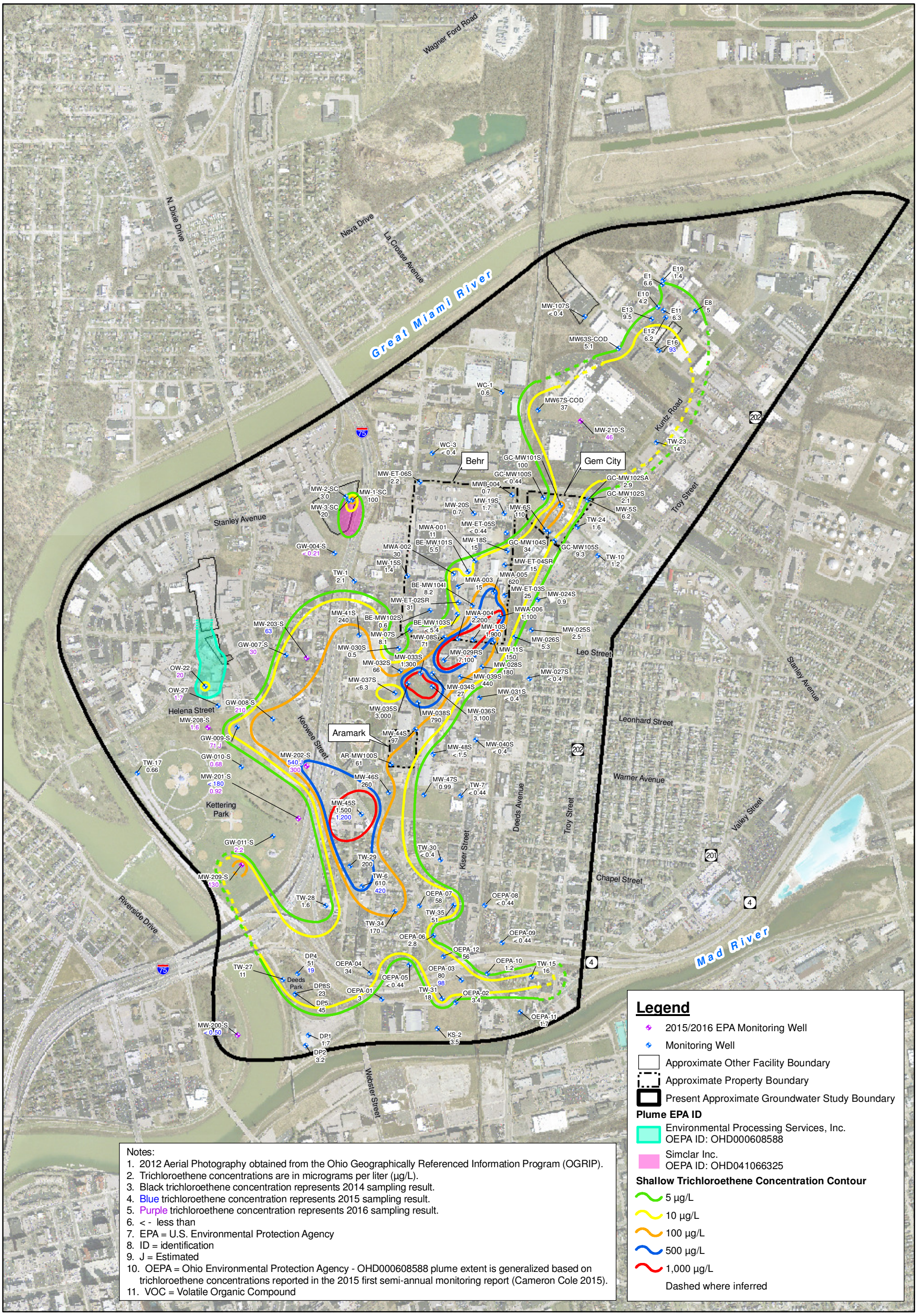



Figure 1
Site Remedial Investigation Area
Interim Record of Decision
*Behr Dayton Thermal System VOC Plume Site*
*Dayton, Ohio*

ch2m.

\\MKEFPP01\PROJ\USENVIRONMENTALPROTE\420125_BEHRDAYTONTHERMAL\MAPFILES\2018\FFS\FIGURE 1-2 - SITE PLAN.MXD JHANSEN1 1/23/2018 1:48:00 PM




Notes:
1. 2012 Aerial Photography obtained from the Ohio Geographically Referenced Information Program (OGRIP).
2. Trichloroethene concentrations are in micrograms per liter (µg/L).
3. Black trichloroethene concentration represents 2014 sampling result.
4. Blue trichloroethene concentration represents 2015 sampling result.
5. Purple trichloroethene concentration represents 2016 sampling result.
6. < - less than
7. EPA = U.S. Environmental Protection Agency
8. ID = identification
9. J = Estimated
10. OEPA = Ohio Environmental Protection Agency - OHD000608588 plume extent is generalized based on trichloroethene concentrations reported in the 2015 first semi-annual monitoring report (Cameron Cole 2015).
11. VOC = Volatile Organic Compound

## Legend

- 2015/2016 EPA Monitoring Well
- Monitoring Well
- Approximate Other Facility Boundary
- Approximate Property Boundary
- Present Approximate Groundwater Study Boundary

**Plume EPA ID**

- Environmental Processing Services, Inc. OEPA ID: OHD000608588
- Simclar Inc. OEPA ID: OHD041066325

**Shallow Trichloroethene Concentration Contour**

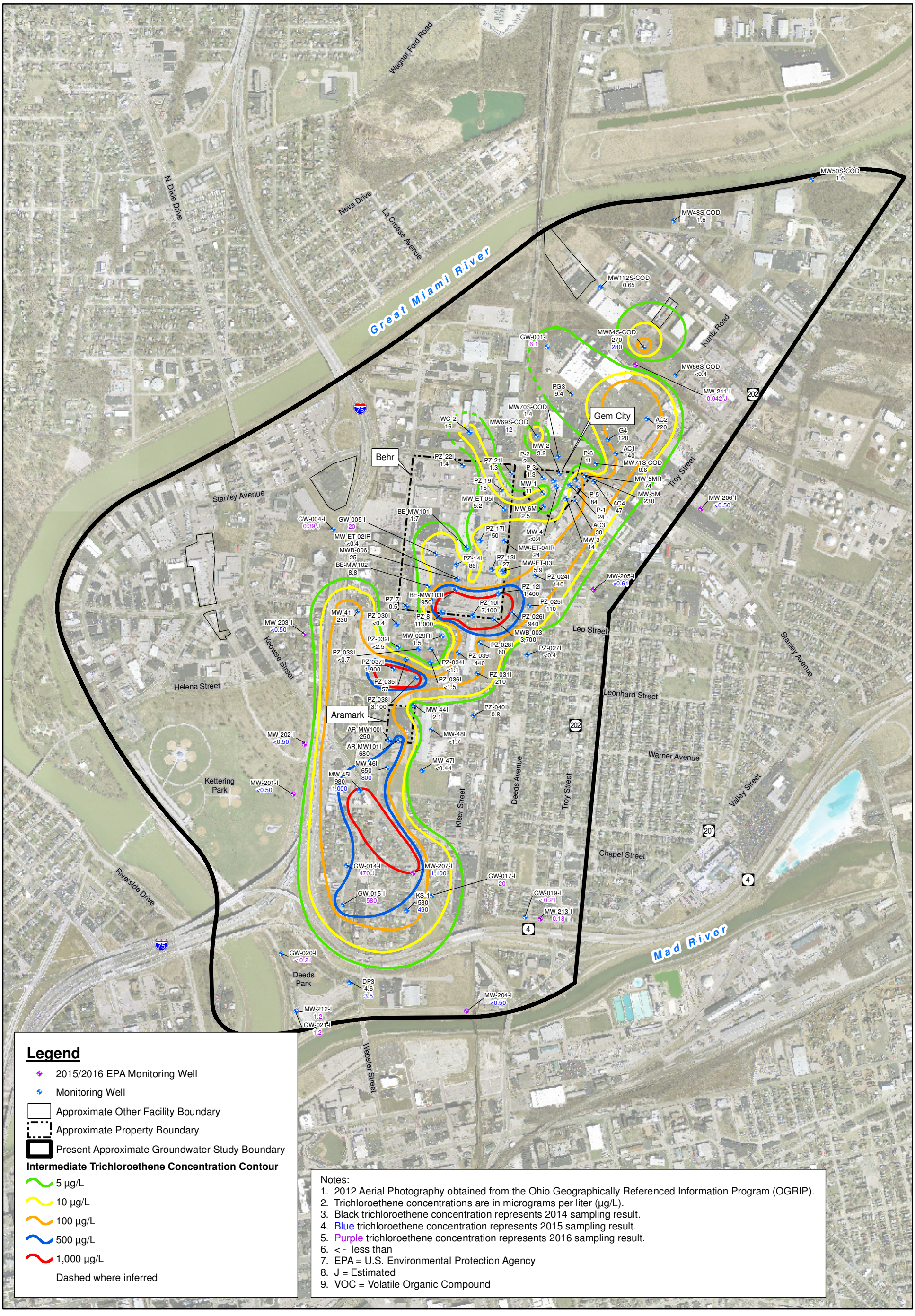
- 5 µg/L
- 10 µg/L
- 100 µg/L
- 500 µg/L
- 1,000 µg/L

Dashed where inferred

**Figure 2**
Shallow Zone of Surficial Aquifer Groundwater TCE Contour Map
Interim Record of Decision
*Behr Dayton Thermal System VOC Plume Site*
*Dayton, Ohio*

ch2m

\\MKEFPP01\PROJ\USENVIRONMENTALPROTE\420125_BEHRDAYTONTHERMAL\MAPFILES\2018\FFS\FIGURE 1-4 - SHALLOW TCE CONTOURS(2016).MXD JHANSEN1 1/23/2018 3:40:28 PM




## Legend

- 2015/2016 EPA Monitoring Well
- Monitoring Well
- Approximate Other Facility Boundary
- Approximate Property Boundary
- Present Approximate Groundwater Study Boundary

**Intermediate Trichloroethene Concentration Contour**

- 5 µg/L
- 10 µg/L
- 100 µg/L
- 500 µg/L
- 1,000 µg/L
- Dashed where inferred

Notes:
1. 2012 Aerial Photography obtained from the Ohio Geographically Referenced Information Program (OGRIP).
2. Trichloroethene concentrations are in micrograms per liter (µg/L).
3. Black trichloroethene concentration represents 2014 sampling result.
4. Blue trichloroethene concentration represents 2015 sampling result.
5. Purple trichloroethene concentration represents 2016 sampling result.
6. < - less than
7. EPA = U.S. Environmental Protection Agency
8. J = Estimated
9. VOC = Volatile Organic Compound

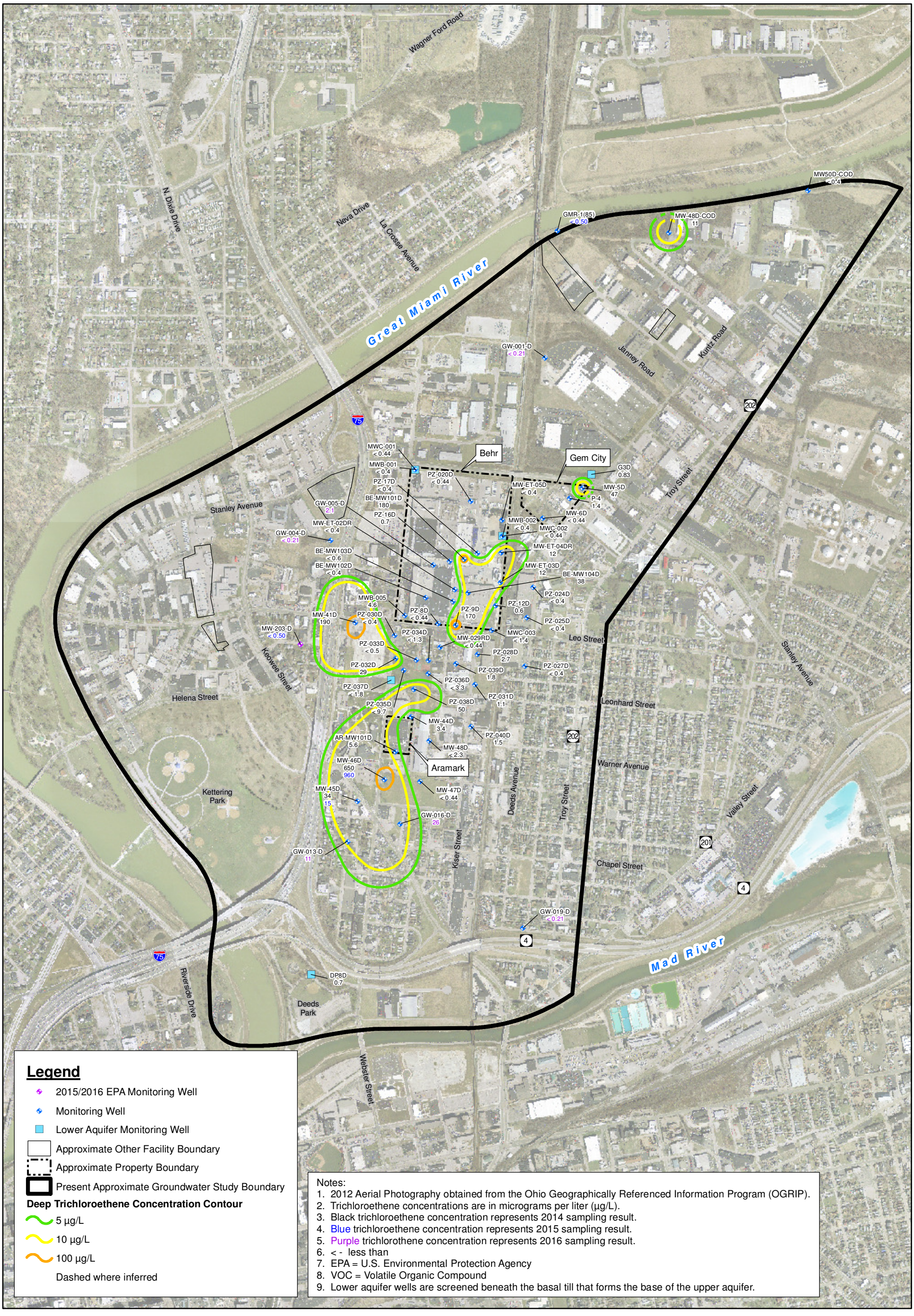
N

0 1,200 2,400

Feet

**Figure 3**
Intermediate Zone of Surficial Aquifer Groundwater TCE Contour Map
Interim Record of Decision
*Behr Dayton Thermal System VOC Plume Site*
*Dayton, Ohio*

\\MKEFPP01\PROJ\USENVIRONMENTALPROTE\420125_BEHRDAYTONTHERMAL\MAPFILES\2018\FFS\FIGURE 1-5 - INTERMEDIATE TCE CONTOURS(2016).MXD JHANSEN1 1/23/2018 3:35:03 PM




## Legend

- 2015/2016 EPA Monitoring Well
- Monitoring Well
- Lower Aquifer Monitoring Well
- Approximate Other Facility Boundary
- Approximate Property Boundary
- Present Approximate Groundwater Study Boundary

**Deep Trichloroethene Concentration Contour**

- 5 µg/L
- 10 µg/L
- 100 µg/L
- Dashed where inferred

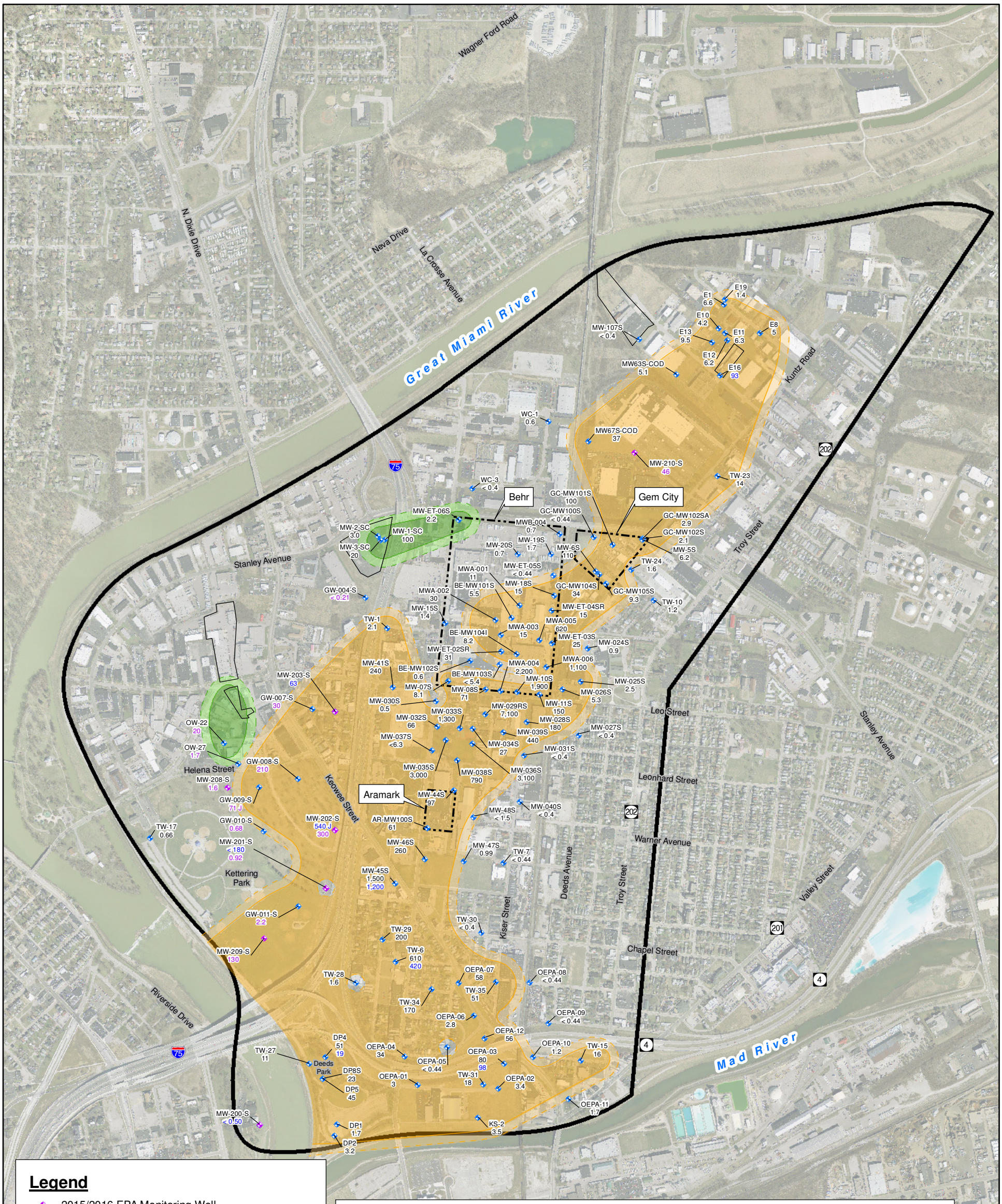
Notes:
1. 2012 Aerial Photography obtained from the Ohio Geographically Referenced Information Program (OGRIP).
2. Trichloroethene concentrations are in micrograms per liter (µg/L).
3. Black trichloroethene concentration represents 2014 sampling result.
4. Blue trichloroethene concentration represents 2015 sampling result.
5. Purple trichlorothene concentration represents 2016 sampling result.
6. < - less than
7. EPA = U.S. Environmental Protection Agency
8. VOC = Volatile Organic Compound
9. Lower aquifer wells are screened beneath the basal till that forms the base of the upper aquifer.

N

0 1,200 2,400

Feet

**Figure 4**
Deep Zone of Surficial Aquifer Groundwater TCE Contour Map
Interim Record of Decision
*Behr Dayton Thermal System VOC Plume Site*
*Dayton, Ohio*




## Legend

- 2015/2016 EPA Monitoring Well
- Monitoring Well
- Estimated Extent of TCE VI AOPC
- 100-foot buffer from TCE VI AOPC
- Approximate Other Facility Boundary
- Approximate Property Boundary
- Present Approximate Groundwater Study Boundary

**VISL Exceedences Potentially Attributed to Non-Site Related Groundwater Plume**

- Estimated Extent of TCE VI AOPC
- 100-foot buffer from TCE VI AOPC

Notes:
1. 2012 Aerial Photography obtained from the Ohio Geographically Referenced Information Program (OGRIP).
2. Trichloroethene (TCE) concentrations are in micrograms per liter (µg/L).
3. Black trichloroethene concentration represents 2014 sampling result.
4. Blue TCE concentration represents 2015 sampling result.
5. Purple TCE concentration represents 2016 sampling result.
6. < - less than
7. EPA = U.S. Environmental Protection Agency
8. J = Estimated
9. The TCE VISL is 2 µg/L based on a residential exposure scenario, a target cancer risk of 1 × 10-6, a noncancer HQ of 1, attenuation factor of 0.001, and a site-specific average groundwater temperature equal to14 degrees Celsius.
10. VISL = vapor intrusion screening level
11. VOC = Volatile Organic Compound
12. Estimated VI AOPC is based on the spatial distribution of groundwater concentrations in exceedance of the U.S. EPA (2016) groundwater-to-indoor air vapor intrusion screening level (VISL).
13. VI AOPC = vapor intrusion (groundwater-to-indoor air) area of potential concern
14. HQ = Hazard Quotient
15. The 100-foot buffer from the VI AOPC is horizontal and/or vertical distance used in VI investigations when comparing groundwater concentrations to VISLs to support the decision whether additional investigation may be need (EPA, 2016).

