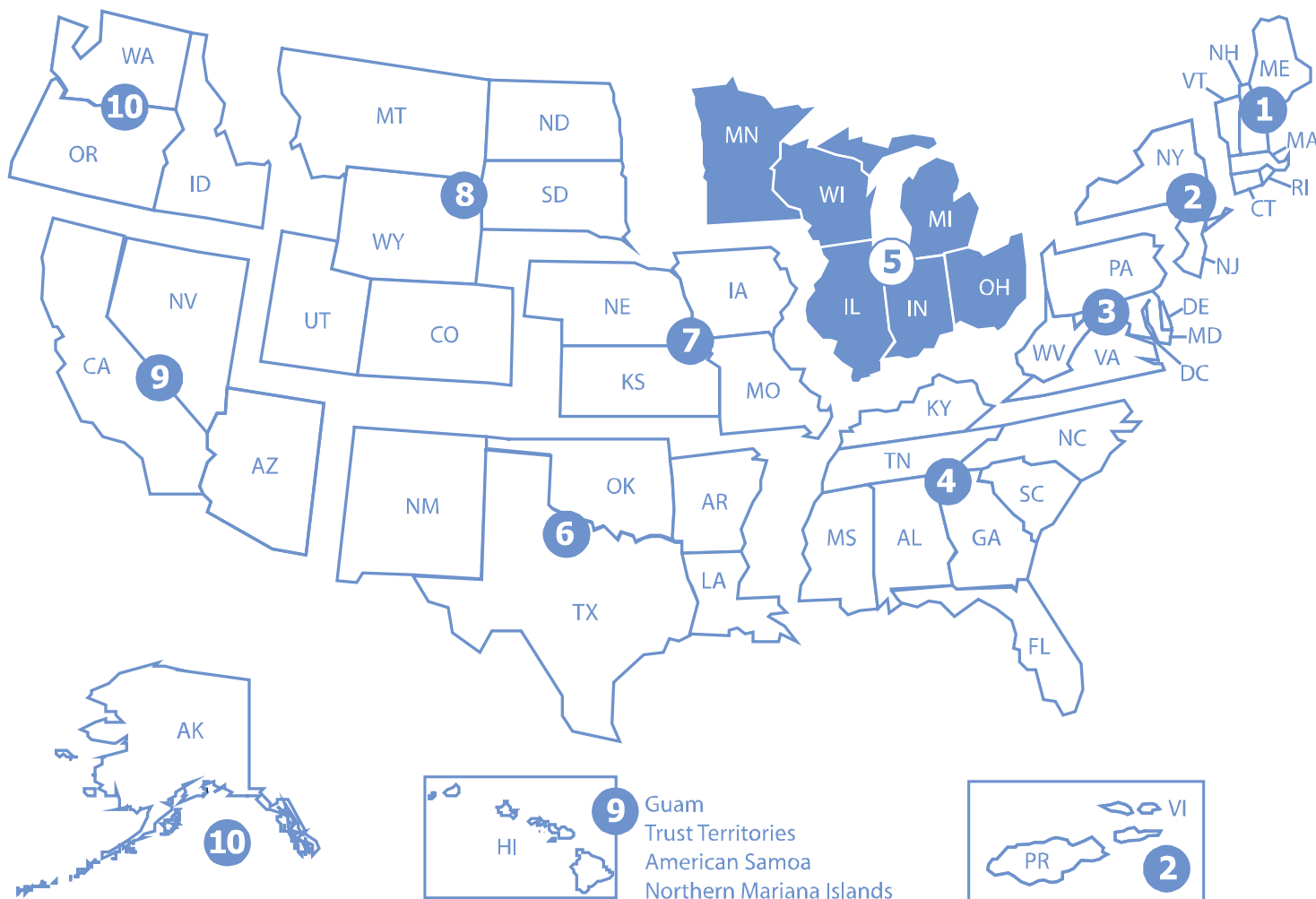




Support Document for the Revised National Priorities List Final Rule – Behr Dayton Thermal System VOC (Volatile Organic Compound) Plume



**Support Document for the
Revised National Priorities List
Final Rule
Behr Dayton Thermal System VOC Plume
April 2009**

**Site Assessment and Remedy Decisions Branch
Office of Superfund Remediation and Technology Innovation
Office of Solid Waste and Emergency Response
U.S. Environmental Protection Agency
Washington, DC 20460**

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Executive Summary

Section 105(a)(8)(B) of CERCLA, as amended by SARA, requires that the EPA prepare a list of national priorities among the known releases or threatened releases of hazardous substances, pollutants, or contaminants throughout the United States. An original National Priorities List (NPL) was promulgated on September 8, 1983 (48 FR 40658). CERCLA requires that EPA update the list at least annually.

This document provides responses to public comments received on the Behr Dayton Thermal System VOC Plume site, proposed on September 3, 2008 (73 FR 51393). This site is being added to the NPL based on an evaluation under EPA's Hazard Ranking System (HRS) in a final rule published in the *Federal Register* in April 2009. Several additional sites are being promulgated concurrently.

Introduction

This document explains the rationale for adding the Behr Dayton Thermal System VOC Plume site, in Dayton, Ohio to the National Priorities List (NPL) of uncontrolled hazardous waste sites and also provides the responses to public comments received on this site. The EPA proposed this site on September 3, 2008 (73 FR 51393). This site is being added to the NPL based on an evaluation under the Hazard Ranking System (HRS) in a final rule published in the *Federal Register* in April 2009.

Background of the NPL

In 1980, Congress enacted the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 U.S.C. Sections 9601 *et seq.* in response to the dangers of uncontrolled hazardous waste sites. CERCLA was amended on October 17, 1986, by the Superfund Amendments and Reauthorization Act (SARA), Public Law No. 99-499, *stat.*, 1613 *et seq.* To implement CERCLA, EPA promulgated the revised National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 CFR Part 300, on July 16, 1982 (47 FR 31180), pursuant to CERCLA Section 105 and Executive Order 12316 (46 FR 42237, August 20, 1981). The NCP, further revised by EPA on September 16, 1985 (50 FR 37624) and November 20, 1985 (50 FR 47912), sets forth guidelines and procedures needed to respond under CERCLA to releases and threatened releases of hazardous substances, pollutants, or contaminants. On March 8, 1990 (55 FR 8666), EPA further revised the NCP in response to SARA.

Section 105(a)(8)(A) of CERCLA, as amended by SARA, requires that the NCP include

criteria for determining priorities among releases or threatened releases throughout the United States for the purpose of taking remedial action and, to the extent practicable, take into account the potential urgency of such action, for the purpose of taking removal action.

Removal action involves cleanup or other actions that are taken in response to emergency conditions or on a short-term or temporary basis (CERCLA Section 101[23]). Remedial action is generally long-term in nature and involves response actions that are consistent with a permanent remedy for a release (CERCLA Section 101[24]). Criteria for placing sites on the NPL, which makes them eligible for remedial actions financed by the Trust Fund established under CERCLA, were included in the HRS. EPA promulgated the HRS as Appendix A of the NCP (47 FR 31219, July 16, 1982). On December 14, 1990 (56 FR 51532), EPA promulgated revisions to the HRS in response to SARA, and established the effective date for the HRS revisions as March 15, 1991.

Section 105(a)(8)(B) of CERCLA, as amended, requires that the statutory criteria provided by the HRS be used to prepare a list of national priorities among the known releases or threatened releases of hazardous substances, pollutants, or contaminants throughout the United States. The list, which is Appendix B of the NCP, is the NPL.

An original NPL of 406 sites was promulgated on September 8, 1983 (48 FR 40658). At that time, an HRS score of 28.5 was established as the cutoff for listing because it yielded an initial NPL of at least 400 sites, as suggested by CERCLA. The NPL has been expanded several times since then, most recently on September 3, 2008 (73 FR 51368). The Agency also has published a number of proposed rulemakings to add sites to the NPL. The most recent proposal was on September 3, 2008 (73 FR 51393).

Development of the NPL

The primary purpose of the NPL is stated in the legislative history of CERCLA (Report of the Committee on Environment and Public Works, Senate Report No. 96-848, 96th Cong., 2d Sess. 60 [1980]).

The priority list serves primarily informational purposes, identifying for the States and the public those facilities and sites or other releases which appear to warrant remedial actions. Inclusion of a facility or site on the list does not in itself reflect a judgment of the activities of its owner or operator, it does not require those persons to undertake any action, nor does it assign liability to any person. Subsequent government actions will be necessary in order to do so, and these actions will be attended by all appropriate procedural safeguards.

The NPL, therefore, is primarily an informational and management tool. The identification of a site for the NPL is intended primarily to guide EPA in determining which sites warrant further investigation to assess the nature and extent of the human health and environmental risks associated with the site and to determine what CERCLA-financed remedial action(s), if any, may be appropriate. The NPL also serves to notify the public of sites EPA believes warrant further investigation. Finally, listing a site may, to the extent potentially responsible parties are identifiable at the time of listing, serve as notice to such parties that the Agency may initiate CERCLA-financed remedial action.

CERCLA Section 105(a)(8)(B) directs EPA to list priority sites among the known releases or threatened release of hazardous substances, pollutants, or contaminants, and Section 105(a)(8)(A) directs EPA to consider certain enumerated and other appropriate factors in doing so. Thus, as a matter of policy, EPA has the discretion not to use CERCLA to respond to certain types of releases. Where other authorities exist, placing sites on the NPL for possible remedial action under CERCLA may not be appropriate. Therefore, EPA has chosen not to place certain types of sites on the NPL even though CERCLA does not exclude such action. If, however, the Agency later determines that sites not listed as a matter of policy are not being properly responded to, the Agency may consider placing them on the NPL.

Hazard Ranking System

The HRS is the principle mechanism EPA uses to place uncontrolled waste sites on the NPL. It is a numerically based screening system that uses information from initial, limited investigations -- the preliminary assessment and site inspection -- to assess the relative potential of sites to pose a threat to human health or the environment. HRS scores, however, do not determine the sequence in which EPA funds remedial response actions, because the information collected to develop HRS scores is not sufficient in itself to determine either the extent of contamination or

the appropriate response for a particular site. Moreover, the sites with the highest scores do not necessarily come to the Agency's attention first, so that addressing sites strictly on the basis of ranking would in some cases require stopping work at sites where it was already underway. Thus, EPA relies on further, more detailed studies in the remedial investigation/feasibility study that typically follows listing.

The HRS uses a structured value analysis approach to scoring sites. This approach assigns numerical values to factors that relate to or indicate risk, based on conditions at the site. The factors are grouped into three categories. Each category has a maximum value. The categories are:

- likelihood that a site has released or has the potential to release hazardous substances into the environment;
- characteristics of the waste (toxicity and waste quantity); and
- people or sensitive environments (targets) affected by the release.

Under the HRS, four pathways can be scored for one or more threats as identified below:

- Ground Water Migration (S_{gw})
 - drinking water
- Surface Water Migration (S_{sw})

The following threats are evaluated for two separate migration components, overland/flood migration and ground water to surface water.

 - drinking water
 - human food chain
 - sensitive environments
- Soil Exposure (S_s)
 - resident population
 - nearby population
 - sensitive environments
- Air Migration (S_a)
 - population
 - sensitive environments

After scores are calculated for one or more pathways according to prescribed guidelines, they are combined using the following root-mean-square equation to determine the overall site score (S), which ranges from 0 to 100:

$$S = \sqrt{\frac{S_{gw}^2 + S_{sw}^2 + S_s^2 + S_a^2}{4}}$$

If all pathway scores are low, the HRS score is low. However, the HRS score can be relatively high even if only one pathway score is high. This is an important requirement for HRS scoring because some extremely dangerous sites pose threats through only one pathway. For example, buried leaking drums of hazardous substances can contaminate drinking water wells, but -- if the drums are buried deep enough and the substances not very volatile -- not surface water or air.

Other Mechanisms for Listing

There are two mechanisms other than the HRS by which sites can be placed on the NPL. The first of these mechanisms, authorized by the NCP at 40 CFR 300.425(c)(2), allows each State and Territory to designate one site as its highest priority regardless of score. The last mechanism, authorized by the NCP at 40 CFR 300.425(c)(3), allows listing a site if it meets the following three requirements:

- Agency for Toxic Substances and Disease Registry (ATSDR) of the U.S. Public Health Service has issued a health advisory that recommends dissociation of individuals from the release;
- EPA determines the site poses a significant threat to public health; and
- EPA anticipates it will be more cost-effective to use its remedial authority than to use its emergency removal authority to respond to the site.

Organization of this Document

The following section contains EPA responses to site-specific public comments received on the proposal of the Behr Dayton Thermal System VOC Plume site on September 3, 2008 (73 FR 51393). The site discussion begins with a list of commenters, followed by a site description, a summary of comments, and Agency responses to each comment. A concluding statement indicates the effect of the comments on the HRS score for the site.

Glossary

The following acronyms and abbreviations are used throughout the text:

ACGIH	American Conference of Governmental Industrial Hygienists
Agency	U.S. Environmental Protection Agency
AOC	Administrative Order on Consent
ATSDR	Agency for Toxic Substances and Disease Registry
BDT	Behr Dayton Thermal System VOC Plume
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980, 42 U.S.C. Sections 9601 <i>et seq.</i> , also known as Superfund
CFR	Code of Federal Regulations
D.C.	District of Columbia
ED₁₀	10 Percent Effective Dose
EPA	U.S. Environmental Protection Agency

FR	Federal Register
FS	Feasibility Study
HEAST	Health Effects Assessment Summary Tables
HRS	Hazard Ranking System, Appendix A of the NCP
HRS score	Overall site score calculated using the Hazard Ranking System; ranges from 0 to 100
HTF	Human Toxicity Factor
IRIS	Integrated Risk Information System
LC₅₀	Lethal Concentration, 50 Percent
LD₅₀	Lethal Dose, 50 Percent
mg/kg	Milligram Per Kilogram
mg/kg/day	Milligram Per Kilogram Per Day
mg/kg-day	Milligram Per Kilogram Per Day
mg/m³	Milligram Per Cubic Meter
NCEA	National Center for Environmental Assessment
NCP	National Oil and Hazardous Substances Pollution Contingency Plan, 40 C.F.R. Part 300
NIOSH	National Institute for Occupational Safety and Health
NPL	National Priorities List, Appendix B of the NCP
PCE	Tetrachloroethene
ppm	Parts Per Million
p.	Page
pp.	Pages
RCRA	Resource Conservation and Recovery Act
Ref(s).	Reference (s)
RfC	Reference Concentration
RfD	Reference Dose
RI	Remedial Investigation
RTECS	Registry of Toxic Effects of Chemical Substances
SARA	Superfund Amendments and Reauthorization Act of 1986
SCDM	Superfund Chemical Data Matrix
SF	Slope Factor
STSCPTV	Superfund Technical Support Center Provisional Toxicity Issue Papers

TCA	Trichloroethane
TCE	Trichloroethene
TDL	Target Distance Limit
ug/L	Microgram Per Liter
µg/L	Microgram Per Liter
USGS	United States Geological Survey
VAP	Voluntary Action Program
VOC	Volatile Organic Compound

1.0 List of Commenters/Correspondents

EPA-HQ-SFUND-2008-0580-0005	Anonymous comment submitted October 9, 2008.
EPA-HQ-SFUND-2008-0580-0006	Comment submitted by Daniel C. Fouke, Professor, Department of Philosophy, University of Dayton, Dayton, Ohio, on October 9, 2008.
EPA-HQ-SFUND-2008-0580-0007	Anonymous public comment submitted October 10, 2008.
EPA-HQ-SFUND-2008-0580-0008	Anonymous public comment submitted October 15, 2008.
EPA-HQ-SFUND-2008-0580-0009	Comment submitted by Emilee George, Old North Dayton Neighborhood Association, Environmental Committee, on October 15, 2008.
EPA-HQ-SFUND-2008-0580-0010	Comment submitted by Matthew Reitman, Coordinator, Ohio Student Environmental Coalition, on October 29, 2008.
EPA-HQ-SFUND-2008-0580-0011	Comment submitted by Richard Stock, Business Research Group, University of Dayton, on October 29, 2008.
EPA-HQ-SFUND-2008-0580-0012	Comment submitted by J. Moser on October 30, 2008.
EPA-HQ-SFUND-2008-0580-0013	Anonymous public comment submitted November 1, 2008.
EPA-HQ-SFUND-2008-0580-0014	Comment submitted by Jerry Bowling III, President, McCook Field Neighborhood Association, on November 1, 2008.
EPA-HQ-SFUND-2008-0580-0014.1	Comment attachment (duplicate of letter submitted per EPA-HQ-SFUND-2008-0580-0023.1, see below) submitted by Jerry Bowling III, President, McCook Field Neighborhood Association, on November 1, 2008. (Attachment is a letter from the McCook Field Neighborhood Association to U.S. EPA CERCLA Docket Office, dated November 1, 2008).