N

0 1,200 2,400

Feet

**Figure 5**
VI AOPC - TCE in Groundwater above VISL with 100-foot Buffer
Interim Record of Decision
*Behr Dayton Thermal System VOC Plume Site*
*Dayton, Ohio*

ch2m

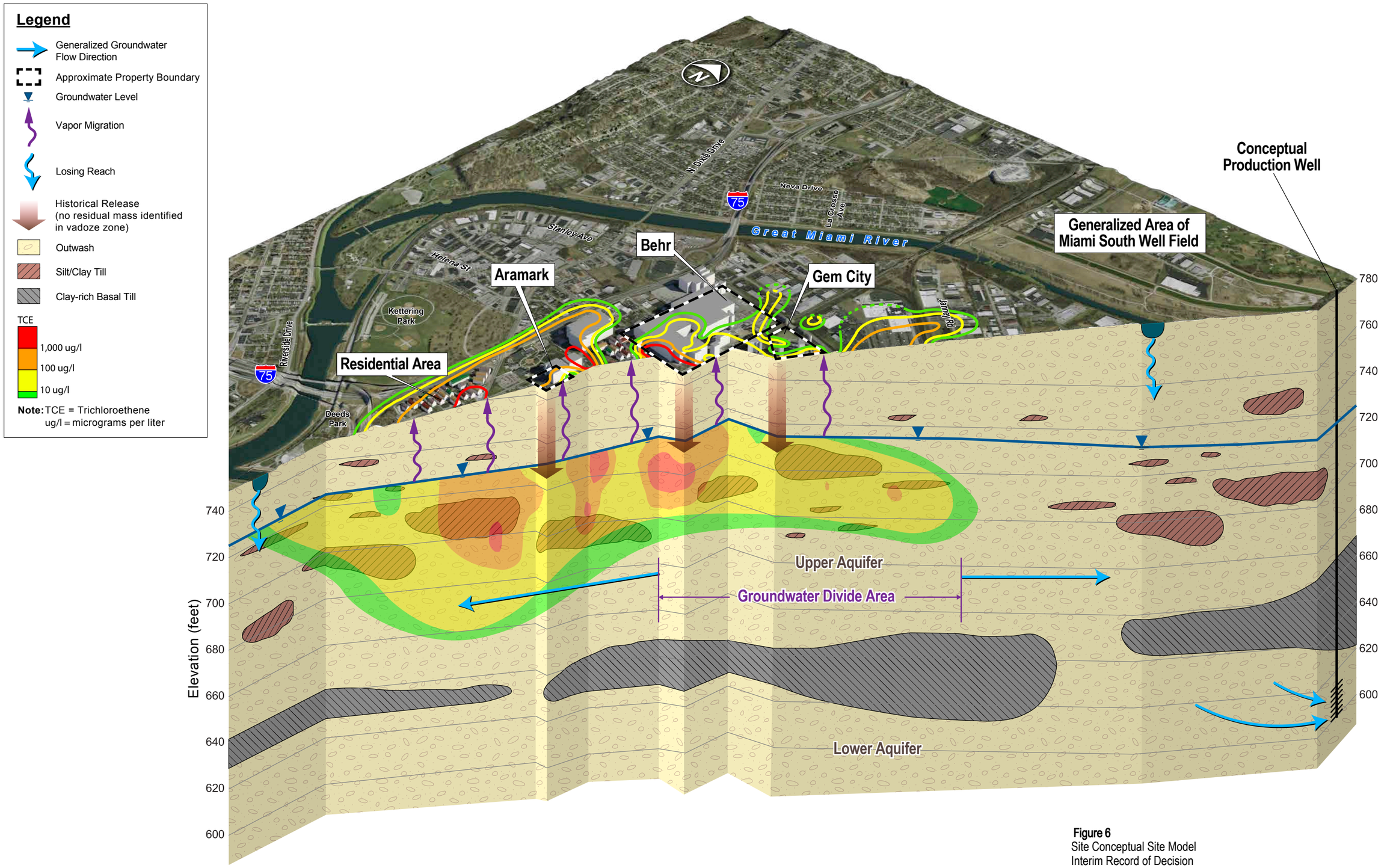
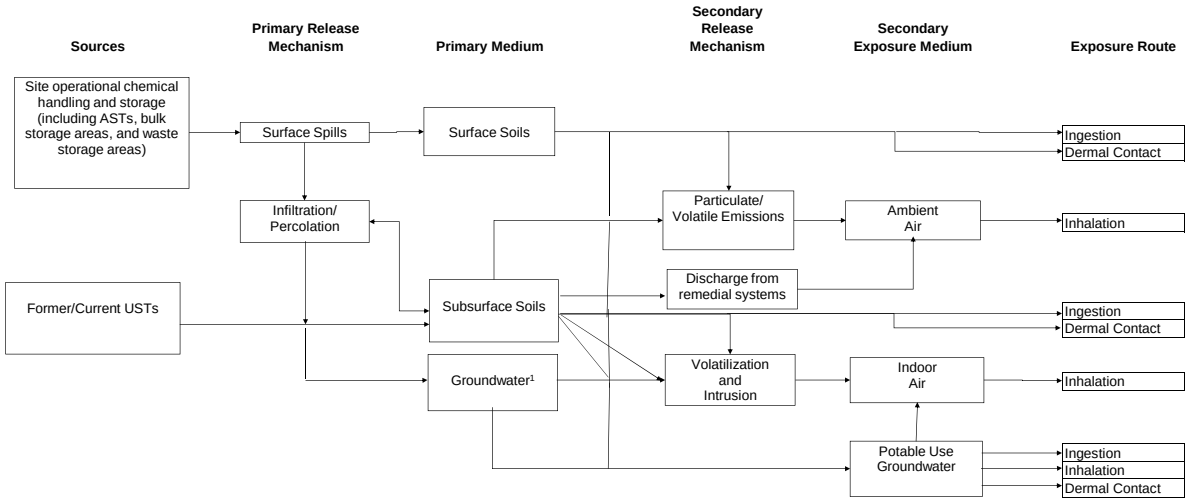



**Figure 6**
Site Conceptual Site Model
Interim Record of Decision
*Behr Dayton Thermal System VOC Plume Site*
*Dayton, Ohio*




| Current and Future Potential Human Receptors | | | | | |
|---|---|---|---|---|---|
| On-facility | | | Sitewide / Off-facility | | |
| Industrial Worker | Construction Worker | Resident | Industrial Worker | Construction Worker | Resident |
| + | + | - | - | - | - |
| + | + | - | - | - | - |
| + | + | + | + | + | + |
| + | + | - | - | - | - |
| + | + | - | - | - | - |
| + | - | + | + | - | + |
| ++ | - | + | ++ | - | + |
| ++ | - | + | ++ | - | + |
| ++ | - | + | ++ | - | + |

+ Potentially complete exposure pathways

++ Potentially complete exposure pathways for a hypothetical future scenario

- Incomplete pathway

**FIGURE 7**
Baseline Human Health Risk Assessment Conceptual Model
Interim Record of Decision
Behr Dayton Thermal Systems VOC Plume Site
Dayton, Ohio

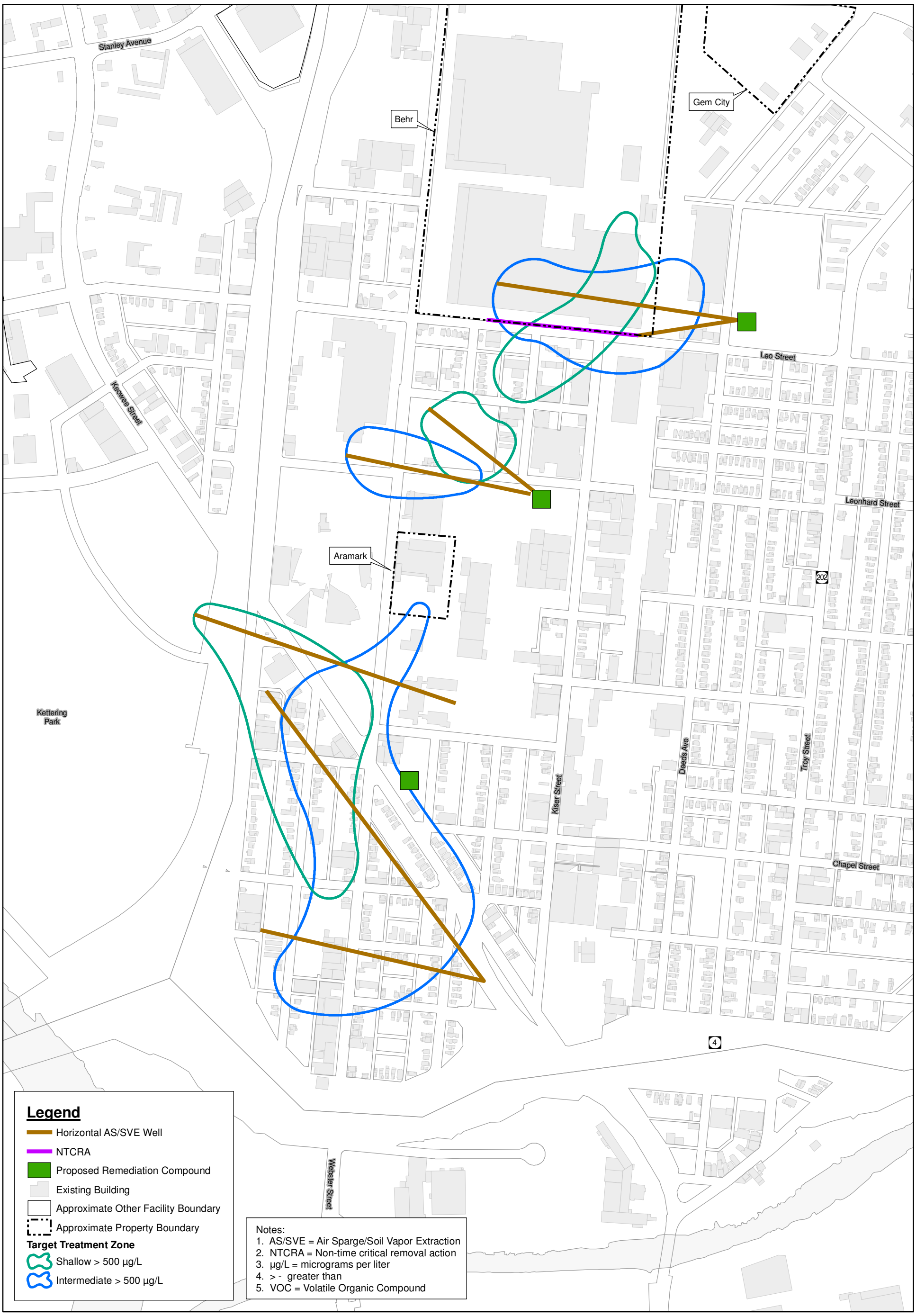



**Figure 8**
Conceptual Layout of AS/SVE with Horizontal Directionally Drilled Wells
Interim Record of Decision
*Behr Dayton Thermal System VOC Plume Site*
*Dayton, Ohio*

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\\MKEFPP01\PROJ\USENVIRONMENTALPROTE\420125_BEHRDAYTONTHERMAL\MAPFILES\2018\FFS\FIGURE 4-2 - ALT 3 - AS_SVE VIA HDD WELLS CONCEPTUAL LAYOUT.MXD JHANSEN1 1/23/2018 4:12:40 PM

North
C

A-A'
Intersect

2400 ft AS/SVE transect

Drill Entry

Drill Entry

South
C'

1200 ft SVE Well

1200 ft SVE Well

1200 ft AS Well

1200 ft AS Well

?

?

?

?

?

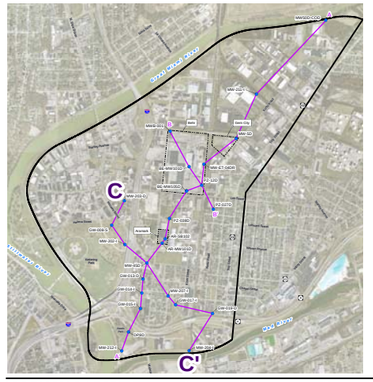
?

Elevation (feet)

760
740
720
700
680
660
640
620
600
580

5,000
4,500
4,000
3,500
3,000
2,500
2,000
1,500
1,000
500
0

Distance (feet)




**LEGEND**

- Potentiometric Surface
- Drilling Length to AS or SVE Well Depth
- AS Well
- SVE Well
- Outwash
- Silt/Clay Till
- Clay-rich Basal Till (dashed where inferred)

VERTICAL SCALE: 1" = 26.3'
HORIZONTAL SCALE: 1" = 387.6'

Notes:
1. Potentiometric surface delineated using measurements in shallow wells from March 2014 Synoptic Water Level event
2. AS = air sparging
3. SVE = soil vapor extraction
4. ft = foot

**Figure 9**
Conceptual Cross Section of AS/SVE with Horizontal Directionally Drilled Wells
Interim Record of Decision
*Behr Dayton Thermal System VOC Plume Site*
*Dayton, Ohio*

# Appendix A

Administrative Record Index

U.S. ENVIRONMENTAL PROTECTION AGENCY
REMOVAL ACTION



ADMINISTRATIVE RECORD
FOR
BEHR VOC PLUME SITE
DAYTON, MONTGOMERY COUNTY, OHIO

ORIGINAL
NOVEMBER 24, 2006

| NO. | DATE | AUTHOR | RECIPIENT | TITLE/DESCRIPTION | PAGES |
|---|---|---|---|---|---|
| 1 | 09/00/04 | OH Dept. of Health | Public | Fact Sheet: Trichloro-ethylene | 2 |
| 2 | 10/28/04 | OH Dept. of Health | Public | Fact Sheet: Vapor In-trusion | 2 |
| 3 | 09/22/06 | Stanczuk, G., Daimler Chrysler | Watterworth, J., Ohio EPA | Letter re: Response to Information Request Made at September 14, 2006 Meeting w/Attachments | 59 |
| 4 | 09/28/06 | Kelly, J., Earth Tech | Stanczuk, G., Daimler Chrysler | Letter re: Additional Monitoring Data from the Former DaimlerChrysler Dayton Thermal Products Plant w/Attachments | 7 |
| 5 | 11/06/06 | Clouse, K., Ohio EPA | El-Zein, J., U.S. EPA | Letter re: OH EPA's Request that the U.S. EPA Assist in Conducting a Time-Critical Removal Action at the Behr Dayton Thermal Systems Site w/Attachment | 5 |
| 6 | 11/09/06 | Renninger, S., U.S. EPA | Watterworth, R., Ohio EPA | Letter re: U.S. EPA's Re-quest that OH EPA Identify any ARARs for the Behr VOC Plume Site | 2 |
| 7 | 12/28/06 | Weston Solutions, Inc. | U.S. EPA | Site Assessment Report for the Behr VOC Plume Site w/Cover Letter | 37 |
| 8 | 11/24/06 | Renninger, S., U.S. EPA | Karl, R., U.S. EPA | Action Memorandum: Request for a Time Critical Removal Action at the Behr VOC Plume Site **(PORTIONS OF THIS DOCUMENT HAVE BEEN REDACTED)** | 27 |

U.S. ENVIRONMENTAL PROTECTION AGENCY
REMOVAL ACTION



ADMINISTRATIVE RECORD
FOR
BEHR VOC PLUME SITE
DAYTON, MONTGOMERY COUNTY, OHIO

UPDATE #1
FEBRUARY 12, 2008

| NO. | DATE | AUTHOR | RECIPIENT | TITLE/DESCRIPTION | PAGES |
|---|---|---|---|---|---|
| 1 | 10/28/03 | OH Dept. of Health | Public | Fact Sheet: Exposure to Toxic Chemicals | 1 |
| 2 | 09/00/04 | OH Dept. of Health | Public | Fact Sheet: Vapor Intrusion | 2 |
| 3 | 09/22/06 | Stanczuk, G., Daimler-Chrysler Corporation | Watterworth, J., Ohio EPA | Letter re: Ohio EPA's Request for Information at the former Daimler-Chrysler Dayton Thermal Products Plant w/Attachments | 59 |
| 4 | 09/28/06 | Kelly, J., Earth Tech | Stanczuk, G., Daimler-Chrysler Corporation | Letter re: Additional Sampling Data from the Former Daimler-Chrysler Dayton Thermal Products Plant w/Attachments | 7 |
| 5 | 10/12/06 | OH Dept. of Health | Public | Fact Sheet: Trichloroethylene (TCE) | 2 |
| 6 | 11/06/06 | Clouse, K., Ohio EPA | El-Zein, J., U.S. EPA | Letter re: Ohio EPA Requests U.S. EPA Assistance in Conducting a Time Critical Removal Action at the Behr VOC Plume Site w/Attachment | 6 |
| 7 | 11/09/06 | Renninger, S., U.S. EPA | Watterworth, R., Ohio EPA | Letter re: U.S. EPA Request that the Ohio EPA Identify any ARARs for the Behr VOC Plume Site | 2 |
| 8 | 12/28/06 | Sherrard, J., Weston Solutions, Inc. | Renninger, S., U.S. EPA | Site Assessment Report for the Behr VOC Plume Site w/Cover Letter | 112 |

| NO. | DATE | AUTHOR | RECIPIENT | TITLE/DESCRIPTION | PAGES |
|---|---|---|---|---|---|
| 9 | 02/13/07 | Frey, R., OH Dept. of Health | Renninger, S., U.S. EPA | Letter re: OH Dept. of Health Recommendations for Deeper Sub-Surface Soil Gas and Groundwater "Action Levels" for TCE, PCE and 1, 2 DCE for the Phase II Investigations at the Behr VOC Plume Site | 3 |
| 10 | 02/22/07 | Watterworth J., Ohio EPA | Renninger, S., U.S. EPA | Letter re: Ohio EPA Comments to the Phase II Work Plan for the Behr VOC Plume Site | 1 |
| 11 | 08/30/07 | Renninger, S., U.S. EPA | Rose, G., Chrysler Corporation | Letter re: U.S. EPA Statement of Position on August 15, 2007 Dispute Concerning the Phase II Work Plan for the Behr VOC Plume Site w/Attachments | 52 |
| 12 | 10/15/07 | Dollhopf, R., U.S. EPA | Rose, G., Chrysler Corporation | Letter re: Final Determinations of the Director in Response to Chrysler Corporation's Dispute of U.S. EPA Modifications to the Phase II Work Plan at the Behr VOC Plume Site | 8 |
| 13 | 11/08/07 | Karl, R., U.S. EPA | Rose, G., Chrysler Corporation | Chrysler Corporation's October 26, 2007 Phase II Work Plan Submittal in Response to Final Determination of the Director | 4 |
| 14 | 11/13/07 | Renninger, S., U.S. EPA | Rose, G., Daimler-Chrysler Corporation | Letter re: Approval of October 26, 2007 Phase II Work Plan for the Behr VOC Plume Site w/Attached Work Plan | 32 |
| 15 | 12/12/07 | Nickel, B., Ohio EPA | Renninger, S., U.S. EPA | Letter re: Ohio EPA Requests U.S. EPA to Expand the Vapor Intrusion Time Critical Removal Action for the Behr VOC Plume Site to Include Nearby Threatened Residential Areas | 2 |

| NO. | DATE | AUTHOR | RECIPIENT | TITLE/DESCRIPTION | PAGES |
|---|---|---|---|---|---|
| 16 | 12/12/08 | Renninger, S., U.S. EPA | Karl, R., U.S. EPA | Action Memorandum: Request for a Ceiling Increase and an Exemption from the 1-Year Exemption Statutory Limit for the Removal Action at the Behr VOC Plume Site (PORTIONS OF THIS DOCUMENT HAVE BENN REDACTED) | 36 |

U.S. ENVIRONMENTAL PROTECTION AGENCY
REMOVAL ACTION

ADMINISTRATIVE RECORD
FOR
BEHR VOC PLUME SITE
DAYTON, MONTGOMERY COUNTY, OHIO

UPDATE #2
JULY 17, 2009

| NO. | DATE | AUTHOR | RECIPIENT | TITLE/DESCRIPTION | PAGES |
|---|---|---|---|---|---|
| 1 | 08/01/08 | ATSDR & Ohio Dept. Of Health | U.S. EPA | Health Consultation (Initial) for the Behr VOC Plume Site **(SDMS ID: 330868)** | 41 |
| 2 | 12/02/08 | Renninger, S., U.S. EPA | Distribution List | Pollution Report (Final POLREP) for the Behr VOC Plume - EPA Fund Lead Removal **(SDMS ID: 330869)** | 5 |
| 3 | 07/09/09 | Gillespi, G., AECOM Technical Services | Coburn, S., U.S. EPA | Letter re: Notice of Contract/Service Termination at the LLC BEHR Dayton VOC Plume Site **(SDMS ID: 330870)** | 2 |
| 4 | 07/17/09 | U.S. EPA | Respondent | Unilateral Administrative Order for the BEHR VOC Plume Site **(SDMS ID: 334441)** | 24 |

# U.S. ENVIRONMENTAL PROTECTION AGENCY
# REMOVAL ACTION

## ADMINISTRATIVE RECORD
## FOR THE
## BEHR DAYTON THERMAL SYSTEM VOC PLUME SITE
## DAYTON, MONTGOMERY COUNTY, OHIO

## UPDATE 3
## DECEMBER 22 2015
## SEMS ID: 922717

| NO. | SEMS ID | DATE | AUTHOR | RECIPIENT | TITLE/DESCRIPTION | PAGES |
|---|---|---|---|---|---|---|
| 1 | 917551 | 1/1/12 | U.S. EPA | Public | Fact Sheet: What You Should Know About the Problem of Vapor Intrusion | 2 |
| 2 | 917550 | 6/25/12 | Ohio Department of Health | Public | Fact Sheet for Trichloroethylene (TCE) | 2 |
| 3 | 917549 | 7/25/12 | Ohio Department of Health | Public | Fact Sheet for Tetrachloroethylene (PCE) | 2 |
| 4 | 902700 | 1/22/13 | U.S. EPA | File | Spreadsheet: Summary of All Data from the August 2012 Groundwater Sampling at the Behr Dayton Thermal Systems VOC Plume Site | 16 |
| 5 | 455517 | 6/7/13 | Hardin, E., U.S. EPA | Karl, R., U.S. EPA | Engineering Evaluation/Cost Analysis Approval Memorandum for a Proposed Non-Time Critical Removal Action at the Behr Dayton Thermal VOC Plume NPL Site | 5 |
| 6 | 917555 | 11/1/14 | U.S. EPA | Public | Fact Sheet - U.S. EPA Proposes Cleanup Options for Industrial Site | 4 |
| 7 | 917548 | 11/11/14 | Kelley, J., and Roelker, R., AECOM | U.S. EPA | Engineering Evaluation/Cost Analysis for the Behr Dayton Thermal Products Plant | 360 |
| 8 | 917547 | 1/15/15 | Hardin, E., U.S. EPA | Nodel, B., Behr Dayton LLC | Letter re: Approval of Final Engineering Evaluation/Cost Analysis and Response to Public Comments | 3 |

| NO. | SEMS ID | DATE | AUTHOR | RECIPIENT | TITLE/DESCRIPTION | PAGES |
|---|---|---|---|---|---|---|
| 9 | 917546 | 3/4/15 | Williams, L., OEPA | Hardin, E., U.S. EPA | Letter re: ARARs for Draft Action Memo | 21 |
| 10 | 917552 | 3/12/15 | U.S. EPA | File | Spreadsheet: Summary of All Data from the March 2015 Groundwater Sampling at the Behr Dayton Thermal Systems VOC Plume Site | - |
| 11 | 920837 | 9/8/15 | Hardin, E., U.S. EPA | Nodel, B., Behr Dayton LLC | Letter re: Follow-Up to August 25, 2015 NTCRA Meeting Between MAHLE and EPA | 4 |
| 12 | 922716 | 12/22/15 | Hardin, E., U.S. EPA | Karl, R., U.S. EPA | Action Memorandum re: Request for a Non-Time Critical Removal Action at the Behr Dayton Therman Systems VOC Plume Site (***Portions of this document have been redacted***) | 71 |

U.S. ENVIRONMENTAL PROTECTION AGENCY
REMOVAL ACTION

# ADMINISTRATIVE RECORD
# FOR THE
# BEHR DAYTON THERMAL SYSTEM VOC PLUME SITE
# DAYTON, MONTGOMERY COUNTY, OHIO

## UPDATE 4
## FEBRUARY 9, 2016
## SEMS ID: 923403

| NO. | SEMS ID | DATE | AUTHOR | RECIPIENT | TITLE/DESCRIPTION | PAGES |
|---|---|---|---|---|---|---|
| 1 | 923245 | 12/22/15 | Karl, R., U.S. EPA | Marks, A., MAHLE Behr Dayton LLC | Administrative Settlement Agreement and Order on Consent for Removal Action | 45 |

U.S. ENVIRONMENTAL PROTECTION AGENCY
REMEDIAL ACTION

# ADMINISTRATIVE RECORD
# FOR THE
# BEHR DAYTON THERMAL SYSTEM VOC PLUME SITE
# DAYTON, MONTGOMERY COUNTY, OHIO

## UPDATE 5
## APRIL 7, 2016
## SEMS ID: 925250

| NO. | SEMS ID | DATE | AUTHOR | RECIPIENT | TITLE/DESCRIPTION | PAGES |
|---|---|---|---|---|---|---|
| 1 | 924823 | 9/27/13 | Karl, R., U.S. EPA | Marks, A., Behr Dayton Thermal Products LLC | Administrative Settlement Agreement and Order on Consent for Engineering Evaluation/Cost Analysis | 23 |

U.S. ENVIRONMENTAL PROTECTION AGENCY
REMEDIAL ACTION

# ADMINISTRATIVE RECORD
# FOR THE
# BEHR DAYTON THERMAL SYSTEM VOC PLUME SITE
# DAYTON, MONTGOMERY COUNTY, OHIO

## UPDATE 6
## FEBRUARY 2, 2018
## SEMS ID: 938893

| NO. | SEMS ID | DATE | AUTHOR | RECIPIENT | TITLE/DESCRIPTION | PAGES |
|---|---|---|---|---|---|---|
| 1 | 936218 | 11/1/17 | CH2M Hill | U.S. EPA | Remedial Investigation Report (Final) - Behr Dayton Thermal System VOC Plume Site - Montgomery County, Dayton, Ohio - Work Assignment No. 138-RICO-B5FH/Contract No. EP-S5-06-01 | 17303 |
| 2 | 938884 | 3/20/17 | Williams, L., Ohio EPA | Hardin, E., U.S. EPA | General Comments on Second Draft Remedial Investigation (RI) Report (Cover Letter Attached) | 12 |
| 3 | 938888 | 6/7/17 | Williams, L., Ohio EPA | Hardin, E., U.S. EPA | General Comments on First Draft Feasibility Study (FS) (Cover Letter Attached) | 12 |
| 4 | 938887 | 6/8/17 | Williams, L., Ohio EPA | Hardin, E., U.S. EPA | Email re: Fwd: Behr RI RTC | 2 |
| 5 | 938885 | 1/8/18 | Hardin, E., U.S. EPA | Williams, L., Ohio EPA | Letter re: Response to Ohio EPA Comments on the January 2017 Draft Remedial Investigation Report for Behr Dayton Thermal VOC Plume Site, Dayton, Montgomery County, Ohio | 6 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 6 | 938886 | 1/24/18 | Hardin, E., U.S. EPA | Williams, L., Ohio EPA | Letter re: Correction about EPA's Response to Ohio EPA Comments on the January 2017 Draft Remedial Investigation for Behr Dayton Thermal VOC Plume Site, Dayton, Montgomery County, Ohio (With Enclosed 10/10/17 Email re: RI Courtesy Review) | 2 |
| 7 | 938892 | 9/27/17 | Fishwild, B., CH2M Hill | Hardin, E., U.S. EPA | Letter re: Response to Ohio EPA Comments on the Remedial Investigation Report for the Behr Dayton Thermal VOC Plume Site | 6 |

U.S. ENVIRONMENTAL PROTECTION AGENCY
REMEDIAL ACTION

# ADMINISTRATIVE RECORD
# FOR THE
# BEHR DAYTON THERMAL SYSTEM VOC PLUME SITE
# DAYTON, MONTGOMERY COUNTY, OHIO

## UPDATE 7
## SEPTEMBER 5, 2018
## SEMS ID: 941478

| NO. | SEMS ID | DATE | AUTHOR | RECIPIENT | TITLE/DESCRIPTION | PAGES |
|---|---|---|---|---|---|---|
| 1 | 941213 | 5/1/18 | CH2M Hill Inc. | U.S. EPA | Final Focused Feasibility Study | 106 |
| 2 | 942664 | 9/1/18 | U.S. EPA | File | Proposed Plan | 39 |