EPA-HQ-SFUND-2008-0580-0014.2	Comment attachment submitted by Jerry Bowling III, President, McCook Field Neighborhood Association, on November 1, 2008. (Attachment is a report, "Cancer Incidence Among Residents of Census Tract 17, Dayton, Montgomery County, Ohio, 1996-2005.")
EPA-HQ-SFUND-2008-0580-0014.3	Comment attachment submitted by Jerry Bowling III, President, McCook Field Neighborhood Association, on November 1, 2008. (Attachment is a letter from U.S. Senators George V. Voinovich and Sherrod Brown to U.S. EPA Administrator Stephen L. Johnson, dated September 30, 2008).
EPA-HQ-SFUND-2008-0580-0015	Comment submitted by M. Johnson on November 2, 2008.
EPA-HQ-SFUND-2008-0580-0016	Anonymous public comment submitted November 2, 2008.
EPA-HQ-SFUND-2008-0580-0017	Comment submitted by Eric Sauer, Envision-Works, Inc. on November 3, 2008.
EPA-HQ-SFUND-2008-0580-0018	Comment submitted by C. Rasmussen on November 3, 2008.
EPA-HQ-SFUND-2008-0580-0019	Comment submitted by D. Phelan on November 3, 2008.
EPA-HQ-SFUND-2008-0580-0020	Anonymous public comment submitted November 3, 2008.
EPA-HQ-SFUND-2008-0580-0021	Comment submitted by K. Gant on November 3, 2008.
EPA-HQ-SFUND-2008-0580-0022	Comment submitted by Teresa Mills, Director, Buckeye Environmental Network, et al., on November 3, 2008.
EPA-HQ-SFUND-2008-0580-0023	Comment submitted by Jerry Bowling III, Member, BVOCAL (Behr VOC Area Leaders), on November 3, 2008.
EPA-HQ-SFUND-2008-0580-0023.1	Comment attachment submitted by Jerry Bowling III, Member, BVOCAL (Behr VOC Area Leaders), November 3, 2008. (Attachment is a duplicate of letter submitted per EPA-HQ-SFUND-2008-0580-0014.1, see above).
EPA-HQ-SFUND-2008-0580-0023.2	Comment attachment submitted by Jerry Bowling III, Member, BVOCAL (Behr VOC Area Leaders), November 3, 2008 (attachment is HRS documentation record for Behr Dayton site).

EPA-HQ-SFUND-2008-0580-0024	Comment submitted by W. Thomas on November 1, 2008.
EPA-HQ-SFUND-2008-0580-0025	Comment submitted by Teresa L. Horvath, President, Old North Dayton Neighborhood Association, on November 3, 2008.
EPA-HQ-SFUND-2008-0580-0026	Comment submitted by Josh Gubkin, Chrysler LLC, dated November 3, 2008.
EPA-HQ-SFUND-2008-0580-0026.1	Letter from Joshua W. Gubkin, Environmental Counsel, Chrysler LLC; letter is undated, but was attached to an email (see EPA-HQ-SFUND-2008-0580-0026, above) dated November 3, 2008.
EPA-HQ-SFUND-2008-0580-0027	Comment submitted by M. Arnold on November 3, 2008.
EPA-HQ-SFUND-2008-0580-0028	Comment submitted by Tammi L. Clements, Director, Department of Water, City of Dayton, on October 31, 2008.
EPA-HQ-SFUND-2008-0580-0028.1	Comment attachment submitted by Tammi L. Clements, Director, Department of Water, City of Dayton, October 31, 2008. (Attachment is an October 31, 2008 letter to U.S. EPA CERCLA Docket Office from Rhine McLin, Mayor; Joey D. Williams, City Commissioner; Dean Lovelace, City Commissioner; Matt Joseph, City Commissioner; Nan L. Whaley, City Commissioner, all of the City of Dayton).
EPA-HQ-SFUND-2008-0580-0029	Comment submitted by Laura Rench, Citizens for the Responsible Destruction of Chemical Weapons, on November 1, 2008.
EPA-HQ-SFUND-2008-0580-0030	Comment submitted by Ellen Mee, Director of Environmental Health Policy, Buckeye Environmental Network, on November 3, 2008.
EPA-HQ-SFUND-2008-0580-0031	Comment submitted by Ann E. Siefker, on October 27, 2008.
EPA-HQ-SFUND-2008-0580-0032	Comment submitted by Rhine McLin, Mayor, City of Dayton, Ohio, on October 31, 2008.
EPA-HQ-SFUND-2008-0580-0033	Comment submitted by M. Bowling on November 3, 2008.

EPA-HQ-SFUND-2008-0580-0033.1	Comment attachment submitted by M. Bowling on November 3, 2008. (Attachment is a letter from Mary Lou Bowling to U.S. EPA Administrator Stephen Johnson, dated November 2, 2008).
EPA-HQ-SFUND-2008-0580-0034	Comment submitted by Fred Strahorn, Minority Whip, 40th District, Ohio House of Representatives, on November 1, 2008.
EPA-HQ-SFUND-2008-0580-0034.1	Comment attachment submitted by Fred Strahorn, Minority Whip, 40th District, Ohio House of Representatives, on November 1, 2008. (Attachment is a letter from Minority Whip Strahorn to U.S. EPA CERCLA Docket Office, dated October 29, 2008).
EPA-HQ-SFUND-2008-0580-0035	Late comment submitted by Tammi L. Clements, Director, Department of Water, City of Dayton, Ohio, dated January 26, 2009

2.0 Site Description

The Behr Dayton Thermal System VOC Plume (BDT) site lies approximately 2 miles northeast of Dayton, Ohio in a dense, mixed residential/industrial neighborhood. The site consists of a release of chlorinated solvents to ground water and one soil source contaminated with chlorinated solvents. The soil source underlies the facility. The extent of the ground water contamination resulting from the releases from the BDT facility has yet to be determined partially because there are multiple possible off-site sources of chlorinated solvents at other facilities in the vicinity of the site, and partially because of the complex geology and hydrogeology in the area. The facility location is shown in Figure 1 of the HRS documentation record at proposal.

The BDT facility contains approximately 60 acres of buildings, parking areas, and outdoor storage areas. It is located between the Great Miami River (which is located west, north, and northeast of the site) and the Mad River (which is located south of the site). The topography at and in the vicinity of the BDT facility is relatively flat and underlain by glacial deposits. Immediately below the top soil (where it is present) is one sand and gravel layer approximately 80 feet in depth. Next is a glacial till composed of layers of clay, sand, and gravel in various proportions and of different thicknesses. This till layer, and especially the clay layers within it, is sufficiently extensive to regionally act as an aquifer discontinuity. However, the clay layers are discontinuous in locations in the vicinity of the BDT site. Below this layer is a second sand and gravel layer that extends to bedrock. Both of the sand and gravel layers are aquifers.

The aquifer being evaluated includes the combined upper and lower sand and gravel aquifers. The till layer does not constitute an aquifer discontinuity locally because it is discontinuous in the vicinity of the facility. Therefore, the two aquifers are considered a single hydrologic unit. The lateral extent of the aquifer extends the standard 4-mile target distance limit (TDL) for the ground water migration pathway. The two rivers, the Great Miami River and the Mad River, do not constitute aquifer discontinuities because they are relatively shallow in this area and do not transect the upper aquifer, let alone the combined aquifers.

The likelihood of release scoring is based on an observed release of chlorinated solvents including tetrachloroethene (PCE), trichloroethene (TCE), and trichloroethane (TCA). Both an observed release by direct observation and observed release by chemical analysis are identified. The direct observation observed release is based on the contaminated soil source extending below the water table, especially during seasonal high ground water levels.

The observed release by chemical analysis is based on a significant increase in chlorinated solvent levels based on a comparison of contaminant levels in background samples taken upgradient and release samples taken immediately downgradient of the BDT facility. Flow gradient in the area is overall north to south and northwest to southeast, but there are clearly some local gradients in other directions, especially in the upper aquifer where flow can vary toward or away from the rivers depending on the water levels on the two rivers. In addition, pumping at the nearby City of Dayton well fields and perhaps by other industrial water users influences local flow gradients.

Given the possible variation in flow gradients, EPA ascertained that regardless of the flow direction the highest concentration of one substance, TCE, in a well on the southern edge of the BDT facility was significantly greater than any TCE concentrations in any possible flow direction and at the other possible off-site sources in the vicinity of the site. This finding and the observed release by direct observation at the BDT facility are sufficient to attribute at least part of the ground water contamination to the site.

The targets evaluated were the population relying on two city of Dayton well fields, one located northeast of the site along the Great Miami River and one located southeast of the site, along the Mad River. Both well fields draw water from the upper and lower aquifers.

Ongoing removal actions at the site consist of pumping and treatment of the ground water contamination and soil vapor extraction from the soil source. EPA and the State of Ohio have identified that, in spite of these removal actions, solvent levels resulting from soil vapor intrusion in nearby homes are above levels of concern.

3.0 Summary of Comments/Correspondence

Chrysler stated that the site score for the Behr Dayton Thermal System VOC Plume site (hereafter BDT site) was incorrect. It claimed that the HRS score was “based on unsupported factual determinations, an incorrect or incomplete reading of the BDT Site Administrative Record, and/or misapplications of the HRS rules...” Chrysler asserted “the HRS score for the site is well below 28.5, which is the long-established USEPA threshold for adding sites to the NPL,” and the BDT Site should not be added to the NPL.

Chrysler asserted that EPA’s HRS evaluation was incorrect because EPA failed to recognize ground water discontinuities. Chrysler stated that the municipal well fields included as targets in the site score are separated from the site by a continuous low permeability till layer, because the target wells are upgradient and on the other side of a ground water divide from the site, and because the Miami River is an aquifer discontinuity between the site and a target well field. In addition, Chrysler commented that EPA “improperly combined sites and failed to properly calculate the ‘Waste Characteristics’ component of the HRS score by ignoring response and remedial activities.” Chrysler also commented that “the public docket is inadequate to support USEPA’s assertions.” Chrysler asserted that EPA “arbitrarily relies on limited information out of context from the majority of evidence to reach conclusions contrary to what a review of all evidence shows.”

Chrysler stated that the groundwater pathway score should be 0.6 and the overall HRS score should be 0.3.

Chrysler attached to its comment letter a review of the HRS score for the BDT site that was prepared by AECOM for Chrysler. AECOM's document presented several scoring scenarios taking into account what Chrysler identified in its main comment letter to be errors in the EPA site scoring. In its document, AECOM summarized Chrysler's main comments and gave the site score considering the comments in the scoring. The document also provided a more detailed argument for why AECOM (and Chrysler) considered the two aquifers at the site not to be interconnected. [96]

Numerous commenters, including the Governor of the State of Ohio, other state government and City of Dayton government representatives, and residents of Dayton who live adjacent to or in the vicinity of the BDT facility, support the listing of the site.

Tammi L. Clements, Director, Department of Water, City of Dayton submitted comments after the close of the comment period for this site. Her comments disputed Chrysler's comments regarding the description of the hydrogeologic conditions in the vicinity of the site and provided additional information on why the upper and lower aquifers under the site should be considered interconnected and why the Great Miami River is not an aquifer discontinuity.

In this support document, EPA responds to the comments submitted within the comment period on the proposed listing of this site and addresses specific "majority of evidence" issues raised by Chrysler and AECOM. Regarding the late comment submitted by a representative of the City of Dayton, as stated in the preamble to the proposed rule, 73 Fed. Reg. 51397 (Sept. 3, 2008), EPA does not generally respond to late comments and as a matter of policy does not generally allow late comments to delay a listing decision. In this case, EPA considered this brief late comment and has determined that it supported the listing of the site, but has not incorporated further responses to the comment into this support document.

After consideration of these items, the HRS site score remains unchanged and EPA has decided to place the site on the NPL.

3.1 Support for Listing

Comment: Numerous commenters, including the Governor of the State of Ohio, other state government and City of Dayton government representatives, and residents of Dayton who live adjacent to or in the vicinity of the BDT facility as identified in section 1.0 of this support document, submitted comments that support the listing of the site.

Response: The Agency has added the BDT site to the NPL. Listing makes a site eligible for remedial action funding under CERCLA, and EPA will examine the site to determine what response, if any, is appropriate. Actual funding may not necessarily be undertaken in the precise order of HRS scores, however, and upon more detailed investigation may not be necessary at all in some cases. EPA will determine the need for using Superfund monies for remedial activities on a site-by-site basis, taking into account the NPL ranking, State priorities, further site investigation, other response alternatives, and other factors as appropriate. EPA typically will not stop work at some sites to begin work at other higher-scoring sites added to the NPL more recently.

3.2 Site Definition

Chrysler commented on EPA's consistency in its description of the site boundaries in different documents and on reserving its right to comment if EPA decided to later score another pathway using the HRS.

3.2.1 Site Boundaries

Comment: Chrysler objected that EPA's description of the site as consisting of a contaminated ground water plume and one source was an incomplete statement contradicted by EPA in the same document. Chrysler identified that multiple sources were shown on Figure 1 in the HRS documentation record at proposal and that several sources outside the BDT site are acknowledged and described by EPA in the HRS documentation record at proposal.

Response: EPA's description of the site in the HRS documentation record at proposal is neither incomplete nor contradictory. As defined in HRS Section 1.1, a "site" is:

Area(s) where a hazardous substance has been deposited, stored, disposed, or placed, or has otherwise come to be located. Such areas may include multiple sources and may include the area between sources.

Additionally, on page 1 of the HRS documentation record at proposal, EPA explained:

The street address, coordinates, and contaminant locations presented in this HRS documentation record identify the general area in which the site is located. They represent one or more locations the EPA considers to be part of the site based on the screening information EPA used to evaluate the site for NPL listing. EPA lists national priorities among the known "releases or threatened releases" of hazardous substances; thus, the focus is on the release, not delineated boundaries. A site is defined as where a hazardous substance has been "deposited, stored, placed, or otherwise come to be located." Generally, HRS scoring and the subsequent listing of a release merely represent the initial determination that a certain area may need to be addressed under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). Accordingly, EPA contemplates that the preliminary description of facility boundaries at the time of scoring will be refined as more information is developed as to where the contamination has come to be located.

Consistent with the HRS definition of site and the above statement regarding site location, and as acknowledged by Chrysler in its comment, EPA defined the BTC site as consisting of a ground water plume and a single source (see page 10 of the HRS documentation record at proposal).

The source included in the HRS scoring is a contaminated soil source and is described on pages 18-26 of the HRS documentation record at proposal. The extent of this source is described on page 19 of the HRS documentation record at proposal, which states that based on soil sampling results, "the approximate area of soil contamination may extend beyond the [BDT] facility boundary; however, the contamination appears to be primarily located in the area within the following monitoring wells and borings . . ." and then lists the wells and borings that delineate the source.

The extent of the ground water plume used for HRS scoring was delineated based on the locations of the contaminated ground water samples used to establish the observed release, as described on pages 38 and 39 of the HRS documentation record at proposal.

Page 26 of the HRS documentation record at proposal discusses Other Potential Sources On-Site. These other possible sources were not included in the site scoring and are not documented as to where hazardous substances are located; however, they are or were all on the BDT facility property and are believed to be co-located with the contaminated soil area. Regarding the discussion of other possible sources in the vicinity of the site, EPA agrees that Figure 1, and a subsection of the Attribution discussion titled Other

Off Site Sources on pages 41-44 of the HRS documentation record at proposal, identify at least six other possible off-site sources of solvent releases. However, the other possible sources are presented and discussed specifically as part of EPA's documentation that some portion of the release of solvents is attributable to the BDT site, not for purposes of identifying the other possible sources as part of the site at this time. (See section 3.3 of this support document which addresses the extent of the site.)

As demonstrated, EPA has not presented contradictory or incomplete statements on what it considers to be part of the BDT site. The HRS documentation record at proposal correctly identified a contaminated soil source and a ground water contamination plume contaminated by multiple chlorinated solvents. As explained in this response and in section 3.3 of this support document, the extent of the site may change as EPA further investigates the site and identifies other locations, if any, where contamination attributable to this site has come to be located.

3.2.2 Pathways not Scored

Comment: Chrysler identified that "USEPA scored only the 'Groundwater Migration Pathway' in assessing the relative threat associated with actual or potential releases of hazardous substances at the BDT Site." Chrysler claimed that therefore its comments only addressed this pathway and that "[s]hould USEPA score other pathways in the future, Chrysler reserves the right to comment on USEPA's application of HRS criteria to those pathways as well."

Response: EPA does not need to score an HRS pathway for all contamination that may ultimately be considered part of the site. As explained in section 3.2.1 of this response, the site boundaries are not established until EPA has finished its investigation of the extent of the release from a facility. Also, when using the HRS to score a release, it is not necessary to score all sources of the release, nor all pathways or threats. It is, however, commonplace and consistent with the HRS to identify other possible pathways at the site as part of a site evaluation even if those pathways are not used in the HRS scoring. EPA discussed other possible pathways, components, and threats not included in the HRS scoring on the Cover Sheet of the HRS documentation record at proposal.

The Cover Sheet specifically states that for the Surface Water Migration Pathway, the Soil Exposure Pathway and the Air Migration Pathway, these pathways "may be of concern to EPA and may be evaluated during further investigations." In addition, in the Soil Exposure Pathway discussion on the Cover Sheet of the HRS documentation record at proposal, EPA specifically noted that Chrysler was operating a soil vapor extraction system and that numerous residences were associated with soil vapor intrusion of TCE issues. EPA may investigate these possible threats as part of further investigations associated with this site.

3.3 Extent of Site

Comment: Chrysler commented that EPA "improperly combined the BDT Site with sites separated by the aquifer discontinuities." Chrysler asserted that the boundaries of the BDT site were originally defined by EPA in an Administrative Order on Consent (AOC) for a removal action entered between EPA and Chrysler in 2006. Chrysler stated that this agreement defined the site as "encompassing the areal extent of the undefined groundwater contamination plume originating from the Behr-Dayton Thermal Systems LLC facility... and a residential area south of the Behr-Dayton facility." Chrysler stated that EPA "then continues, improperly including areas that it admits are northeast and east (i.e. upgradient) of the Behr facility and outside of the pathway it states it is evaluating."

Chrysler stated that as a result, EPA arbitrarily transformed two or more sites into one, inappropriate "site." Chrysler quoted the U.S. Court of Appeals for the D.C. Circuit as stating in *Mead*

Corp. v Browner, 100 F.3d 152 (1996) that “[t]he idea that Congress implicitly allowed EPA broad discretion to lump low-risk sites together with high risk sites, and thereby to transform the one into the other is *anything but reasonable*.” (Emphasis is Chrysler’s). Chrysler continued, “[m]oreover, it results in incorrect HRS scoring by selectively picking unrelated facts out of context to reach higher scores.”

Chrysler pointed out that there is only one source in the documentation record and that references are almost exclusively to the BDT site, but that simultaneously, EPA notes that there are “multiple other sources and potential sources of TCE in the area.” Chrysler pointed out that EPA explicitly stated that, “TCE ground water contamination has been confirmed upgradient of the Behr property,” and that there are other known sources of VOCs in the area surrounding the Behr facility.

In addition, Chrysler asserted that because there is a ground water divide, it is necessary for EPA to “distinguish facts obtained north of that divide versus those associated with the BDT Site, located south of the divide,” and that by failing to do so, EPA “drew contradictory and incorrect conclusions that resulted in an inappropriate score.”

Response: Chrysler is incorrect that EPA combined multiple sites in this listing. Regardless of the extent of the site defined in the AOC, EPA is today listing the site that consists of a contaminated ground water plume and one source, contaminated soil, associated with the use of industrial solvents released by the operations at the BDT facility. To score a site under the HRS, it is not necessary (indeed, often not possible without a comprehensive investigation) to identify and score every possible source and every possible pathway presented at a particular site. The exact extent of the site is not known at listing but will be defined in greater detail during the Superfund investigation and response process. Thus, the BDT site evaluation does not include other facilities in the vicinity nor has the site been determined to extend the entire TDL used in identifying eligible targets.

Chrysler’s comment regarding EPA transforming two or more sites is not pertinent. The NPL is a list of known or threatened releases of hazardous substances, pollutants, or contaminants. Those releases may have multiple sources, as contemplated by the HRS definition of “site,” which states in part that a site “may include multiple sources and may include the area between sources.” EPA acknowledges that at this time all sources have not yet been identified, although the HRS documentation record at proposal identifies other possible off-site sources of VOC contamination in the area, within the context of demonstrating that at least part of the observed release contamination in the ground water plume was attributable to releases from the BDT facility. (See the Attribution section on pages 39-44 of the HRS documentation record at proposal; see also page 41 of the HRS documentation record at proposal identifying these sources at other facilities in a section titled “Other Off Site Sources” [emphasis added]). EPA also discusses the issue of other possible off site sources in section 3.2.1 of this support document. The other possible sources identified in the HRS documentation record at proposal have not to date been connected with the release evaluated at the site, therefore, EPA has not combined multiple sites in this listing. Since Chrysler’s comments go to sources not yet identified as part of the site, this comment has no effect on the site score.

Regarding Chrysler’s claim that the site included areas north and east of the facility and outside the pathway EPA evaluated, Chrysler is incorrect. These areas are within the target distance limit (TDL) for the site, but were not identified as part of the site. The delineation of the target distance limit, as directed by HRS Section 3.0.1.1, *Ground water target distance limit*:

The target distance limit defines the maximum distance from the sources at the site over which targets are evaluated. Use a target distance limit of 4 miles for the ground water migration pathway, except when aquifer discontinuities apply. . . . Furthermore, consider

any well with an observed release from a source at the site (see section 3.1.1) to lie within the target distance limit of the site, regardless of the well's distance from the sources at the site.

This HRS direction does not identify, assume, or require that the entire area within the TDL to be where contamination has come to be located, and thus the entire TDL for the site is not considered part of the site.

Regarding the delineation of the TDL and aquifer discontinuities, Chrysler's comments on this topic are discussed in detail in section 3.5 of this support document.

3.4 Consideration of Response Actions

Comment: Chrysler commented that “[l]isting the BDT Site on the NPL is not appropriate because implementing the on-going removal actions south of the Behr plant are all appropriate response actions based on the risks presented at the BDT site,” and that “USEPA failed to consider these actions.” Chrysler stated that “[t]his failure is in direct conflict with USEPA guidance, USEPA policies expressed in the 1990 HRS revisions, and the express provisions of the HRS.”

Chrysler identified that EPA's *Guidelines for Withdrawing a Proposal to List a Site on the NPL (De-Proposal)* (2002) set forth three criteria for determining if a site should be de-proposed from the NPL, consistent with section 300.425(e) of the NCP (which addresses deletion from the NPL).

...EPA shall consider, in consultation with the state, whether any of the following criteria has been met:

- (i) Responsible parties or other persons have implemented all appropriate response actions required;
- (ii) All appropriate Fund-financed response action under CERCLA has been implemented, and no further response action by responsible parties is appropriate; or
- (iii) The remedial investigation has shown that the release poses no significant threat to public health or the environment and, therefore, taking of remedial measures is not appropriate.

Chrysler claimed that “actions are being undertaken by Chrysler LLC pursuant to an agreement with the Ohio Environmental Protection Agency, emergency response actions being undertaken by Chrysler LLC pursuant to an Administrative Order on Consent with USEPA-Region V, and emergency response actions being undertaken by USEPA-Region V to eliminate the actual and potential threats presented by groundwater contamination in the vicinity of the BDT Site.”

Chrysler asserted that the de-proposal guidance is consistent with the Agency's position previously documented in the preamble discussions to the 1990 revisions to the HRS. It asserted that preamble indicates that “[i]f the current site conditions have been affected by a previous or ongoing response action, EPA must consider that action when conducting the HRS scoring.” Chrysler also stated that the site score “must address the effects of response actions taken either by private parties or the States, if those actions were taken prior to performance of the Site Investigation.”

Chrysler then asserted that “groundwater monitoring data developed for the Ohio VAP and for USEPA's removal actions . . . show the release from the BDT Site poses no significant threat to public health or to the environment, and therefore, listing on the NPL for further remedial measures is not appropriate,”

particularly that the groundwater gradient and VOC contaminant migration is to the southwest, away from the BDT site. Chrysler also identified that the HRS documentation record indicates that EPA is aware of the various response and removal actions and cited places in the document supporting this claim.

Chrysler argued that the failure to consider ongoing response actions “resulted in an overestimation of the actual and potential risks to the groundwater resource.”

Chrysler closed its comments on this issue by claiming that the HRS documentation record contains no evidence to substantiate EPA’s consideration of the response and removal actions.

Response: EPA has taken into account the time-critical removal actions undertaken by Chrysler in the evaluation of the need to list the BDT site on the NPL and considers the information it presently has to be insufficient to conclude that no further response is appropriate.

As explained in the preamble to the HRS, EPA considers certain response actions in the listing decision, to increase incentives for rapid response actions at sites. However, EPA tries “to balance the benefits of considering removal actions in HRS scores . . . while also ensuring that the HRS score reflects any continuing risks at sites where contamination occurred prior to any response action.” (55 FR 51568, December 14, 1990).

As stated by Chrysler, EPA is aware that Behr Dayton has built and operated a soil vapor extraction system to remove VOCs from the soil underneath the present BDT facility and a ground water treatment system to remove VOCs from ground water under the site and to the south where the ground water contamination has migrated, and has recovered hundreds of pounds of VOCs. However, both activities have demonstrated that contamination is remaining, although no one has determined the amount remaining.

Regardless of the response actions and/or any evidence of groundwater flow, EPA cannot determine that all appropriate response actions required have been undertaken at the BDT site and that there is no remaining threat to human health or the environment.. The remedial investigation for the site has not been completed. Furthermore, the State of Ohio and EPA have identified that the VOCs in the soil and ground water, via vapor intrusion into nearby structures and residences at levels of concern to both EPA and the Agency for Toxic Substances and Disease Registry (ATSDR), pose a possible threat to human health (see page 13 of the HRS documentation record at proposal). Further, the State of Ohio supports the listing, as discussed in section 3.1 of this support document.

Chrysler’s specific comments concerning the effect of the removal actions at the site source and of ground water flow on the HRS scoring are addressed in sections 3.8.1, 3.9, 3.10.2, and 3.10.3 of this support document.

3.5 Aquifer Delineation and Target Eligibility

Comment: Chrysler commented that EPA failed to recognize aquifer discontinuities in scoring the BDT site. Chrysler pointed out that the HRS directs EPA to restrict aquifer boundaries if aquifer discontinuities can be established, and to exclude that portion of the aquifer beyond the discontinuity in evaluating the ground water migration pathway. Chrysler identified what it considered to be three discontinuities: till layers, a groundwater divide based on ground water flow, and the Great Miami River.

By not recognizing these features as discontinuities, Chrysler claimed that EPA incorrectly considered the ground water targets scored in the HRS evaluation, two municipal well fields, as eligible targets because the well fields are separated from the site by these features.

Response: The delineation of the aquifer being evaluated for HRS scoring purposes is consistent with the HRS regulation. HRS Section 3.0.1.1, *Ground water target distance limit*, defines the TDL in relevant part as:

. . . the maximum distance from the sources at the site over which targets are evaluated. Use a target distance limit of 4 miles for the ground water migration pathway, except when aquifer discontinuities apply. . . .

HRS Section 3.0.1.2, *Aquifer boundaries*, states:

Combine multiple aquifers into a single hydrologic unit for scoring purposes if aquifer interconnections can be established for these aquifers. In contrast, restrict aquifer boundaries if aquifer discontinuities can be established.

HRS Section 3.0.1.2.1, *Aquifer interconnections*, identifies the requirement used to consider the two aquifers at this site as interconnected:

Evaluate whether aquifer interconnections occur within 2 miles of the sources at the site. If they occur within this 2-mile distance, combine the aquifers having interconnections in scoring the site.

HRS section 3.0.1.2.2, *Aquifer discontinuities*, describes the process for identifying aquifer discontinuities:

Evaluate whether aquifer discontinuities occur within the 4-mile target distance limit. An aquifer discontinuity occurs for scoring purposes only when a geologic, topographic, or other structure or feature entirely transects an aquifer within the 4-mile target distance limit, thereby creating a continuous boundary to ground water flow within this limit. If two or more aquifers can be combined into a single hydrologic unit for scoring purposes, an aquifer discontinuity occurs only when the structure or feature entirely transects the boundaries of this single hydrologic unit. (emphasis added)

Pages 29-32 of the HRS documentation record at proposal provide a regional description of the geology and hydrogeology in the area of the site, and then present a site-specific discussion of the aquifer being evaluated in terms of its horizontal and vertical extent. In general, the Dayton, Ohio area is located on glacial and glacial fluvial deposits. The uppermost recognizable unit is a sand and gravel outwash that can be up to 80 feet deep. In many local areas, underlying this formation is a till layer that takes the form of massive clay units or zones of alternating clay with stratified sand and gravel and silt. Below this is a second sand and gravel outwash layer that extends to bedrock.

Both sand and gravel layers are regional aquifers. The upper layer is referred to as the upper or unconfined aquifer. The second sand and gravel layer is referred to as the lower or semi-confined aquifer, being confined locally by the till layer if a till layer is present. The till layer between the two, depending on its presence and if the clay layers within it are continuous in the local area, can act as a localized confining layer, limiting direct hydraulic communication between the two aquifers when it is present. As described below, in the vicinity of the site the till layer is absent within 2 miles of the site sources, therefore the two aquifers are treated as one hydrologic unit for HRS purposes.

The HRS documentation record at proposal does not identify any aquifer discontinuities within the maximum 4-mile TDL. Two features are discussed in the HRS documentation record at proposal, the Great Miami River and its tributary the Mad River (see Figure 1 and pages 30-32 of the HRS

documentation record at proposal). Neither of these features constitutes an aquifer discontinuity as that term is defined in the HRS. Neither the Great Miami River nor the Mad River entirely transects even the upper aquifer, let alone transecting the combined upper and lower aquifers; therefore, these features were not identified as aquifer discontinuities in the HRS evaluation.

Hence, the aquifer being evaluated is described as the combined upper and lower sand and gravel aquifers, and the TDL is the entire 4-mile maximum radial distance from the site source.

Chrysler's specific comments regarding aquifer interconnection and discontinuities and associated Agency responses are detailed in the following sections:

- 3.5.1 Till Layers and Aquifer Interconnection
- 3.5.2 Presence of a Ground Water Divide
- 3.5.3 The Great Miami River and Aquifer Discontinuity
- 3.5.4 Establishment of the Target Distance Limit

3.5.1 Till Layers and Aquifer Interconnection

Comment: Chrysler stated that EPA "impermissibly assumed an aquifer interconnection allowing groundwater contamination in an upper aquifer to be attributed to a lower aquifer, which eventually flows to the reference well fields." Chrysler asserted that EPA's failure to recognize that a continuous low permeability till layer exists beneath the site involved two factors. Chrysler asserted that EPA failed to identify documents that show a confining till layer exists, and that improperly presented geologic studies led EPA to erroneously conclude that aquifer interconnection exists.

Response: Chrysler's comments on the presence of till layers, their impact on aquifer interconnection, and EPA's response to these comments are discussed in the subsections below.

3.5.1.1 Presence of Till Layers

Comment: Chrysler objected to the scoring of two aquifers under the BDT facility as a single hydraulic unit. Chrysler argued that a till layer between the two aquifers was a discontinuity that hydraulically separates the aquifers. Chrysler first argued that USEPA failed to identify documents that prove the existence of a low permeability till layer underlying the BDT site. Chrysler quoted the HRS as saying "[i]f data are not adequate to establish aquifer interconnections, evaluate aquifers as separate aquifers." Chrysler also quoted the preamble to the HRS:

[I]n the absence of definitive studies and where costs of field studies are prohibitive, the Agency will rely on expert opinion (e.g., U.S. Geological Survey Staff or State geologists). In the absence of such information, EPA assumes that aquifers are not interconnected. (Emphasis added by Chrysler.)

Chrysler stated that, in concluding there was an aquifer interconnection, USEPA relied heavily on a United States Geological Survey (USGS) study but claimed that the USGS study "does not definitively determine that an aquifer interconnection exists." Chrysler continued "[c]onversely, it documents the existence of an upper and lower aquifer separated by till layers in the immediate vicinity of the BDT site," and therefore the study "establishes that these till layers separate contaminated groundwater in the upper aquifer from the lower aquifer."

Chrysler then asserted that a till layer exists between the aquifers in the Miami River Valley that would prevent contamination from the BDT site from reaching the Miami River Well Field. Chrysler acknowledged the USGS considered the data was meager but that was “for others to determine,” and continued “the evidence of this impermeable layer at the BDT Site is irrefutable.” Chrysler also stated there are two impermeable till layers in the Mad River Valley “which constitute two confining layers acting to keep the upper and lower aquifers separated,” and therefore the Mad River Well Field should also be excluded from the HRS scoring.

Chrysler next cited a study by the Terran Corporation (included as Reference 58 to the HRS documentation record at proposal) that it claimed concluded that the “glacial till layer hydraulically behaves as a confining layer separating the upper shallow sand and gravel outwash aquifer from lower sand and gravel outwash aquifers as noted by exploratory soil borings and well logs drilled in the Dayton area.” Chrysler continued, “[t]herefore, USEPA was incorrect in concluding that the aquifers in this area are ‘interconnected’ and instead, must assume they are instead disconnected and accordingly can not be treated as a single hydrologic unit.” (Emphasis added by Chrysler.)