U.S. ENVIRONMENTAL PROTECTION AGENCY
REMEDIAL ACTION

# ADMINISTRATIVE RECORD
# FOR THE
# BEHR DAYTON THERMAL SYSTEM VOC PLUME
# DAYTON, MONTGOMERY COUNTY, OHIO

## UPDATE 8
## JULY, 2019
## SEMS ID:

| NO. | SEMS ID | DATE | AUTHOR | RECIPIENT | TITLE/DESCRIPTION | PAGES |
|---|---|---|---|---|---|---|
| 1 | 947182 | Undated | TETRA TECH, Inc. | U.S. EPA | Aerial Photo of Draft 2003 TCE Concentrations | 1 |
| 2 | 947150 | 5/3/1990 | Shank, R. L., U.S. EPA | DAP, Inc. | Ohio U.S. EPA - Re: Director's Final Findings and Orders (Signed) | 10 |
| 3 | 304980 | 2/18/1993 | DePaul & Associates | Aratex Services, Inc. | Subsurface Investigation Phase II Progress Report - (Reference 49) | 47 |
| 4 | 947152 | 8/17/1993 | Schregardus, D., Ohio EPA | Gayston, Corporation | Ohio U.S. EPA - Re: Director's Final Findings and Orders (Signed) | 31 |
| 5 | 947153 | 9/10/1996 | Schregardus, D., Ohio EPA | Gem City Chemicals, Inc. | Ohio U.S. EPA - Amendment to Director's Final Findings and Orders (Signed) | 20 |
| 6 | 947168 | 11/14/2003 | ARAMARK The Wetlands Co. LLC | U.S. EPA | Soil Vapor Extraction/Air Sparing System Sixth and Final Annual Progress Report | 107 |
| 7 | 427084 | 2/28/2006 | Sherrard, J., Weston Solutions, Inc. | Renninger, S., Stanuch, G., U.S. EPA | Site Assessment Report with Attached Cover Letter | 37 |
| 8 | 947186 | 7/17/2007 | _____ | _____ | Excel Spread Sheet of Pre-Listing Data of Concern | 1 |
| 9 | 406437 | 7/2/2007 | Korleski, C., Ohio EPA | Gade, M., U.S. EPA | Ohio EPA Letter re: Superfund Investigation and Remediation | 2 |
| 10 | 947178 | 7/31/2007 | Ohio EPA | Behr Dayton Thermal System VOC Plume | Aerial Photo of Property Boundary Figure 04 2003 TCE and PCE Concentrations | 1 |

| NO. | SEMS ID | DATE | AUTHOR | RECIPIENT | TITLE/DESCRIPTION | PAGES |
|---|---|---|---|---|---|---|
| 11 | 287725 | 8/28/2007 | Frey, R., Ohio Department of Health Ohio EPA | Karl, R., U.S. EPA | Ohio Department of Health Letter re: Support of Expanded Investigation | 4 |
| 12 | 947181 | 8/30/2007 | Ohio EPA | Behr Dayton Thermal System VOC Plume | Inspection - Aerial Photo of Site Sample Locations | 1 |
| 13 | 287730 | 9/17/2007 | Watterworth, J., Ohio EPA | Renninger, S., U.S. EPA | Ohio EPA Letter re: TCE Groundwater Contamination | 1 |
| 14 | 947183 | 9/28/2007 | Weston Solutions, Inc. | U.S. EPA | Aerial Photo July 2007 TCE Plume Map | 1 |
| 15 | 947179 | 10/2/2007 | Ohio EPA | Behr Dayton Thermal System VOC Plume | Aerial Photo 557-2391 of Known and Suspected Sources (2) | 1 |
| 16 | 330868 | 8/1/2008 | Ohio Department of Health/ATSDR | U.S. EPA | ATSDR Health Consultation - Initial | 41 |
| 17 | 948411 | 11/5/2008 | _____ | _____ | Boring Logs and MACTEC Diagrams - 7/1991-11/2008 | 28 |
| 18 | 433137 | 2/20/2009 | Paul, J., Regional Air Pollution Control Agency | Renninger, S., U.S. EPA | RAPCA Letter re: Response to Chrysler Corp. Request to Remove Carbon Canister Control Equipment | 2 |
| 19 | 947151 | 7/17/2009 | Karl, R. C., U.S. EPA | Arneson, D., Behr Dayton | U.S. EPA - Administrative Order - Unilateral Agreement (Signed) | 30 |
| 20 | 947158 | 2/12/2012 | Sherrard, J., Beodry, F., Weston Solutions, Inc. | Renninger, S., U.S. EPA | [Redacted] Final Letter and Technical Report - PRP Removal with Attachments | 814 |
| | | | | | | 1 |
| 21 | 947170 | 8/1/2012 | CH2M Hill, Inc. | Behr Dayton Thermal System VOC Plume | Aerial Photo Ohio Program (OGRIP) | 1 |
| 22 | 947173 | 8/1/2012 | CH2M Hill, Inc. | Behr Dayton Thermal System VOC Plume | Figure 02 Aerial Photo TCE Concentrations in Groundwater | 1 |
| 23 | 947174 | 8/1/2012 | CH2M Hill, Inc. | Behr Dayton Thermal System VOC Plume | Figure 03 Aerial Photo TCE Concentrations in Groundwater | 1 |

| NO. | SEMS ID | DATE | AUTHOR | RECIPIENT | TITLE/DESCRIPTION | PAGES |
|---|---|---|---|---|---|---|
| 24 | 947175 | 8/1/2012 | CH2M Hill, Inc. | Behr Dayton Thermal System VOC Plume | Figure 04 Aerial Photo PCE Concentrations in Groundwater | 1 |
| 25 | 902702 | 2/7/2013 | U.S. EPA | File | Residential Groundwater to Indoor Air RSL Exceedances from the August 2012 Groundwater Sampling Site | 8 |
| 26 | 947171 | 5/13/2013 | CH2M Hill, Inc. | Behr Dayton Thermal System VOC Plume | Figure 01 Aerial Photo TCE Concentrations in Groundwater | 1 |
| 27 | 947172 | 5/23/2013 | CH2M Hill, Inc. | Behr Dayton Thermal System VOC Plume | Aerial Photo Behr Site and Regional Monitoring Well Locations | 1 |
| 28 | 948047 | 5/16/2014 | Ohio EPA | DAP Dayton Facility | Potentiometric Map and TCE/DCE Groundwater Concentrations | 1 |
| 29 | 948410 | 5/16/2014 | Ohio EPA | _____ | Ground Water Sampling Event Potentiometric Contour Map | 1 |
| 30 | 947166 | 7/11/2014 | AECOM | Hardin, D. E., U.S. EPA | Response to Comments Revised Draft EECA | 18 |
| 31 | 947169 | 3/4/2015 | Leslie Williams Ohio EPA | Hardin, D. E., U.S. EPA | ARARS For Draft Action Memorandum | 21 |
| 32 | 947154 | 6/1/2015 | OSWER | U.S. EPA | Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air | 267 |
| 33 | 947176 | 12/1/2015 | CH2M Hill, Inc. | Hardin, D. E., U.S. EPA Roelker, R. AECOM | Technical Memo - Estimated Daily TCE Mass Flux through Proposed Air Sparging Barrier | 2 |
| 34 | 947177 | 12/1/2015 | Behr Dayton Thermal System VOC Plume | File | Comparison of Hapsite to Confirmatory Laboratory Samples for PCE (1) | 4 |
| 35 | 947165 | 5/6/2016 | Roelker, R. AECOM | Hardin, D. E., U.S. EPA | Response to Comments for Revised Draft Removal Action Work Plan W/Attachments (AOI) | 16 |
| 36 | 947159 | 6/3/2016 | AECOM | Hardin, D. E., U.S. EPA | Final Draft Removal Action Plan | 374 |

| NO. | SEMS ID | DATE | AUTHOR | RECIPIENT | TITLE/DESCRIPTION | PAGES |
|---|---|---|---|---|---|---|
| 37 | 948408 | 6/14/2016 | CH2M Hill, Inc. | U.S. EPA | Technical Memo - Remedial Technologies Screening | 4 |
| 38 | 948409 | 9/30/2016 | CH2M Hill, Inc. | U.S. EPA | Technical Memo - Remedial Alternatives Evaluation | 10 |
| 39 | 947155 | 3/24/2017 | Fishwild, B., CH2M Hill, Inc. | Hardin, D. E., U.S. EPA | Email Message Re: Summary of MNA Uncertainty | 1 |
| 40 | 947161 | 11/1/2017 | U.S. EPA Mahle Industries, Inc. | Behr Dayton Thermal System VOC Plume | Comments on Final Remedial Investigation Report | 8 |
| 41 | 944765 | 9/20/2018 | U.S. EPA | General Public | EPA - Public Hearing Transcript Regarding Behr Dayton | 12 |
| 42 | 947167 | 9/25/2018 | Anonymous Home Owner | Hardin, D. E., U.S. EPA | Anonymous Post Marked Letter Regarding Property Values | 1 |
| 43 | 944766 | 9/30/2018 | Nadeau, S.C., Honigman, Miller, Schwartz & Cohn | Hardin, D. E., U.S. EPA Leon, H. U.S. EPA Gonzalez, M. U.S. EPA | Letter Re: MAHLE Behr Dayton Request for an Extension of the Public Comment Period | 2 |
| 44 | 947184 | 10/29/2018 | CH2M Hill, Inc. AECOM | U.S. EPA | Aerial Photo's of Remedial Investigation Site Review | 8 |
| 45 | 947187 | 10/31/2018 | TETRA TECH, Inc. | U.S. EPA | Technical Report and Peer Review Memorandum | 8 |
| 46 | 947163 | 11/1/2018 | Nadeau, S.C., Honigman, Miller, Schwartz & Cohn | Hardin, D. E., U.S. EPA | Cover Letter Regarding Comments on Specific Reports | 2 |
| 47 | 944756 | 11/1/2018 | Nadeau, S.C., Honigman, Miller, Schwartz & Cohn | Hardin, D. E., U.S. EPA | Public Comment Submitted by MAHLE Industries Inc. on U.S. EPA Proposed Plan W/Review of Figures 1-8 | 5 |
| 48 | 944758 | 11/1/2018 | Nadeau, S.C., Honigman, Miller, Schwartz & Cohn | Hardin, D. E., U.S. EPA Leon, H. U.S. EPA Gonzalez, M. U.S. EPA | Public Comment Submitted by MAHLE Industries Inc. on U.S. EPA Draft Focused Feasibility Study | 5 |

| NO. | SEMS ID | DATE | AUTHOR | RECIPIENT | TITLE/DESCRIPTION | PAGES |
|---|---|---|---|---|---|---|
| 49 | 944770 | 11/4/2018 | Dr. Lundberg, W. | Leon, H.<br>U.S. EPA | Public Comment Submitted by Dr. Wayne Lundberg Regarding Contaminated Superfund Site | 1 |
| 50 | 947189 | 11/5/2018 | President of McCook Field Neighborhood Assoc. | Leon, H.<br>U.S. EPA | [Redacted] Public Comment Regarding Interim Cleanup Action Proposal from BVVP and CAG | 5 |
| 51 | 947190 | 11/5/2018 | President of McCook Field Neighborhood Assoc. | Leon, H.<br>U.S. EPA | [Redacted] Public Comment Regarding Interim Cleanup Action Proposal from BVOCL and MFNA | 4 |
| 52 | 947191 | 11/5/2018 | VNCC<br>ONDNA<br>CAG | Leon, H.<br>U.S. EPA | [Redacted] Public Comment Regarding Alternative 3 and the Noise Generated by the Compounds | 1 |
| 53 | 947192 | 11/5/2018 | VNCC | Leon, H.<br>U.S. EPA | [Redacted] Public Comment Submitted by Concerned Home Owner Regarding the choice of the Alternative 3 Treatment Option | 1 |
| 54 | 944761 | 11/9/2018 | Nadeau, S.C., Honigman, Miller, Schwartz & Cohn | Hardin, D. E., U.S. EPA<br>Leon, H.<br>U.S. EPA<br>Gonzalez, M.<br>U.S. EPA | Public Comment Re: MAHLE Industries, Inc. Revised Site Figures | 11 |
| 55 | 947156 | 12/10/2018 | CH2M Hill, Inc. | U.S. EPA | Technical Report for Exterior Soil Vapor Sampling Investigation | 287 |
| 56 | 947478 | 5/21/2019 | Stevenson, L., Ohio EPA | Ballotti, D., U.S. EPA | Ohio EPA Letter Regarding Record of Decision Concurrence | 2 |
| 57 | Pending | _____ | _____ | _____ | *(Pending Record of Decision)* | _____ |

# Appendix B

State Concurrence Letter

Ohio Environmental Protection Agency

**Mike DeWine**, Governor
**Jon Husted**, Lt. Governor
**Laurie A. Stevenson**, Director

May 21, 2019

Douglas Ballotti, Director
Superfund Division
U.S. EPA, Region 5
77 West Jackson Boulevard
Chicago, IL 60604-3590

**Re: Behr Dayton Thermal Products LLC, Dayton**
**Remediation Response**
**Project records**
**Remedial Response**
**Montgomery County**
**557002391009**

**Subject: Record of Decision Concurrence**
**Behr Dayton Thermal VOC Plume Superfund Site, Dayton, Montgomery County, Ohio**

Dear Mr. Ballotti:

The Ohio Environmental Protection Agency has reviewed the Interim Record of Decision for Behr Dayton Thermal VOC Plume Superfund Site. Ohio EPA concurs with U.S. EPA's selected interim remedy, which consists of the following components:

1. Air sparging/soil vapor extraction (AS/SVE) technology to treat ground water where trichloroethylene (TCE) concentrations exceed 500 parts per billion (ppb).
2. Vapor intrusion monitoring, mitigation, and maintenance which includes the following:
    - Sampling additional occupiable commercial, residential, and industrial buildings for potential Site-related vapor intrusion (VI) impacts not previously identified as well as resampling of occupied buildings above the Site ground water plume that were assessed under previous Site efforts.
    - Installing new vapor intrusion mitigation systems (VIMS) for occupiable commercial, residential, and industrial buildings above the Site ground water plume affected by VI above current health-based screening levels.
    - Continuing to operate the 2008 SVE system.
    - Maintaining and monitoring new and existing Site-related VIMS and the 2008 SVE system.
3. Institutional controls which include the following:
    - A prohibition on the installation of potable wells in ground water above maximum contaminant levels.
    - A requirement that construction of new, occupied structures overlying ground water concentrations greater than vapor intrusion screening levels include protective measures, such as vapor barriers or sub-slab depressurization systems.
    - A requirement to notify appropriate parties of the presence of potentially hazardous concentrations of subsurface vapors.

- A requirement that building owners who did not grant access for testing or refused the installation of a mitigation system are made aware of the potential for vapor intrusion, steps they can take to reduce potential risks to building occupants, and who they should contact to grant access to their property.
- Restrictions to protect construction workers against exposures to contaminated ground water from unacceptable ingestion or dermal exposures.
- Proprietary controls on property as needed to protect remedy components.

We look forward to working with U.S. EPA on the successful design and implementation of the selected interim remedy. If you have any questions concerning the above, please feel free to contact Leslie Williams at (937) 285-6054.

Sincerely,

Laurie A. Stevenson
Director

ec: James Sferra, DERR/CO
Mark Rickrich, DERR/CO
Leslie Williams, DERR/SWDO
Mike Starkey, DERR/SWDO

# Appendix C

Table A-7 from the BHHRA – Pre-Mitigation Indoor Air and Sub-slab Soil Gas Data Summary – Detects used for BHHRA

Table A-7. Pre-Mitigation Indoor Air and Subslab Soil Gas Data Summary - Detects

*Baseline Human Health Risk Assessment, Remedial Investigation Report*

*Behr Dayton Thermal System VOC Plume Site, Dayton, Ohio*

| Structure Type | Number of Structures Sampled | Sample Matrix | Analyte | Unit | Number of Samples | Number of Non-detects | Number of Detects | Minimum Nondetect Concentration | Maximum Nondetect Concentration | Minimum Detect Concentration | Maximum Detect Concentration | Average Detect | Historical SL[a] | VISL[b] | VISL ($1 \times 10^{-5}$)[c] | Number of Detects > Historical SL[a] | Number of Detects > VISL[b] | Number of Detects > VISL[c] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Commer-cial | 28 | Indoor Air | PCE | ppbv | 2 | 0 | 2 | -- | -- | 0.66 | 4.5 | 2.6 | 50 | 6.9 | 27 | 0 | 1 | 0 |
| | | | TCE | ppbv | 16 | 1 | 15 | 0.5 | 0.5 | 0.3 | 430 | 46 | 1.7 | 0.56 | 1.6 | 14 | 14 | 14 |
| | | Subslab Soil Vapor | PCE | ppbv | 1 | 0 | 1 | -- | -- | 840 | 840 | 840 | 500 | 236 | 1,300 | 1 | 1 | 0 |
| | | | TCE | ppbv | 24 | 3 | 21 | 0.16 | 0.16 | 0.2 | 14,400 | 2,015 | 17 | 19 | 53 | 12 | 10 | 10 |
| Residen-tial | 395 | Indoor Air | PCE | ppbv | 271 | 168 | 103 | 0.08 | 2.4 | 0.15 | 30 | 2.2 | 12 | 1.6 | 6.2 | 6 | 24 | 8 |
| | | | TCE | ppbv | 362 | 132 | 230 | 0.038 | 2.4 | 0.04 | 1,440 | 13 | 0.4 | 0.089 | 0.39 | 170 | 227 | 174 |
| | | Subslab Soil Vapor | PCE | ppbv | 208 | 54 | 154 | 0.65 | 6.4 | 0.19 | 7000 | 218 | 120 | 53 | 210 | 32 | 60 | 19 |
| | | | TCE | ppbv | 346 | 66 | 280 | 0.04 | 2 | 0.1 | 67,000 | 1,629 | 17 | 3 | 13 | 225 | 231 | 202 |
| Industrial | 19 | Indoor Air | TCE | ppbv | 21 | 11 | 10 | 0.2 | 62 | 0.1 | 22 | 9.2 | 100,000 | 0.56 | 1.6 | 0 | 8 | 8 |

Notes:

ppbv = parts per billion (by volume)

PCE = tetrachloroethene

TCE = trichloroethene

SL = screening-level

VISL = vapor intrusion screening level

[a] Historical RBSLs for residential and commercial structures were based on EPA's OSWER Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air

[b] VISLs for indoor air are USEPA residential indoor air RSLs (November 2016) based on a target cancer risk of $1 \times 10^{-6}$ and a noncancer HQ of 1. VISLs for

[c] VISLs for indoor air are USEPA residential indoor air RSLs (November 2016) based on a target cancer risk of $1 \times 10^{-5}$ and a noncancer HQ of 1. VISLs for

# Appendix D

Applicable or Relevant and Appropriate Requirements

| CATEGORY | 16 USC | 40 CFR | ORC | OAC | PARAGRAPH | CAPTION | TEXT | APPLICATION |
|---|---|---|---|---|---|---|---|---|
| ACTION SPECIFIC | | | 3734.02 | | (I) | AIR EMISSIONS FROM HAZARDOUS WASTE FACILITIES | NO HAZARDOUS WASTE FACILITY SHALL EMIT ANY PARTICULATE MATTER, DUST, FUMES, GAS, MIST, SMOKE, VAPOR OR ODOROUS SUBSTANCE THAT INTERFERES WITH THE COMFORTABLE ENJOYMENT OF LIFE OR PROPERTY OR IS INJURIOUS TO PUBLIC HEALTH. | PERTAINS TO ANY SITE AT WHICH HAZARDOUS WASTE WILL BE MANAGED SUCH THAT AIR EMISSIONS MAY OCCUR. CONSIDER FOR SITES THAT WILL UNDERGO MOVEMENT OF EARTH OR INCINERATION. |
| ACTION SPECIFIC | | | 3767.14 | | | PROHIBITION OF NUISANCES | PROHIBITION AGAINST THROWING REFUSE, OIL, OR FILTH INTO LAKES, STREAMS, OR DRAINS | PERTAINS TO ALL SITES LOCATED ADJACENT TO LAKES, STREAMS, OR DRAINS |
| ACTION SPECIFIC | | | 6111.04 | | | ACTS OF POLLUTION PROHIBITED | POLLUTION OF WATERS OF THE STATE IS PROHIBITED. | PERTAINS TO ANY SITE WHICH HAS CONTAMINATED onsite GROUND OR SURFACE WATER OR WILL HAVE A DISCHARGE TO onsite SURFACE OR GROUND WATER. |
| CHEMICAL SPECIFIC | | | | 3745-15-05 | A-D | DE MINIMIS AIR CONTAMINANT SOURCE EXEMPTION | ESTABLISHES LIMITS BELOW WHICH AIR DISCHARGE PERMITS ARE NOT NEEDED | PERTAINS TO ANY SITE WHICH UTILIZES OR WILL UTILIZE AIR POLLUTION CONTROL EQUIPMENT onsite. |
| ACTION SPECIFIC | | | | 3745-15-07 | A | AIR POLLUTION NUISANCES PROHIBITED | DEFINES AIR POLLUTION NUISANCE AS THE EMISSION OR ESCAPE INTO THE AIR FROM ANY SOURCES(S)) OF SMOKE, ASHES, DUST, DIRT, GRIME, ACIDS, FUMES, GASES, VAPORS, ODORS AND COMBINATIONS OF THE ABOVE THAT ENDANGER HEALTH, SAFETY OR WELFARE OF THE PUBLIC OR CAUSE PERSONAL INJURY OR PROPERTY DAMAGE. SUCH NUISANCES ARE PROHIBITED. | PERTAINS TO ANY SITE WHICH CAUSES, OR MAY REASONABLY CAUSE, AIR POLLUTION NUISANCES. CONSIDER FOR SITES THAT WILL UNDERGO EXCAVATION, DEMOLITION, CAP INSTALLATION, METHANE PRODUCTION, CLEARING AND GRUBBING, WATER TREATMENT, INCINERATION AND WASTE FUEL RECOVERY |
| ACTION SPECIFIC | | | | 3745-15-08 | A | CIRCUMVENTION | FORBIDS DILUTION OR OTHER MEANS TO CONCEAL EMISSIONS WITHOUT ACTUAL REDUCTIONS | CONSIDER FOR SITES WITH EMISSIONS TO AIR, AIR STRIPPING, INCINERATION, SOIL VAPOR EXTRACTION ETC. |
| ACTION SPECIFIC | | | | 3745-17-08 | A1, A2, B, D | EMISSION RESTRICTIONS FOR FUGITIVE DUST | ALL EMISSIONS OF FUGITIVE DUST SHALL BE CONTROLLED. | PERTAINS TO SITES WHICH MAY HAVE FUGITIVE EMISSIONS (NON-STACK) OF DUST. CONSIDER FOR SITES THAT WILL UNDERGO GRADING, LOADING OPERATIONS, DEMOLITION, CLEARING AND GRUBBING AND CONSTRUCTION UTILIZE INCINERATION OR FUEL RECOVERY (WASTE FUEL RECOVERY) |
| ACTION SPECIFIC | | | | 3745-270-07 | A-E | TESTING, TRACKING, AND RECORDKEEPING REQUIREMENTS | TESTING, TRACKING, AND RECORDKEEPING REQUIREMENTS FOR GENERATORS, TREATERS, AND DISPOSAL FACILITIES. | CONSIDER FOR SITES AT WHICH WASTES ARE GENERATED, STORED, DISPOSED, OR TREATED |
| ACTION SPECIFIC | | | | 3745-34-07 | | NO MOVEMENT OF FLUID INTO UNDERGROUND DRINKING WATER | THE UNDERGROUND INJECTION OF FLUID CONTAINING ANY CONTAMINANT INTO AN UNDERGROUND SOURCE OF DRINKING WATER IS PROHIBITED IF THE PRESENCE OF THAT CONTAMINANT MAY CAUSE A VIOLATION OF THE PRIMARY DRINKING WATER STANDARDS OR OTHER WISE ADVERSELY AFFECT THE HEALTH OF PERSONS. | PERTAINS TO SITES AT WHICH MATERIALS ARE TO BE INJECTED UNDERGROUND. CONSIDER FOR TECHNOLOGIES SUCH AS BIOREMEDIATION AND SOIL FLUSHING. |
| ACTION SPECIFIC | | | | 3745-34-11 | | CLASS V WELLS | SPECIFIES REQUIREMENTS FOR CLASS V WELLS. SEE 3745-34-04 FOR DEFINITIONS. | PERTAINS TO SITES AT WHICH MATERIALS ARE TO BE INJECTED UNDERGROUND. CONSIDER FOR TECHNOLOGIES SUCH AS BIOREMEDIATION AND SOIL FLUSHING. |
| ACTION SPECIFIC | | | | 3745-34-16 | | CLASS V WELL PERMIT REQUIREMENTS | SPECIFIES REQUIREMENTS FOR CLASS V WELLS. SEE 3745-34-04 FOR DEFINITIONS. | PERTAINS TO SITES AT WHICH MATERIALS ARE TO BE INJECTED UNDERGROUND. CONSIDER FOR TECHNOLOGIES SUCH AS BIOREMEDIATION AND SOIL FLUSHING. |
| ACTION SPECIFIC | | | | 3745-34-26 | | CONDITIONS APPLICABLE TO ALL PERMITS | SPECIFIES MINIMUM CONDITIONS TO BE APPLIED TO ALL UNDERGROUND INJECTIONS. | PERTAINS TO SITES AT WHICH MATERIALS ARE TO BE INJECTED UNDERGROUND. CONSIDER FOR TECHNOLOGIES SUCH AS BIOREMEDIATION AND SOIL FLUSHING. |
| ACTION SPECIFIC | | | | 3745-34-34 | | MECHANICAL INTEGRITY | SPECIFIES REQUIREMENTS TO BE MET TO ENSURE MECHANICAL INTEGRITY OF WELLS. | PERTAINS TO SITES AT WHICH MATERIALS ARE TO BE INJECTED UNDERGROUND. CONSIDER FOR TECHNOLOGIES SUCH AS BIOREMEDIATION AND SOIL FLUSHING. |
| ACTION SPECIFIC | | | | 3745-52-11 | A-D | EVALUATION OF WASTES | ANY PERSON GENERATING A WASTE MUST DETERMINE IF THAT WASTE IS A HAZARDOUS WASTE (EITHER THROUGH LISTING OR BY CHARACTERISTIC). | PERTAINS TO SITES AT WHICH WASTES OF ANY TYPE (BOTH SOLID AND HAZARDOUS) ARE LOCATED. |