Chrysler summarized that EPA improperly concluded that the two aquifers were hydraulically interconnected and therefore could be treated as a single hydrologic unit. It stated that EPA’s own reference documents did not support this conclusion and, in fact, instead might be considered as evidence to the contrary. Chrysler continued that “not only is it that ‘data are not adequate to establish aquifer interconnections,’ USEPA must conduct its scoring considering the conclusive evidence that the upper ‘unconfined aquifer’ and lower ‘semi-confined aquifer’ are separate aquifers.” Chrysler closed by claiming that the site score should be 0.3 if the two well fields were not included in the scoring and that the site should not be listed on the NPL.

In Attachment B to Chrysler’s comments, AECOM stated that the “[c]ross-sectional data provided as reference by the EPA is based on limited historic data” and that “[r]ecent investigation data provides for a more complete understanding of the geology at the site.” AECOM claimed that the recent “data has consistently shown the presence of a continuous low permeability till layer beneath the site, separating the upper and lower aquifers.” In explanation, AECOM stated that the cross sections provided by Weston (the EPA contractor tasked to do so) in References 52 and 53 of the HRS documentation record at proposal are “inappropriate to describe the geology at the site.” Specifically regarding cross sections in Reference 52 (prepared by the USGS), AECOM stated that although one cross section (A-A”) “is an accurate representation of the surficial geology to the south and south east of the site, cross section D-D’-D” from the same document bisects the Behr-Dayton site, and is a more appropriate representation of the geology.” AECOM claimed that this cross section showed that the “underlying till appears to extend from the site south to the river,” but the rest of the cross section “lacked sufficient information to characterize the entire area,” and that AECOM prepared different cross sections “based on historic investigations at the site” and both the USGS and AECOM’s cross sections show the “continuous nature of the low permeability till beneath the site.”

AECOM next stated that “[t]he presence and efficacy of this layer is documented through boring logs, flow information and groundwater samples of wells in the well field, and no evidence of groundwater contaminants associated with the site have been noted at either the Miami River Well field or the Mad River Well field. This finding supports the presence of a continuous confining unit at the site.”

Response: While EPA agrees that a till layer can be found in areas between the upper and lower aquifers in the vicinity of the site, the till layer and the clay layers within the till layer are not continuous within 2 miles of the site sources. Therefore, the till layer does not constitute a continuous confining layer for HRS purposes, and the two aquifers were properly considered interconnected and scored as a single hydrologic unit.

HRS Section 3.0.1.2, *Aquifer Boundaries*, states:

Combine multiple aquifers into a single hydrologic unit for scoring purposes if aquifer interconnections can be established for these aquifers. In contrast, restrict aquifer boundaries if aquifer discontinuities can be established.

HRS Section 3.0.1.2.1 *Aquifer interconnections*, states:

Evaluate whether aquifer interconnections occur within 2 miles of the sources at the site. If they occur within this 2-mile distance, combine the aquifers having interconnections in scoring the site. . . . If data are not adequate to establish aquifer interconnections, evaluate the aquifers as separate aquifers.

The preamble to the final HRS under the heading *Aquifer Interconnections* (55 FR 51553, December 14, 1990), explains:

In practice, EPA has found that studies in the field to determine whether aquifers are interconnected in the vicinity of the site will generally require resources more consistent with remedial investigations than SIs [site investigations], especially where installation of deep wells is necessary to conduct aquifer testing. Thus, EPA has in the past relied largely on existing information to make such determinations and the Agency finds it necessary to continue that approach.

The HRS preamble goes on to list examples of the types of information useful in identifying aquifer interconnections, including:

- Literature or well logs that indicate that no lower relative hydraulic conductivity layer or confining layer separates the aquifers being assessed (e.g., presence of a layer with a hydraulic conductivity lower by two or more orders of magnitude); and
- Literature or well logs that indicate that a lower relative hydraulic conductivity layer or confining layer that separates the aquifers is not continuous throughout the 2-mile radius (i.e., hydrogeological interconnections between the aquifers are identified).

Consistent with HRS Sections 3.0.1.2 and 3.0.1.2.1 quoted above, and the examples given above from the HRS preamble, the HRS documentation record for the BDT site at proposal presents evidence that the till layer and the clay layers within it between the deep and shallow aquifers are not continuous throughout the 2-mile radius from the site source.

The discussion on pages 27-32 of the HRS documentation record at proposal identifies the presence of a till layer between the upper and lower aquifers numerous times in its description of the regional geology, of the regional hydrogeology, and of the site-specific geology, as well as in the section titled *Aquifer Interconnection*. At the same time, the HRS documentation record at proposal on pages 27-32 identifies several reasons why the two aquifers are considered to be interconnected in the HRS evaluation.

First, the discussion on page 29 in the *Regional Hydrogeology* section of the HRS documentation record at proposal identifies that from a regional perspective:

This [till] layer appears to be laterally persistent across areas on the order of a mile, but evidence suggests that it may be discontinuous on a larger regional scale across the entire

buried valley in the Dayton region. The till has been found to be absent from some locations in the region either because of non-deposition or erosion (Ref. 7, pp.22, 24; 8, pp. 49, 57; 51, pp. 24, 42, 43; 52; 58, pp.10, 11 12).

This identifies that the till layer is not regionally continuous.

Second, the discussion on page 30 in the Aquifer Interconnection section of the HRS documentation record at proposal contains specific information identifying that the till layer is not continuous within 2 miles of the site source. That discussion first states that till layers generally are confining layers where present. It points out a USGS study by Norris and Spieker (Reference 51, *Ground-Water Resources of the Dayton Area, Ohio, Geological Survey Water-Supply Paper 1808*, of the HRS documentation record at proposal) that “found that leakage through the confining layer was responsible for most of the ground water recharge to the lower aquifer (Refs. 8, p. 57; 51, pp. 59, 60).” In this study, Norris et al. estimated an average rate of leakage for the strata in which the till layer is found if there were no breach in the layer. However, the report states that the layer was not continuous and discusses areas within 2 miles of the sources at the BDT site where the layer is missing. Therefore, Norris’s calculation does not indicate that there is no aquifer interconnection; but rather, the calculation was based on that assumption and the rate is illustrative of the overall rate of leaching rather than a site-specific estimate.

Also, the Aquifer Interconnection section on pages 30-31 of the HRS documentation record at proposal states that based on the Norris/USGS study (Reference 51 of the HRS documentation record at proposal):

In small areas, notably in the Mad River valley immediately below Eastwood Park, the till is absent from the sand and gravel deposits or consists only of few scattered lenses (Ref. 51, pp. 42). Elsewhere, there are small openings in otherwise extensive till sheets; these probably represent stream channels cut through the till when it was exposed at the surface (Ref. 51, pp. 42, 43, 173). The cross section that passes south of the site and through the 2-mile radius target distance limit (TDL) suggests several openings in the till sheet within 2-mile TDL (Ref. 51, p. 173; 52, p.1)

The HRS documentation record then identifies on page 31 that the USGS study report (Reference 51 of the HRS documentation record at proposal) also stated:

The till-rich zone is relatively ineffective as a confining bed in the Mad River Valley in the Findlay Street-Eastwood Park area, where interbedded till deposits are generally thin or absent (Ref. 51. p. 110).

Findlay Street runs southeast to northwest immediately east of the BDT facility and Eastwood Park is along the Mad River about 2 miles southeast of the site (see Reference 5 of the HRS documentation record at proposal). Thus, the Findlay Street-Eastwood Park area is within 2 miles of the site source. Accordingly, EPA considered that this evidence supports the conclusion that an aquifer interconnection exists.

Third, the HRS documentation record at proposal on page 31 also identifies that:

At the nearby Gayston facility, the clay till unit is absent and the entire aquifer thickness is considered to be unconfined. A regional cross-section shows that the clay till is not continuous (Ref. 12, p. 120).

The Gayston facility is approximately $\frac{3}{4}$ of a mile northeast of the BDT facility and thus the absence of the till layer at this facility also supports aquifer interconnection.

Fourth, the HRS documentation record at proposal on page 31 documents cross sections prepared for the site by an EPA contractor (Ref. 56, p. 1; 57 p. 1; 58, p. 1). These cross sections show several discontinuous till layers within the 2-mile distance from the source at the site. Again, this evidence supports that there is an aquifer interconnection within 2 miles of the site source.

For these reasons, EPA concluded that it is more likely than not that the till layer is not continuous in at least two locations within 2 miles of the site sources. Therefore, in accordance with HRS Section 3.0.1.2.1, *Aquifer interconnections*, EPA considered the upper and lower aquifers interconnected and considered them as a single hydrologic unit in the HRS evaluation.

Regarding the Chrysler claim that a Terran report (Reference 58 of the HRS documentation record at proposal) concluded that the “glacial till layer hydraulically behaves as a confining layer separating the upper shallow sand and gravel outwash aquifer from lower sand and gravel outwash aquifers as noted by exploratory soil borings and well logs drilled in the Dayton area.,” Chrysler took this statement out of context. The Terran report is a study focused on quantifying the surface water and ground water interactions between the upper aquifer and the Great Miami River, not a study on the interconnection between the upper and lower aquifers or the continuity of the till layer within 2 miles of the BDT site sources. The statement quoted from page 8 of Reference 58 was part of a description of the geologic setting for the specific area at which the study was performed, which was limited to a three-block area along the Great Miami River west of the BDT site. The statement cannot be interpreted to conclude that the till layer is continuous within 2 miles of the BDT site sources. In fact, the same paragraph identifies that the till layer was not encountered in two drilling locations in the Terran study area. (EPA did not rely on this information to conclude the till layer was not continuous at these locations because the depths of the drillings may not have been sufficient to reach the till layer if it did exist in the drilling locations [see Figures 2 and 3 on pages 11 and 12 of Reference 8].)

Regarding AECOM’s issues with the cross sections used to illustrate the geology, AECOM did not show how the USGS cross sections other than D-D’-D” and the cross sections produced by Weston for EPA were inappropriate or why cross section D-D’-D” should be considered better for the HRS evaluation. All of the cross sections include representations of the till layer (and its presence or absence) within 2 miles of the site, and Chrysler did not present evidence that any of the cross sections were inaccurately created. Thus, regardless of whether D-D’-D” bisects the site, the other cross-sections are still relevant for the HRS evaluation. AECOM’s cross sections were not submitted by Chrysler with its comments; EPA was unable to assess them. Regardless, since EPA’s determination of aquifer interconnections is not dependent on these cross sections, AECOM’s comments are insufficient to show the aquifers are not interconnected.

Even if AECOM’s claim that contamination from the site has not been found in the wells at the city well fields were substantiated, this would not demonstrate conclusively there is no aquifer interconnection at the BDT site. For example, the contamination may simply not have had sufficient time to migrate to the well field.

3.5.1.2 Presentation of Geologic Studies

Comment: Chrysler commented that EPA’s conclusions about the interconnection between the upper and lower aquifers “are unreliable because improperly presented geologic studies were used.” As an example, it asserted that one cross section (Reference 52 of the documentation record at proposal) is not properly placed on a site map (Reference 53 of the documentation record at proposal), and that “[s]imilar mistakes were made with other geologic cross sections. Therefore, it is unclear whether USEPA properly relied on

the various geologic cross sections when analyzing the BDT site. Consequently, the conclusions reached by USEPA cannot be relied upon and must be dismissed.”

AECOM, in questioning the adequacy of USGS-prepared cross sections to represent the geology at the site (see section 3.5.1.1 of this support document) asserted “[t]his is one example of poor or inappropriate documentation for the HRS score provided,” and that “[a]n in depth review of the supporting documents was not completed, so there may be similar instances of these types of errors.”

Response: EPA has reviewed References 52 and 53 of the HRS documentation record at proposal, and in light of this comment finds no inconsistency in the location of the cross section in Reference 52 as shown on a site map in that same reference. It appears that Chrysler and AECOM may have confused the presentation of different cross sections in different references. Reference 52 contains on page 1, a cross section produced by and taken from a report by The Payne Firm on 09/07/93, as identified in the figure title box on the lower right hand corner of the cross section (see also Reference 12 of the HRS documentation record at proposal). The location of this cross section is presented on a map on page 2 of Reference 52. Reference 53 contains a map showing the locations of four cross sections drawn by Weston Solutions, Inc., which are presented in References 54 through 57 of the HRS documentation record at proposal, as identified in the title box for this map and in the title presented for this reference in the Reference list on page 9 of the HRS documentation record at proposal.

Regarding “similar mistakes” in other cross sections referred to by Chrysler and AECOM, since neither Chrysler nor AECOM identified these specifically, EPA cannot respond to these comments regarding their validity or any possible effects on the listing decision.

3.5.2 Presence of a Ground Water Divide

Comment: Chrysler commented that EPA “ignored the documented existence of a groundwater divide, which serves as another groundwater discontinuity.” Chrysler partially quoted phrases from the HRS Section 3.0.1.2.2 as stating that “a groundwater discontinuity creates ‘a continuous boundary to ground water flow.’” Chrysler asserted that “[a] groundwater divide is a continuous boundary to groundwater flow.” It then quoted from a common ground water text (Freeze and Cherry, 1979, p.194) as stating “[i]n that aquifer discontinuity, ‘...the system creates vertical boundaries...across which there is not flow. These imaginary impermeable boundaries are known as groundwater divides’.” (Emphases added by Chrysler.)

Chrysler asserted that there is a ground water divide that is a discontinuity north of the BDT site, which separates the site from municipal wells identified by EPA, and that EPA failed to account for this discontinuity. Specifically, Chrysler stated, “[i]n contrast to the repeated assertions that ground water flow from the BDT Site is to the south and southwest, the sources located north of the BDT Site but still south of the Miami River Well Field, are identified as being upgradient of those municipal wells,” and cites a reference used in the HRS scoring that describes the well field as downgradient of the DAP, Inc., facility. Chrysler argues that “[t]his is a tacit acknowledgement that a groundwater divide exists, affecting ground water flow.” Chrysler concluded, “[b]ecause USEPA ignored its own determination that a ground water divide exists, it impermissibly overlooked a geologic feature that establishes an aquifer discontinuity, which separates the BDT site from municipal wells.”

Chrysler claimed that EPA admits in the documentation record that there is a ground water divide north of the Behr property which is illustrated on figures that indicate flow directions and in text that discusses flow direction as being to the south from the Behr property, not toward the municipal wells. It also pointed out that EPA defined the site as a soil source and a TCE plume extending downgradient (i.e., south) of the Behr facility. Chrysler next noted that EPA stated that there was TCE contamination

upgradient of the Behr property. Chrysler asserted that EPA “specifically used the term ‘*upgradient*’ in its description, admitting that for some distance north of the BDT Site, groundwater flows generally north/northeast to south/southwest.”

Chrysler also claimed that EPA ignored other data that establishes a ground water divide between the BDT site and the municipal well fields. It argued that EPA selected background wells north of the site because they are upgradient of the site. Chrysler noted that the wells were between the site and the Miami River Well Field. In addition, Chrysler pointed to other wells that show no contamination east of the site, and asserted therefore, the population associated with Mad River Well Field “cannot be included in the groundwater migration pathway calculation.”

Response: EPA agrees that flow direction during the investigations used to establish releases from the BDT site was at the time away from the Great Miami Well field. However, as explained in the remainder of this section, the evidence cited by Chrysler in its comments establishes only ground water flow direction at the time of the sampling events and any such “imaginary impermeable boundaries” may have been created by localized changes in flow direction. Such limited data do not establish the existence of a permanent (i.e., continuous) boundary to ground water flow that entirely transects the combined aquifers such that an “aquifer discontinuity” exists as that term is used in the HRS.

HRS Section 3.0.1.2.2, *Aquifer discontinuities*, defines when a feature is considered a discontinuity:

An aquifer discontinuity occurs for scoring purposes only when a geologic, topographic, or other structure or feature entirely transects an aquifer within the 4-mile target distance limit, thereby creating a continuous boundary to ground water flow within this limit. If two or more aquifers can be combined into a single hydrologic unit for scoring purposes, an aquifer discontinuity occurs only when the structure or feature entirely transects the boundaries of this single hydrologic unit. (Emphases added.)

As discussed in the preamble to the final HRS (55 FR 51553, December 14, 1990) EPA contemplated considering flow direction in evaluating targets and determined that it was beyond the scope of a screening site investigation to collect sufficient information to do so. In fact, in its discussion of this determination, EPA drew a distinction between the relative permanence of features like aquifer discontinuities and the variability of measured ground water flow:

Aquifer interconnections and discontinuities . . . which are evaluated in the final [HRS] rule, are geologic features that are unlikely to change over the short-term. *In contrast*, ground water flow direction can be influenced by factors such as seasonal flows and pumping from well fields. In addition, the ground water flow direction may be different in each aquifer at a site, and the direction of hazardous substance migration is not always the same as the direction of ground water flow. Therefore, data on ground water flow direction would need to be considerably more extensive than would the data required to document the other hydrogeologic factors. (Emphasis added.)

Similarly, the references used in the HRS evaluation and Chrysler’s comments regarding ground water flow direction are based on a limited number of short-term sampling events at the site. EPA does not consider these sampling events alone to be of sufficient duration to use in predicting site specific/local contaminant transport direction over time or the permanent or even predicted location of ground water divides over time. The scope of a study to collect the level of information necessary to predict flow direction and the location of related ground water divides would have to reflect the seasonality of flow conditions and the effects of major events such as 10-year flood events and of the change in land use of the area and of response actions. Such a study is beyond the scope of screening investigations used to

gather information for an HRS evaluation. A study of this complexity is typically performed during the remedial investigation of a site, which, if needed, is undertaken during a later phase of the Superfund investigation and response process.

EPA agrees with the commenter that the existing information is sufficient to identify that ground water flow direction and contaminant transport in the area varies according to variations in climate and in the Great Miami flow stages. EPA also considers it likely for flow direction to have changed over time due to manmade and natural disturbances and the rate of pumping by various nearby industries and by the nearby City of Dayton well fields. For example, Chrysler pointed out that during some periods of time the ground water flow is toward the Great Miami River, and at others away from the river depending on the river stage, which in turn varies from season to season and with the magnitude of rain and snow events from year to year. A study by Terran Corporation (Reference 58 of the HRS documentation record at proposal) estimated that the river, depending on location along a single transect, was a gaining stream from 3.4% to 86% of the time in a time period between 2006 and 2007. Another example of the effects of well pumping on flow direction is illustrated in that Chrysler's pump and treatment system was designed to reverse the local flow direction toward the wells in the system.

Finally, EPA also points out on the HRS preamble page cited above, that while the HRS does not consider flow direction directly in determining the eligibility of targets, it does consider flow direction indirectly in the method used to evaluate target populations. If wells have not been contaminated by the site, as Chrysler assumes upgradient wells at the BDT site would not be, the population drawing from those wells is distance-weighted as compared to wells documented to contain contamination released from the site. Indeed, this was done in the evaluation of this site, as documented on pages 48-50 of the HRS documentation record at proposal.

3.5.3 *The Great Miami River and Aquifer Discontinuity*

Comment: Chrysler commented that EPA "also curiously failed to consider that the Great Miami River itself is an additional aquifer discontinuity between the BDT Site and the Miami River Well Field." Chrysler asserted that EPA's argument that the river "does not entirely transect the upper 'unconfined aquifer' where VOC contamination is observed . . . is not true." Chrysler argued that EPA is citing information in only one river segment immediately adjacent to downtown Dayton and that EPA had not analyzed information about the Miami River in the appropriate area. Chrysler commented that, as discussed in the Terran study used by EPA to support its claim, the river is a ground water divide and therefore a discontinuity that bisects the upper aquifer. Chrysler asserted that "[w]hen the stream is gaining water, groundwater moves into it from both directions and it is a discharge divide. When it becomes losing it is a groundwater recharge divide."

Response: Based on HRS Section 3.0.1.2.2, EPA has correctly considered the Great Miami River not to be a discontinuity that restricts the TDL for the BDT site. HRS Section 3.0.1.2.2, *Aquifer discontinuities*, defines when a feature such as a river is considered a discontinuity:

An aquifer discontinuity occurs for scoring purposes only when a geologic, topographic, or other structure or feature entirely transects an aquifer within the 4 mile target distance limit, thereby creating a continuous boundary to ground water flow within this limit. If two or more aquifers can be combined into a single hydrologic unit for scoring purposes, an aquifer discontinuity occurs only when the structure or feature entirely transects the boundaries of this single hydrologic unit. (Emphases added)

As detailed on pages 30 and 31 of the HRS documentation record at proposal, EPA evaluated the combined upper and lower aquifers as one unconsolidated, hydrologically interconnected aquifer.

According to the HRS definition above, the Great Miami River would have to entirely transect the entire interconnected aquifer system to be considered an aquifer discontinuity. In fact, the Great Miami River does not entirely transect the upper aquifer, let alone the combined upper and lower aquifers.

EPA discussed possible aquifer discontinuities in the HRS documentation record at proposal in the section titled Aquifer Discontinuity. Regarding the possibility that the Great Miami River qualifies at the BDT site as an aquifer discontinuity, the HRS documentation record at proposal states on page 31:

A thermometric study was conducted along Great Miami River, near downtown Dayton, Ohio, to investigate the interrelationship of surface water and ground water in the metropolitan area (Ref. 58, p. 4). The cross-sections developed during the thermometric study suggest that the Miami River does not completely intersect the aquifer (Ref. 58, pp.10, 11, 12, 34 through 43). The Miami River in the area of study is shallow and has a depth of less than 5-feet (Ref. 58, pp. 11, 12, 34 through 43). Therefore, the Great Miami River in the area of the study does not completely transect the aquifer which is 75 to 80 feet thick (Ref. 8 p. 51).

Chrysler presented no information that demonstrated that the above discussion is incorrect.

The assertion that the river is either a gaining stream or a losing stream during portions of the year also does not demonstrate that the river qualifies as an aquifer discontinuity under the HRS. First, as explained in section 3.5.2 of this support document, flow gradient divides generally do not constitute an aquifer discontinuity per HRS definition. Regardless, Chrysler presented no documentation that the flow gradients caused by the river entirely transect both the upper and lower components of the combined aquifer. In fact, that the flow gradients reverse documents the temporal nature of their existence and is an example of why EPA generally does not consider flow gradients sufficient to establish an aquifer discontinuity. Moreover, at this site, since the well fields are adjacent to the river (e.g., the Great Miami River Well field is directly across the River from the BDT facility), the pumping of the wells could easily be drawing water from the opposite side of the river in both the lower and upper aquifers (i.e., the consolidated aquifer used in the HRS evaluation), especially during periods when the influence of the river on ground water flow is neutral and thus not acting as a local flow divide..

In response to the comment that the study used to document the Great Miami River depth is not in the appropriate area, the location of the depth analysis is irrelevant as long as it is within the TDL for the site. As stated above, HRS Section 3.0.1.2.2 provides that an aquifer discontinuity must be evaluated within the 4-mile TDL. This segment is within the 4-mile TDL for the site, a fact that Chrysler does not dispute. The location is less than 2 miles southwest of the site where the First Street and Third Street bridges cross the river (see figures 1, 2, and 3 on pages 9, 10, and 11, respectively, of Reference 58 of the HRS documentation record at the time of proposal). The depth information in the study shows that the river does not entirely transect either the upper aquifer or the combined aquifer being evaluated within the TDL. Nor does Chrysler present any information supporting that the river depth in the TDL area is incorrect or even unique.

In addition, the USGS cross section D-D' presented in Reference 52 (pages 170, 173) of the HRS documentation record at proposal also shows that the Miami River does not entirely transect the upper aquifer where the cross section transect crosses the river within 2 miles of the site source.

Thus, EPA has no reason to consider the Great Miami River to be an aquifer discontinuity of either the upper or lower aquifers and certainly not the interconnected aquifer, that transects the entire TDL for the BDT site. Chrysler's comments on this subject have no effect on the HRS site score.

3.5.4 Establishment of the Target Distance Limit

Comment: Chrysler claimed that EPA incorrectly calculated the ground water TDL as including both the upper and lower aquifers for a distance of 4 miles from the site source. Chrysler interpreted HRS Section 3.0.1.2.1 as saying “[o]nly when an aquifer interconnection is found within 2 miles of sources at the Site is USEPA allowed to consider two separate aquifers as a single hydrologic unit for scoring purposes.” (Emphasis added.) Chrysler asserted that by ignoring what Chrysler claimed to be discontinuities, EPA “erroneously evaluated targets at the maximum distance of 4 miles, in conflict with the explicit directions of the HRS.”

Chrysler also interpreted this HRS section as requiring that “evaluating whether aquifer interconnections allow separate aquifers to be considered a single hydrologic unit is dependent on whether groundwater contamination ‘attributable to the sources at the site extends beyond 2 miles from the sources,’” and that “[i]f contamination (known to originate from the sources at the subject Site), is documented as extending beyond 2 miles of those sources, then and only then is USEPA allowed to consider whether any aquifer interconnections occur in the area 2 miles from the Site sources that would allow separate aquifers to be combined as considered as a single hydrologic unit.”

Chrysler concluded because the ground water TDL is then used in determining the Targets factor value for the aquifer, EPA’s “errors in calculating the ‘Ground water target distance limit’ will result in a substantial overestimate of the actual and potential risks presented by the subject Site.”

Response: Given that the upper and lower aquifers at the BDT site are interconnected within 2 miles of the source at the BDT site and there are no aquifer discontinuities completely transecting the interconnected aquifers within the 4-mile target distance limit (as explained in the above subsections of section 3.5 of this support document), the two aquifers are correctly evaluated as a single hydrologic unit for HRS scoring and the TDL of 4 miles is correctly identified.

Regarding Chrysler’s reading of the HRS as stating that contamination attributable to the site must be shown to be at a distance greater than 2 miles from the site sources for an evaluation of aquifer interconnections within the 2 miles of the sources to occur, this is a misinterpretation of, and inconsistent with, the text of the HRS. HRS Section 3.0.1.2.1, *Aquifer interconnections*, states:

Evaluate whether aquifer interconnections occur within 2 miles of the sources at the site. If they occur within this 2-mile distance, combine the aquifers having interconnections in scoring the site. In addition, if observed ground water contamination attributable to the sources at the site extends beyond 2 miles from the sources, use any locations within the limits of this observed ground water contamination in evaluating aquifer interconnections. (Emphasis added.)

The plain language of the HRS therefore provides for two situations in which aquifers can be combined into a single hydrologic unit. The first situation is when an interconnection is found within 2 miles of the site sources. The second situation is when ground water contamination attributable to the sources at the site extends beyond 2 miles from the sources, in which case the user is not limited to the 2-mile distance in the first sentence. For example, if contamination attributable to site can be documented to be 3 miles from the site, an interconnection to another aquifer need only be within 3 miles of the site, instead of 2 miles, for the aquifers to be considered interconnected. Contrary to Chrysler’s suggestion, the reference in HRS Section 3.0.1.2.1 to using “any locations within the limits of this observed ground water contamination” does not limit the user to only the 2-mile distance in the first sentence.

This interpretation is consistent with EPA's explanation in the preamble to the final HRS (55 FR 51553, December 14, 1990), which states in the section titled *Aquifer interconnections*:

Aquifer interconnections facilitate the transfer of ground water or hazardous substances between aquifers. The final rule specifies that if aquifer interconnections occur within two miles of the sources at the site (or within areas of observed ground water contamination attributed to sources at the site that extend beyond two miles from the sources), the interconnected aquifers are treated as a single aquifer for the purposes of scoring the site.

For the BDT site, the aquifers are interconnected based on the 2-mile distance limit and the option of using the distance of contamination was not used.

As explained throughout this section (section 3.5) of this support document, the extent of the aquifer being evaluated and the TDL were established consistently with the HRS. Chrysler's comments on the delineation of the aquifer and the TDL, therefore, have no effect on the HRS score for the site

3.6 Source Containment

Comment: Chrysler objected to the HRS documentation record not mentioning that Source 1 has a cover. Chrysler pointed to page 24 of the HRS documentation record at proposal as stating the source had no cover. Chrysler commented that "[a]ll areas of the Behr plant are paved or covered with buildings. Infiltration is therefore unlikely or limited. The site is not a landfill and therefore, would not be expected to have a leachate collection system."

Response: EPA acknowledges that it did not document whether the source has a cover. However, the presence or absence of a cover on this source does not change the assignment of a containment factor value of 10 to this source.

HRS Section 3.1.2.1, *Containment*, directs the scorer to "[a]ssign a containment factor value from Table 3-2 to each source at the site." The portion of HRS Table 3-2 used to assign the containment factor value for this source, contaminated soil, is the portion that applies to "All Sources (Except Surface Impoundments, Land Treatment, Containers, and Tanks)." Based on this table, a factor value of 10 is assigned if no liner exists or, if a liner is present, there is neither a maintained and engineered cover, a functioning and maintained run-on control system and runoff management system, or a functioning leachate collection and removal system immediately above the liner.

Page 24 of the HRS documentation record at proposal states that "the contaminated soil source has no liner, maintained engineered cover, functioning and maintained run-on control system, runoff management system, or functioning leachate collection and removal system. Based on this information, the Containment Factor Value (CFV) for Source 1 was assigned a maximum value of 10" per HRS Table 3-2.

The HRS documentation record at proposal does not document the presence of a cover for the site; however, this omission does not impact the assignment of the containment factor value. Since Source 1 had no liner, a score of 10 is appropriate whether or not Source 1 has a cover; Chrysler did not dispute the absence of a liner. If no liner is present, the existence of a cover is not relevant. If a liner were present, then the existence of a cover (or lack thereof) could have an impact.

EPA has removed the identification of no cover in the HRS documentation record at promulgation. That the source is not a landfill does not alter the factor value assignment for this source, as it turns on the considerations identified above.

3.7 Observed Release by Chemical Analysis: Attribution

Comment: Chrysler commented that EPA had not provided appropriate support to its assertion on page 39 of the HRS documentation record that “the TCE concentration in particular, between these other sources and Behr Dayton is significantly lower than that found in the ground water under and immediately downgradient of Behr Dayton documenting that the release of VOCs at Behr Dayton has significantly increased the contaminant concentrations of VOCs above that from other off site sources.” In support of its comment, Chrysler identified that the TCE concentrations in “monitoring wells on site or immediately downgradient of [two other properties [or “facilities”],] Simclar and Aramark, show concentrations in the range of 520 to 830 ug/L, exceeding all but the highest sampling points in the immediate vicinity of the Behr plant.”

Response: EPA provided appropriate support to its assertion that the release of VOCs at Behr Dayton has significantly increased the contaminant concentrations of VOCs above that from other off-site sources, including those at Simclar and Aramark. As explained below, the statement referred to by Chrysler was made in support of attributing, at least in part, a release to the BDT site. Attribution is one of the steps involved in identifying an observed release by chemical analysis at a site.

The HRS identifies the requirements for establishing an observed release in HRS Section 2.3, *Likelihood of release*, which states that an observed release can be established:

either by direct observation of the release of a hazardous substance into the media being evaluated . . . or by chemical analysis of samples appropriate to the pathway being evaluated.

HRS Section 2.3 further states the following for establishing an observed release by chemical analysis for all media:

[t]he minimum standard to establish an observed release by chemical analysis is analytical evidence of a hazardous substance in the media significantly above the background level. Further, some portion of the release must be attributable to the site. (emphasis added)

In its comment, Chrysler challenged whether EPA had adequately supported that at least some portion of the TCE release was attributable to the Behr Dayton facility.

Attribution is discussed on pages 39 to 44 of the HRS documentation record at proposal. This section identifies that there are two reasons for establishing that at least some portion of the release is attributable to the site. The first reason given is that EPA had established an observed release by direct observation based on the finding of TCE in soils at the site being in direct contact with the ground water (see pages 32-34 of the HRS documentation record at proposal) This observed release by direct observation by itself is sufficient to establish that the release from the BDT site is contributing in part to the significant increase in TCE in the ground water beneath the BDT facility, since it is clear TCE from the site has migrated into ground water.

The second reason given for identifying that some portion of the TCE release was from the BDT site was described in the HRS documentation record on page 39:

Second, while there are other sources of TCE in the vicinity of Behr Dayton, the VOC, and the TCE concentration in particular, between these other sources and Behr Dayton is significantly lower than that found in the ground water under and immediately downgradient of Behr Dayton documenting that the release of VOCs at Behr Dayton has significantly increased the contaminant concentrations of VOCs above that from other off site sources.”

EPA presented its rationale for the above assertion on pages 40 to 44 of the HRS documentation record at proposal. It documented that TCE was associated with the contaminated soil source at the site based on sampling, and that the TCE may have been released by Behr Dayton from leaks and spills on the Behr property. EPA also identified that the soil vapor extraction system operated by Chrysler has recovered hundreds of pounds of VOCs (TCE being a VOC) during its operation.

EPA then presented its rationale for why it considered that at least part of the TCE in the ground water was coming from the BDT site and not from other off-site sources. In a section titled “Other Off Site Sources” on pages 41 to 44 of the HRS documentation record at proposal, EPA acknowledged that the BDT site was not the only possible source of TCE release in the vicinity. EPA identified several other facilities in the vicinity including the two mentioned by Chrysler, Aramark and Simclar, and their locations relative to the BDT facility.

The Simclar property is located west of the Behr property, and Aramark is located south of the Behr property (see Figure 1 of the HRS documentation record at proposal). The ground water flow direction near the Simclar property was estimated to be predominantly north to south, making it side gradient to the Behr property (see Figure 4 of the HRS documentation record at proposal), and thus contaminant migration from it would not be toward the BDT site. The Aramark facility is south of the BDT site and the flow gradient was also north to south, thus contamination from it would also not flow toward the Behr facility (see Figures 1 and 4).