| CATEGORY | 16 USC | 40 CFR | ORC | OAC | PARAGRAPH | CAPTION | TEXT | APPLICATION |
|---|---|---|---|---|---|---|---|---|
| ACTION SPECIFIC | | | | 3745-52-12 | A-C | GENERATOR IDENTIFICATION NUMBER | A GENERATOR MUST NOT STORE, TREAT DISPOSE OR TRANSPORT HAZARDOUS WASTES WITHOUT A GENERATOR NUMBER | PERTAINS TO SITES WHERE HAZARDOUS WASTE WILL BE TRANSPORTED offsite FOR TREATMENT, STORAGE OR DISPOSAL |
| ACTION SPECIFIC | | | | 3745-52-20 | | HAZARDOUS WASTE MANIFEST - GENERAL REQUIREMENTS | REQUIRES A GENERATOR WHO TRANSPORTS OR OFFERS FOR TRANSPORTATION HAZARDOUS WASTE FOR offsite TREATMENT, STORAGE OR DISPOSAL TO PREPARE A UNIFORM HAZARDOUS WASTE MANIFEST | PERTAINS TO SITES WHERE HAZARDOUS WASTE WILL BE TRANSPORTED offsite FOR TREATMENT, STORAGE OR DISPOSAL |
| ACTION SPECIFIC | | | | 3745-52-22 | | HAZARDOUS WASTE MANIFEST - NUMBER OF COPIES | SPECIFIES THE NUMBER OF MANIFEST COPIES TO BE PREPARED | PERTAINS TO SITES WHERE HAZARDOUS WASTE WILL BE TRANSPORTED offsite FOR TREATMENT, STORAGE OR DISPOSAL |
| ACTION SPECIFIC | | | | 3745-52-23 | | HAZARDOUS WASTE MANIFEST - USE | SPECIFIES PROCEDURES FOR THE USE OF HAZARDOUS WASTE MANIFESTS INCLUDING A REQUIREMENT THAT THEY BE HAND SIGNED BY THE GENERATOR | PERTAINS TO SITES WHERE HAZARDOUS WASTE WILL BE TRANSPORTED offsite FOR TREATMENT, STORAGE OR DISPOSAL |
| ACTION SPECIFIC | | | | 3745-52-30 | | HAZARDOUS WASTE PACKAGING | REQUIRES A GENERATOR TO PACKAGE HAZARDOUS WASTE IN ACCORDANCE WITH U.S. DOT REGULATIONS FOR TRANSPORTATION offsite. | PERTAINS TO ANY SITE WHERE HAZARDOUS WASTE WILL BE GENERATED BY onsite ACTIVITIES AND SHIPPED offsite FOR TREATMENT AND/OR DISPOSAL. |
| ACTION SPECIFIC | | | | 3745-52-31 | | HAZARDOUS WASTE LABELING | REQUIRES PACKAGES OF HAZARDOUS WASTE TO BE LABELED IN ACCORDANCE WITH U.S.DOT REGULATIONS FOR offsite TRANSPORTATION. | PERTAINS TO ANY SITE WHERE HAZARDOUS WASTE WILL BE GENERATED BY onsite ACTIVITIES AND SHIPPED offsite FOR TREATMENT AND/OR DISPOSAL. |
| ACTION SPECIFIC | | | | 3745-52-32 | | HAZARDOUS WASTE MARKING | SPECIFIES LANGUAGE FOR MARKING PACKAGES OF HAZARDOUS WASTE PRIOR TO offsite TRANSPORTATION | PERTAINS TO ANY SITE WHERE HAZARDOUS WASTE WILL BE GENERATED BY onsite ACTIVITIES AND SHIPPED offsite FOR TREATMENT AND/OR DISPOSAL. |
| ACTION SPECIFIC | | | | 3745-52-33 | | HAZARDOUS WASTE PLACARDING | GENERATOR SHALL PLACARD HAZARDOUS WASTE PRIOR TO offsite TRANSPORTATION. | PERTAINS TO ANY SITE WHERE HAZARDOUS WASTE WILL BE GENERATED BY onsite ACTIVITIES AND SHIPPED offsite FOR TREATMENT AND/OR DISPOSAL. |
| ACTION SPECIFIC | | | | 3745-52-34 | | ACCUMULATION TIME OF HAZARDOUS WASTE | IDENTIFIES MAXIMUM TIME PERIODS THAT A GENERATOR MAY ACCUMULATE A HAZARDOUS WASTE WITHOUT BEING CONSIDERED AN OPERATOR OF A STORAGE FACILITY. ALSO ESTABLISHES STANDARDS FOR MANAGEMENT OF HAZARDOUS WASTES BY GENERATORS. | PERTAINS TO A SITE WHERE HAZARDOUS WASTE WILL BE GENERATED AS A RESULT OF THE REMEDIAL ACTIVITIES. |
| ACTION SPECIFIC | | | | 3745-52-40 | A-D | RECORDKEEPING REQUIREMENTS, THREE YEAR RETENTION | SPECIFIES RECORDS THAT SHALL BE KEPT FOR THREE YEARS | CONSIDER FOR SITES AT WHICH HAZARDOUS WASTES ARE GENERATED |
| ACTION SPECIFIC | | | | 3745-52-41 | A-B | ANNUAL REPORT | REQUIRES GENERATORS TO PREPARE ANNUAL REPORT TO OEPA | APPLICABLE AT SITES GENERATING WASTES FOR OFF--SITE SHIPMENT |
| CHEMICAL SPECIFIC | | | | 3745-52-11 | C(1) | GENERAL ANALYSIS OF HAZARDOUS WASTE | PRIOR TO ANY TREATMENT, STORAGE OR DISPOSAL OF HAZARDOUS WASTES, A REPRESENTATIVE SAMPLE OF THE WASTE MUST BE CHEMICALLY AND PHYSICALLY ANALYZED. | PERTAINS TO SITES WHERE HAZARDOUS WASTE WILL BE TRANSPORTED offsite FOR TREATMENT, STORAGE OR DISPOSAL |
| ACTION SPECIFIC | | | | 3745-55-14 | | DISPOSAL/ DECON OF EQUIPMENT, STRUCTURES & SOILS | REQUIRES THAT ALL CONTAMINATED EQUIPMENT, STRUCTURES AND SOILS BE PROPERLY DISPOSED OF OR DECONTAMINATED. REMOVAL OF HAZARDOUS WASTES OR CONSTITUENTS FROM A UNIT MAY CONSTITUTE GENERATION OF HAZARDOUS WASTES. | PERTAINS TO ANY SITE AT WHICH HAZARDOUS WASTE IS TO BE TREATED, STORED OR DISPOSED OF (OR HAS BEEN TREATED, STORED OR DISPOSED OF). |
| CHEMICAL SPECIFIC | | 141.61 | | | | MAXIMUM CONTAMINANT LEVELS FOR ORGANIC CHEMICALS | PRESENTS MCLS FOR ORGANICS. | PERTAINS TO ANY SITE WHICH HAS CONTAMINATED GROUND OR SURFACE WATER THAT IS EITHER BEING USED, OR HAS THE POTENTIAL FOR USE, AS A DRINKING WATER SOURCE. RELEVANT AND APPROPRIATE FOR ALL REMEDIATION OF GROUNDWATER UNDER CERCLA. |
| ACTION SPECIFIC | | | | 3745-9-03 | A-C | MONITORING WELL | STANDARDS FOR DESIGN AND CLOSURE OF WELLS, COMPLIANCE WITH DDAGW GUIDANCE | PERTAINS TO ALL GROUND WATER WELLS ON THE SITE THAT EITHER WILL BE INSTALLED OR HAVE BEEN INSTALLED SINCE FEB. 15, 1975. WOULD PERTAIN DURING THE FS IF NEW WELLS ARE CONSTRUCTED FOR TREATABILITY STUDIES. |

| CATEGORY | 16 USC | 40 CFR | ORC | OAC | PARAGRAPH | CAPTION | TEXT | APPLICATION |
|---|---|---|---|---|---|---|---|---|
| LOCATION SPECIFIC | | | | 3745-9-04 | A,B | WELL SITING | MANDATES THAT GROUND WATER WELLS BE:A) LOCATED AND MAINTAINED SO AS TO PREVENT CONTAMINANTS FROM ENTERING WELL.B) LOCATED SO AS TO BE ACCESSIBLE FOR CLEANING AND MAINTENANCE. | PERTAINS TO ALL GROUND WATER WELLS ON THE SITE THAT EITHER WILL BE INSTALLED OR HAVE BEEN INSTALLED SINCE FEB. 15, 1975. WOULD PERTAIN DURING THE FS IF NEW WELLS ARE CONSTRUCTED FOR TREATABILITY STUDIES. |
| ACTION SPECIFIC | | | | 3745-9-05 | A1,B-H | WELL CONSTRUCTION | SPECIFIES MINIMUM CONSTRUCTION REQUIREMENTS FOR NEW GROUND WATER WELLS IN REGARDS TO CASING MATERIAL, CASING DEPTH, POTABLE WATER, ANNULAR SPACES, USE OF DRIVE SHOE, OPENINGS TO ALLOW WATER ENTRY, CONTAMINANT ENTRY. | PERTAINS TO ALL GROUND WATER WELLS ON THE SITE THAT EITHER WILL BE INSTALLED OR HAVE BEEN INSTALLED SINCE FEB. 15, 1975. WOULD PERTAIN DURING THE FS IF NEW WELLS ARE CONSTRUCTED FOR TREATABILITY STUDIES. |
| LOCATION SPECIFIC | | | | 3745-9-06 | A | WELL CONSTRUCTION, SPECIFIC GEOLOGIC CONDITIONS | ESTABLISHES SPECIFIC REQUIREMENTS FOR WELLS IN DIFFERENT TYPES OF AQUIFERS | PERTAINS TO ALL GROUND WATER WELLS ON THE SITE THAT EITHER WILL BE INSTALLED OR HAVE BEEN INSTALLED SINCE FEB. 15, 1975. WOULD PERTAIN DURING THE FS IF NEW WELLS ARE CONSTRUCTED FOR TREATABILITY STUDIES. |
| ACTION SPECIFIC | | | | 3745-9-07 | A-C | WELL GROUTING FOR CONSTRUCTION OF CLOSURE | ESTABLISHES SPECIFIC GROUTING PROCEDURES | PERTAINS TO ALL GROUND WATER WELLS ON THE SITE THAT EITHER WILL BE INSTALLED OR HAVE BEEN INSTALLED SINCE FEB. 15, 1975. WOULD PERTAIN DURING THE FS IF NEW WELLS ARE CONSTRUCTED FOR TREATABILITY STUDIES. |
| Action Specific | | | | 3745-9-10 | A,B,C | ABANDONED WELL SEALING | PROCEDURES FOR CLOSING AND SEALING WELLS. | PERTAINS TO ALL GROUND WATER WELLS ON THE SITE THAT EITHER WILL BE INSTALLED OR HAVE BEEN INSTALLED SINCE FEB. 15, 1975. |
| Action Specific | | | | 3745-27-13 | 2(H), F | "DIGGING" WHERE HAZ OR SOLID WASTE FACILITY WAS LOCATED | FILLING, GRADING, EXCAVATING, BUILDING, DRILLING OR MINING ON LAND WHERE HAZARDOUS WASTE OR SOLID WASTE FACILITY WAS OPERATED | PERTAINS TO SITES WHERE CONSTRUCT ACTIVITIES WILL BE OCCURRING. |
| Action Specific | | | 3704.05 | | A-I | PROHIBITED ACTS | PROHIBITS EMISSION OF ANY AIR CONTAMINANT IN VIOLATION OF 3704 OR ANY RULES, PERMITS OR VARIANCE ISSUES | PERTAINS TO ANY SITE THAT WHERE EMISSIONS OF AIR CONTAMINANTS OCCURS AS A RESULT OF REMEDIAL ACTIVITIES. |
| Action Specific | | | | 3745-54-14 | A-C | SECURITY FOR HAZARDOUS WASTE FACILITIES | HAZARDOUS WATER FACILITIES MUST BE SECURED SO THAT UNAUTHORIZED AND UNKNOWING ENTRY ARE MINIMIZED OR PROHIBITED | PERTAINS TO ANY SITE AT WHICH HAZARDOUS MATERIALS IS TO BE TREATED, STORED , OR DISPOSED OF |
| CHEMICAL SPECIFIC | | | | 3745-81-11 | A, B, C | MAXIMUM CONTAMINANT LEVELS FOR INORGANICS | ESTABLISHES STATE OF OHIO MAXIMUM CONTAMINANT LEVELS (MCLS) FOR INORGANIC CONTAMINANTS FOR PUBLIC WATER SUPPLIES. | RELEVANT AND APPROPRIATE TO ANY SITE WITH GROUNDWATER CONTAMINATION AND GROUNDWATER REMEDIAL ACTIVITIES WHERE THE STATE LEVEL IS MORE STRINGENT THAN THE FEDERAL LEVEL. |
| CHEMICAL SPECIFIC | | | | 3745-81-12 | A, B, C | MAXIMUM CONTAMINANT LEVELS FOR ORGANICS | ESTABLISHES STATE OF OHIO MAXIMUM CONTAMINANT LEVELS (MCLS) FOR ORGANIC CONTAMINANTS FOR PUBLIC WATER SUPPLIES. | RELEVANT AND APPROPRIATE TO ANY SITE WITH GROUNDWATER CONTAMINATION AND GROUNDWATER REMEDIAL ACTIVITIES WHERE THE STATE LEVEL IS MORE STRINGENT THAN THE FEDERAL LEVEL. |
| LOCATION SPECIFIC | | | 6101.19 | | | OHIO CONSERVANCY DISTRICT | TO PROTECT AND PRESERVE THE WORKS, IMPROVEMENTS, AND PROPERTIES OWNED OR CONTROLLED BY THE DISTRICT. | |
| ACTION SPECIFIC | | | 3767.13 | | | PROHIBITED ACTS | PROHIBITS NOXIOUS EXHALATIONS OR SMELLS AND THE OBSTRUCTION OF WATERWAYS. | PERTAINS TO ANY SITE THAT MAY HAVE NOXIOUS SMELLS OR MAY OBSTRUCT WATERWAYS. |
| ACTION SPECIFIC | | | | 3745-15-06 | A1, A2 | MALFUNCTION OF EQUIPMENT; SCHEDULED MAINTENANCE; REPORTING | ESTABLISHES SCHEDULED MAINTENANCE AND SPECIFIES WHEN POLLUTION SOURCE MUST BE SHUT DOWN DURING MAINTENANCE. | PERTAINS TO ANY SITE WHICH UTILIZES OR WILL UTILIZE AIR POLLUTION CONTROL EQUIPMENT onsite. |
| ACTION SPECIFIC | | | | 3745-34-36 | | PLUGGING AND ABANDONING CLASS I WELLS | SPECIFIES REQUIREMENTS TO BE MET WHEN PLUGGING OR ABANDONING A CLASS I WELL. SEE 3745-34-04 FOR DEFINITIONS. | PERTAINS TO SITES AT WHICH MATERIALS ARE TO BE INJECTED UNDERGROUND. CONSIDER FOR TECHNOLOGIES SUCH AS BIOREMEDIATION AND SOIL FLUSHING. |

| CATEGORY | 16 USC | 40 CFR | ORC | OAC | PARAGRAPH | CAPTION | TEXT | APPLICATION |
|---|---|---|---|---|---|---|---|---|
| ACTION SPECIFIC | | | | 3745-34-37 | | CONSTRUCTION REQUIREMENTS FOR CLASS I WELLS | SPECIFIES CONSTRUCTION AND SITING REQUIREMENTS FOR CLASS I WELLS. PERTAINS TO SITES AT WHICH MATERIALS ARE TO BE INJECTED UNDERGROUND. CONSIDER FOR TECHNOLOGIES SUCH AS BIOREMEDIATION AND SOIL FLUSHING. | PERTAINS TO SITES AT WHICH MATERIALS ARE TO BE INJECTED UNDERGROUND. CONSIDER FOR TECHNOLOGIES SUCH AS BIOREMEDIATION AND SOIL FLUSHING. |
| ACTION SPECIFIC | | | | 3745-34-38 | | OPERATING, MONITORING, AND REPORTING REQUIREMENTS FOR CLASS I WELLS | SPECIFIES OPERATING, MONITORING AND REPORTING REQUIREMENTS NECESSARY FOR CLASS I WELLS. | PERTAINS TO SITES AT WHICH MATERIALS ARE TO BE INJECTED UNDERGROUND. |
| TO BE CONSIDERED | | | | 3745-50-44 | C2 | CONTENTS OF "PART B" OF THE PERMIT APPLICATION | ESTABLISHES SUBSTANTIVE HAZARDOUS WASTE PERMIT REQUIREMENTS NECESSARY FOR OHIO EPA TO DETERMINE ADEQUACY OF TANK TREATMENT AND STORAGE UNITS. INCLUDES INFORMATION SUCH AS ASSESSMENT OF STRUCTURAL INTEGRITY, DETAILED PLANS OF TANK SYSTEM(S), DESCRIPTION OF SECONDARY CONTAINMENT SYSTEM, ETC. SEE OAC 3745- 55-90 THROUGH 3745-55-99 FOR ADDITIONAL REQUIREMENTS. THIS, ALONG WITH OTHER PARAGRAPHS OF THIS RULE AND OAC 3745-55-90 THROUGH 3745-55- 99, ESTABLISHES THE MINIMUM INFORMATION REQUIRED DURING THE REMEDIAL DESIGN STAGE. | PERTAINS TO ANY SITE AT WHICH STORAGE OR TREATMENT OF HAZARDOUS WASTE IN TANKS WILL OCCUR onsite. |
| ACTION SPECIFIC | | | | 3745-54-15 | A, C | GENERAL INSPECTION REQUIREMENTS | HAZARDOUS WASTE FACILITIES MUST BE INSPECTED REGULARLY TO DETECT MALFUNCTIONS, DETERIORATIONS, OPERATIONAL ERRORS AND DISCHARGES. ANY MALFUNCTIONS OR DETERIORATIONS DETECTED SHALL BE REMEDIED EXPEDITIOUSLY. | PERTAINS TO ANY SITE AT WHICH HAZARDOUS WASTE IS TO BE TREATED, STORED OR DISPOSED OF (OR HAS BEEN DISPOSED OF). CONSIDER FOR SITES WHERE WASTES WILL BE STORED IN CONTAINERS. |
| ACTION SPECIFIC | | | | 3745-54-31 | | DESIGN AND OPERATION OF FACILITY | HAZARDOUS WASTE FACILITIES MUST BE DESIGNED, CONSTRUCTED, MAINTAINED AND OPERATED TO MINIMIZE THE POSSIBILITY OF FIRE, EXPLOSION OR UNPLANNED RELEASE OF HAZARDOUS WASTE OR HAZARDOUS CONSTITUENTS TO THE AIR, SOIL OR SURFACE WATER WHICH COULD THREATEN HUMAN HEALTH OR THE ENVIRONMENT. | PERTAINS TO ANY SITE AT WHICH HAZARDOUS WASTE IS TO BE TREATED, STORED OR DISPOSED OF (OR HAS BEEN DISPOSED OF). CONSIDER FOR SITES WHERE WASTES WILL BE STORED IN CONTAINERS. |
| Action Specific | | | | 3745-54-32 | A-D | REQUIRED EQUIPMENT | ALL HAZARDOUS WASTE FACILITIES MUST BE EQUIPPED WITH EMERGENCY EQUIPMENT, SUCH AS AN ALARM SYSTEM, FIRE CONTROL EQUIPMENT AND A TELEPHONE OR RADIO. PERTAINS TO ANY SITE AT WHICH HAZARDOUS IS TO BE TREATED, STORED OR DISPOSED OF (OR HAS BEEN DISPOSED OF). | PERTAINS TO ANY SITE AT WHICH HAZARDOUS WASTE IS TO BE TREATED, STORED OR DISPOSED OF (OR HAS BEEN DISPOSED OF). CONSIDER FOR SITES WHERE WASTES WILL BE STORED IN CONTAINERS. |
| ACTION SPECIFIC | | | | 3745-54-33 | | TESTING AND MAINTENANCE OF EQUIPMENT | ALL HAZARDOUS WASTE FACILITIES MUST TEST AND MAINTAIN EMERGENCY EQUIPMENT TO ASSURE PROPER OPERATION. PERTAINS TO ANY SITE AT WHICH HAZARDOUS WASTE IS TO BE TREATED, STORED OR DISPOSED OF (OR HAS BEEN DISPOSED OF). | PERTAINS TO ANY SITE AT WHICH HAZARDOUS WASTE IS TO BE TREATED, STORED OR DISPOSED OF (OR HAS BEEN DISPOSED OF). CONSIDER FOR SITES WHERE WASTES WILL BE STORED IN CONTAINERS. |
| ACTION SPECIFIC | | | | 3745-65-34 | | ACCESS TO COMMUNICATIONS OR ALARM SYSTEM | WHENEVER HAZARDOUS WASTE IS BEING HANDLED, ALL PERSONNEL INVOLVED SHALL HAVE IMMEDIATE ACCESS TO AN INTERNAL ALARM OR EMERGENCY COMMUNICATION DEVICE. | PERTAINS TO ANY SITE AT WHICH HAZARDOUS WASTE IS TO BE TREATED, STORED OR DISPOSED OF (OR HAS BEEN DISPOSED OF). |
| ACTION SPECIFIC | | | | 3745-54-35 | | REQUIRED AISLE SPACE | ADEQUATE AISLE SPACE SHALL BE MAINTAINED TO ALLOW UNOBSTRUCTED MOVEMENT OF PERSONNEL, FIRE EQUIPMENT, SPILL CONTROL EQUIPMENT AND DECONTAMINATION EQUIPMENT INTO ANY AREA OF THE FACILITY OPERATION IN THE EVENT OF AN EMERGENCY. | PERTAINS TO ANY SITE AT WHICH HAZARDOUS WASTE IS TO BE TREATED, STORED OR DISPOSED OF (OR HAS BEEN DISPOSED OF). CONSIDER FOR SITES WHERE WASTES WILL BE STORED IN CONTAINERS. |
| ACTION SPECIFIC | | | | 3745-65-37 | A, B | ARRANGEMENTS/AGREEMENTS WITH LOCAL AUTHORITIES | ARRANGEMENTS OR AGREEMENTS WITH LOCAL AUTHORITIES, SUCH AS POLICE, FIRE DEPARTMENT AND EMERGENCY RESPONSE TEAMS MUST BE MADE. IF LOCAL AUTHORITIES WILL NOT COOPERATE, DOCUMENTATION OF THAT NON-COOPERATION SHOULD BE PROVIDED. | PERTAINS TO ANY SITE AT WHICH HAZARDOUS WASTE IS TO BE TREATED, STORED OR DISPOSED OF (OR HAS BEEN DISPOSED OF). |
| ACTION SPECIFIC | | | | 3745-65-52 | A-F | CONTENT OF CONTINGENCY PLAN | HAZARDOUS WASTE FACILITIES MUST HAVE A CONTINGENCY PLAN THAT ADDRESSES ANY UNPLANNED RELEASE OF HAZARDOUS WASTES OR HAZARDOUS CONSTITUENTS INTO THE AIR, SOIL OR SURFACE WATER. THIS RULE ESTABLISHES THE MINIMUM REQUIRED INFORMATION OF SUCH A PLAN. | PERTAINS TO ANY SITE AT WHICH HAZARDOUS WASTE IS TO BE TREATED, STORED OR DISPOSED OF (OR HAS BEEN DISPOSED OF). |