The PermaFix property located to the west, southwest of the Behr property, also appears to be downgradient and side gradient of the Behr property (see Figures 1 and 4 of the HRS documentation record at proposal). In contrast, Gem City Chemicals, DAP, and Gayston properties located east or northeast of the Behr property appear to be upgradient of the Behr property (see Figures 1 and 4 of the HRS documentation record at proposal). However, since the background samples that EPA used to establish a significant increase in the TCE concentrations at the BDT site were between these properties and the BDT site, and since the TCE concentration in these samples was at least three times lower than at the BDT site, EPA concluded that the BDT site must be contributing to the significant increase in TCE concentrations found at the site.

Therefore, based both on the identification of an observed release by direct observation of TCE to ground water at the site and an analysis of flow directions and TCE concentrations, EPA provided appropriate support to its assertion on page 39 of the HRS documentation record that “the TCE concentration in particular, between these other sources [of TCE in the vicinity of Behr Dayton] and Behr Dayton, is significantly lower than that found in the ground water under and immediately downgradient of Behr Dayton documenting that the release of VOCs at Behr Dayton has significantly increased the contaminant concentrations of VOCs above that from other off site sources.”

Furthermore, even if the Simclar and Aramark properties had been directly upgradient of the Behr property at other times (given potential changes in local flow direction) and the TCE levels found at these facilities were used to establish background levels, attribution of at least part of a significant increase in TCE concentrations to the BDT facility could still have been identified. TCE was found in samples MW-

010S (19,000 µg/L), MWA-006 (4,700 µg/L), and MW-028A (3,200 µg/L) at the BDT site. These levels are at least three times greater than the levels of TCE found at the Simclar and Aramark facilities (520 µg/L and 830 µg/L respectively). Thus, even if the concentrations at the Aramark and Simclar facilities were used as background levels for the BDT site, at least part of the significant increase would still be attributed to releases from the BDT site based on the difference in TCE levels between the facilities.

That not all the TCE concentrations at the BDT facility were three times the levels at the two other facilities does not negate the significant increase found in the three on site samples and thus does not negate the finding that at least part of the significant increase is attributable to releases from BDT.

Furthermore, the alternative selection of background levels based on TCE levels at off site sources also would not negate the identification of the observed release by direct observation of TCE from the BDT facility. As discussed above, this direct observation of an observed release also documents that at least some of the significant increase in TCE concentrations at the BDT facility was due to releases from the BDT facility.

3.8 Waste Characteristics

3.8.1 Hazardous Waste Quantity

Comment: Chrysler commented that the HRS requires “EPA to consider the effects of any previous response or removal actions on the hazardous waste quantity and the hazardous waste quantity factor value that ultimately is used to calculate the ‘Waste Characteristics’ component” of the HRS score equation. Chrysler asserted that the Hazardous Waste Quantity component of the ground water migration pathway must consider the response actions in assigning the hazardous waste quantity factor value for the pathway. Chrysler claimed that “[d]espite numerous references to those response and removal actions, and incorporation into the administrative record a number of references that provide detailed information about the types and quantities of hazardous substances removed from the BDT Site through those actions, the HRS Documentation Record contains no evidence to substantiate EPA’s consideration of those actions.” Chrysler commented that EPA failure to consider these actions corrupted the calculation of the “Waste Characteristics” component of the HRS score.

Response: Consistent with the HRS, EPA considered in its evaluation the effect of any previous response and removal actions on the assigned source “hazardous waste quantity” for the contaminated soil source (Source 1), the pathway waste quantity for the ground water pathway, and the assigned HRS score for the site. This consideration, however, did not have any impact on the assigned source or pathway hazardous waste quantity factor values since adequate determination of the hazardous constituent quantity both before and after any removals could not be made. Consistent with the HRS, EPA therefore used a minimal source hazardous waste quantity factor value and assigned the pathway waste quantity based on that value.

Two waste quantity factor values are assigned during the HRS evaluation of a site - source waste quantity values and a pathway waste quantity factor value. The evaluation of source waste quantity is described in HRS Section 2.4.2.1, *Source hazardous waste quantity*. The HRS allows the evaluation of source hazardous waste quantity based on a four-tier scale depending on the level of information available. The four tiers, in the order of descending quality of data, are: hazardous constituent quantity, hazardous wastestream quantity, volume, and area. HRS Section 2.4.2.1.5, *Calculation of source hazardous waste quantity value*, directs the scorer to select the highest of the values assigned to the four tiers.

The pathway waste quantity factor value is assigned according to the procedure contained in HRS Section 2.4.2.2, *Calculation of hazardous waste quantity factor value*. HRS Section 2.4.2.2 directs the scorer to

sum the source waste quantity of all sources eligible for a migration pathway (i.e., for this site, the ground water migration pathway), round it to an integer as specified (including the instruction that “if the sum is greater than 0, but less than 1, round it to 1”), and assign the pathway hazardous waste quantity value based on that sum according to HRS Table 2-6 and other instructions in HRS Section 2.4.2.2. In the situation when the Table 2-6 value is 1, footnote “b” of the table directs the scorer not to assign the value of 1, but instead to assign the value according to the other instructions in HRS Section 2.4.2.2. These instructions applicable to this site state:

For a migration pathway, if the hazardous constituent quantity is adequately determined (see section 2.4.2.2.1) for all sources (or all portions of sources and releases remaining after a removal action), assign the value from Table 2-6 as the hazardous waste quantity factor value for the pathway. If the hazardous constituent quantity is not adequately determined for one or more sources (or one or more portions of sources or releases remaining after a removal action), assign a factor value as follows:

- If any target for that migration pathway is subject to Level I or Level II concentrations (see section 2.5), assign either the value from Table 2-6 or a value of 100, whichever is greater, as the hazardous waste quantity factor value for that pathway.
- If none of the targets for that pathway is subject to Level I or Level II concentrations, assign a factor value as follows:
 - If there has been no removal action, assign either the value from Table 2-6 or a value of 10, whichever is greater, as the hazardous waste quantity factor value for that pathway.
 - If there has been a removal action:
 - Determine values from Table 2-6 with and without consideration of the removal action.
 - If the value that would be assigned from Table 2-6 without consideration of the removal action would be 100 or greater, assign either the value from Table 2-6 with consideration of the removal action or a value of 100, whichever is greater, as the hazardous waste quantity factor value for the pathway.
 - If the value that would be assigned from Table 2-6 without consideration of the removal action would be less than 100, assign a value of 10 as the hazardous waste quantity factor value for the pathway.

Section C of the preamble to the final HRS (55 FR 51543, December 14, 1990), explains these instructions:

If the hazardous constituent quantity for all sources is not adequately determined, and none of the targets are subject to Level I or II contamination, the minimum factor value assigned for hazardous waste quantity depends on whether there has been a removal action, and *what the hazardous waste quantity factor would have been without consideration of the removal action*. If there has not been a removal action, the minimum hazardous waste quantity factor value will be 10. If there has been a removal action and . . . [i]f the hazardous waste quantity factor value was less than 100 prior to consideration of the removal action, a minimum hazardous waste quantity factor value of 10 will be assigned. This will ensure that the Agency provides an incentive for removal actions and that in no case will consideration of removal actions result in an increased hazardous waste quantity factor value score. (emphasis added)

As stated in the emphasized portion of the HRS preamble text above, the HRS provides that (where the hazardous constituent quantity for all sources is not adequately determined, and none of the targets are subject to Level I or II contamination) if a removal action has occurred, the waste quantity is considered before and after the removal action. In this case, since there is only one source evaluated at this site, the source waste quantity and the sum of the source waste quantities are the same. This value was input to Table 2-6 of the HRS, and the pathway waste quantity factor value was assigned based on that summed value.

The estimate of waste quantity for the BDT site was not impacted by any response actions at the site. As explained below, whether or not the removal actions undertaken by Chrysler were considered in the HRS evaluation, EPA would have established a hazardous waste quantity factor value of 10.

The value assigned in the HRS documentation record at proposal was based on conditions before the removal action. For the source at the BDT site, the HRS documentation record at proposal identified numerous samples collected prior to any response action that contained elevated concentrations of multiple contaminants resulting from site activities (see pages 18-26 of the HRS documentation record at proposal). For the source (Source 1), sample concentrations were reported from multiple depths below ground surface (see the table on pages 21-23 of the HRS documentation record at proposal), and while an approximate contaminated soil source area was identified, the extent of contamination under the buildings was not known (see page 20 of the HRS documentation record at proposal), making it impossible to support a complete estimate of hazardous waste quantity using any of the HRS tiers. Therefore, EPA was able to demonstrate only that there were hazardous substances present the source. As a result, the source was characterized as having a hazardous waste quantity of “> 0 [greater than zero], but the amount is unknown,” based on the unquantifiable but known presence of hazardous substances in the source (see pages 24-26 of the HRS documentation record at proposal).

As stated above, the hazardous constituent quantity could not be adequately determined for this source with any confidence, nor was any actual contamination of any target wells (targets subject to Level I or Level II contamination) established. Assuming that the removal did not qualify for consideration in the HRS scoring, a factor value of 1 would be assigned from Table 2-6 for a waste quantity of >0. Under footnote b to Table 2-6 and other parts of HRS section 2.4.2.2, the scorer is then to “assign either the value from Table 2-6 or a value of 10, whichever is greater[.]” Therefore, a pathway hazardous waste quantity factor value of 10 would apply in scoring this site if the removal is not considered.

If EPA were to consider conditions after the removal as altered from the initial conditions by the amount of VOCs removed by the existing soil vapor extraction system and a ground water pump and treatment system, which are removing estimated hundreds of pounds of VOCs per year, a source hazardous waste quantity factor value of unknown but greater than 0 still applies, for two reasons. First, the treatment systems are continuing to remove VOCs from the source area, demonstrating that hazardous substances from the source remain in the soil and in the ground water. Second, as discussed in the HRS documentation record at proposal on page 13, soil vapor intrusion of TCE from the site is occurring into residences in areas adjacent to the BDT facility. Therefore, not all released contamination has been addressed and the source hazardous waste quantity would be assigned as “>0, but the amount is unknown.”

The unknown but greater than zero source hazardous waste quantity factor value would correspond to a value of 1 from HRS Table 2-6. However, based on the instructions in footnote b of Table 2-6 and those in other parts of HRS Section 2.4.2.2, a pathway waste quantity factor value of 10 still applies. When a removal has occurred, HRS Section 2.4.2.2. specifies, “[d]etermine values from Table 2-6 *with and without consideration of the removal action.*” (emphasis added) Then the HRS directs in relevant part

that “[i]f the value that would be assigned from Table 2-6 without consideration of the removal action would be less than 100, assign a value of 10 as the hazardous waste quantity factor value for the pathway.” Thus, a pathway hazardous waste quantity factor value of 10 would be assigned.

Therefore, a pathway hazardous waste quantity factor value would be assigned a 10 (the hazardous waste quantity factor value assigned at proposal) based either on conditions before or after the removal action. Accordingly, Chrysler’s comments have no effect on the site score.

3.8.2 TCE Toxicity

Comment: Chrysler stated that the HRS documentation record does not indicate how EPA derived the maximum toxicity value of 10,000 for TCE, claiming that “[t]he record contains absolutely no explanation or justification for USEPA’s selection of the maximum allowable Toxicity Factor Value for the TCE present in the ground water and attributed to the BDT Site.” Chrysler said that the HRS “mandates a ‘decision tree’ method for deriving the Toxicity Factor Value for any hazardous substance or chemical present at a Site being scored,” and that it is not clear whether EPA followed its own methodology in this case.

Chrysler asserted that EPA’s “failure to document the basis for its selection of the Maximum Toxicity Factor Value is compounded by the conflicting references regarding the purported carcinogenicity and/or toxicity of TCE.” Chrysler stated EPA had developed toxicity values to estimate the risk of getting cancer or other adverse health effects, based on studying test animals given relatively high doses over their lifetimes, then adjusting and normalizing these doses to a milligram per kilogram per day basis for humans, and by studying humans exposed in occupational settings. Chrysler wrote that “at this time, USEPA has withdrawn all previously published carcinogenicity values for TCE as further scientific data have become available and are being evaluated.”

Chrysler asserted that EPA “certainly envisioned that reliable data would be used for calculating the toxicity values of hazardous substances and chemicals addressed in the HRS scoring process.” This assertion was based on the proposed rulemaking for the HRS revisions which Chrysler quoted as stating, “The proposed toxicity scoring methodology would use readily available, high quality toxicity data, rely on a data base that is large enough to provide a score for all sites, and be consistent with existing USEPA procedures.”

Chrysler noted that the HRS does not specify the reference documents or the EPA databases to be used as the source for the toxicity data. Chrysler commented that EPA’s IRIS database “states ‘no data’ for the Oral Rfd Assessment, ‘no data’ for the Inhalation Rfc Assessment, and the carcinogen assessment summary for this substance has been withdrawn following further review.” Chrysler asserted that “[f]or TCE, there is no ‘high quality toxicity data.’” Chrysler identified that the Superfund Chemical Data Matrix (SCDM) is another EPA database from which toxicity and health effects data are taken for HRS scoring, and that SCDM refers to IRIS as one source for its information. Chrysler stated that “there appears to be a significant conflict between the toxicity information for TCE included in the IRIS database and the toxicity value stated in the SCDM database.”

Chrysler concluded that “[w]ithout consistent data on the toxicity of TCE, it is arbitrary and capricious for USEPA to calculate a Toxicity Factor Value without specifying the source of the data upon which the calculation is based.” It claimed that “the toxicity value for TCE is the dominant element in calculation of the Ground Water Migration Score and must be determined to be accurate and supported by substantial evidence in the administrative record,” which “USEPA has not done and its decision cannot be upheld.”

Response: In response, the human toxicity factor value of 10,000 for TCE is appropriately assigned and referenced consistent with the HRS. The HRS has an orderly method for determining a human toxicity factor (HTF) value and this method was followed in assigning the HTF value for TCE. This method is specified in HRS Section 2.4.1.1, *Toxicity factor*, which states in relevant part that:

Establish human toxicity factor values based on quantitative dose-response parameters for the following three types of toxicity:

- Cancer - Use slope factors (also referred to as cancer potency factors) combined with weight-of-evidence ratings for carcinogenicity. If a slope factor is not available for a substance, use its ED₁₀ value to estimate a slope factor as follows:

$$\text{Slope factor} = \frac{1}{6 (\text{ED}_{10})}$$

- Noncancer toxicological responses of chronic exposure - use reference dose (RfD) values.
- Noncancer toxicological responses of acute exposure - use acute toxicity parameters, such as the LD₅₀.

Assign human toxicity factor values to a hazardous substance using Table 2-4 as follows:

- If RfD and slope factor values are both available for the hazardous substance, assign the substance a value from Table 2-4 for each. Select the higher of the two values assigned and use it as the overall toxicity factor value for the hazardous substance.
- If either an RfD or slope factor value is available, but not both, assign the hazardous substance an overall toxicity factor value from Table 2-4 based solely on the available value (RfD or slope factor).
- If neither an RfD nor slope factor value is available, assign the hazardous substance an overall toxicity factor value from Table 2-4 based solely on acute toxicity. That is, consider the acute toxicity in Table 2-4 only when both RfD and slope factor values are not available.
- If neither an RfD, nor slope factor, nor acute toxicity value is available, assign the hazardous substance an overall toxicity factor value of 0 and use other hazardous substances for which information is available in evaluating the pathway.

The SCDM report that contains the data used to assign the HTF lists the following dose response parameters for TCE. (These data are on page A-1 of the SCDM TCE report included in Reference 2 of the HRS documentation record at proposal.)

- Oral RfD = 3.0E-4 mg/kg/day
- Inhalation RfD = 1.2 E-2 mg/kg/day
- Oral slope = 4.0E-1 (mg/kg/day)⁻¹
- Oral Weight of Evidence = B2
- Oral ED₁₀ = 1.0E+1 mg/kg/day
- Oral ED₁₀ = Weight-of-Evidence = B2
- Inhalation ED₁₀ = 1.0E+1 mg/kg/day

- Inhalation ED₁₀ Weight-of-Evidence = B2
- Oral LD₅₀ = 6.0E+3 mg/kg
- Dermal LD₅₀ = 2.4E+4 mg/kg
- Gas Inhalation LC₅₀ = 4.8E+3 ppm
- Dust Inhalation LC₅₀ = 3.3E+1 mg/L

Using the criteria established in HRS Section 2.4.1.1, an HTF of 10,000 was assigned to TCE from HRS Table 2-4. The directions applicable to TCE from HRS Section 2.4.1.1 state that if an RfD and a slope factor are both available, assign the substance a value from HRS Table 2-4 for each and select the higher of the two assigned values.