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|---|---|---|---|---|---|---|---|---|
| ACTION SPECIFIC | | | | 3745-65-53 | A, B | COPIES OF CONTINGENCY PLAN | HAZARDOUS WASTE FACILITIES COPIES OF THE CONTINGENCY PLAN REQUIRED BY 3745-54-50 MUST BE MAINTAINED AT THE FACILITY AND SUBMITTED TO ALL LOCAL POLICE DEPARTMENTS, FIRE DEPARTMENTS, HOSPITALS LOCAL EMERGENCY RESPONSE TEAMS AND THE OHIO EPA. | PERTAINS TO ANY SITE AT WHICH HAZARDOUS WASTE IS TO BE TREATED, STORED OR DISPOSED OF (OR HAS BEEN DISPOSED OF). |
| Action Specific | | | | 3745-65-54 | A | AMENDMENT OF CONTINGENCY PLAN | HAZARDOUS WASTE FACILITIES THE CONTINGENCY PLAN MUST BE AMENDED IF IT FAILS IN AN EMERGENCY, THE FACILITY CHANGES (IN ITS DESIGN, CONSTRUCTION, MAINTENANCE OR OPERATION), THE LIST OF EMERGENCY COORDINATORS CHANGE OR THE LIST OF EMERGENCY EQUIPMENT. | PERTAINS TO ANY SITE AT WHICH HAZARDOUS WASTE IS TO BE TREATED, STORED OR DISPOSED OF (OR HAS BEEN DISPOSED OF). |
| Action Specific | | | | 3745-65-55 | | EMERGENCY COORDINATOR | AT ALL TIMES THERE SHOULD BE AT LEAST ONE EMPLOYEE EITHER ON THE PREMISES OR ON CALL TO COORDINATE ALL EMERGENCY RESPONSE MEASURES. | PERTAINS TO ANY SITE AT WHICH HAZARDOUS WASTE IS TO BE TREATED, STORED OR DISPOSED OF (OR HAS BEEN DISPOSED OF). |
| Action Specific | | | | 3745-65-56 | A-I | EMERGENCY PROCEDURES | SPECIFIES THE PROCEDURES TO BE FOLLOWED IN THE EVENT OF AN EMERGENCY. | PERTAINS TO ANY SITE AT WHICH HAZARDOUS WASTE IS TO BE TREATED, STORED OR DISPOSED OF (OR HAS BEEN DISPOSED OF). |
| Action Specific | | | | 3745-54-73 | A, B | OPERATING RECORD | SPECIFIES RECORDS TO BE KEPT AT TSD FACILITIES. | CONSIDER FOR SITES WITH onsite TREATMENT, STORAGE OR DISPOSAL. |
| Action Specific | | | | 3745-54-77 | A | ADDITIONAL REPORTS | REQUIRES FACILITIES TO REPORT FIRES, EXPLOSIONS OR OTHER MISHAPS. | CONSIDER FOR SITES WITH onsite TREATMENT, STORAGE OR DISPOSALonsite.. |
| Action Specific | | | | 3745-66-71 | | CONDITION OF CONTAINERS | CONTAINERS HOLDING HAZARDOUS WASTE MUST BE MAINTAINED IN GOOD CONDITION (NO RUST OR STRUCTURAL DEFECTS). | PERTAINS TO ANY SITE AT WHICH HAZARDOUS WASTE WILL BE STORED IN CONTAINERS. |
| ACTION SPECIFIC | | | | 3745-66-72 | | COMPATIBILITY OF WASTE WITH CONTAINERS | HAZARDOUS WASTES PLACED IN CONTAINER MUST NOT REACT WITH THE CONTAINER MATERIAL OR LINER MATERIAL. | PERTAINS TO ANY SITE AT WHICH HAZARDOUS WASTE WILL BE STORED IN CONTAINERS. |
| ACTION SPECIFIC | | | | 3745-66-73 | | MANAGEMENT OF CONTAINERS | CONTAINERS HOLDING HAZARDOUS WASTE MUST BE CLOSED (EXCEPT TO ADD OR REMOVE WASTE) AND MUST NOT BE HANDLED IN A MANNER THAT MAY RUPTURE THE CONTAINER OR CAUSE IT TO LEAK. | PERTAINS TO ANY SITE AT WHICH HAZARDOUS WASTE WILL BE STORED IN CONTAINERS. |
| ACTION SPECIFIC | | | | 3745-66-74 | | INSPECTIONS | REQUIRES AT LEAST WEEKLY INSPECTIONS OF CONTAINER STORAGE AREAS. | PERTAINS TO ANY SITE AT WHICH HAZARDOUS WASTE WILL BE STORED IN CONTAINERS. |
| ACTION SPECIFIC | | | | 3745-66-75 | A-D | CONTAINMENT | REQUIRES THAT CONTAINER STORAGE AREAS HAVE A CONTAINMENT SYSTEM AND SPECIFIES THE MINIMUM REQUIREMENTS OF SUCH A SYSTEM. | PERTAINS TO ANY SITE AT WHICH HAZARDOUS WASTE WILL BE STORED IN CONTAINERS. |
| ACTION SPECIFIC | | | | 3745-66-91 | A, B, D | ASSESSMENT OF EXISTING TANK SYSTEMS INTEGRITY | REQUIRES THAT EACH EXISTING TANK USED TO STORE OR TREAT HAZARDOUS WASTE THAT DOES NOT HAVE SECONDARY CONTAINMENT BE TESTED TO ASSURE TANK INTEGRITY. | PERTAINS TO ANY SITE WHICH HAS EXISTING HAZARDOUS WASTE TREATMENT OR STORAGE TANKS THAT LACK SECONDARY CONTAINMENT. |
| ACTION SPECIFIC | | | | 3745-66-92 | A-G | DESIGN AND INSTALLATION OF NEW TANK SYSTEMS OR COMPONENTS | REQUIRES A SECONDARY CONTAINMENT SYSTEM FOR TANKS AND ASSESSMENT TO DETERMINE TANK INTEGRITY. PERTAINS TO ANY SITE AT WHICH HAZARDOUS WASTE WILL BE EITHER STORED OR TREATED IN TANKS. | PERTAINS TO ANY SITE AT WHICH HAZARDOUS WASTE WILL BE EITHER STORED OR TREATED IN TANKS. |
| ACTION SPECIFIC | | | | 3745-66-93 | A-G, I | CONTAINMENT AND DETECTION OF RELEASES | REQUIRES SECONDARY CONTAINMENT AND LEAK DETECTION SYSTEMS FOR TANKS. PERTAINS TO ANY SITE AT WHICH HAZARDOUS WASTE WILL BE EITHER STORED OR TREATED IN TANKS. | PERTAINS TO ANY SITE AT WHICH HAZARDOUS WASTE WILL BE EITHER STORED OR TREATED IN TANKS. |
| ACTION SPECIFIC | | | | 3745-66-94 | A, B, C | GENERAL OPERATING REQUIREMENTS | SPECIFIES GENERAL OPERATING REQUIREMENTS FOR TANK SYSTEMS. | PERTAINS TO ANY SITE AT WHICH HAZARDOUS WASTE WILL BE EITHER STORED OR TREATED IN TANKS. |
| ACTION SPECIFIC | | | | 3745-66-95 | A-D | INSPECTIONS | REQUIRES INSPECTIONS AT LEAST ONCE EACH OPERATING DAY. | PERTAINS TO ANY SITE AT WHICH HAZARDOUS WASTE WILL BE EITHER STORED OR TREATED IN TANKS. |
| ACTION SPECIFIC | | | | 3745-66-96 | A,B,C,E | RESPONSE TO LEAKS OR SPILLS AND DISPOSITION OF LEAKING OR UNFIT FOR USE TANK SYSTEMS | REQUIRES THAT UNFIT TANKS BE REMOVED FROM USE AND FURTHER RELEASES BE PREVENTED. | PERTAINS TO ANY SITE AT WHICH HAZARDOUS WASTE WILL BE EITHER STORED OR TREATED IN TANKS. |

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|---|---|---|---|---|---|---|---|---|
| ACTION SPECIFIC | | | | 3745-66-97 | A,B | CLOSURE OF TANK SYSTEMS | REQUIRES THAT ALL TANK SYSTEMS BE CLOSED BY THE REMOVAL, DECONTAMINATION, AND/OR DISPOSAL OF ALL HAZARDOUS WASTE. IF ALL WASTE CANNOT BE REMOVED THE SYSTEM IS SUBJECT TO POST-CLOSURE CARE | PERTAINS TO ANY SITE AT WHICH HAZARDOUS WASTE WILL BE EITHER STORED OR TREATED IN TANKS. |
| CHEMICAL SPECIFIC | | | | 3745-25-02 | (A) through (F) | AMBIENT AIR QUALITY STANDARDS | LIMITS TO EMISSIONS OF PARTICULATE MATTER, SULFUR DIOXIDE, CARBON MONOXIDE, NITROGEN DIOXIDE, AND LEAD. | APPLICABLE TO REMEDIES INVOLVING EMISSIONS OF THE CITED POLLUTANTS (MAY INCLUDE PARTICULATE MATTER, CARBON MONOXIDE, OZONE, AND/OR NITROGEN DIOXIDE, DEPENDING ON THE SELECTED ALTERNATIVE OR ACTIVITY). |
| CHEMICAL SPECIFIC | | | | 3745-21 | | CARBON MONOXIDE, OZONE, HYDROCARBON AIR QUALITY STANDARDS, AND RELATED EMISSION REQUIREMENTS | CONTROLS EMISSIONS OF ORGANIC MATERIALS FROM STATIONARY SOURCES | THESE EMISSIONS REGULATIONS MAY APPLY TO CERTAIN PROCESSES THAT WOULD BE EMPLOYED. |
| LOCATION SPECIFIC | 703 | | | | | MIGRATORY BIRD TREATY ACT | PROTECTS LISTED SPECIES IN THE UNITED STATES FROM UNREGULATED TAKING | APPLICABLE TO ALL LOCATIONS WITHIN A FLYWAY. THE SITE IS LOCATED WITHIN THE MISSISSIPPI MIGRATORY FLYWAY. |
| ACTION SPECIFIC | | | | 3745-27-03 | (A)(2) | SOLID AND INFECTIOUS WASTE REGULATIONS | ALL SOLID WASTE SHALL BE STORED IN SUCH A MANNER AS TO PREVENT THE CREATION OF A NUISANCE, INSANITARY CONDITIONS, OR A POTENTIAL PUBLIC HEALTH HAZARD. | APPLICABLE FOR ACCUMULATING NON-HAZARDOUS WASTE |

# Appendix E

Cost Estimate for the Selected Interim Remedy

| Alternative | Remedy | Capital | Annual Range | | -30% | NPV | 50% |
|---|---|---|---|---|---|---|---|
| 1 | No action | | | | | | |
| 2 | 500 µg/L Pump and treat with discharge to surface water | $ 6,014,933 | $ 325,375 | $ 801,509 | $ 13,492,493 | **$ 19,274,990** | $ 28,912,486 |
| 3 | 500 µg/L AS/SVE | $ 6,770,050 | $ 330,375 | $ 825,475 | $ 12,678,927 | **$ 18,112,752** | $ 27,169,128 |
| 4 | 500 µg/L ISCO | $ 8,250,731 | $ 330,375 | $ 8,724,160 | $ 42,514,567 | **$ 60,735,095** | $ 91,102,643 |

**ALTERNATIVE 2**
**Pump and Treat**

| Item | Number | Unit | Unit Cost | Total | Notes | Source |
|---|---|---|---|---|---|---|
| **Capital** | | | | | | |
| *Aquifer Pump Testing* | | | | | | |
| Frac tank delivery to site | 1 | EA | $ 1,500 | $ 1,500 | | EE |
| Frac tank and containment rentals | 0.5 | MONTH | $ 1,500 | $ 750 | | |
| Frac tank move between locations | 6 | 500 | $ 1,000 | $ 6,000 | | |
| Staff labor to prepare for each pumping well test | 6 | EA | $ 2,160 | $ 12,960 | 2 staff, each 8-hr days, preparing for each test. | EE |
| Staff labor to execute 24 hour test on each well | 6 | EA | $ 4,860 | $ 29,160 | 3 staff, each 12-hr days, performing each test. | EE |
| Staff labor to reduce data from each test | 6 | EA | $ 2,400 | $ 14,400 | 2 staff, each 8-hr days, analyzing each test. | EE |
| Rental of pump, transducers, level meters, etc. | 6 | EA | $ 7,500 | $ 45,000 | Pump, meters, conveyance, etc. Rentals/purchases as needed. | EE |
| POTW discharge permit | 1 | LS | $ 5,000 | $ 5,000 | Engineering labor to obtain POTW discharge permit and negotiated disposal rate | EE |
| Fluid disposal | 1,080 | 1,000 gal | $ 10.00 | $ 10,800 | Assume average 250 gpm extraction rate for 12 hours for each well. Negotiated disposal rate to POWT. | EE |
| Analytical costs for POTW discharge sampling | 6 | EA | $ 250 | $ 1,500 | Assume VOCs, SVOCs, metals required for each location's discharge. | EE |
| Traffic controls | 0.5 | month | $ 25,000 | $ 12,500 | Includes traffic control plans, equipment, and staff. | EE |
| Modeling | 1 | LS | $ - | $ - | See professional services subsection. | - |
| *Aquifer Pump Testing Subtotal* | | | | $ 139,570 | | |
| *Drilling Costs* | | | | | | |
| Utility Location | 1 | LS | $ 2,500 | $ 2,500 | | EE |
| Driller Mobilization | 1 | LS | $ 25,000 | $ 25,000 | | Cascade |
| Recovery Well Installation | 570 | Feet | $ 200 | $ 114,000 | 95 feet deep, 8- to 10-inch diameter. Inclusive rate for drilling, well materials, completions, development. | Cascade |
| Monitoring Well Installation | 1,250 | Feet | $ 60 | $ 75,000 | Assume 20 new wells, inclusive rate for drilling, well materials, completions, development. | Cascade |
| Support Crew Drilling | 22 | Day | $ 425 | $ 9,350 | 2 days per recovery well, 0.5 day per monitoring well. | Cascade |
| Traffic controls | 0.5 | month | $ 25,000 | $ 12,500 | Includes traffic control plans, equipment, and staff. | EE |
| IDW | 25 | Ton | $ 200 | $ 5,000 | Handling, waste characterization sampling, disposal of 25 tons of soil. Development water to be disposed of during pump test (above). | EE |
| Analytical - Waste Profiling | 1 | LS | $ 1,500 | $ 1,500 | | |
| *Drilling Subtotal* | | | | $ 243,350 | | |
| *Site Work Costs* | | | | | | |
| Site Work Contractor Mob/Demob/Site Prep | 1 | LS | $ 50,000 | $ 50,000 | | EE |
| Utility Location | 1 | LS | $ 20,000 | $ 20,000 | | EE |
| Submersible Grundfos pumps, 230S100-3 or equivalent | 6 | Each | $ 9,000 | $ 54,000 | Material only. Each 10 hp to provide 125 gpm with 150-ft lift. | Seneca |
| Pump Truck Installation | 6 | Each | $ 2,500 | $ 15,000 | Materials and labor to install pumps downwell. | EE |
| Well Vaults | 6 | Each | $ 4,000 | $ 24,000 | Assume 36-by-36-inch well vault. Materials and labor to install. | EE |
| Utility Connections (Electric) | 6 | Each | $ 25,000 | $ 150,000 | Electric service for each submersible pump. | EE |
| Land Easements for Siting Pumping Well Infrastructure | 1 | LS | $ 50,000 | $ 50,000 | Labor to establish easements at each pumping well location to house power components. | EE |
| Subsurface Conveyance Trenching - Jack and Bore | 946 | Feet | $ 120 | $ 113,520 | Inclusive of road closures, flagmen, permits, launching, receiving pits, shoring, and restoration. | EE |
| Subsurface Conveyance Trenching - Conventional ROW | 8,514 | Feet | $ 26 | $ 221,364 | Inclusive of road closures, flagmen, permits, saw cutting and trenching up to 8 ft bgs. | EE |
| Trenching Restoration - Curb Removal and Replacement | 17,028 | SF | $ 20 | $ 340,560 | | EE |
| Trenching Restoration - Pavement Removal and Replacement | 17,028 | SF | $ 21 | $ 357,588 | Assume 2-ft width along trenchlines. Includes aggregate base course. | |
| Trenching Restoration - Sidewalk Removal and Replacement | 34,056 | SF | $ 7 | $ 246,906 | Assume half of trench alignment will require 4-ft wide sidewalk removal and replacement. | EE |
| Subsurface Conveyance - Utility Crossings | 9 | Each | $ 5,000 | $ 42,570 | Assume one utility conflict per 1,000 feet. | EE |
| Subsurface Signal Wiring | 14,400 | Feet | $ 15 | $ 216,000 | From each pumping well to the central system. | EE |
| Manholes | 14 | Each | $ 5,000 | $ 72,000 | New manhole every 1,000 feet. | EE |
| Subsurface Conveyance Piping - 3" | 0 | Feet | $ 6 | $ - | Materials and labor, pressure testing, traffic controls during installation, etc. | EE |
| Subsurface Conveyance Piping - 4" | 10,900 | Feet | $ 8 | $ 87,200 | Materials and labor, pressure testing, traffic controls during installation, etc. | EE |
| Subsurface Conveyance Piping - 6" | 6,700 | Feet | $ 12 | $ 80,400 | Materials and labor, pressure testing, traffic controls during installation, etc. | EE |
| Discharge Outfall Construction | 1 | LS | $ 50,000 | $ 50,000 | Discharge at Mad River. Riprap, etc. | EE |
| Staking and As-Built Surveys | 1 | LS | $ 20,000 | $ 20,000 | Discharge at Mad River. Riprap, etc. | EE |
| Well infrastructure abandonment | 1,820 | Feet | $ 20 | $ 36,400 | Per foot of well. | |
| Civil Decommissioning | 1 | Each | $ 50,000 | $ 50,000 | Per building. | |
| *Site Work Subtotal* | | | | $ 2,297,508 | | |
| *Treatment System Costs* | | | | | | |
| Land Procurement for Siting Treatment Building | 1 | LS | $ 100,000 | $ 100,000 | Labor and land purchase, 325 Kiser Street property per Dayton GIS. | Dayton GIS |
| Treatment Building | 5000 | SF | $ 100 | $ 500,000 | Wood frame 50 by 100 by 12 building, built onsite. Includes utility location, site preparation, E&S, waste management, etc. | EE |
| Filter, stainless steel housing | 6 | LS | $ 25,000 | $ 150,000 | Series of 3 filters (100, 50, 10 micron) on each influent line. | Seneca |
| Filter bags | 480 | Each | $ 10 | $ 4,800 | Start with 80 per housing. | Seneca |
| QED 1000 GPM Air Stripper | 2 | Each | $ 163,000 | $ 326,000 | or equivalent | Seneca |
| Blower, each rated 5200 CFM | 1 | Each | $ 17,500 | $ 17,500 | flow rating from QED | Seneca |
| VGAC, Tetrasolv VF-5000 | 2 | Each | $ 18,500 | $ 37,000 | 5,000 lbs in vessel, rated for up to 6,000 scfm air. | Seneca |
| Chemical Feed System for Sequestration | 1 | LS | $ 25,000 | $ 25,000 | Assume iron sequestration and hardness scaling agents needed. Meters, chemicals, pumps, etc. | Seneca |
| EQ Tanks for Mixing | 2 | Each | $ 5,000 | $ 10,000 | Empty pressure rated vessels for mixing reagents. | Seneca |
| Manifold piping | 1 | LS | $ 75,000 | $ 75,000 | Sch 80 PVC predominately. | Seneca |
| Transfer Pumps | 2 | Each | $ 10,000 | $ 20,000 | Assume the 4 waste streams will each by discharged by dedicated pumps. | Seneca |
| Instrumentation and Controls | 1 | LS | $ 400,000 | $ 400,000 | | Seneca |
| Freight | 1 | LS | $ 45,000 | $ 45,000 | Equipment to be procured by vendor and shipped to site. | Seneca |
| Mechanical connections | 1 | LS | $ 150,000 | $ 150,000 | Onsite mechanical materials and labor to install system. | EE |
| Electrical Installation | 1 | LS | $ 100,000 | $ 100,000 | Onsite electrical materials and labor to install system. | EE |
| *Treatment System Subtotal* | | | | $ 1,960,300 | | |
| *Capital Costs* | | | | $ 4,640,728 | | |
| *Tax, Bonding, and Markup* | | | | | | |
| Taxes on Equipment | 7.25% | of | $ 1,119,300 | $ 81,149 | Taxes applied to equipment furnished by others and delivered to site for installation. | Dayton OH sales tax |
| Subcontractor Bonding | 2% | of | $ 2,993,508 | $ 59,870 | Bonding applied to civil construction elements. | EE |
| Subcontractor Markup | 5% | of | $ 4,261,158 | $ 213,058 | Subcontractor markup applied to equipment, civil construction, and drilling. | Assumed |
| *Tax, Bond, and Markup Subtotal* | | | | $ 354,077 | | |
| *Professional Services Costs* | | | | | | |
| Groundwater Modeling | 1 | LS | $ 150,000 | $ 150,000 | | EE |
| Design | 1 | LS | $ 150,000 | $ 150,000 | | EE |
| Permitting | 1 | LS | $ 100,000 | $ 100,000 | NPDES; Air Modeling; Siting and Licensing; Land Use and Building | EE |
| System Startup | 1 | LS | $ 125,000 | $ 125,000 | | EE |
| Construction Oversight | 6% | % | $ 4,501,158 | $ 270,069 | | EPA FS Guidance |
| Project Management/office support | 5% | % | $ 4,501,158 | $ 225,058 | | EPA FS Guidance |
| *Professional Services Subtotal* | | | | $ 1,020,127 | | |
| **Total** | | | | **$ 6,014,933** | | |
| *+50%* | | | | *$ 9,022,399* | | |
| *-30%* | | | | *$ 4,210,453* | | |

**ALTERNATIVE 2**
**Pump and Treat**

| Item | | Number | Unit | Unit Cost | Total | Notes | Source |
|---|---|---|---|---|---|---|---|
| **Annual** | | | | | | | |
| **O&M components - Annual for 5 years** | | | | | | | |
| VGAC changeouts and disposal | | 4,000 | lb | $ 3 | $ 12,000 | Assumes that ~20K lb of GAC is needed to treat the 6,000 lb of COCs over a 5-yr span. | EE |
| | **Total** | | | | **$ 12,000** | | |
| | *+50%* | | | | $ 18,000 | | |
| | *-30%* | | | | $ 8,400 | | |
| | **Years** | **5** | | | | | |
| | **NPV** | **2%** | | | **$ 56,562** | | |
| | *+50%* | | | | *$ 84,842* | | |
| | *-30%* | | | | *$ 39,593* | | |
| **O&M components - Annual for 10 years (System Operation)** | | | | | | | |
| Monthly Sampling/NPDES Reporting | | 12 | Monthly | $ 5,000 | $ 60,000 | | EE |
| Easement renewals | | 6 | Each | $ 750 | $ 4,500 | | EE |
| Electricity | | 12 | Monthly | $ 13,403 | $ 160,834 | | EE |
| System O&M - P&T | | 1 | Year | $ 50,000 | $ 50,000 | Labor for routine O&M, equipment overhauls, etc. | EE |
| Equipment Maintenance - P&T | | 1 | LS | $ 138,800 | $ 138,800 | | EE |
| Project Management | | 1 | LS | $ 50,000 | $ 50,000 | | EE |
| | **Total** | | | | **$ 464,134** | | |
| | *+50%* | | | | *$ 696,200* | | |
| | *-30%* | | | | *$ 324,894* | | |
| | **Years** | **10** | | | | | |
| | **NPV** | **2%** | | | **$ 4,169,120** | | |
| | *+50%* | | | | *$ 6,253,679* | | |
| | *-30%* | | | | *$ 2,918,384* | | |
| **O&M components - Annual for 30 years (LTM + VIMS)** | | | | | | | |
| Performance Monitoring - GW and VI Sampling | | 2 | Event | $ 125,000 | $ 250,000 | Semiannual Sampling | EE |
| System O&M - VIMs | | 1 | LS | $ 50,000 | $ 50,000 | | EE |
| Equipment Maintenance - VIMs | | 1 | LS | $ 5,375 | $ 5,375 | Assume 25 houses need blower replacement ($215/blower) | EE |
| Project Management | | 1 | LS | $ 20,000 | $ 20,000 | | EE |
| | **Total** | | | | **$ 325,375** | | |
| | *+50%* | | | | *$ 488,063* | | |
| | *-30%* | | | | *$ 227,763* | | |
| | **Years** | **30** | | | | | |
| | **NPV** | **2%** | | | **$ 7,287,247** | | |
| | *+50%* | | | | *$ 10,930,870* | | |
| | *-30%* | | | | *$ 5,101,073* | | |
| | *Contingency* | 10% | of | $ 17,471,299 | *$ 1,747,130* | | |
| | **Total** | | | | **$ 19,274,990** | | |
| | *+50%* | | | | *$ 28,912,486* | | |
| | *-30%* | | | | *$ 13,492,493* | | |

Notes:
Items sourced as Cascade or Seneca from recent vendor quotes.

This is not an offer for construction and/or project execution. Please note, these AACE Class 4 order of magnitude cost estimates are assumed to represent the actual installed cost within the range of - 30 percent to + 50 percent of the costs indicated. The cost estimate has been prepared for guidance in project evaluation and implementation from the information available at the time of the estimate. The final costs of the project will depend on final approved design, actual labor and material costs, competitive variable factors. This estimate is not an offer to perform the work.

**ALTERNATIVE 3**
**AS/SVE via HDD Wells**

| Item | Qty | Unit | Unit Cost | Total | Notes | Source |
|---|---|---|---|---|---|---|
| **Capital** | | | | | | |
| *Drilling Costs* | | | | | | |
| Mobilization | 1 | LS | $ 100,000 | $ 100,000 | | EE |
| Utility Location | 1 | LS | $ 5,000 | $ 5,000 | | EE |
| Horizontal AS Wells | 8,730 | Feet | $ 150 | $ 1,309,500 | Based on shallow TCE 500 ppb (extra 320 entry for 2nd AS well on a transect) | EE |
| Horizontal SVE wells (1 per AS well) | 6,111 | Feet | $ 150 | $ 916,650 | assumed 70% of AS length required | EE |
| | 1,250 | Feet | $ 60 | $ 75,000 | | |
| Monitoring Well Installation | | | | | Assume 20 new wells, inclusive rate for drilling, well materials, completions, development | Cascade |
| Vapor Monitoring Point Installation | 320 | Feet | $ 60 | $ 19,200 | Assume 20 points, inclusive rate for drilling, well materials, completions | Cascade |
| Support Crew Drilling | 20 | Day | $ 425 | $ 8,500 | 2 wells per day for installation | Cascade |
| Traffic controls | 1 | month | $ 25,000 | $ 25,000 | Includes traffic control plans, equipment, and staff | EE |
| Frac tank delivery to site | 1 | EA | $ 1,500 | $ 1,500 | For well development water | EE |
| Frac tank and containment rentals | 3 | MONTH | $ 1,500 | $ 4,500 | For well development water | EE |
| IDW - Development Water | 35,000 | Gal | $ 1 | $ 35,000 | Transportation and disposal of development water; 3 borehole volumes assumed | EE |
| IDW | 250 | Ton | $ 200 | $ 50,000 | Handling, waste characterization sampling, disposal of 250 tons of soil. | EE |
| Analytical - Waste Profiling | 1 | LS | $ 2,500 | $ 2,500 | | |
| *Drilling Subtotal* | | | | *$ 2,552,350* | | |
| *Pre-Design Exploratory Boring Investigation* | | | | | | |
| Mobilization | 1 | LS | $ 25,000 | $ 25,000 | | EE |
| Utility Location | 1 | LS | $ 5,000 | $ 5,000 | | EE |
| Exploratory Borings | 3,000 | Feet | $ 50 | $ 150,000 | A boring every 300 feet along the Horizontal sparge wells - to 100 feet | EE |
| IDW - Soil | 50 | Ton | $ 200 | $ 10,000 | Handling, waste characterization sampling, disposal of 50 tons of soil. | EE |
| Analytical - Waste Profiling | 1 | LS | $ 1,500 | $ 1,500 | | |
| Boring abandonment | 3,000 | Feet | $ 10 | $ 30,000 | A boring every 300 feet along the Horizontal sparge wells - to 100 feet | EE |
| *Pre-Design Investigation Subtotal* | | | | *$ 221,500* | | |
| *Site Work Costs* | | | | | | |
| Well Vaults | 10 | Each | $ 4,000 | $ 40,000 | Assume 36"x36" well vault. Materials and labor to install. | EE |
| Utility Location | 1 | LS | $ 25,000 | $ 25,000 | | EE |
| Traffic Controls during Well/Conveyance Pipe installation | 3 | Month | $ 25,000 | $ 75,000 | Assume 1 months for MW/VMP installation and 2 months for conveyance pipe (3000 feet/month) | EE |
| Subsurface Conveyance Trenching - Jack and Bore | 210 | Feet | $ 120 | $ 25,200 | | |
| | | | | | Inclusive of road closures, flagmen, permits, restoration, etc. (10% of 2,100 feet of total trench) | EE |
| | 1,890 | Feet | $ 26 | $ 49,140 | | |
| Subsurface Conveyance Trenching - Conventional ROW | | | | | Inclusive of road closures, flagmen, permits, restoration, etc. (90% of 2,100 feet of total trench) | EE |
| Trenching Restoration - Curb Removal and Replacement | 1,890 | Feet | $ 20 | $ 37,800 | | EE |
| Trenching Restoration - Pavement Removal and Replacement | 3,780 | SF | $ 21 | $ 79,380 | Assume 2-ft width along trenchlines. Includes aggregate base course. | EE |
| Trenching Restoration - Sidewalk Removal and Replacement | 3,780 | SF | $ 7 | $ 27,405 | Assume half of trench alignment will require 4-ft wide sidewalk removal and replacement | EE |
| Subsurface Conveyance Trenching - Utility Crossings | 2 | Each | $ 5,000 | $ 9,450 | Assume one utility conflict per 1,000 feet | EE |
| Manholes | 2 | Each | $ 5,000 | $ 9,450 | new manhole every 1000 feet | EE |
| Subsurface Conveyance Piping - 4" HDPE (AS) | 2,400 | Feet | $ 8 | $ 19,200 | Materials and labor, pressure testing, traffic controls during installation, etc. | EE |
| Subsurface Conveyance Piping - 6" HDPE (SVE) | 1,200 | Feet | $ 12 | $ 14,400 | Materials and labor, pressure testing, traffic controls during installation, etc. | EE |
| Subsurface Conveyance Piping - 8" HDPE (SVE) | 1,200 | Feet | $ 16 | $ 19,200 | Materials and labor, pressure testing, traffic controls during installation, etc. | EE |
| Staking and As-Built Surveys | 1 | LS | $ 25,000 | $ 25,000 | AS/SVE wells, conveyance pipe, equipment , etc. | EE |
| Well infrastructure abandonment | 16,411 | Feet | $ 20 | $ 328,220 | Per foot of well | |
| Civil Decommissioning | 3 | Each | $ 50,000 | $ 150,000 | Per building | |
| *Site Work Subtotal* | | | | *$ 933,845* | | |
| *Treatment System Costs* | | | | | | |
| Land Procurement for Siting equipment enclosures | 3 | Each | $ 50,000 | $ 150,000 | Labor and land purchase | Dayton GIS |
| Equipment Enclosure(s) - excludes GAC vessels | 3 | Each | $ 390,000 | $ 1,170,000 | | |
| | | | | | Each system includes a 200-HP Compressors; Air Receiver Tank with covers, and SVE blower, and equipment enclosure with associated instrumentation and controls and PLC. | Seneca |
| | 3 | Each | $ 40,000 | $ 120,000 | GPC120 - Carbonair budgetary estimate, delivered to site, 13,500 lb GAC, loss of 2.5" WC @ 2500 SCFM | |
| GAC units | | | | | | Carbonair |
| Security Fence | 3 | LS | $ 10,000 | $ 30,000 | one per compound, costs pulled from similar project quote | EE |
| Mechanical connections | 3 | LS | $ 25,000 | $ 75,000 | on site mechanical materials and labor to install system | EE |
| Electrical Installation | 3 | LS | $ 50,000 | $ 150,000 | on site electrical materials and labor to install system | EE |
| Freight | 1 | LS | $ 50,000 | $ 50,000 | equipment to be procured by vendor and shipped to site | Seneca |
| *Treatment System Subtotal* | | | | *$ 1,745,000* | | |
| *Capital Costs* | | | | *$ 5,452,695* | | |
| *Tax, Bonding, and Markup* | | | | | | |
| Taxes on Equipment | 7% | of | $ 1,290,000 | $ 93,525 | Taxes applied to equipment furnished by others and delivered to site for installation | Dayton OH sales tax |
| Subcontractor Bonding | 2% | of | $ 3,486,195 | $ 69,724 | Bonding applied to civil construction elements | EE |
| Subcontractor Markup | 5% | of | $ 3,486,195 | $ 174,310 | Subcontractor markup applied to equipment, civil construction, and drilling | Assumed |
| *Tax, Bond, and Markup Subtotal* | | | | *$ 337,559* | | |
| *Professional Services Costs* | | | | | | |
| Design | 1 | LS | $ 150,000 | $ 150,000 | | EE |
| UIC Exemption | 1 | LS | $ 30,000 | $ 30,000 | | EE |
| Air Permit (SVE stream) | 1 | LS | $ 50,000 | $ 50,000 | | EE |
| System Startup | 1 | LS | $ 150,000 | $ 150,000 | | EE |
| Construction Oversight | 6% | of | $ 5,452,695 | $ 327,162 | | EE |
| Project Management/office support | 5% | of | $ 5,452,695 | $ 272,635 | | EPA |
| *Professional Services Subtotal* | | | | *$ 979,796* | | |
| **Total** | | | | **$ 6,770,050** | | |
| *+50%* | | | | *$ 10,155,075* | | |
| *-30%* | | | | *$ 4,739,035* | | |
| **Annual** | | | | | | |
| **O&M components - Annual for 3 years** | | | | | | |
| VGAC | 6,700 | Lb | $ 3 | $ 20,100 | Assumes that ~20K lb of GAC is needed to treat the 6,000 lb of COCs over a 3-yr span. | EE |
| **Total** | | | | **$ 20,100** | | |
| *+50%* | | | | $ 30,150 | | |
| *-30%* | | | | $ 14,070 | | |
| **Years** | **3** | | | | | |
| **NPV** | **2%** | | | **$ 57,966** | | |
| *+50%* | | | | *$ 86,949* | | |
| *-30%* | | | | *$ 40,576* | | |
| **O&M components - Annual for 5 years (AS/SVE)** | | | | | | |
| Monthly UIC Reporting | 12 | Month | $ 3,000 | $ 36,000 | | EE |
| Air permit monitoring and reporting | 12 | Month | $ 5,000 | $ 60,000 | | EE |
| Performance Monitoring - Soil Gas Sampling | 2 | Event | $ 25,000 | $ 50,000 | 20 sampling locations/event | EE |
| Electricity | 12 | Month | $ 12,000 | $ 144,000 | | EE |
| System O&M - AS/SVE | 1 | Year | $ 50,000 | $ 50,000 | | EE |
| Equipment Maintenance - AS/SVE | 1 | LS | $ 75,000 | $ 75,000 | | EE |
| Project Management | 1 | LS | $ 60,000 | $ 60,000 | | EPA |
| **Total** | | | | **$ 475,000** | | |
| *+50%* | | | | $ 712,500 | | |
| *-30%* | | | | $ 332,500 | | |

**ALTERNATIVE 3**
**AS/SVE via HDD Wells**

| Item | | Qty | Unit | Unit Cost | Total | Notes | Source |
|---|---|---|---|---|---|---|---|
| | **Years** | **5** | | | | | |
| | **NPV** | **2%** | | | **$ 2,238,893** | | |
| | *+50%* | | | | *$ 3,358,340* | | |
| | *-30%* | | | | *$ 1,567,225* | | |
| **O&M components - Annual for 30 years (LTM + VIMS)** | | | | | | | |
| Performance Monitoring - GW and VI Sampling | | 2 | Event | $ 125,000 | $ 250,000 | | EE |
| System O&M - VIMs | | 1 | LS | $ 50,000 | $ 50,000 | | EE |
| Equipment Maintenance - VIMs | | 1 | LS | $ 5,375 | $ 5,375 | Assume 25 houses need blower replacement ($215/blower) | EE |
| Project Management | | 10% | % | $ 300,000.00 | $ 25,000 | | EE |
| | **Total** | | | | **$ 330,375** | | |
| | *+50%* | | | | $ 495,563 | | |
| | *-30%* | | | | $ 231,263 | | |
| | **Years** | **30** | | | | | |
| | **NPV** | **2%** | | | **$ 7,399,229** | | |
| | *+50%* | | | | *$ 11,098,844* | | |
| | *-30%* | | | | *$ 5,179,460* | | |
| | *Contingency* | 10% | of | $ 16,466,138 | *$ 1,646,614* | | |
| | **Total** | | | | **$ 18,112,752** | | |
| | *+50%* | | | | *$ 27,169,128* | | |
| | *-30%* | | | | *$ 12,678,927* | | |

Notes:
Items sourced as Cascade, Carbonair, or Seneca from recent vendor quotes.

This is not an offer for construction and/or project execution. Please note, these AACE Class 4 order of magnitude cost estimates are assumed to represent the actual installed cost within the range of - 30 percent to + 50 percent of the costs indicated. The cost estimate has been prepared for guidance in project evaluation and implementation from the information available at the time of the estimate. The final costs of the project will depend on final approved design, actual labor and material costs, competitive variable factors. This estimate is not an offer to perform the work.

**ALTERNATIVE 4**
**ISCO via Direct Injection**

| Item | Qty | Unit | Unit Cost | Total | Notes | Source |
|---|---|---|---|---|---|---|
| *Drilling Costs* | | | | | | |
| Mobilization | 1 | LS | $ 50,000 | $ 50,000 | | Engineer's Estimate (EE) |
| Utility Location | 1 | LS | $ 30,000 | $ 30,000 | | EE |
| Vertical ISCO wells - Shallow Pairs | 13,090 | Feet | $ 60 | $ 785,400 | 4630 total feet with 30 feet spacing or 154 pairs, inclusive rate for drilling, well materials, completions, development | Cascade |
| Vertical ISCO wells - Intermediate Pairs | 37,835 | Feet | $ 60 | $ 2,270,100 | 9870 total feet with 30 feet spacing or 329 pairs, inclusive rate for drilling, well materials, completions, development | Cascade |
| Vertical ISCO wells - Trios (S & I) | 15,300 | Feet | $ 60 | $ 918,000 | 3060 total feet with 30 feet spacing or 102 trios, inclusive rate for drilling, well materials, completions, development | Cascade |
| Monitoring Well Installation | 1,170 | Feet | $ 60 | $ 70,200 | Assume 18 new wells, inclusive rate for drilling, well materials, completions, development | Cascade |
| Support Crew Drilling | 645 | Day | $ 425 | $ 274,125 | 2 days per well for installation (1,290 wells) | Cascade |
| Traffic controls | 24 | month | $ 25,000 | $ 600,000 | Includes traffic control plans, equipment, and staff | EE |
| Well infrastructure abandonment | 67,395 | Feet | $ 20 | $ 1,347,900 | Per foot of well | |
| As-Built Survey | 1 | LS | $ 25,000 | $ 25,000 | Well survey | EE |
| Frac tank delivery to site | 1 | EA | $ 1,500 | $ 1,500 | For well development water | EE |
| Frac tank and containment rentals | 24 | MONTH | $ 1,500 | $ 36,000 | For well development water | EE |
| IDW - Development Water | 150,000 | Gal | $ 1 | $ 150,000 | Transportation and disposal of development water, assumed 3 well volumes per well | EE |
| IDW | 1,000 | Ton | $ 200 | $ 200,000 | Handling, waste characterization sampling, disposal of 1000 tons of soil. | EE |
| Analytical - Waste Profiling | 1 | LS | $ 2,500 | $ 2,500 | | |
| *Drilling Subtotal* | | | | *$ 6,760,725* | | |
| *Injection System Costs* | | | | | | |
| Injection equipment | 1 | LS | $ 100,000 | $ 100,000 | | |
| *Injection System Subtotal* | | | | *$ 100,000* | | |
| *Tax, Bonding, and Markup* | | | | | | |
| Taxes on Equipment | 7% | of | $ 100,000 | $ 7,250 | Taxes applied to equipment furnished by others and delivered to site for installation | |
| Subcontractor Bonding | 2% | of | $ 6,758,225 | $ 135,165 | Bonding applied to civil construction elements | |
| Subcontractor Markup | 5% | of | $ 6,858,225 | $ 342,911 | Subcontractor markup applied to equipment, civil construction, and drilling | |
| *Tax, Bond, and Markup Subtotal* | | | | *$ 485,326* | | |
| *Professional Services Costs* | | | | | | |
| Design | 1 | LS | $ 150,000 | $ 150,000 | | |
| Construction Oversight | 6% | of | $ 6,860,725 | $ 411,644 | | |
| Project Management/office support | 5% | of | $ 6,860,725 | $ 343,036 | | |
| *Professional Services Subtotal* | | | | *$ 904,680* | | |
| **Total** | | | | **$ 8,250,731** | | |
| *+50%* | | | | *$ 12,376,096* | | |
| *-30%* | | | | *$ 5,775,511* | | |
| **Annual** | | | | | | |
| **O&M components - Annual for 5 years (ISCO)** | | | | | | |
| Monthly UIC Reporting | 12 | Month | $ 3,000 | $ 36,000 | | EE |
| UIC Exemption | 1 | LS | $ 30,000 | $ 30,000 | Work Plan submitted prior to each injection | EE |
| Water | 4000 | 1,000 gal. | $ 1.00 | $ 4,000 | | EE |
| Oxidant (Permanganate) | 914,909 | lb | $ 2.10 | $ 1,921,310 | | Carus |
| 3% oxidant solution delivered | 3,654,522 | Gal | $ 1.45 | $ 5,299,056 | Chemical included on previous line; for solution, trucks and delivery directly from truck | Carus |
| Labor | 4200 | hours | $ 100 | $ 420,000 | 2 staff for 170 days, 1 staff for 80 days for chemical handling | EE |
| Traffic controls | 6 | month | $ 25,000 | $ 150,000 | Includes traffic control plans, equipment, and staff | EE |
| Expenses | 420 | days | $ 400 | $ 168,000 | 2 staff for 170 days, 1 staff for 80 days for chemical handling | EE |
| Project Management | 5% | of | $ 8,028,366 | $ 401,418 | | |
| **Total** | | | | **$ 8,393,785** | | |
| *+50%* | | | | $ 12,590,677 | | |
| *-30%* | | | | $ 5,875,649 | | |
| **Years** | **5** | | | | | |
| **NPV** | **2%** | | | **$ 39,563,763** | | |
| *+50%* | | | | *$ 59,345,645* | | |
| *-30%* | | | | *$ 27,694,634* | | |
| **O&M components - Annual for 30 years (LTM + VIMS)** | | | | | | |
| Performance Monitoring - GW and VI Sampling | 2 | Event | $ 125,000 | $ 250,000 | | EE |
| System O&M - VIMs | 1 | LS | $ 50,000 | $ 50,000 | | EE |
| Equipment Maintenance - VIMs | 1 | LS | $ 5,375 | $ 5,375 | Assume 25 houses need blower replacement ($215/blower) | EE |
| Project Management | 10% | % | $ 300,000 | $ 25,000 | | EE |
| **Total** | | | | **$ 330,375** | | |
| *+50%* | | | | $ 495,563 | | |
| *-30%* | | | | $ 231,263 | | |
| **Years** | **30** | | | | | |
| **NPV** | **2%** | | | **$ 7,399,229** | | |
| *+50%* | | | | *$ 11,098,844* | | |
| *-30%* | | | | *$ 5,179,460* | | |
| *Contingency* | 10% | of | $ 55,213,723 | *$ 5,521,372* | | |
| **Total** | | | | **$ 60,735,095** | | |
| *+50%* | | | | *$ 91,102,643* | | |
| *-30%* | | | | *$ 42,514,567* | | |

Notes:
Items sourced as Cascade or Seneca from recent vendor quotes.

This is not an offer for construction and/or project execution. Please note, these AACE Class 4 order of magnitude cost estimates are assumed to represent the actual installed cost within the range of - 30 percent to + 50 percent of the costs indicated. The cost estimate has been prepared for guidance in project evaluation and implementation from the information available at the time of the estimate. The final costs of the project will depend on final approved design, actual labor and material costs, competitive variable factors. This estimate is not an offer to perform the work.

# Itemized Cost Summary

BEHR DAYTON SITE, DAYTON, OH SITE ID = B5 FH

Cumulative Site Expenditures Through 04/30/2020.

| | |
|---|---|
| **REGIONAL PAYROLL COSTS** | $765,374.79 |
| **HEADQUARTERS PAYROLL COSTS** | $12,555.64 |
| **REGIONAL TRAVEL COSTS** | $39,220.03 |
| **HEADQUARTERS TRAVEL COSTS** | $328.12 |
| **ALLOCATION TRANSFER IAG (ATS)** | |
| AGENCY FOR TOXIC SUBSTANCES & DISEASE RGY (ATSDR) | $191,302.35 |
| **EMERGENCY REMOVAL CLEANUP (ERC) CONTRACT** | |
| ENVIRONMENTAL QUALITY MANAGEMENT (68-S5-0306) | $940,951.16 |
| **ENFORCEMENT SUPPORT SERVICES (ESS) CONTRACT** | |
| TOEROEK ASSOCIATES, INC. (EPS51401) | $27,126.04 |
| GRB ENVIRONMENTAL SERVICES, INC. (EPW05013) | $32,361.73 |
| **ENVIRONMENTAL SERVICES ASSISTANCE TEAMS (ESAT)** | |
| TECHLAW, INC. (EPW06031) | $66,580.52 |
| TECHLAW, INC. (EPW13025) | $104,030.50 |
| **INTERAGENCY AGREEMENT (IAG)** | |
| DEPARTMENT OF ENERGY (DW89923106) | $2,817.50 |
| **RESPONSE ACTION (RAC) CONTRACT** | |
| CH2M HILL, INC. (EPS50601) | $3,939,626.24 |
| **SUPERFUND COOPERATIVE AGREEMENT (SCA)** | |
| OHIO ENVIRONMENTAL PROTECTION AGENCY (V00E01185) | $46,143.97 |
| OHIO ENVIRONMENTAL PROTECTION AGENCY (V01E01185) | $66,943.03 |
| OHIO ENVIRONMENTAL PROTECTION AGENCY (V02E01185) | $28,861.39 |
| OHIO ENVIRONMENTAL PROTECTION AGENCY (V03E01185) | $13,771.46 |
| OHIO ENVIRONMENTAL PROTECTION AGENCY (V04E01185) | $7,229.57 |
| OHIO E.P.A. (V98568703) | $16,905.04 |

Itemized Cost Summary

BEHR DAYTON SITE, DAYTON, OH SITE ID = B5 FH

Cumulative Site Expenditures Through 04/30/2020.

| | |
|---|---|
| OHIO E.P.A. (V98568704) | $69,231.78 |
| **SUPERFUND TECH. ASSISTANCE & RESPONSE TEAM (START)** | |
| WESTON SOLUTIONS, INC. (EPS50604) | $893,111.08 |
| **TECHNICAL SERVICE AND SUPPORT** | |
| DYNCORP SYSTEMS & SOLUTIONS LLC (68-W0-3016) | $53,708.68 |
| COMPUTER SERVICE CORP. (68-W0-6046) | $1,114.47 |
| ASRC MANAGEMENT SERVICES, INC. (EPW05052) | $12,310.55 |
| PRIMUS SOLUTIONS, INC. (EPW11024) | $10,190.05 |
| ARCTIC SLOPE MISSION SERVICES (EPW17011) | $925.19 |
| SCIENCE APPLICATIONS INT'L CORP. (GSF0076J) | $2,846.29 |
| E2, INC. (GSF0309N) | $33,318.01 |
| **CONTRACT LAB PROGRAM (CLP) COSTS** | |
| FINANCIAL COST SUMMARY | $508,320.58 |
| **EPA INDIRECT COSTS** | $4,715,313.60 |
| **TOTAL SITE COSTS BEFORE COST RECOVERY COLLECTIONS** | $12,602,519.36 |
| **COLLECTIONS/ADJUSTMENTS** | ($2,275,943.74) |
| **Total Site Costs:** | $10,326,575.62 |

# REMEDIAL DESIGN/REMEDIAL ACTION

# STATEMENT OF WORK

# BEHR DAYTON THERMAL VOC PLUME SUPERFUND SITE

**Dayton, Montgomery County, State of Ohio**

**EPA Region 5**

**July 2020**

## TABLE OF CONTENTS

# 1. INTRODUCTION

**1.1 Purpose of the SOW**. This Statement of Work (SOW) sets forth the procedures and requirements for implementing the Work.

**1.2 Structure of the SOW**

- Section 2 (Community Involvement) sets forth EPA's and Settling Defendants' (SDs') responsibilities for community involvement.
- Section 3 (Remedial Design) sets forth the process for developing the RD, which includes the submission of specified primary deliverables.
- Section 4 (Remedial Action) sets forth requirements regarding the completion of the RA, including primary deliverables related to completion of the RA.
- Section 5 (Reporting) sets forth SDs' reporting obligations.
- Section 6 (Deliverables) describes the content of the supporting deliverables and the general requirements regarding SDs' submission of, and EPA's review of, approval of, comment on, and/or modification of, the deliverables.
- Section 7 (Schedules) sets forth the schedule for submitting the primary deliverables, specifies the supporting deliverables that must accompany each primary deliverable, and sets forth the schedule of milestones regarding the completion of the RA.
- Section 8 (State Participation) addresses State participation.
- Section 9 (References) provides a list of references, including URLs.

**1.3** The Scope of the Remedy includes the actions described in Section 1.4 of the ROD, including:

(a) Installing, operating, maintaining, and monitoring an air sparging (AS) and soil vapor extraction (SVE) system to mitigate trichloroethylene (TCE) concentrations in the surficial aquifer. The zone of influence of the AS wells shall extend to no less than the portion of the groundwater plume at the Site consisting of 500 parts per billion (ppb) or more of TCE. The zone of influence of the SVE in the vadose zone shall exceed the corresponding area of influence of the AS in the saturated zone by no less than 100 feet.

(b) Sampling of occupiable commercial, residential, and industrial buildings for potential vapor intrusion (VI) impacts. This includes the following buildings above the portion of the Site groundwater plume which is in excess of the most current (at the time of sampling) vapor intrusion screening level (VISL) or within 100 feet of the portion of the groundwater plume exceeding the VISL:

1) Buildings for which a complete set of VI samples was not collected in accordance with the unilateral administrative order issued by EPA to Behr Dayton Thermal LLC in 2009 (the 2009 UAO); and

2) Buildings for which VI samples were taken more than 5 years prior (at the time of sampling) and not equipped with a vapor intrusion mitigation system (VIMS).