Both an oral slope factor (with corresponding oral weight-of-evidence) and an oral RfD are available for TCE. Considering the “Carcinogenicity (Human)” section of HRS Table 2-4, the oral slope factor (SF) of $4.0E-1$ (mg/kg/day)⁻¹ with an oral weight-of-evidence of B2 falls within the weight-of-evidence “B” column and the “ $0.05 \leq SF < 0.5$ ” slope factor value categories in HRS Table 2-4, which would result in assigning TCE an HTF of 100.

However, because an oral RfD is also available for TCE, the “Chronic Toxicity (Human)” section of HRS Table 2-4 is also considered. That is, the TCE oral RfD of $3.4E-4$ mg/kg/day when applied to HRS Table 2-4 falls in the category of “RfD < 0.0005” and the assigned HTF value for this category is 10,000. Consistent with HRS Section 2.4.1.1, the higher of the two assigned HTF values was selected; thus, TCE was assigned an HTF of 10,000. Although additional toxicity data are available for TCE, they need not be considered because the HRS specifies that the RfD and the slope factor values be considered in preference to these data (HRS Section 2.4.1.1).

As Chrysler noted, the HRS does not specify the references to be used as sources for toxicity information. Thus, EPA must review available resources to identify whether toxicity data exists, and in what form. In this case, EPA first checked for TCE toxicity data in the following order: the EPA Integrated Risk Information System (IRIS), the EPA *Superfund Technical Support Center Provisional Toxicity Issue Papers* (STSCPTV), the EPA *Health Effects Assessment Summary Tables* (HEAST), the American Conference of Governmental Industrial Hygienists (ACGIH) *Documentation of the Threshold Limit Value and Biological Exposure Indices*, and the National Institute for Occupational Safety and Health (NIOSH) *Registry of Toxic Effects of Chemical Substances* (RTECS).

As Chrysler pointed out, IRIS does not contain an RfD or a slope factor for TCE. Similarly, STSCPTV and HEAST also did not contain toxicity data for TCE. EPA found ED₁₀ values in the other standard references listed above, which can be used to calculate a slope factor. However, because the ED₁₀ data were issued in 1988 and were not considered the most recent evaluation of TCE toxicity, they were not used to assign the TCE HTF. Both ACGIH and RTECS data contained LD₅₀ and/or LC₅₀ values, but because the criteria established in HRS Section 2.4.1.1, requires that RfDs and/or slope factors be used in preference to LD₅₀ and LC₅₀ values, EPA decided to search for the most recent available TCE evaluation of human health risk which contained RfDs and an oral slope factor. For these reasons, the scorer used another EPA data source for obtaining the RfD and slope factors for TCE.

EPA identified a data source for the TCE oral RfD, inhalation RfD, and oral slope factor values in the EPA report titled, *Trichloroethylene Health Risk Assessment: Synthesis and Characterization (External Review Draft)* (EPA/600/P-01/002A) (US EPA Office of Research and Development). On page ii of that report EPA states:

This assessment presents EPA's most current evaluation of the potential health risks from exposure to TCE (trichloroethylene). TCE exposure is associated with several adverse health effects, including neurotoxicity, immunotoxicity, developmental toxicity, liver toxicity, kidney toxicity, endocrine effects, and several forms of cancer. Mechanistic research indicates that TCE-induced carcinogenesis is complex, involving multiple carcinogenic metabolites acting through multiple modes of action. Under EPA's proposed (1996) cancer guidelines, TCE can be characterized as "highly likely to produce cancer in humans."

For effects other than cancer, an oral RfD of 3×10^{-4} mg/kg-d was based on critical effects in the liver, kidney, and developing fetus. An inhalation RfC of 4×10^{-2} mg/m³ was based on critical effects in the central nervous system, liver, and endocrine system. Several cancer slope factors were developed, with most between 2×10^{-2} and 4×10^{-1} per mg/kg-d. Several sources of uncertainty have been identified and quantified.

The mechanistic information suggests some risk factors that may make some populations more sensitive. There are suggestions that TCE could affect children and adults differently. In addition, several chemicals have the potential to alter TCE's metabolism and clearance and subsequent toxicity; conversely, TCE exposure can augment the toxicity of other chemicals. Widespread environmental exposure to some of TCE's metabolites makes it important to consider the cumulative effect of TCE along with other environmental contaminants.

EPA considered it reasonable to use TCE information in the *Trichloroethylene Health Risk Assessment: Synthesis and Characterization (External Review Draft) report* as the data source for TCE toxicity data used to assign the toxicity factor value for TCE for multiple reasons: 1) because of the HRS' preference for the use of available RfDs and slope factors, 2) because EPA considers it more protective of human health to use the value in the draft report than to have no value when there is evidence suggesting the substance has a significant toxicity, 3) because the purpose of the HRS evaluation is to identify sites that warrant further investigation, and 4) because the report's assessment is EPA's most current evaluation of TCE toxicity and it was endorsed by EPA's National Center for Environmental Assessment (NCEA)., This report is publicly available (<http://cfpub.epa.gov/ncea/cfm/recordisplay.cfm?deid=23249>).

As was done in this case, when EPA uses a source for toxicity data other than the standard sources noted above, it generally lists the value (but not the reference) in a database called LIVECHEM within the SCDM database. The LIVECHEM database is identified in the SCDM Report as a repository of data selected by EPA. EPA enters values into the LIVECHEM database when a data value is not available in the sources mentioned above (as was the case here), when the data in the standard references are outdated compared to a newer reference, or if the usability of the data has been questioned. The reference name is added to the list of references in Chapter 2 of the SCDM Report when the next version of the overall report is prepared. Until that occurs, EPA retains the reference information and it is available upon request.

In this case, since the TCE value was reviewed independently of a SCDM database update, EPA posted the changed value (10,000) on the SCDM Web page. However, in response to Chrysler's comment, and to make the information more readily available to the public, EPA will in the future identify both the changed value and the reference for that value on the same Web posting, instead of waiting for the next update of the SCDM database to identify the reference.

Regarding Chrysler's comment that there is a conflict between the toxicity information for TCE included in the IRIS database and the toxicity value stated in the SCDM, EPA does not find this analysis to be

correct. The lack of data for a substance in the IRIS database or the indication that a substance is under review for inclusion in IRIS by no means indicates that data found for this substance in another EPA reference or another scientifically reliable source misrepresents the risk posed by the substance.

Furthermore, even if the toxicity factor value for TCE were dropped from the HRS scoring, another substance, PCE, found in observed releases, associated with the soil source, and available to the pathway would have been used in the scoring as it is associated with the next highest toxicity/mobility factor value of 100 (see page 43 of the HRS documentation record at proposal). Using a toxicity/mobility factor value of 100 would lower the waste characteristics value from 18 to 6, but the pathway score would remain 100 and the maximum pathway value and the site score would remain 50.00. Therefore, the HRS site score of 50.00 is not dependent on the TCE toxicity value.

3.9 Potential Targets

Comment: Chrysler stated that EPA “incorrectly scored the groundwater migration pathway in the HRS calculation.” Specifically, Chrysler stated that EPA “scored targets which the BDT Site has no potential to contaminate. The HRS provides that ‘[t]he primary targets are populations served by municipal wells that could potentially be exposed to contaminated drinking water.’” [Emphasis added by Chrysler.] Chrysler also asserted that “[i]f it is a factual impossibility for contamination to reach certain wells, it is illogical and inappropriate to include such wells in the HRS scoring calculation. See *Bradley Mining Co. v. USEPA*, 972 F.2d 1356, 13568 [sic] (D.C. Cir. 1992) (Congress required USEPA to amend the HRS to accurately assess, to the maximum extent feasible, the relative degree of risk from various sites).”

Chrysler claimed that “neither the Miami River Well Field nor the Mad River Well Field could potentially expose Dayton residents to contaminated drinking water from the source attributed to the BDT Site.” Chrysler asserted that these two well fields were separated by discontinuities from the BDT Site, some of which were discontinuities related to flow direction.

Response: As discussed in section 3.5 of this support document, neither the presence of till layers, a ground water divide based on ground water flow, nor the Great Miami River constitutes a discontinuity as defined in the HRS. Therefore, EPA’s delineation of the TDL and EPA’s consideration of the wells in the Miami River Well Field and the Mad River Well Field (which are within the delineated TDL for the site) as potential targets, is consistent with the HRS.

Regarding the argument that scored wells are upgradient in terms of flow from the site and therefore should not be scored, EPA’s scoring of upgradient wells within the delineated TDL as potential targets is consistent with the HRS. As discussed in the preamble to the HRS (55 FR 51553, December 14, 1990), the HRS does not specifically take into account such level of detail as ground water flow gradient to determine target populations, as EPA concluded that “it was not feasible to adopt a tiered approach in the targets factors for evaluating ground water flow direction.” (Emphasis added.) EPA also pointed out in the same page in the preamble to the HRS that “[a]lthough the [HRS] does not consider ground water flow direction directly in evaluating targets, it does consider flow direction indirectly in the method used to evaluate target populations.”

As specified in HRS Sections 3.0.1.1, *Ground water target distance limit*, and 3.0.1.2.2, *Aquifer discontinuities*, the HRS uses a distance of 4 miles from the sources used in the HRS scoring when determining the targets to be evaluated, provided there is no discontinuity that completely transects the aquifer of concern between the sources and the well being scored for HRS purposes. The nearest well target and the target population at risk due to actual or potential contamination targets are evaluated using the TDL, as specified in HRS Sections 3.3.1 and 3.3.2, According to HRS Section 3.3.2.4, *Potential contamination*, if wells have not been contaminated by the site, as would be typical of upgradient wells,

those wells that are considered potentially rather than actually contaminated and the population drawing from those wells is distance weighted. Conversely, if wells have been contaminated by the site, a likelihood for downgradient wells, the wells are considered actually contaminated and given higher weight in scoring (see HRS Section 3.3.2, *Population*, and subsections).

As discussed on page 46 of the HRS documentation record at proposal, for the BDT site EPA evaluated as the “primary targets . . . populations served by the municipal wells that could potentially be exposed to contaminated drinking water.” EPA did not score any wells as being subject to actual contamination. Consistent with the HRS, as discussed on page 48 of the HRS documentation record, “[a] distance-weighted population value was assigned to each distance category based on the number of people within the distance category.”

Thus, whereas EPA considered whether aquifer discontinuities exist in its delineation of TDL and in HRS scoring, EPA did not consider ground water flow direction in evaluating potential targets. The HRS does not directly consider ground water flow information when evaluating target populations, as explained above.

Concerning the comment regarding scoring potentially contaminated targets that, as stated in *Bradley Mining Co. v. USEPA*, 972 F.2d 1356, 13568 (D.C. Cir. 1992), “Congress required USEPA to amend the HRS to accurately assess, to the maximum extent feasible, the relative degree of risk from various sites,” as described in this response, EPA followed the HRS in evaluating the potential targets for this site.

If Chrysler is commenting on whether the HRS is consistent with CERCLA, that comment is outside the scope of this rulemaking. The present HRS was promulgated on December 14, 1990, 55 Fed. Reg. 51532, and is not being reconsidered in this NPL listing rulemaking.

3.10 Adequacy of the Public Docket

Comment: Chrysler stated that the administrative record for the site was incomplete or inadequate to evaluate many of EPA’s assertions or conclusions in the HRS documentation record. It also claimed that many of the references were missing, incomplete, or incorrect. Chrysler specified 17 items in Attachment A to its comments in support of these assertions. Chrysler cited the court case, *Tex Tin Corp. v. U.S. EPA* 935, F.2d 1321, 1323 (D.C. Cir. 1991) “(failure of agency to adequately explain and support its decision to list a site on the NPL is grounds for remanding rule)” in support.

Response: EPA has reviewed the 17 items identified by Chrysler and addressed them in this support document, either in earlier sections or in this section. Comments on issues not previously raised in the main body of Chrysler's submittal and that, if accurate, could have impacted the site score, were included in earlier sections of this support document (see sections 3.2, 3.5, 3.6, and 3.7 of this support document). The rest of the comments in Attachment A submitted by Chrysler are addressed in subsections 3.10.1 through 3.10.11 of this support document.

3.10.1 Screening levels

Comment: Chrysler objected to the fact that EPA had not identified TCE screening levels for residential and commercial sub-slab and indoor air as draft levels on page 13 of the HRS documentation record at proposal. Chrysler also pointed out that indoor air is not a scored pathway. Additionally, Chrysler cited a transcript of an EPA public hearing in Dayton Ohio on October 8, 2008, quoting EPA as saying “the .4 per billion screening level for our homes, that’s a recommendation from the health agency, from Ohio Department of Health.”

Response: Regardless of whether the indoor screening levels are draft, the point being made in the HRS documentation record at proposal was that the levels were exceeded. Also, regardless of whether the levels are draft, as pointed out by Chrysler, this information was not used in the HRS scoring of the site.

Page 13 of the HRS documentation record is part of the narrative Site History section. Page 13 noted that the indoor air levels of TCE in samples exceeded the ATSDR residential TCE indoor air screening level.

The sentence Chrysler referred to is on page 13 in Section 2.0.2, *Site History*, of the HRS documentation record at proposal, and is shown italicized below:

In the Daniel Street and Leo Street area, OEPA documented elevated soil gas VOC concentrations. TCE concentrations as high as 62,000 ppb were detected in the sub-slab samples (Refs. 4, p. 10; 5, p. 12). *The Agency for Toxic Substances and Disease Registry (ATSDR) and the Ohio Department of Health (ODH) established TCE screening and action levels for residential and commercial sub-slab and indoor air* (Refs. 4, p. 10; 5, p. 8). The ATSDR residential indoor air screening level is 0.4 ppb, and the action level is 100 ppb. The ATSDR residential sub-slab screening level is 4 ppbv. Samples from all eight residences exceeded the ATSDR residential TCE sub-slab screening level of 4 ppbv (Refs. 4, p. 10; 41, p. 1; 43, p. 2).

As indicated in Chrysler's comment, indoor screening level information was not used in the HRS evaluation (which scored only the ground water pathway), so whether the indoor air screening levels were draft or final does not impact the HRS evaluation in any way.

EPA notes that Chrysler's comments on unscored pathways are discussed in section 3.2.2 of this support document.

3.10.2 Flow Direction

Comment: Chrysler asserted that Figure 3 of the HRS documentation record is incorrect in showing that flow direction in the vicinity of the Behr plant is to the north or northeast, but that ground water flows "north to south and northeast to south" as stated elsewhere in the HRS documentation record. Chrysler claimed that "the presence of chlorinated solvents in wells north of the Behr plant does not provide evidence supporting the Targets or Population factors use in scoring the BDT Site, but rather evidence of an upgradient, off-site source of groundwater contamination."

Response: Figure 3 of the HRS documentation record at proposal was not revised based on Chrysler's comment. This figure was taken from and developed based on information contained in Reference 18 of the HRS documentation record at proposal. Reference 18 is the appendix to a site investigation report for the BDT site prepared by the Ohio EPA. This figure shows localized flow contours to the north on the north edge of the BDT facility based on a single sampling event. Chrysler has presented no information indicating the flow contour representations are in error; it claims the flow direction disagrees with other statements in the HRS documentation record.

EPA agrees that the main direction of ground water flow under the facility is north to south and northeast to southeast; however, EPA notes that there may be localized flow in other directions at various times. In fact, a northern flow direction at this location would be toward the Great Miami River, which as Chrysler asserts elsewhere in its comments (see section 3.5.3 of this support document), at times is a "losing" river; that is, ground water flows into it. Therefore, because the northern edge of the BDT property is the

closest location to this river, a local component of northern flow at this location as shown in Figure 3 is consistent with Chrysler's other comments.

Finally, that there may be other sites whose releases threaten the same target population does not make those targets ineligible for consideration at any one or all of the sites for which the targets are within the TDL for each site. Further, as noted in section 3.9 of this support document, the targets scored for the BDT site are only identified as potentially threatened and no scoring is based on a claim that the release from this site (or any other) has reached these targets.

3.10.3 TCE Plume Contours and Flow Direction

Comment: Chrysler commented that Figure 4 on page 17 of the HRS documentation record shows a TCE plume contour at the northernmost point, but that based on the flow direction, TCE would need to travel over 1,000 feet upgradient to reach a well field. Chrysler also disagreed with an arrow on Figure 4 that shows a flow direction component to the east.

Response: EPA does not disagree that TCE would have to travel over 1,000 feet from the contaminated soil source to reach a well field. However, because Chrysler has presented no information demonstrating that the identification of an eastern flow component is incorrect, Figure 4 has not been revised.

As identified on the figure, Figure 4 was taken from and developed based on information contained in Reference 18 of the HRS documentation record at proposal, the appendix to a site investigation report for the BDT site prepared by the Ohio EPA. Chrysler has presented no contrary information or identified an error in the figure's development.