(c) Installing new VIMS for occupied commercial, residential, and industrial buildings impacted by VI above current (at the time of sampling) health-based screening levels or for which EPA finds VI impacts to be imminent (based on sub-slab soil vapors);

(d) Maintaining and monitoring new and existing VIMS equipped on buildings in the vicinity of the Site as well as the SVE system that is located just south of the MAHLE Behr Dayton LLC facility at 1600 Webster Street in Dayton, Ohio (the MAHLE facility) and was installed in or about 2008 (the 2008 SVE); and

(e) Implementing institutional controls.

**1.4** The terms used in this SOW that are defined in CERCLA, in regulations promulgated under CERCLA, or in the Consent Decree (CD), have the meanings assigned to them in CERCLA, in such regulations, or in the CD, except that the term "Paragraph" or "¶" means a paragraph of the SOW, and the term "Section" means a section of the SOW, unless otherwise stated.

## 2. COMMUNITY INVOLVEMENT

### 2.1 Community Involvement Responsibilities

(a) EPA has the lead responsibility for developing and implementing community involvement activities at the Site. During the remedial investigation/feasibility study (RI/FS) phase, EPA developed a Community Involvement Plan (CIP) for the Site. Pursuant to 40 C.F.R. § 300.435(c), EPA shall review the existing CIP and determine whether it should be revised to describe further public involvement activities during the Work that are not already addressed or provided for in the existing CIP.

(b) If requested by EPA, SDs shall participate in community involvement activities, including participation in (1) the preparation of information regarding the Work for dissemination to the public, with consideration given to including mass media and/or Internet notification, and (2) public meetings that may be held or sponsored by EPA to explain activities at or relating to the Site. SDs' support of EPA's community involvement activities may include providing online access to initial submissions and updates of deliverables to (1) any Community Advisory Groups, (2) any Technical Assistance Grant recipients and their advisors, and (3) other entities to provide them with a reasonable opportunity for review and comment. EPA may describe in its CIP SDs' responsibilities for community involvement activities. All community involvement activities conducted by SDs at EPA's request are subject to EPA's oversight. Upon EPA's request, SDs shall establish a community information repository at or near the Site to house one copy of the administrative record or maintain the existing repository.

(c) **SDs' CI Coordinator**. If requested by EPA, SDs shall, within 15 days, designate and notify EPA of SDs' Community Involvement Coordinator (SDs' CI Coordinator). SDs may hire a contractor for this purpose. SDs' notice must include the name, title, and qualifications of the SDs' CI Coordinator. SDs' CI Coordinator is responsible for providing support regarding EPA's community involvement activities, including coordinating with EPA's CI Coordinator regarding responses to the public's inquiries about the Site.

## 3. REMEDIAL DESIGN

**3.1** **RD Work Plan**. SDs shall submit a Remedial Design (RD) Work Plan (RDWP) for EPA approval. The RDWP must include:

(a) Plans for implementing all RD activities identified in this SOW, in the RDWP, or required by EPA to be conducted to develop the RD;

(b) A description of the overall management strategy for performing the RD, including a proposal for phasing of design and construction, if applicable;

(c) A description of the proposed general approach to contracting, construction, operation, maintenance, and monitoring of the Remedial Action (RA) as necessary to implement the Work;

(d) A description of the responsibility and authority of all organizations and key personnel involved with the development of the RD;

(e) Descriptions of any areas requiring clarification and/or anticipated problems (e.g., data gaps);

(f) Description of any proposed pre-design investigation;

(g) Descriptions of any applicable permitting requirements and other regulatory requirements;

(h) Description of plans for obtaining access in connection with the Work, such as property acquisition, property leases, right-of-way (ROW) access, and/or easements; and

(i) The following supporting deliverables described in ¶ 6.7 (Supporting Deliverables): Health and Safety Plan; Emergency Response Plan; Field Sampling Plan, and Quality Assurance Project Plan.

**3.2** Until the RD is deemed final, SDs shall meet weekly (in person, via telephone, or via web conference) with EPA to discuss design issues as necessary, unless otherwise directed by EPA.

**3.3** **Pre-Design Investigation**. The purpose of the Pre-Design Investigation (PDI) is to address data gaps by conducting additional field investigations.

(a) **PDI Work Plan**. SDs shall submit a PDI Work Plan (PDIWP) for EPA approval. The PDIWP must include:

(1) An evaluation and summary of existing data and description of data gaps;

(2) A sampling plan including media to be sampled, contaminants or parameters for which sampling will be conducted, location (areal extent and depths), and number of samples; and

(3) Cross references to quality assurance/quality control (QA/QC) requirements set forth in the Quality Assurance Project Plan (QAPP) as described in ¶ 6.7(d).

(b) Following the PDI, SDs shall submit a PDI Evaluation Report for EPA approval. This report must include:

(1) Summary of the investigations performed;

(2) Summary of investigation results;

(3) Summary of validated data (i.e., tables and graphics);

(4) Data validation reports and laboratory data reports;

(5) Narrative interpretation of data and results;

(6) Results of statistical and modeling analyses;

(7) Photographs documenting the work conducted; and

(8) Conclusions and recommendations for RD, including design parameters and criteria.

(c) EPA may require SDs to supplement the PDI Evaluation Report and/or to perform additional pre-design studies.

**3.4 Preliminary (30%) RD**. SDs shall submit a Preliminary (30%) RD for EPA's comment. The Preliminary RD must include:

(a) A design criteria report, as described in the *Remedial Design/Remedial Action Handbook*, EPA 540/R-95/059 (June 1995);

(b) Preliminary drawings and specifications;

(c) Descriptions of permit requirements, if applicable;

(d) Preliminary Operation and Maintenance (O&M) Plan and O&M Manual;

(e) A description of how the RA will be implemented in a manner that minimizes environmental impacts in accordance with EPA's *Principles for Greener Cleanups* (Aug. 2009);

(f) A description of monitoring and control measures to protect human health and the environment, such as air monitoring and dust suppression, during the RA;

(g) Any proposed revisions to the RA Schedule that is set forth in ¶ 7.3 (RA Schedule); and

(h) Updates of all supporting deliverables required to accompany the RDWP and the following additional supporting deliverables described in ¶ 6.7 (Supporting Deliverables): Site Wide Monitoring Plan; Construction Quality Assurance/Quality Control Plan; Transportation and Off-Site Disposal Plan; O&M Plan; O&M Manual; and Institutional Controls Implementation and Assurance Plan.

**3.5 Intermediate (60%) RD**. Unless otherwise directed by EPA, SDs shall submit the Intermediate (60%) RD for EPA's comment. The Intermediate RD must: (a) be a continuation and expansion of the Preliminary RD; (b) address EPA's comments regarding the Preliminary RD; and (c) include the same elements as are required for the Preliminary (30%) RD.

**3.6 Pre-Final (95%) RD**. SDs shall submit the Pre-final (95%) RD for EPA's comment. The Pre-final RD must be a continuation and expansion of the previous design submittal and must address EPA's comments regarding the Intermediate RD. The Pre-final RD will serve as the approved Final (100%) RD if EPA approves the Pre-final RD without comments. The Pre-final RD must include:

(a) A complete set of construction drawings and specifications that are: (1) certified by a registered professional engineer; (2) suitable for procurement; and (3) follow the Construction Specifications Institute's MasterFormat or equivalent, as approved by EPA.

(b) A survey and engineering drawings showing existing Site features, such as elements, property borders, easements, and Site conditions;

(c) Pre-Final versions of the same elements and deliverables as are required for the Preliminary and Intermediate RD;

(d) A specification for photographic documentation of the RA; and

(e) Updates of all supporting deliverables required to accompany the Preliminary (30%) RD.

**3.7 Final (100%) RD**. SDs shall submit the Final (100%) RD for EPA approval. The Final RD must address EPA's comments on the Pre-final RD and must include final versions of all Pre-final RD deliverables.

## 4. REMEDIAL ACTION

**4.1 RA Work Plan**. SDs shall submit a RA Work Plan (RAWP) for EPA approval that includes:

(a) A proposed RA Construction Schedule;

(b) An updated Health and Safety Plan that covers activities during the RA; and

(c) Plans for satisfying permitting requirements, including obtaining any needed permits for off-Site activity and for satisfying substantive requirements of permits for on-Site activity.

**4.2 Meetings and Inspections**

(a) **Preconstruction Conference**. After RD approval and no less than 14 days before construction mobilization, SDs shall hold a preconstruction conference with EPA and others as directed or approved by EPA and as described in the *Remedial Design/Remedial Action Handbook*, EPA 540/R-95/059 (June 1995). SDs shall prepare minutes of the conference and shall distribute the minutes to all Parties.

(b) **Periodic Meetings**. During the construction portion of the RA (RA Construction), SDs shall meet (in person or via telephone or web conference) weekly with EPA and others, or as frequently as directed by EPA, to discuss construction issues. SDs shall distribute an agenda and list of attendees to all Parties prior to each meeting. SDs shall prepare minutes of the meetings and shall distribute the minutes to all Parties.

(c) **Inspections**

(1) EPA or its representative shall conduct periodic inspections of and have an on-Site presence during the Work. At EPA's request, the Supervising Contractor or other designee shall accompany EPA or its representative during inspections.

(2) SDs shall provide personal protective equipment needed for EPA personnel and any oversight officials to perform their oversight duties.

(3) Upon notification by EPA of any deficiencies in the RA Construction, SDs shall take all necessary steps to correct the deficiencies and/or bring the RA Construction into compliance with the approved Final RD, any approved design changes, and/or the approved RAWP. If applicable, SDs shall comply with any schedule provided by EPA in its notice of deficiency.

**4.3 Emergency Response and Reporting**

(a) **Emergency Response and Reporting**. If any event occurs during performance of the Work that causes or threatens to cause a release of Waste Material on, at, or from the Site and that either constitutes an emergency situation or that may present an immediate threat to public health or welfare or the environment, SDs shall: (1) immediately take all appropriate action to prevent, abate, or minimize such release or threat of release; (2) immediately notify the authorized EPA officer (as specified in ¶ 4.3(c)) orally; and (3) take such actions in consultation with the authorized EPA officer and in accordance with all applicable provisions of the Health and Safety Plan, the Emergency Response Plan, and any other deliverable approved by EPA under the SOW.

(b) **Release Reporting**. Upon the occurrence of any event during performance of the Work that SDs are required to report pursuant to Section 103 of CERCLA, 42 U.S.C. § 9603, or Section 304 of the Emergency Planning and Community Right-to-Know Act (EPCRA), 42 U.S.C. § 11004, SDs shall immediately notify the authorized EPA officer orally.

(c) The "authorized EPA officer" for purposes of immediate oral notifications and consultations under ¶ 4.3(a) and ¶ 4.3(b) is the EPA Project Coordinator, the EPA Alternate Project Coordinator (if the EPA Project Coordinator is unavailable), or Ohio EPA's Site Manager (if neither EPA Project Coordinator is available).

(d) For any event covered by ¶ 4.3(a) and ¶ 4.3(b), SDs shall: (1) within 14 days after the onset of such event, submit a report to EPA describing the actions or events that occurred and the measures taken, and to be taken, in response thereto; and (2) within 30 days after the conclusion of such event, submit a report to EPA describing all actions taken in response to such event.

(e) The reporting requirements under ¶ 4.3 are in addition to the reporting required by CERCLA § 103 or EPCRA § 304.

### 4.4 Off-Site Shipments

(a) SDs may ship hazardous substances, pollutants, and contaminants from the Site to an off-Site facility only if they comply with Section 121(d)(3) of CERCLA, 42 U.S.C. § 9621(d)(3), and 40 C.F.R. § 300.440. SDs will be deemed to be in compliance with CERCLA § 121(d)(3) and 40 C.F.R. § 300.440 regarding a shipment if SDs obtain a prior determination from EPA that the proposed receiving facility for such shipment is acceptable under the criteria of 40 C.F.R. § 300.440(b).

(b) SDs may ship Waste Material from the Site to an out-of-state waste management facility only if, prior to any shipment, they provide notice to the appropriate state environmental official in the receiving facility's state and to the EPA Project Coordinator. This notice requirement will not apply to any off-Site shipments when the total quantity of all such shipments does not exceed 10 cubic yards. The notice must include the following information, if available: (1) the name and

location of the receiving facility; (2) the type and quantity of Waste Material to be shipped; (3) the schedule for the shipment; and (4) the method of transportation. SDs also shall notify the state environmental official referenced above and the EPA Project Coordinator of any major changes in the shipment plan, such as a decision to ship the Waste Material to a different out-of-state facility. SDs shall provide the notice after the award of the contract for RA construction and before the Waste Material is shipped.

(c) SDs may ship Investigation Derived Waste (IDW) from the Site to an off-Site facility only if they comply with Section 121(d)(3) of CERCLA, 42 U.S.C. § 9621(d)(3), 40 C.F.R. § 300.440, *EPA's Guide to Management of Investigation Derived Waste*, OSWER 9345.3-03FS (Jan. 1992), and any IDW-specific requirements contained in the ROD. Wastes shipped off-Site to a laboratory for characterization, and RCRA hazardous wastes that meet the requirements for an exemption from RCRA under 40 CFR § 261.4(e) shipped off-Site for treatability studies, are not subject to 40 C.F.R. § 300.440.

## 4.5 RA Construction Completion

(a) For purposes of this ¶ 4.5, "RA Construction" comprises the construction and operational startup of the AS/SVE system described in ¶ 1.3 as well as the construction and implementation of all other monitoring and maintenance equipment and activities deemed necessary by EPA for the system to be fully operational.

(b) **Inspection of Constructed Remedy**. SDs shall schedule an inspection to review the construction and operation of the system and to review whether the system is functioning properly and as designed. The inspection must be attended by SDs and EPA and/or their representatives. A re-inspection must be conducted if requested by EPA.

(c) **Shakedown Period**. There shall be a shakedown period of up to one year for EPA to review whether the remedy is functioning properly and performing as designed. SDs shall provide such information as EPA requests for such review.

(d) **RA Report**. Following the shakedown period, SDs shall submit an "RA Report" requesting EPA's determination that the RA Construction has been completed. The RA Report must: (1) include statements by a registered professional engineer and by SDs' Project Coordinator that construction of the system is complete and that the system is functioning properly and as designed; (2) include a demonstration, and supporting documentation, that construction of the system is complete and that the system is functioning properly and as designed; (3) include as-built drawings signed and stamped by a registered professional engineer; (4) be prepared in accordance with Chapter 2 (Remedial Action Completion) of EPA's *Close Out Procedures for NPL Sites* guidance (May 2011), as supplemented by *Guidance for Management of Superfund Remedies in Post Construction*, OLEM

9200.3-105 (Feb. 2017); and (5) be certified in accordance with ¶ 6.5 (Certification).

(e) If EPA determines that RA Construction is not complete, EPA shall so notify SDs. EPA's notice must include a description of, and schedule for, the activities that SDs must perform to complete RA Construction. EPA's notice may include a schedule for completion of such activities or may require SDs to submit a proposed schedule for EPA approval. SDs shall perform all activities described in the EPA notice in accordance with the schedule.

(f) If EPA determines, based on the initial or any subsequent RA Report, that RA Construction is complete, EPA shall so notify SDs.

**4.6 Certification of RA Completion**

(a) **Monitoring Report**. Following the RA construction completion determination, SDs shall submit a Monitoring Report to EPA requesting EPA's Certification of RA Completion. The report must: (1) include certifications by a registered professional engineer and by SD's Project Coordinator that the RA is complete; (2) be prepared in accordance with Chapter 2 (Remedial Action Completion) of EPA's *Close Out Procedures for NPL Sites* guidance (May 2011), as supplemented by *Guidance for Management of Superfund Remedies in Post Construction*, OLEM 9200.3-105 (Feb. 2017); (3) contain monitoring data to demonstrate that Performance Standards have been achieved; and (4) be certified in accordance with ¶ 6.5 (Certification).

(b) If EPA concludes that the RA is not complete, EPA shall so notify SDs. EPA's notice must include a description of any deficiencies. EPA's notice may include a schedule for addressing such deficiencies or may require SDs to submit a schedule for EPA approval. SDs shall perform all activities described in the notice in accordance with the schedule.

(c) If EPA concludes, based on the initial or any subsequent Monitoring Report requesting Certification of RA Completion, that the RA is Complete, EPA shall so certify to SDs. This certification will constitute the Certification of RA Completion for purposes of the CD, including Section XV of the CD (Covenants by Plaintiff). Certification of RA Completion will not affect SDs' remaining obligations under the CD.

**4.7 Periodic Review Support Plan (PRSP)**. SDs shall submit the PRSP for EPA approval. The PRSP addresses the studies and investigations that SDs shall conduct to support EPA's reviews of whether the RA is protective of human health and the environment in accordance with Section 121(c) of CERCLA, 42 U.S.C. § 9621(c) (also known as "Five-year Reviews"). SDs shall develop the plan in accordance with *Comprehensive Five-year Review Guidance*, OSWER 9355.7-03B-P (June 2001), and any other relevant five-year review guidances.

**4.8 Certification of Work Completion**

(a) **Work Completion Inspection**. SDs shall schedule an inspection for the purpose of obtaining EPA's Certification of Work Completion. The inspection must be attended by SDs and EPA and/or their representatives.

(b) **Work Completion Report**. Following the inspection, SDs shall submit a report to EPA requesting EPA's Certification of Work Completion. The report must: (1) include certifications by a registered professional engineer and by SDs' Project Coordinator that the Work, including all O&M activities, is complete; and (2) be certified in accordance with ¶ 6.5 (Certification). If the RA Monitoring Report submitted under ¶ 4.6(a) includes all elements required under this ¶ 4.8(b), then the RA Monitoring Report suffices to satisfy all requirements under this ¶ 4.8(b).

(c) If EPA concludes that the Work is not complete, EPA shall so notify SDs. EPA's notice must include a description of the activities that SDs must perform to complete the Work. EPA's notice must include specifications and a schedule for such activities or must require SDs to submit specifications and a schedule for EPA approval. SDs shall perform all activities described in the notice or in the EPA-approved specifications and schedule.

(d) If EPA concludes, based on the initial or any subsequent report requesting Certification of Work Completion, that the Work is complete, EPA shall so certify in writing to SDs. Issuance of the Certification of Work Completion does not affect the following continuing obligations: (1) activities under the PRSP; (2) obligations under Sections VIII (Property Requirements), XIX (Retention of Records), and XVIII (Access to Information) of the CD; (3) Institutional Controls obligations as provided in the ICIAP; (4) all VI activities described in ¶ 1.3; and (5) reimbursement of EPA's Future Response Costs under Section X (Payments for Response Costs) of the CD.

## 5. REPORTING

**5.1 Progress Reports**. Commencing with the month following lodging of the CD and until EPA approves the RA Construction Completion, SDs shall submit progress reports to EPA on a monthly basis, or as otherwise requested by EPA. The reports must cover all activities that took place during the prior reporting period, including:

(a) The actions that have been taken toward achieving compliance with the CD;

(b) A summary of all results of sampling, tests, and all other data received or generated by SDs;

(c) A description of all deliverables that SDs submitted to EPA;

(d) A description of all activities relating to RA Construction that are scheduled for the next six weeks;

(e) An updated RA Construction Schedule, together with information regarding percentage of completion, delays encountered or anticipated that may affect the future schedule for implementation of the Work, and a description of efforts made to mitigate those delays or anticipated delays;

(f) A description of any modifications to the work plans or other schedules that SDs have proposed or that have been approved by EPA; and

(g) A description of all activities undertaken in support of the CIP during the reporting period and those to be undertaken in the next six weeks.

**5.2** **Notice of Progress Report Schedule Changes**. If the schedule for any activity described in the Progress Reports, including activities required to be described under ¶ 5.1(d), changes, SDs shall notify EPA of such change at least 7 days before performance of the activity.

## 6. DELIVERABLES

**6.1** **Applicability**. SDs shall submit deliverables for EPA approval or for EPA comment as specified in the SOW. If neither is specified, the deliverable does not require EPA's approval or comment. Paragraphs 6.2 (In Writing) through 6.4 (Technical Specifications) apply to all deliverables. Paragraph 6.5 (Certification) applies to any deliverable that is required to be certified. Paragraph 6.6 (Approval of Deliverables) applies to any deliverable that is required to be submitted for EPA approval.

**6.2** **In Writing**. As provided in ¶ 87 of the CD, all deliverables under this SOW must be in writing unless otherwise specified.

**6.3** **General Requirements for Deliverables.** All deliverables must be submitted by the deadlines in the RD Schedule or RA Schedule, as applicable. SDs shall submit all deliverables to EPA in electronic form. Technical specifications for sampling and monitoring data and spatial data are addressed in ¶ 6.4. All other deliverables shall be submitted to EPA in the electronic form specified by the EPA Project Coordinator. If any deliverable includes maps, drawings, or other exhibits that are larger than 8.5" by 11", SDs shall also provide EPA with paper copies of such exhibits.

**6.4** **Technical Specifications**

(a) Sampling and monitoring data should be submitted in standard EPA Region 5 Electronic Data Deliverable (EDD) format, which can be found at https://www.epa.gov/superfund/region-5-superfund-electronic-data-submission. Other delivery methods may be allowed if electronic direct submission presents a significant burden or as technology changes.

(b) Spatial data, including spatially-referenced data and geospatial data, should be submitted: (1) in the ESRI File Geodatabase format and (2) as unprojected geographic coordinates in decimal degree format using North American Datum 1983 (NAD83) or World Geodetic System 1984 (WGS84) as the datum. If

applicable, submissions should include the collection method(s). Projected coordinates may optionally be included but must be documented. Spatial data should be accompanied by metadata, and such metadata should be compliant with the Federal Geographic Data Committee (FGDC) Content Standard for Digital Geospatial Metadata and its EPA profile, the EPA Geospatial Metadata Technical Specification. An add-on metadata editor for ESRI software, the EPA Metadata Editor (EME), complies with these FGDC and EPA metadata requirements and is available at https://www.epa.gov/geospatial/epa-metadata-editor.

(c) Each file must include an attribute name for each Site unit or sub-unit submitted. Consult https://www.epa.gov/geospatial/geospatial-policies-and-standards for any further available guidance on attribute identification and naming.

(d) Spatial data submitted by SDs does not, and is not intended to, define the boundaries of the Site.

**6.5 Certification**. All deliverables that require compliance with this ¶ 6.5 must be signed by the SDs' Project Coordinator, or other responsible official of SDs, and must contain the following statement:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I have no personal knowledge that the information submitted is other than true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

**6.6 Approval of Deliverables**

(a) **Initial Submissions**

(1) After review of any deliverable that is required to be submitted for EPA approval under the CD or the SOW, EPA shall: (i) approve, in whole or in part, the submission; (ii) approve the submission upon specified conditions; (iii) disapprove, in whole or in part, the submission; or (iv) any combination of the foregoing.

(2) EPA also may modify the initial submission to cure deficiencies in the submission if: (i) EPA determines that disapproving the submission and awaiting a resubmission would cause substantial disruption to the Work; or (ii) previous submission(s) have been disapproved due to material defects and the deficiencies in the initial submission under consideration indicate a bad faith lack of effort to submit an acceptable deliverable.

(b) **Resubmissions**. Upon receipt of a notice of disapproval under ¶ 6.6(a) (Initial Submissions), or if required by a notice of approval upon specified conditions under ¶ 6.6(a), SDs shall, within 14 days or such longer time as specified by EPA in such notice, correct the deficiencies and resubmit the deliverable for approval. After review of the resubmitted deliverable, EPA may: (1) approve, in whole or in part, the resubmission; (2) approve the resubmission upon specified conditions; (3) modify the resubmission; (4) disapprove, in whole or in part, the resubmission, requiring SDs to correct the deficiencies; or (5) any combination of the foregoing.

(c) **Implementation**. Upon approval, approval upon conditions, or modification by EPA under ¶ 6.6(a) (Initial Submissions) or ¶ 6.6(b) (Resubmissions), of any deliverable, or any portion thereof: (1) such deliverable, or portion thereof, will be incorporated into and enforceable under the CD; and (2) SDs shall take any action required by such deliverable, or portion thereof. The implementation of any non-deficient portion of a deliverable submitted or resubmitted under ¶ 6.6(a) or ¶ 6.6(b) does not relieve SDs of any liability for stipulated penalties under Section XIV (Stipulated Penalties) of the CD.

**6.7 Supporting Deliverables**. SDs shall submit each of the following supporting deliverables for EPA approval, except as specifically provided. SDs shall develop the deliverables in accordance with all applicable regulations, guidances, and policies (see Section 9 (References)). SDs shall update each of these supporting deliverables as necessary or appropriate during the course of the Work, and/or as requested by EPA.

(a) **Health and Safety Plan**. The Health and Safety Plan (HASP) describes all activities to be performed to protect on-Site personnel and area residents from physical, chemical, and all other hazards posed by the Work. SDs shall develop the HASP in accordance with EPA's Emergency Responder Health and Safety and Occupational Safety and Health Administration (OSHA) requirements under 29 C.F.R. §§ 1910 and 1926. The HASP should cover RD activities and should be, as appropriate, updated to cover activities during the RA and updated to cover activities after RA completion. EPA does not approve the HASP but will review it to ensure that all necessary elements are included and that the plan provides for the protection of human health and the environment.

(b) **Emergency Response Plan**. The Emergency Response Plan (ERP) must describe procedures to be used in the event of an accident or emergency at the Site (for example, power outages, water impoundment failure, treatment plant failure, slope failure, etc.). The ERP must include:

(1) Name of the person or entity responsible for responding in the event of an emergency incident;

(2) Plan and date(s) for meeting(s) with the local community, including local, State, and federal agencies involved in the cleanup, as well as local emergency squads and hospitals;

(3) Spill Prevention, Control, and Countermeasures (SPCC) Plan (if applicable), consistent with the regulations under 40 C.F.R. Part 112, describing measures to prevent, and contingency plans for, spills and discharges;

(4) Notification activities in accordance with ¶ 4.3(b) (Release Reporting) in the event of a release of hazardous substances requiring reporting under Section 103 of CERCLA, 42 U.S.C. § 9603, or Section 304 of the Emergency Planning and Community Right-to-know Act (EPCRA), 42 U.S.C. § 11004; and

(5) A description of all necessary actions to ensure compliance with Paragraph 11 (Emergencies and Releases) of the CD in the event of an occurrence during the performance of the Work that causes or threatens a release of Waste Material from the Site that constitutes an emergency or may present an immediate threat to public health or welfare or the environment.

(c) **Field Sampling Plan**. The Field Sampling Plan (FSP) addresses all sample collection activities. The FSP must be written so that a field sampling team unfamiliar with the project would be able to gather the samples and field information required. SDs shall develop the FSP in accordance with *Guidance for Conducting Remedial Investigations and Feasibility Studies*, EPA/540/G 89/004 (Oct. 1988).

(d) **Quality Assurance Project Plan**. The Quality Assurance Project Plan (QAPP) augments the FSP and addresses sample analysis and data handling regarding the Work. The QAPP must include a detailed explanation of SDs' quality assurance, quality control, and chain of custody procedures for all treatability, design, compliance, and monitoring samples. SDs shall develop the QAPP in accordance with *EPA Requirements for Quality Assurance Project Plans*, QA/R-5, EPA/240/B-01/003 (Mar. 2001, reissued May 2006); *Guidance for Quality Assurance Project Plans*, QA/G-5, EPA/240/R 02/009 (Dec. 2002); and *Uniform Federal Policy for Quality Assurance Project Plans*, Parts 1-3, EPA/505/B-04/900A though 900C (Mar. 2005). The QAPP also must include procedures:

(1) To ensure that EPA and its authorized representative have reasonable access to laboratories used by SDs in implementing the CD (SDs' Labs);

(2) To ensure that SDs' Labs analyze all samples submitted by EPA pursuant to the QAPP for quality assurance monitoring;

(3) To ensure that SDs' Labs can obtain reporting limits that conform to the required regulatory levels and perform all analyses using EPA-accepted methods (i.e., the methods documented in *USEPA Contract Laboratory Program Statement of Work for Inorganic Analysis*, ILM05.4 (Dec. 2006); *USEPA Contract Laboratory Program Statement of Work for Organic*

*Analysis*, SOM01.2 (amended Apr. 2007); and *USEPA Contract Laboratory Program Statement of Work for Inorganic Superfund Methods (Multi-Media, Multi-Concentration)*, ISM01.2 (Jan. 2010)) or other methods acceptable to EPA;

(4) To ensure that SDs' Labs participate in an EPA-accepted QA/QC program or other program QA/QC acceptable to EPA;

(5) For SDs to provide EPA with notice at least 28 days prior to any sample collection activity;

(6) For SDs to provide split samples and/or duplicate samples to EPA upon request;

(7) For EPA to take any additional samples that it deems necessary;

(8) For EPA to provide to SDs, upon request, split samples and/or duplicate samples in connection with EPA's oversight sampling; and

(9) For SDs to submit to EPA all sampling and test results and other data in connection with the implementation of the CD.

(e) **Site Wide Monitoring Plan**. The purpose of the Site Wide Monitoring Plan (SWMP) is to obtain baseline information regarding the extent of contamination in affected media at the Site; to obtain information, through short- and long- term monitoring, about the movement of and changes in contamination throughout the Site, before and during implementation of the RA; to obtain information regarding contamination levels to determine whether Performance Standards (PS) are achieved; and to obtain information to determine whether to perform additional actions, including further Site monitoring. The SWMP must include descriptions of:

(1) The environmental media to be monitored;

(2) The data collection parameters, including existing and proposed monitoring devices and locations, schedule and frequency of monitoring, analytical parameters to be monitored, and analytical methods employed;

(3) How performance data will be analyzed, interpreted, and reported, and/or other Site-related requirements;

(4) Verification sampling procedures;

(5) Deliverables that will be generated in connection with monitoring, including sampling schedules, laboratory records, monitoring reports, and monthly and annual reports to EPA and State agencies; and

(6) Proposed additional monitoring and data collection actions (such as increases in frequency of monitoring, and/or installation of additional monitoring devices in the affected areas) in the event that results from monitoring devices indicate changed conditions (such as higher than expected concentrations of the contaminants of concern or groundwater contaminant plume movement).

(f) **Construction Quality Assurance/Quality Control Plan (CQA/QCP)**. The purpose of the Construction Quality Assurance Plan (CQAP) is to describe planned and systemic activities that provide confidence that the RA construction will satisfy all plans, specifications, and related requirements, including quality objectives. The purpose of the Construction Quality Control Plan (CQCP) is to describe the activities to verify that RA construction has satisfied all plans, specifications, and related requirements, including quality objectives. The CQA/QCP must:

(1) Identify, and describe the responsibilities of, the organizations and personnel implementing the CQA/QCP;

(2) Describe the PS required to be met to achieve Completion of the RA;

(3) Describe the activities to be performed: (i) to provide confidence that PS will be met and (ii) to determine whether PS have been met;

(4) Describe verification activities, such as inspections, sampling, testing, monitoring, and production controls, under the CQA/QCP;

(5) Describe industry standards and technical specifications used in implementing the CQA/QCP;

(6) Describe procedures for tracking construction deficiencies from identification through corrective action;

(7) Describe procedures for documenting all CQA/QCP activities; and

(8) Describe procedures for retention of documents and for final storage of documents.

(g) **Transportation and Off-Site Disposal Plan**. The Transportation and Off-Site Disposal Plan (TODP) describes plans to ensure compliance with ¶ 4.4 (Off-Site Shipments). The TODP must include:

(1) Proposed routes for off-Site shipment of Waste Material;

(2) Identification of communities affected by shipment of Waste Material; and

(3) Description of plans to minimize impacts on affected communities.

(h) **O&M Plan**. The O&M Plan describes the requirements for inspecting, operating, and maintaining the RA. SDs shall develop the O&M Plan in accordance with *Guidance for Management of Superfund Remedies in Post Construction*, OLEM 9200.3-105 (Feb. 2017). The O&M Plan must include the following additional requirements:

(1) Description of PS required to be met to implement the ROD;

(2) Description of activities to be performed: (i) to provide confidence that PS will be met and (ii) to determine whether PS have been met;

(3) **O&M Reporting**. Description of records and reports that will be generated during O&M, such as daily operating logs, laboratory records, records of operating costs, reports regarding emergencies, personnel and maintenance records, monitoring reports, and monthly and annual reports to EPA and State agencies;

(4) Description of corrective action in case of systems failure, including: (i) alternative procedures to prevent the release or threatened release of Waste Material which may endanger public health and the environment or may cause a failure to achieve PS; (ii) analysis of vulnerability and additional resource requirements should a failure occur; (iii) notification and reporting requirements should O&M systems fail or be in danger of imminent failure; and (iv) community notification requirements; and

(5) Description of corrective action to be implemented in the event that PS are not achieved and a schedule for implementing these corrective actions.

(i) **O&M Manual**. The O&M Manual serves as a guide to the purpose and function of the equipment and systems that make up the remedy. SDs shall develop the O&M Manual in accordance with *Guidance for Management of Superfund Remedies in Post Construction*, OLEM 9200.3-105 (Feb. 2017).

(j) **Institutional Controls Implementation and Assurance Plan**. The Institutional Controls Implementation and Assurance Plan (ICIAP) describes plans to implement, maintain, and enforce the Institutional Controls (ICs) at the Site. SDs shall develop the ICIAP in accordance with *Institutional Controls: A Guide to Planning, Implementing, Maintaining, and Enforcing Institutional Controls at Contaminated Sites*, OSWER 9355.0-89, EPA/540/R-09/001 (Dec. 2012), and *Institutional Controls: A Guide to Preparing Institutional Controls Implementation and Assurance Plans at Contaminated Sites*, OSWER 9200.0-77, EPA/540/R-09/02 (Dec. 2012). The ICIAP must include the following additional requirements:

(1) Locations of recorded real property interests (e.g., easements, liens) and resource interests in the property that may affect ICs (e.g., surface, mineral, and water rights) including accurate mapping and geographic information system (GIS) coordinates of such interests; and

(2) Legal descriptions and survey maps that are prepared according to current American Land Title Association (ALTA) survey guidelines and certified by a licensed surveyor.

## 7. SCHEDULES

**7.1 Applicability and Revisions**. All deliverables and tasks required under this SOW must be submitted or completed by the deadlines or within the time durations listed in the RD and RA Schedules set forth below. SDs may submit proposed revised RD Schedules or RA Schedules for EPA approval. Upon EPA's approval, the revised RD and/or RA Schedules supersede the RD and RA Schedules set forth below, and any previously-approved RD and/or RA Schedules.

**7.2 RD Schedule**

| | **Description of Deliverable, Task** | **¶ Ref.** | **Deadline** |
|---|---|---|---|
| | | | |
| | | | |
| 1 | RDWP | 3.1 | 60 days after EPA's Authorization to Proceed regarding Supervising Contractor under CD ¶ [**9.c**] |
| 2 | PDIWP | 3.3(a) | 30 days after EPA's Authorization to Proceed regarding Supervising Contractor under CD ¶ [**9.c**] |
| 3 | Preliminary (30%) RD | 3.4, 3.3(a) | 30 days after EPA approval of Final RDWP |
| 5 | Intermediate (60%) RD | 3.5 | 30 days after EPA comments on Preliminary RD |
| 7 | Pre-final (90/95%) RD | 3.6 | 30 days after EPA comments on Intermediate RD |
| 8 | Final (100%) RD | 3.7 | 14 days after EPA comments on Pre-final RD |

**7.3 RA Schedule**

| | Description of Deliverable / Task | ¶ Ref. | Deadline |
|---|---|---|---|
| 1 | Award RA contract | | 30 days after EPA Notice of Authorization to Proceed with RA |
| 2 | RAWP | 4.1 | 60 days after EPA Notice of Authorization to Proceed with RA |
| 3 | Pre-Construction Conference | 4.2(a) | 14 days after Approval of RAWP |
| 4 | Start of Construction | | 30 days after Approval of RAWP or at the beginning of the next construction season, as approved by EPA |
| 5 | Completion of Construction | | 180 days after start of construction |
| 6 | Pre-final Inspection | 4.5(b) | 14 days after completion of construction |
| 7 | Pre-final Inspection Report | 4.5(d) | 30 days after completion of Pre-final Inspection |
| 8 | Final Inspection | | 14 days after Completion of Work identified in Pre-final Inspection Report |
| 9 | RA Report | 4.5(d) | 30 days after Final Inspection |
| 10 | Monitoring Report | 4.6(a) | 60 days after RA Construction Completion determination |
| 11 | Work Completion Report | 4.8(b) | |
| 12 | Periodic Review Support Plan | 4.7 | Five years after Start of RA Construction |

## 8. STATE PARTICIPATION

**8.1** **Copies**. SDs shall, at any time they send a deliverable to EPA, send a copy of such deliverable to the State. EPA shall, at any time it sends a notice, authorization, approval, disapproval, or certification to SDs, send a copy of such document to the State.

**8.2** **Review and Comment**. The State will have a reasonable opportunity for review and comment prior to:

(a) Any EPA approval or disapproval under ¶ 6.6 (Approval of Deliverables) of any deliverables that are required to be submitted for EPA approval; and

(b) Any approval or disapproval of the Construction Phase under ¶ 4.5 (RA Construction Completion), any disapproval of, or Certification of RA Completion under ¶ 4.6 (Certification of RA Completion), and any disapproval of, or Certification of Work Completion under ¶ 4.8 (Certification of Work Completion).

## 9. REFERENCES

**9.1** The following regulations and guidance documents, among others, apply to the Work. Any item for which a specific URL is not provided below is available on one of the two EPA Web pages listed in ¶ 9.2:

(a) A Compendium of Superfund Field Operations Methods, OSWER 9355.0-14, EPA/540/P-87/001a (Aug. 1987).

(b) CERCLA Compliance with Other Laws Manual, Part I: Interim Final, OSWER 9234.1-01, EPA/540/G-89/006 (Aug. 1988).

(c) Guidance for Conducting Remedial Investigations and Feasibility Studies, OSWER 9355.3-01, EPA/540/G-89/004 (Oct. 1988).

(d) CERCLA Compliance with Other Laws Manual, Part II, OSWER 9234.1-02, EPA/540/G-89/009 (Aug. 1989).

(e) Guidance on EPA Oversight of Remedial Designs and Remedial Actions Performed by Potentially Responsible Parties, OSWER 9355.5-01, EPA/540/G-90/001 (Apr.1990).

(f) Guidance on Expediting Remedial Design and Remedial Actions, OSWER 9355.5-02, EPA/540/G-90/006 (Aug. 1990).

(g) Guide to Management of Investigation-Derived Wastes, OSWER 9345.3-03FS (Jan. 1992).

(h) Permits and Permit Equivalency Processes for CERCLA On-Site Response Actions, OSWER 9355.7-03 (Feb. 1992).

(i) Guidance for Conducting Treatability Studies under CERCLA, OSWER 9380.3-10, EPA/540/R-92/071A (Nov. 1992).

(j) National Oil and Hazardous Substances Pollution Contingency Plan; Final Rule, 40 C.F.R. Part 300 (Oct. 1994).

(k) Guidance for Scoping the Remedial Design, OSWER 9355.0-43, EPA/540/R-95/025 (Mar. 1995).

(l) Remedial Design/Remedial Action Handbook, OSWER 9355.0-04B, EPA/540/R-95/059 (June 1995).

(m) EPA Guidance for Data Quality Assessment, Practical Methods for Data Analysis, QA/G-9, EPA/600/R-96/084 (July 2000).

(n) Comprehensive Five-year Review Guidance, OSWER 9355.7-03B-P, 540-R-01-007 (June 2001).

(o) Guidance for Quality Assurance Project Plans, QA/G-5, EPA/240/R-02/009 (Dec. 2002).

(p) Institutional Controls: Third Party Beneficiary Rights in Proprietary Controls (Apr. 2004).

(q) Quality management systems for environmental information and technology programs -- Requirements with guidance for use, ASQ/ANSI E4:2014 (American Society for Quality, February 2014).

(r) Uniform Federal Policy for Quality Assurance Project Plans, Parts 1-3, EPA/505/B-04/900A though 900C (Mar. 2005).

(s) Superfund Community Involvement Handbook, SEMS 100000070 (January 2016), https://www.epa.gov/superfund/community-involvement-tools-and-resources.

(t) EPA Guidance on Systematic Planning Using the Data Quality Objectives Process, QA/G-4, EPA/240/B-06/001 (Feb. 2006).

(u) EPA Requirements for Quality Assurance Project Plans, QA/R-5, EPA/240/B-01/003 (Mar. 2001, reissued May 2006).

(v) EPA Requirements for Quality Management Plans, QA/R-2, EPA/240/B-01/002 (Mar. 2001, reissued May 2006).

(w) USEPA Contract Laboratory Program Statement of Work for Inorganic Analysis, ILM05.4 (Dec. 2006).

(x) USEPA Contract Laboratory Program Statement of Work for Organic Analysis, SOM01.2 (amended Apr. 2007).

(y) EPA National Geospatial Data Policy, CIO Policy Transmittal 05-002 (Aug. 2008), https://www.epa.gov/geospatial/geospatial-policies-and-standards and https://www.epa.gov/geospatial/epa-national-geospatial-data-policy.

(z) Summary of Key Existing EPA CERCLA Policies for Groundwater Restoration, OSWER 9283.1-33 (June 2009).

(aa) Principles for Greener Cleanups (Aug. 2009), https://www.epa.gov/greenercleanups/epa-principles-greener-cleanups.

(bb) USEPA Contract Laboratory Program Statement of Work for Inorganic Superfund Methods (Multi-Media, Multi-Concentration), ISM01.2 (Jan. 2010).

(cc) Close Out Procedures for National Priorities List Sites, OSWER 9320.2-22 (May 2011).

(dd) Groundwater Road Map: Recommended Process for Restoring Contaminated Groundwater at Superfund Sites, OSWER 9283.1-34 (July 2011).

(ee) Recommended Evaluation of Institutional Controls: Supplement to the "Comprehensive Five-Year Review Guidance," OSWER 9355.7-18 (Sep. 2011).

(ff) Construction Specifications Institute's MasterFormat [**specify current edition**], available from https://www.csiresources.org/home.

(gg) Updated Superfund Response and Settlement Approach for Sites Using the Superfund Alternative Approach, OSWER 9200.2-125 (Sep. 2012)

(hh) Institutional Controls: A Guide to Planning, Implementing, Maintaining, and Enforcing Institutional Controls at Contaminated Sites, OSWER 9355.0-89, EPA/540/R-09/001 (Dec. 2012).

(ii) Institutional Controls: A Guide to Preparing Institutional Controls Implementation and Assurance Plans at Contaminated Sites, OSWER 9200.0-77, EPA/540/R-09/02 (Dec. 2012).

(jj) EPA's Emergency Responder Health and Safety Manual, OSWER 9285.3-12 (July 2005 and updates), https://www.epaosc.org/_HealthSafetyManual/manual-index.htm.

(kk) Broader Application of Remedial Design and Remedial Action Pilot Project Lessons Learned, OSWER 9200.2-129 (Feb. 2013).

(ll) Guidance for Evaluating Completion of Groundwater Restoration Remedial Actions, OSWER 9355.0-129 (Nov. 2013).

(mm) Groundwater Remedy Completion Strategy: Moving Forward with the End in Mind, OSWER 9200.2-144 (May 2014).

(nn) Guidance for Management of Superfund Remedies in Post Construction, OLEM 9200.3-105 (Feb. 2017), https://www.epa.gov/superfund/superfund-post-construction-completion.

**9.2** A more complete list may be found on the following EPA Web pages:

Laws, Policy, and Guidance: https://www.epa.gov/superfund/superfund-policy-guidance-and-laws

Test Methods Collections: https://www.epa.gov/measurements/collection-methods

**9.3** For any regulation or guidance referenced in the CD or SOW, the reference will be read to include any subsequent modification, amendment, or replacement of such regulation or guidance. Such modifications, amendments, or replacements apply to the Work only after SDs receive notification from EPA of the modification, amendment, or replacement.

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Office of Enforcement and Compliance Assurance
EPA-300-B-17-001 June 2017

# U.S. EPA Small Business Resources Information Sheet

The United States Environmental Protection Agency provides an array of resources to help small businesses understand and comply with federal and state environmental laws. In addition to helping small businesses understand their environmental obligations and improve compliance, these resources will also help such businesses find cost-effective ways to comply through pollution prevention techniques and innovative technologies.

**Office of Small and Disadvantaged Business Utilization (OSDBU)**
www.epa.gov/aboutepa/about-officesmall-and-disadvantaged-businessutilization-osdbu

EPA's OSBBU advocates and advances business, regulatory, and environmental compliance concerns of small and socio-economically disadvantaged businesses.

**EPA's Asbestos Small Business Ombudsman (ASBO)**
www.epa.gov/resources-smallbusinesses/asbestos-small-businessombudsman or 1-800-368-5888

The EPA ASBO serves as a conduit for small businesses to access EPA and facilitates communications between the small business community and the Agency.

**Small Business Environmental Assistance Program**
https://nationalsbeap.org This program provides a "one-stop shop" for small businesses and assistance providers seeking information on a wide range of environmental topics and statespecific environmental compliance assistance resources.

**EPA's Compliance Assistance Homepage**
www.epa.gov/compliance

This page is a gateway to industry and statute-specific environmental resources, from extensive web-based information to hotlines and compliance assistance specialists.

**Compliance Assistance Centers**
www.complianceassistance.net

EPA sponsored Compliance Assistance Centers provide information targeted to industries with many small businesses. They were developed in partnership with industry, universities and other federal and state agencies.

**Agriculture**
www.epa.gov/agriculture

**Automotive Recycling**
www.ecarcenter.org

**Automotive Service and Repair**
www.ccar-greenlink.org or 1-888-GRN-LINK

**Chemical Manufacturing**
www.chemalliance.org

**Construction**
www.cicacenter.org

**Education**
www.campuserc.org

**Food Processing**
www.fpeac.org

**Healthcare**
www.hercenter.org

**Local Government**
www.lgean.org

**Surface Finishing**
http://www.sterc.org

**Paints and Coatings**
www.paintcenter.org

**Printing**
www.pneac.org

**Ports**
www.portcompliance.org

**Transportation**
www.tercenter.org

**U.S. Border Compliance and Import/Export Issues**
www.bordercenter.org

**EPA Hotlines and Clearinghouses**
www.epa.gov/home/epa-hotlines

EPA sponsors many free hotlines and clearinghouses that provide convenient assistance regarding environmental requirements. Examples include:

**Clean Air Technology Center (CATC) Info-line** www.epa.gov/catc or 1-919-541-0800

**Superfund, TRI, EPCRA, RMP, and Oil Information Center** 1-800-424-9346

**EPA Imported Vehicles and Engines Public Helpline**
www.epa.gov/otaq/imports or 1-734-214-4100

**National Pesticide Information Center**
www.npic.orst.edu or 1-800-858-7378

**National Response Center Hotline** to report oil and hazardous substance spills - http://nrc.uscg.mil or 1-800-424-8802

**Pollution Prevention Information Clearinghouse (PPIC)** - www.epa.gov/p2/pollution-preventionresources#ppic or 1-202-566-0799

**Safe Drinking Water Hotline** - www.epa.gov/ground-water-and-drinkingwater/safe-drinking-water-hotline or 1800-426-4791

**Toxic Substances Control Act (TSCA) Hotline** tsca-hotline@epa.gov or 1-202-554-1404

**Office of Enforcement and Compliance Assurance**

## U.S. Small Business Resources

**Small Entity Compliance Guides**
https://www.epa.gov/reg-flex/small-entity-complianceguides

EPA publishes a Small Entity Compliance Guide (SECG) for every rule for which the Agency has prepared a final regulatory flexibility analysis, in accordance with Section 604 of the Regulatory Flexibility Act (RFA).

**Regional Small Business Liaisons**
www.epa.gov/resources-small-businesses/epa-regionaloffice-small-business-liaisons

The U.S. Environmental Protection Agency (EPA) Regional Small Business Liaison (RSBL) is the primary regional contact and often the expert on small business assistance, advocacy, and outreach. The RSBL is the regional voice for the EPA Asbestos and Small Business Ombudsman (ASBO).

**State Resource Locators**
www.envcap.org/statetools

The Locators provide state-specific contacts, regulations and resources covering the major environmental laws.

**State Small Business Environmental Assistance Programs (SBEAPs)**
https://nationalsbeap.org/states/list

State SBEAPs help small businesses and assistance providers understand environmental requirements and sustainable business practices through workshops, trainings and site visits.

**EPA's Tribal Portal**
www.epa.gov/tribalportal

The Portal helps users locate tribal-related information within EPA and other federal agencies.

**EPA Compliance Incentives**

EPA provides incentives for environmental compliance. By participating in compliance assistance programs or voluntarily disclosing and promptly correcting violations before an enforcement action has been initiated, businesses may be eligible for penalty waivers or reductions. EPA has two such policies that may apply to small businesses:

**EPA's Small Business Compliance Policy**
www.epa.gov/enforcement/small-businesses-andenforcement

**EPA's Audit Policy** www.epa.gov/compliance/epas-audit-policy

**Commenting on Federal Enforcement Actions and Compliance Activities**

The Small Business Regulatory Enforcement Fairness Act (SBREFA) established a SBREFA Ombudsman and 10 Regional Fairness Boards to receive comments from small businesses about federal agency enforcement actions. If you believe that you fall within the Small Business Administration's definition of a small business (based on your North American Industry Classification System designation, number of employees or annual receipts, as defined at 13 C.F.R. 121.201; in most cases, this means a business with 500 or fewer employees), and wish to comment on federal enforcement and compliance activities, call the SBREFA Ombudsman's toll-free number at 1-888-REG-FAIR (1-888-734-3247).

Every small business that is the subject of an enforcement or compliance action is entitled to comment on the Agency's actions without fear of retaliation. EPA employees are prohibited from using enforcement or any other means of retaliation against any member of the regulated community in response to comments made under SBREFA.

**Your Duty to Comply**

If you receive compliance assistance or submit a comment to the SBREFA Ombudsman or Regional Fairness Boards, you still have the duty to comply with the law, including providing timely responses to EPA information requests, administrative or civil complaints, other enforcement actions or communications. The assistance information and comment processes do not give you any new rights or defenses in any enforcement action. These processes also do not affect EPA's obligation to protect public health or the environment under any of the environmental statutes it enforces, including the right to take emergency remedial or emergency response actions when appropriate. Those decisions will be based on the facts in each situation. The SBREFA Ombudsman and Fairness Boards do not participate in resolving EPA's enforcement actions. Also, remember that to preserve your rights, you need to comply with all rules governing the enforcement process.

***EPA is disseminating this information to you without making a determination that your business or organization is a small business as defined by Section 222 of the Small Business Regulatory Enforcement Fairness Act or related provisions.***