In addition, as explained in section 3.5.3 of this support document, EPA agrees that the main direction of ground water flow under the facility is north to south and northeast to southeast, however, that there may be localized flow in other directions at various times does not change the overall flow direction over time.

Furthermore, as explained in sections 3.5 (and its subsections) and 3.9 of this support document, that contamination would have to travel over 1,000 feet to reach a well field does not affect the identification of such a well field as an eligible target for this site. Moreover, as explained in section 3.9 of this support document, ground water flow is not used in evaluating potential targets in HRS scoring.

3.10.4 Various On-Site Releases

Comment: Chrysler commented that while several releases were identified as occurring at the BDT facility in several places in the HRS documentation record, there is no evidence these releases were to soil. Chrysler also asserted that the statements on releases were misleading and irrelevant, and that the HRS scoring is focused on the release of chlorinated solvents.

Response: EPA considers the statements on releases in the HRS documentation record at proposal to be neither misleading nor irrelevant. Therefore, no changes have been made to the HRS documentation record based on these comments. The statements Chrysler refers to are on pages 18 and 32 of the HRS documentation record at proposal. The statements on page 18 are part of a background discussion for the Source Characterization section of the HRS documentation record. The statements on page 32 are in a discussion supporting the identification of an observed release by direct observation. The sentences in both cases are part of an overall discussion of BDT waste handling practices.

The discussion on pages 32-33 of the HRS documentation record at proposal states, with the pertinent sentences italicized:

The contamination in the soil is considered to have come from Behr operations. Waste materials were stored on the property in various waste accumulation areas (Ref. 6, p. 4). Accumulation areas consisted of roll-offs, drum storage areas, and waste storage tanks (Ref. 6, p. 4). Accumulation areas changed throughout the site history based on changes in production and construction changes at the site (Ref. 6, p. 4). *The facility reported releases from a leaking underground storage tank; 1990 process wastewater discharge; a polychlorinated biphenyl (PCB) release and cleanup; 1996 oil/water mixture release; 1990 zinc discharge due to process malfunction; 1991 process overflow; 1991 process overflow; 1996 hydrogen peroxide release; 1996 waste oil release; 1996 stamping oil overflow; 1996 oil/water mixture release; 1997 wastewater discharge; and two 1997 non-contact cooling water releases (Ref 6, p. 6).* Industrial solvent cleaners used in the manufacturing process included PCE; TCE; 1,1,1-TCA; and sulfuric acid (Refs. 6, p. 3; 33, p. 2; 34, p. 41).

This discussion gives the public background on the handling of waste materials and history of various releases of wastes at BDT. Chrysler did not deny the statements were true.

Furthermore, as noted by Chrysler, because the focus of the HRS evaluation was on chlorinated solvents, even if these statements were removed, there would be no effect on the HRS score for the site.

3.10.5 Ground Water Remediation System

Comment: Chrysler claimed that in two places in the HRS documentation record, citations to the status of a ground water remediation system were to the wrong page of the reference, and that the discussion improperly suggests the system stopped operating in December 2006.

Response: The page numbers cited in the HRS documentation record at proposal were stated consistently with the Notes to Reader section on page 2 of the HRS documentation record at proposal.

Page 2 of the HRS documentation record at proposal states that: “[i]f the reference cited has an original (or native) page number and a repaginated number, then the repaginated number is cited.”

Pages 19 and 40 of the HRS documentation record at proposal state:

A ground water remediation system was designed and installed at the site and operated from June 2004 through December 2005 (Ref. 5, p. 8). The ground water system removed a total of 1,031 pounds of VOCs (Ref. 5, p. 8). (Emphasis added.)

Reference 5, the *Administrative Settlement Agreement and Order on Consent for Removal Action in the Matter of Behr VOC Plume Site, Dayton, Montgomery County, Ohio*, a copy of which is in the docket for this site, has an original page number in the upper right hand corner, and a repaginated number on the lower right hand corner. The information referred to is on page 6 according to the original page number, but page 8 according to the repaginated page number. Therefore the citation in the HRS documentation record at proposal is correct.

Regarding what Chrysler considers to be a misrepresentation that the treatment system stopped operating in 2006, the HRS documentation record at proposal states that the system operated from June 2004

through December 2005. Reference 5, which is cited in the HRS documentation record at proposal to support this statement, on repaginated page 8 states that:

Earth Tech installed a groundwater remediation system on the Behr-Dayton facility property and began operation in June 2004. Through December 2005, the groundwater system had removed a total of 1031 pounds of VOCs, and dechlorinated 325 pounds of VOCs.

Thus, EPA did not state that the treatment system was stopped in December 2005, only that the treatment system recovered certain volumes of VOCs during a specific time period ending in December 2005. However, even if the sentence were misconstrued to mean that remediation system operations ended in December 2005, this would have no impact on the site score since neither the dates of remediation nor volume of VOCs removed were considered in calculating any factor values in the HRS evaluation. (See also Section 3.4 of this support document regarding the effect of this treatment system on the HRS evaluation.)

3.10.6 Contaminant Concentration

Comment: Chrysler stated that the reference provided for the second sentence on page 41 of the HRS documentation record at proposal, which supports the identification of a TCE concentration of 19,000 ug/L for sample MW-010S as being the highest concentration immediately downgradient of the Behr property, “does not provide appropriate support to the assertion” and that the “statement has no basis as presented in the text and therefore cannot be properly evaluated.” Chrysler continued that as of February 2008, the well had “concentrations of TCE present at 4,290ug/L, not 19,000ug/L.” Chrysler concluded that the “HRS documentation record inaccurately states concentrations more than four times what current data shows.”

Response: The TCE concentration of 19,000 ug/L was appropriately documented in the HRS documentation record at proposal, and its use in establishing an observed release was consistent with the HRS.

The sentence Chrysler referred to in its comment is on page 41 of the HRS documentation record at proposal:

However, the highest concentration of TCE is present immediately downgradient of the Behr property at 19,000 ug/L for MW-010S (Section 2.2.2, Source 1, Section 3.1.1, Observed Release—Behr Property, and Figures 2 and 3 of this HRS documentation record.)

EPA agrees that the citation to other parts of the HRS documentation record was partially incorrect.

Section 2.2.2 is on page 24 of the HRS documentation record at proposal and is part of the Source 1 discussion but is titled “Hazardous Substances Available to a Pathway,” not “Source 1.” Section 2.2.2 also does not discuss this contaminant concentration. (This citation has been removed from the HRS documentation record at promulgation.)

Section 3.1.1 extends from page 32 to 44 of the HRS documentation record at proposal and is titled “Observed Release” not “Observed Release-Behr Property.” (The section title in the citation has been corrected in the HRS documentation record at promulgation.) Section 3.1.1 contains on page 38 a table titled “Contaminant Concentrations-Behr Property-Source 1.” The fourth row of this table identifies that a sample from Well MW-010S had a TCE concentration of 19,000 D ug/L. (A footnote to the table on

page 39 explains that the “D” simply indicates that the compound was analyzed at a secondary dilution factor, which does not affect the accuracy of the value.) The citations supporting the 19,000 D ug/L concentration are presented in the seventh column of the table on page 39 and cite various pages of References 4, 13, 13a, 18, 20 and 21. These references contain the laboratory reports for the analysis and the data quality documentation reported on page 39. Therefore, the citation to Section 3.1.1 of the HRS documentation record at proposal correctly pointed the reader to the documentation supporting this analytical result.

Regarding Figures 2 and 3 on pages 15 and 16 of the HRS documentation record at proposal, Figure 2 presents the location of this analytical result in relation to the BDT facility. Figure 3 shows the local flow direction at the time of the sampling event.

Therefore, citations given for Section 3.1.1 and Figures 2 and 3 of the HRS documentation record at proposal adequately support the concentration, location, and relative flow direction of the location of sample MW-010S.

3.10.7 Recharge Source for the Lower Aquifer

Comment: Chrysler disagreed with a statement on page 29 of the HRS documentation record at proposal attributed to a study performed by Norris (USGS) that most of the recharge to the lower aquifer is due to leakage from the upper aquifer, instead of that primary sources were the Great Miami and Mad Rivers.

Response: No changes to the HRS documentation record or to the HRS score as proposed have been made based on this comment. EPA’s and Chrysler’s assertions are not in conflict with each other.

The paragraph on page 29 of the HRS documentation record at proposal, with the sentence referred to in italics, states:

Till layers generally act as confining layers, controlling aquifer recharge and creating barriers to ground water flow. *Norris examined recharge to the aquifer underlying a regional till layer and found that leakage through the confining layer was responsible for most of the ground water recharge to the lower aquifer. This leakage was not assumed to represent a breach in the till layer but rather uniform transmission of water through the till under a hydraulic gradient. A leakage coefficient was computed for the till of 0.003 gallon per day per cubic foot (Ref. 8, p. 57).*

The above paragraph is a quotation from Reference 8, repaginated page number 57, of the HRS documentation record at proposal.

Reference 4, pages 11 and 12 (both original and as repaginated) of the HRS documentation record at proposal states:

The Great Miami and Mad Rivers are the primary source of recharge water to Dayton’s well fields. Recharge occurs from leakage through the bottom of river bottoms, nearby lakes, and artificial recharge lagoons. Unpaved areas contribute some recharge to the underlying aquifer as does ground water flow from upland areas.

Reference 51, page 16 (original page; repaginated page 16 does not discuss this topic) of the HRS documentation record at proposal states on this subject:

Till being relatively impermeable, is a major factor in the hydrologic cycle in the Dayton area because it is generally interbedded with the sand and gravel deposits in the large valleys and it slows recharge to the underlying aquifers.

There is no actual conflict between these statements because water from the two rivers would have to pass through the till layer identified by both EPA and Chrysler (or via areas where the till layer is absent) to reach the lower aquifer. As discussed in section 3.5 and its subsections of this support document, neither the Mad River nor the Great Miami River nor flow divides related to them are aquifer discontinuities that transect the upper aquifer. Thus, water from these rivers would have to pass through the till layer (where present) to recharge the lower aquifer.

EPA notes that Chrysler's claim that the rivers recharge the lower aquifer is inconsistent with Chrysler's assertion that the till layer below the rivers and between the upper and lower aquifers is an aquifer discontinuity that stops interconnection between the two aquifers (e.g., see sections 3.5 and its subsections and 3.10.8 of this support document).

3.10.8 *Hydraulic Interconnection*

Comment: Chrysler stated that EPA provided no reference to support a statement that the hydraulic interconnection between the upper and lower aquifer is "well established." It argued that there may be large areas where the till layer is an effective confining unit separating the upper and lower aquifers, and that aquifer discontinuities exist in the area of the Behr plant to establish that there is no hydraulic interconnection between the aquifers.

Response: The assertion that the interconnection is "well established" is supported by the rationale presented in the HRS documentation record at proposal that leads up to this conclusive statement. As it is a conclusion, it needs no specific reference citation.

The statement that Chrysler noted in its comment appears on page 31 of the HRS documentation record at proposal:

The hydraulic interconnection between the upper and lower aquifers, therefore, is well established, and the lower and upper aquifer system is referred to as the unconsolidated aquifer. (Emphasis added.)

The "therefore" in the sentence connotes that this is a conclusion. The sentence is at the end of a section of the HRS documentation record at proposal on pages 30-31 titled Aquifer Interconnection, but also reflects information presented earlier in section 3.0.1 of the HRS documentation record at proposal titled General Considerations. This section of the HRS documentation record at proposal gives both regional and local geologic and hydrogeologic information for the area and defines the aquifer evaluated in the HRS scoring. (See section 3.5 of this support document and its subsections for EPA's response to Chrysler's comments on the adequacy of this conclusion.)

3.10.9 *Location of Background Wells*

Comment: Chrysler cited an EPA statement identifying that several background wells were upgradient of contaminated wells used to establish an observed release, and commented that "[i]n addition to noting that contamination attributed to the BDT site cannot flow to the municipal wells (because they are also upgradient), use of the wells as background proves that in fact, contamination *is not* flowing in that direction." (Emphasis added by Chrysler.)

Response: That the background wells are upgradient of the site does not necessarily mean that contaminant flow could not reverse in the future, that users of the municipals well that are presently upgradient of the BDT facility are not potentially threatened in the future, or that these users were incorrectly included in the HRS scoring.

The sentence referred to by Chrysler is in a paragraph in the HRS documentation record at proposal that explains why specific wells were chosen to represent background conditions for the purposes of establishing an observed release attributable to the site. This section does not discuss the eligibility of users of upgradient wells for a water supply to be included as targets in the HRS scoring. Section 3.5 and its subsections and section 3.9 of this support document explain that flow direction is not a factor considered when determining the extent of the aquifer being evaluated and the eligibility of potential targets. Projecting future flow direction of ground water is beyond the scope of an HRS investigation; a more thorough evaluation of the site may be performed later in the Superfund process.

3.10.10 *Flow Direction in 1988*

Comment: Chrysler questioned the adequacy of the reference supporting a statement in the HRS documentation record at proposal that in 1998 the ground water flow direction was toward the City of Dayton South Miami Well Field. Chrysler stated that the citation was to page 6 of a document that is only 3 pages in length. Chrysler also noted that the statement contradicts other statements in the HRS documentation record and that it appeared that the determination was made on old data from a very limited number of wells.

Response: EPA agrees that the citation in the HRS documentation record at proposal in support of the questioned statement was not correct. Instead of Reference 45, the HRS documentation record as proposed should have identified Reference 42. In addition, the date of the sampling event was 1988, not 1998. The HRS documentation record at promulgation has been revised to cite the correct reference (Reference 42) where appropriate and to correct the sampling date. EPA also identified errors in citations to References 41, 42, 43, 44, and 45 and has corrected these throughout the HRS document record at promulgation. None of the citations corrected referenced information directly used in the HRS scoring of the site, and therefore these corrections had no impact on the HRS score.

The sentence Chrysler commented on is in a section on page 42 of the HRS documentation record at proposal discussing a possible off-site source, Gem City Chemicals, and refers to the flow direction at that facility based on information collected during a 1988 (not a 1998) investigation. This section states, with the sentence in question shown in italics:

. . . The site is located at the south boundary of the City of Dayton's well field protection area (Ref. 45, p. 6). *The ground water flow direction at the time of the 1998 [sic] investigation was towards the City of Dayton South Miami Well Field (Ref. 45, p. 6).* A numerical ground water modeling study suggested that the leading edge of the ground water plume from the site would reach South Miami Well Field within three years (Ref. 45, p. 6). . .

Reference 42 of the HRS documentation record at proposal is an *Amendment to the Directors Final Findings and Orders of July 6, 1992* before the Ohio EPA, In the Matter of Gem City Chemicals. Page 6 of this document is part of the "Findings of Fact Determinations, and Conclusions of Law" section of the document and states:

11. Currently, the direction of local ground water flow from beneath the Site [Gem CITY Chemicals] has been calculated to the north-north east, in the direction of the South Miami Well Field of the City of Dayton.”

This citation error has no impact on the HRS site score for the BDT facility. The ground water flow direction at the Gem City Chemical facility was not considered in the scoring of the BDT site, nor does the date of the study impact any HRS score.

That the site-specific flow direction was to the north toward the South Miami Well Field at the Gem City Chemical facility at one particular point in time is not contradictory to the general overall flow direction to the south and southeast at the BDT facility. In fact, it illustrates that flow direction can vary locally and over time, and is consistent with Figure 4 of the HRS documentation record at proposal that shows a localized easterly component of flow near the BDT facility and the Gem City facility. (See sections 3.10, 3.10.2, and 3.10.3 of this support document for discussions of flow direction and its impact on HRS scoring of the BDT site.)

3.10.11 Identification of Target Wells

Comment: Chrysler disagreed with HRS documentation record statements identifying that the Great Miami and the Mad River Well Fields are eligible targets because there are aquifer discontinuities between the site and the well fields, and that “[t]he primary targets are the populations served by municipal wells that could potentially be exposed to contaminated drinking water.” Chrysler also stated that “[p]otential other sources, GEM, DAP and Gayston are all identified in the HRS document and are both upgradient of the Behr Plant and closer to the Miami River Well Field.”

Response: The population served by the two well fields was correctly identified as eligible targets for the BDT HRS scoring. As discussed in section 3.5 of this support document and its subsections, there are no aquifer discontinuities between the BDT site and the two well fields. As discussed in section 3.9 of this support document, the users of the well field were correctly identified and scored as potential targets in the HRS scoring.

Regarding the presence of other sources being upgradient of and closer to the Miami River Well Field than the BDT site, this situation does not have any impact on the identification of the population served by the well field as targets. The HRS does not require the site being evaluated to be the only possible source or site threatening the targets included in the scoring.

4. Conclusion

The original HRS score for this site was 50.00. Based on the above response to comments, the score remains unchanged. The final scores for the Behr Dayton Thermal Systems site are:

Ground Water: 100.00
Surface Water: Not Scored
Soil Exposure: Not Scored
Air Pathway: Not Scored

HRS Score: 50.00